UNIVERSITI MALAYSIA PERLIS

ACADEMIC GUIDE BOOK
DIPLOMA & BACHELOR DEGREE PROGRAMME

BUKU PANDUAN

AKADEMIK

PROGRAM DIPLOMA & SARJANA MUDA



SIDANG AKADEMIK
2020/2021
ACADEMIC SESSION

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dan/and

semua Dekan-dekan Fakulti dan Pengarah Pusat/Unit di Universiti Malaysia Perlis.
all Deans and Directors of Centres/Units in Universiti Malaysia Perlis.

serta/and

kepada semua staf di Bahagian Pemantapan Akademik (AED), Pusat Pengurusan Akademik, Universiti Malaysia Perlis.
all the staff at Academic Enhancement Division (AED), Academic Management Centre, Universiti Malaysia Perlis.

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* Dari semasa ke semasa, universiti mungkin melakukan perubahan kepada beberapa aspek kurikulum dan sistem akademik tertentu bagi memenuhi keperluan semasa. Semua pelajar akan dimaklumkan dan tertakluk kepada perubahan tersebut.
** From time to time, the university may amend certain aspects of curriculum and academic system in order to fulfil current needs and requirements. All students shall be informed of and are subject to the change.*

PENGENALAN/*INTRODUCTION:*

Buku Panduan Program Diploma dan Ijazah Sarjana Muda ini disediakan untuk membantu pelajar baru dalam memahami proses dan prosedur yang berkaitan dengan pengajian mereka di UniMAP. Pelajar perlu menggunakan buku ini sebagai panduan utama dalam merancang dan membuat keputusan mengenai kursus yang akan diambil dari semester pertama sehingga semester akhir pengajian. Buku panduan ini juga memberikan beberapa maklumat asas mengenai sistem akademik, struktur program, senarai kursus yang ditawarkan bersama-sama dengan sinopsis, sumber rujukan, senarai kakitangan dan maklumat berkaitan yang lain. Diharapkan pelajar akan mendapat manfaat daripada maklumat yang diberikan dalam buku panduan untuk merancang pengajian mereka di UniMAP.

The Academic Guidebook for Diploma and Bachelor's Degree Programme is prepared to assist newly-enrolled UniMAP students in understanding processes and procedures that are related to their studies in UniMAP. Students should use this book as the main guide in the planning and selection of courses to be taken starting from the first semester until the final semester of their studies. This guidebook also provides some basic information on the academic system, programme structures, list of courses offered (with the synopsis), references, list of staff members and other related information. It is hoped that students will benefit from the information provided in this guidebook and use the information to plan their studies in UniMAP.

Senarai Faculty/List of Faculty:

1. Fakulti Teknologi Kejuruteraan Elektrik/ Faculty of Electrical Engineering Technology
2. Fakulti Teknologi Kejuruteraan Elektronik / Faculty of Electronic Engineering Technology
3. Fakulti Teknologi Kejuruteraan Mekanikal /Faculty of Mechanical Engineering Technology
4. Fakulti Teknologi Kejuruteraan Kimia/ Faculty of Chemical Engineering Techonolgy
5. Fakulti Teknologi Kejuruteraan Awam /Faculty of Civil Engineering Techonolgy
6. Fakulti Sains Gunaan & Kemanusiaan / Faculty of Applied and Human Sciences

Senarai Program Pengajian /*List of Programmes:*

1.Muda Kejuruteraan Mikroelektronik dengan Kepujian / *Bachelor of Microelectronic Engineering with Honours*
2.Sarjana Muda Kejuruteraan Elektronik dengan Kepujian / *Bachelor of Electronic Engineering with Honours*
3.Sarjana Muda Kejuruteraan Komputer dengan Kepujian / *Bachelor of Computer Engineering with Honours*
4.Sarjana Muda Kejuruteraan Mekatronik dengan Kepujian / *Bachelor of Mechatronic Engineering with Honours*
5.Sarjana Muda Kejuruteraan Mekanikal dengan Kepujian / *Bachelor of Mechanical Engineering with Honours*
6.Sarjana Muda Kejuruteraan Elektronik Bioperubatan dengan Kepujian / *Bachelor of Biomedical Electronic Engineering with Honours*
7.Sarjana Muda Kejuruteraan Elektrik dengan Kepujian / *Bachelor of Electrical Engineering with Honours*
8.Sarjana Muda Kejuruteraan Pembuatan dengan Kepujian / *Bachelor of Manufacturing Engineering with Honours*
9.Sarjana Muda Kejuruteraan Bahan dengan Kepujian / *Bachelor of Material Engineering with Honours*
10.Sarjana Muda Kejuruteraan Polimer dengan Kepujian / *Bachelor of Polymer Engineering with Honours*
11.Sarjana Muda Kejuruteraan Kimia dengan Kepujian / *Bachelor of Chemical Engineering with Honours*
12.Sarjana Muda Kejuruteraan Pertanian dengan Kepujian / *Bachelor of Agricultural Engineering with Honours*
13.Sarjana Muda Kejuruteraan Alam Sekitar dengan Kepujian / *Bachelor of Environmental Engineering with Honours*
14.Sarjana Muda Kejuruteraan Awam dengan Kepujian / *Bachelor of Civil Engineering with Honours*
15.Sarjana Muda Teknologi Kejuruteraan Kimia (Bioteknologi Industri) dengan Kepujian / *Bachelor of Chemical Engineering Technology (Biotechnology Industry) with Honours*
16. Sarjana Muda Teknologi Kejuruteraan Elektronik (Reka Bentuk Rangkaian Elektronik) dengan Kepujian / *Bachelor of Electronic Engineering Technology (Electronic Network Design)with Honours*
17.Sarjana Muda Teknologi Kejuruteraan Elektrik (Kuasa Industri) dengan Kepujian/ *Bachelor of Electrical Engineering Technology (Industrial Power) with Honours*
18.Sarjana Muda Teknologi Kejuruteraan Mekanikal (Pemesinan) q dengan Kepujian / *Bachelor of Mechanical Engineering Technology (Machining)with Honours*
19.Sarjana Muda Teknologi Kejuruteraan Mekanikal (Sistem Pertanian) dengan Kepujian / *Bachelor of Mechanical Engineering Technology (Agricultural Systems)with Honours*
20.Sarjana Muda Teknologi Kejuruteraan Awam (Pembinaan) dengan Kepujian / *Bachelor of Civil Engineering Technology (Construction) with Honours*
21.Sarjana Muda Teknologi Kejuruteraan Mekanikal (Reka Bentuk Produk) dengan Kepujian/ *Bachelor of Mechanical Engineering Technology Product Design)with Honours*
22.Sarjana Muda Teknologi Kejuruteraan Mekanikal (Pemprosesan Bahan) dengan Kepujian / *Bachelor of Mechanical Engineering Technology (Materials Processing) with Honours*
23.Sarjana Muda Teknologi Kejuruteraan Elektrik (Teknologi Robotik dan Automasi) dengan Kepujian / *Bachelor of Electrical Engineer ing Technology (Robotic and Automation Technology)with Honours*
24.Sarjana Muda Teknologi Kejuruteraan Elektronik (Sistem Elektronik) dengan Kepujian / *Bachelor of Electronic Engineering Technology (Electronic Systems) with Honours*
25.Sarjana Muda Teknologi Kejuruteraan Elektronik (Rekabentuk Telekomunikasi Elektronik) dengan Kepujian / *Bachelor of Electronic Engineering Technology (Electronic Telecommunication Design)with Honours*
26.Sarjana Muda Teknologi Kejuruteraan Kimia (Proses Kimia Industri) dengan Kepujian / *Bachelor of Chemical Engineering Technology (Industrial Chemical Process) with Honours*
27.Sarjana Muda Teknologi Kejuruteraan Kimia (Teknologi Makanan) dengan Kepujian / *Bachelor of Chemical Engineering Technology (Food Technology) with Honours*
28.Sarjana Muda Perniagaan (Kepujian) (Keusahawanan Kejuruteraan) /

Bachelor of Business (Honours) (Entrepreneurial Engineering)

29. Sarjana Muda Perniagaan (Kepujian) (Perniagaan Antarabangsa) / *Bachelor of Business (Honours) (International Business)*
30. Sarjana Muda Komunikasi Media Baharu (Kepujian) / *Bachelor of New Media Communication (Honours)*
31. Sarjana Muda Teknologi Penyelengaraan Sistem Elektrik/ *Bachelor of Technology In Electrical System Maintenance With Honours*
32. Sarjana Muda Teknologi Automasi Elektrik Industri/ *Bachelor of Technology In Industrial Electronic Automation With Honours*
33. Sarjana Muda Teknologi Automotif dengan Kepujian / *Bachelor of Technology in Automotive with Honours*
34. Sarjana Muda Teknologi Kimpalan dengan Kepujian/ *Bachelor of Technology in Welding with Honours*
35. Sarjana Muda Teknologi Pemesinan Industri dengan Kepujian/ *Bachelor of Technology in Industrial Machining with Honours*
36. Sarjana Muda Teknologi Pembinaan Bangunan dengan Kepujian/ *Bachelor of Technology in Building Construction with Honours*
37. Diploma Kejuruteraan Komputer / *Diploma in Computer Engineering*
38. Diploma Kejuruteraan Elektrik / *Diploma in Electrical Engineering*
39. Diploma Kejuruteraan Mekatronik / *Diploma in Mechatronic Engineering*
40. Diploma Kejuruteraan Pembuatan / *Diploma in Manufacturing Engineering*
41. Diploma Kejuruteraan Elektronik / *Diploma in Electronic Engineering*
42. Diploma Kejuruteraan Metalurgi / *Diploma in Metallurgical Engineering*

MISI/*MISSION:*

Melahirkan insan kamil yang menyumbang kepada agenda pembangunan dan daya saing industri negara.
To produce exemplary individuals who contribute to the nation's development and industry competitiveness agenda.

VISI/*VISION:*

Universiti Teknikal yang berdaya saing di persada antarabangsa.
An internationally competitive technical university.

NILAI TERAS/ *CORE VALUES*
Ilmu, Keikhlasan, Kecemerlangan
Knowledge, Sincerity, Excellence

LAGU UniMAP/UniMAP ANTHEM:

WAWASANKU
Universiti Malaysia Perlis
Alam Kejuruteraan
Ilmu Keikhlasan Kecemerlangan
Wawasan Jiwa Kita

Berdikari rohaniah
Berteknologi
Pemimpin Berbestari
Untuk Bangsa Insan Dan Umat dunia
Negara Yang Tercinta

Universiti Malaysia Perlis
Alam Kejuruteraan
Ilmu Keikhlasan Kecemerlangan
Wawasan Jiwa Kita

ACADEMIC GUIDE BOOK
BACHELOR DEGREE PROGRAM | BUKU PANDUAN

AKADEMIK

PROGRAM SARJANA MUDA



D.Y.T.M. TUANKU SYED FAIZUDDIN PUTRA IBNI TUANKU SYED SIRAJUDDIN PUTRA JAMALULLAIL D.K., S.P.M.P.

RAJA MUDA PERLIS / *CROWN PRINCE OF PERLIS*
(CANSELOR UniMAP / *CHANCELLOR OF UniMAP*)

SIDANG AKADEMIK / ACADEMIC SESSION 2020/2021

ACADEMIC GUIDE BOOK
BACHELOR DEGREE PROGRAM | BUKU PANDUAN

AKADEMIK

PROGRAM SARJANA MUDA



D.Y.T.M TUANKU HAJAH LAILATUL SHAHREEN AKASHAH KHALIL

RAJA PUAN MUDA PERLIS / *CROWN PRINCE OF PERLIS*
(PRO CANSELOR UniMAP / *PRO CHANCELLOR OF UniMAP*)

SIDANG AKADEMIK / ACADEMIC SESSION 2020/2021

KATA ALUAN NAIB CANSELOR / FOREWORD BY THE VICE CHANCELLOR OF UniMAP

Bismillahirrahmanirrahim
Dengan Nama Allah Yang Maha Pemurah Lagi Maha Mengasihani.

Assalamualaikum Warahmatullahi Wabarakatuh.
Salam Ilmu, Keikhlasan Kecemerlangan UniMAP.
Di sini, saya ingin memanjatkan rasa syukur ke hadrat Allah SWT kerana dengan limpah dan kurnia-Nya, Buku Panduan Akademik Program Pengajian Diploma & Ijazah Sarjana Muda Sidang Akademik 2020/2021 dapat diterbitkan bagi membantu saudara/saudari sebagai pelajar baharu untuk memahami proses dan prosedur yang berkaitan dengan pengajian saudara/saudari di universiti ini.

Saya mewakili pihak pentadbiran Universiti Malaysia Perlis (UniMAP) ingin mengucapkan selamat datang dan setinggi-tinggi tahniah atas kejayaan saudara/saudari yang terpilih untuk menyambung pengajian di UniMAP bagi Sidang Akademik 2020/2021. Sesungguhnya UniMAP merupakan pilihan yang tepat kerana UniMAP sentiasa berusaha dalam merealisasikan matlamatnya sebagai penyumbang utama dalam pembangunan insan yang berkepakaran tinggi selari dengan kehendak dan keperluan Negara.

Program yang ditawarkan oleh UniMAP digubal agar memenuhi keperluan industri di mana struktur kurikulumnya memenuhi standard yang telah ditetapkan oleh Board of Engineers Malaysia (BEM) dan Malaysian Qualifications Agency (MQA). Sebenarnya pelbagai faktor yang menjadi penyumbang kepada kekuatan ini, antaranya penglibatan industri dalam pembentukan, pelaksanaan dan penilaian kepada program pengajian yang kita tawarkan ini.

Besarlah harapan UniMAP agar saudara/saudari akan berusaha membuktikan kecemerlangan diri bukan sahaja melalui akademik tetapi juga sahsiah diri kerana itu juga merupakan bukti kejayaan di sini. Bermula dari saat ini, manfaatkanlah segala peluang yang ada sehingga saudara/saudari berjaya dengan cemerlang tatkala menggenggam segulung ijazah kelak.

Akhir kata sebagai mahasiswa dan mahasiswi UniMAP, jagalah amanah dan tanggungjawab sebagai pelajar UniMAP demi kepentingan diri, keluarga, masyarakat dan negara tercinta. Selamat Maju Jaya!

In the name of Allah, Most Gracious, Most Merciful

I would like to express my gratitude to Allah SWT because it is with His Grace that we are able to publish the 2020/2021 Academic Session Diploma & Bachelor's Degree Programme Academic Guidebook. This guidebook will aid you as a newly-enrolled UniMAP student to understand the processes and procedures relevant to your time here at this university.

On behalf of the administration of Universiti Malaysia Perlis (UniMAP), I would like to welcome you to UniMAP and congratulate you for being selected to pursue your Diploma & Bachelor's Degree studies at UniMAP. Your decision to choose UniMAP is the right choice as we always strive to realise our goal as primary contributor of highly skilled talent in line with the country's needs and demands.

The programmes offered by UniMAP are aligned to the needs of the industries. Our curriculum structure fulfils the standards set by the Board of Engineers Malaysia (BEM) and the Malaysian Qualifications Agency (MQA). Many factors contribute to our strengths, particularly our involvement with the industry in the development, implementation and assessment of our programmes.

It is our utmost hope that you will strive for excellence not only in academics but also develop your personality as that is also part of the success valued here in UniMAP. Starting from now on, grab every opportunity that comes your way until you graduate with a bachelor's degree in your hands.

Last but not least, it is very important to remember that as a UniMAP student, upholding the value of integrity and responsibility are equally important not just for your own good but also for your family, society, and for the beloved country. Good luck and all the best!
Wassalam.

YBhg. Prof. Ir. Ts. Dr. R.Badlishah Ahmad
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Universiti Malaysia Perlis

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Pendaftar / *Registrar*



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Bendahari / *Bursar*



Pn. Mazmin Mat Akhir
Ketua Pustakawan /
Chief Librarian

KALENDAR AKADEMIK DIPLOMA / *DIPLOMA ACADEMIC CALENDAR*
SIDANG AKADEMIK / *ACADEMIC SESSION 2020/2021*

AKTIVITI/ *ACTIVITIES*	SEMESTER PERTAMA/*FIRST SEMESTER* 17 Ogos 2020 - 31 Januari 2021 (20 minggu/*weeks*)		
	JANGKA MASA/*DATE*	TEMPOH/ *DURATION*	CATATAN/ *NOTES*
Pendaftaran Pelajar Baru / Minggu Suai Kenal/ *New Intake Registration*	8 - 16 Ogos 2020	7 hari/*day*	
Kuliah/ *Lectures*	17 Ogos - 14 Oktober 2020	7 minggu/*weeks*	**Awal Muharram** 20.08.2020 [Khamis/*Thusday*] **Hari Kebangsaan / *National Day*** 31.08.2020 [Isnin/*Monday*] **Hari Malaysia /*Malaysia Day*** 16.09.2020 [Rabu/*Wednesday*]
Cuti Pertengahan Semester/ *Mid. Semester Break*	5 - 11 Oktober 2020	1 minggu/*weeks*	
Kuliah/ *Lectures*	12 Oktober - 29 November 2020	7 minggu/*weeks*	**Maulidur Rasul / *Prophet Muhammad's Birthday*** 29.10.2020 [Khamis/*Thusday]* **Hari Deepavali/*Deepavali*** 14.11.2020 [Sabtu/*Saturday*]
Minggu Ulangkaji/ *Revision Week*	30 November - 6 Disember 2020	1 minggu/*weeks*	-
Cuti Khas/ *Special Break*	7 - 13 Disember 2020	1 minggu/*weeks*	
Peperiksaan/ *Examination*	14 Disember 2020 - 3 Januari 2021	3 minggu/*weeks*	**Hari Krismas / *Christmas*** 25.12.2020 [Jumaat/*Friday*]
Cuti Antara Semester/ *Semester Break*	4 - 31 Januari 2021	4 minggu/*weeks*	

KALENDAR AKADEMIK DIPLOMA / *DIPLOMA ACADEMIC CALENDAR*
SIDANG AKADEMIK / *ACADEMIC SESSION 2020/2021*

AKTIVITI/*ACTIVITIES*	**SEMESTER KEDUA/*SECOND SEMESTER*** 1 Februari - 13 Jun 2021 (19 minggu/*weeks*)		
	JANGKA MASA/*DATE*	**TEMPOH/ *DURATION***	**CATATAN/*NOTES***
Kuliah/ *Lectures*	1 Februari - 21 Mac 2021	7 minggu/*weeks*	**Tahun Baru Cina / *Chinese New Year*** 12 & 13.02.2021 [Jumaat & Sabtu / *Friday & Saturday*] **Israk Mikraj** 11.03.2021 [Khamis/*Thusday*]
Cuti Pertengahan Semester/ *Mid. Semester Break*	22 - 28 Mac 2021	1 minggu/*weeks*	-
Kuliah/ *Lectures*	29 Mac - 16 Mei 2021	7 minggu/*weeks*	**Nuzul Al-Quran** 29.04.2021 [Khamis/*Thusday*] **Hari Pekerja / Labour Day** 01.05.2021 [Sabtu/*Saturday*] **Hari Raya Aidilfitri /Eid-ul Fitr** 13 & 14.05.2021 (Khamis & Jumaat / *Thusday & Friday*)
Minggu Ulangkaji/ *Revision Week*	17 - 23 Mei 2021	1 minggu/*weeks*	
Peperiksaan/ *Examination*	24 Mei - 13 Jun 2021	3 minggu/*weeks*	**Hari Wesak / *Wesak Day*** 26.05.2021 [Rabu/*Wednesday*]
Cuti Panjang/ *Long Break*	14 Jun - 8 Ogos 2021	8 minggu/*weeks*	**Hari Keputeraan SPB YD Agong** / *Agong Birthday* 07.06.2021 [Isnin/*Monday*] **Hari Keputeraan Raja Perlis / *Birthday of DYMM Tuanku Raja Perlis*** 17.07.2021 (Jumaat/*Friday*) **Hari Raya Aidiladha / *Eid-ul Adha*** 20 & 21 Julai 2020 [Selasa & Rabu /*Tuesday & Wednesday*]

KALENDAR AKADEMIK IJAZAH SARJANA MUDA / *DEGREE ACADEMIC CALENDAR*
SIDANG AKADEMIK / *ACADEMIC SESSION 2020/2021*

AKTIVITI/*ACTIVITIES*	**SEMESTER PERTAMA/*FIRST SEMESTER*** 19 Oktober 2020 - 4 April 2021 (20 minggu/*weeks*)		
	JANGKA MASA/*DATE*	**TEMPOH/ *DURATION***	**CATATAN/ *NOTES***
Pendaftaran Pelajar Baru & Minggu Suai Kenal / *New Undergraduate Student Registration & Orientation Week*	5 - 10 Oktober 2020	7 hari/*days*	-
Kuliah /*Lectures*	19 Oktober - 6 Disember 2020	7 minggu/*weeks*	**Maulidur Rasul / Prophet Muhammad's Birthday** 29.10.2020 [Khamis/*Thursday*] **Hari Deepavali/*Deepavali*** 14.11.2020 [Sabtu/*Saturday*]
Cuti Pertengahan Semester / *Mid. Semester Break*	7 - 13 Disember 2020	1 minggu/*weeks*	
Kuliah/*Lectures*	14 Disember 2020 - 31 Januari 2021	7 minggu/*weeks*	**Hari Krismas / *Christmas*** 25.12.2020 [Jumaat/*Friday*]
Minggu Ulangkaji/*Revision Week*	1 - 7 Februari 2021	1 minggu/*weeks*	
Cuti Khas/ *Special Break*	8 - 14 Februari 2021	1 minggu/*weeks*	**Tahun Baru Cina / *Chinese New Year*** 12 & 13.02.2021 [Jumaat & Sabtu / *Friday & Saturday*]
Peperiksaan / *Examination*	15 Februari - 7 Mac 2021	3 minggu/*weeks*	-
Cuti Antara Semester/ *Semester Break*	8 Mac - 4 April 2021	4 minggu/*weeks*	**Israk Mikraj** 11.03.2021 [Khamis/*Thusday*]

KALENDAR AKADEMIK IJAZAH SARJANA MUDA / *DEGREE ACADEMIC CALENDAR*
SIDANG AKADEMIK / *ACADEMIC SESSION 2020/2021*

AKTIVITI/*ACTIVITIES*	**SEMESTER KEDUA/*SECOND SEMESTER*** 5 April - 15 Ogos 2021 (19 minggu/*weeks*)		
	JANGKA MASA/*DATE*	**TEMPOH/ *DURATION***	**CATATAN/*NOTES***
Kuliah/*Lectures*	5 April - 9 Mei 2021	5 minggu/*weeks*	**Nuzul Al-Quran** 29.04.2021 [Khamis/*Thusday*] **Hari Pekerja / Labour Day** 01.05.2021 [Sabtu/*Saturday*]
Cuti Pertengahan Semester/ *Mid Semester Break*	10 - 16 Mei 2021	1 minggu/*weeks*	**Hari Raya Aidilfitri /Eid-ul Fitr** 13 & 14.05.2021 (Khamis & Jumaat / *Thusday & Friday*)
Kuliah/*Lectures*	17 Mei - 18 Julai 2021	9 minggu/*weeks*	**Hari Wesak / *Wesak Day*** 26.05.2021 [Rabu/*Wednesday*] **Hari Keputeraan SPB YD Agong** / *Agong Birthday* 07.06.2021 [Isnin/*Monday*] **Hari Keputeraan Raja Perlis / Birthday of DYMM Tuanku Raja** 17.07.2021 [Jumaat/ *Friday*]
Minggu Ulangkaji/*Revision Week*	19 - 25 Julai 2021	1 minggu/*weeks*	**Hari Raya Aidiladha / *Eid-ul Adha*** 20 & 21 Julai 2021 [Selasa & Rabu /*Tuesday & Wednesday*]
Peperiksaan/ *Examination*	26 Julai - 15 Ogos 2021	3 minggu/*weeks*	
Cuti Panjang/ Latihan Industri	16 Ogos - 17 Oktober 2021	9 minggu/*weeks*	**Awal Muharram** 10.10.2021 Ogos [Selasa/*Tuesday]* **Hari Kebangsaan** 31.08.2021 [Selasa/*Tuesday*] **Hari Malaysia /*Malaysia Day*** 16.09.2021 [Khamis / *Thursday*]

SISTEM AKADEMIK

Kurikulum program pengajian Sarjana Muda Kejuruteraan dan Sarjana Muda Teknologi Kejuruteraan dirangka untuk dilengkapkan dalam tempoh 4 tahun, Sarjana Muda Teknologi pula dirangka untuk dilengkapkan dalam tempoh 3 1/2 tahun manakala bagi program pengajian Sarjana Muda Perniagaan, Sarjana Muda Komunikasi Media Baharu dan Diploma pula dalam tempoh 3 tahun dengan setiap Tahun Akademik atau Sidang Akademik dibahagikan kepada Semester I dan Semester II. Setiap semester mengandungi 14 minggu pembelajaran. Peperiksaan akan diadakan pada hujung semester.

Pelajar juga perlu lulus semua kursus dan mendapat jumlah kredit yang diperlukan mengikut program pengajian masing-masing serta PNGK sekurang-kurangnya 2.00 untuk bergraduat.

STRUKTUR PROGRAM

Struktur program Sarjana Muda Kejuruteraan, Sarjana Muda Teknologi Kejuruteraan, Sarjana Muda Teknologi, Sarjana Muda Perniagaan, Sarjana Muda Komunikasi Media Baharu dan Diploma Kejuruteraan dikelompokkan seperti yang ditunjukkan dalam Jadual 1 (a), (b), (c), (d), (e), (f) dan (g). Bagi tujuan pengijazahan, pelajar dikehendaki untuk mengambil sejumlah 136 unit bagi program Sarjana Muda Kejuruteraan, 141 unit bagi program Sarjana Muda Teknologi Kejuruteraan, 124 unit bagi program Sarjana Muda Teknologi, 120 unit program Sarjana Muda Perniagaan, 123 unit bagi program Sarjana Muda Komunikasi Media Baharu dan 95 unit untuk Diploma Kejuruteraan.

Jadual 1(a): Struktur Program Sarjana Muda Kejuruteraan

KURSUS	Kemasukan 2017	Kemasukan 2018	Kemasukan 2019	Kemasukan 2020
	KREDIT	KREDIT	KREDIT	KREDIT
KURSUS TERAS KEJURUTERAAN	**120**	**120**	**120**	**120**
KURSUS KEPERLUAN UNIVERSITI	**17**	**16**	**16**	**16**
a) Keusahawanan Kejuruteraan	2	2	2	2
b) Kemahiran Berfikir	2	2	-	2
c) Pengantar Falsafah	-	-	2	-
d) Bahasa Melayu Universiti	2	2	2	2
e) Bahasa Inggeris persediaan	2*	2*	2*	2*
f) Bahasa Inggeris Untuk Komunikasi Umum	2**	2**	2**	2**
g) Bahasa Inggeris Untuk Komunikasi Teknikal	2	2	2	2
h) Tamadun Islam dan Tamadun Asia (TITAS)	2	2	2	-
i) Hubungan Etnik	2	2	2	-
j) Falsafah dan Isu Semasa	-	-	-	2
k) Penghayatan Etika dan Peradaban	-	-	-	2
l) Ko-Kurikulum	3	2	2	2
m) Opsyen	2	2	2	2
JUMLAH	**137**	**136**	**136**	**136**

Penerangan:

1. **- Kursus ini wajib kepada pelajar yang mendapat Band 1 atau 2 dalam MUET*
   - *Merupakan kursus audit*
2. *** - Kursus ini wajib kepada pelajar yang mendapat Band 3 dalam MUET*

Jadual 1(b): Struktur Program Sarjana Muda Teknologi Kejuruteraan

KURSUS	Kemasukan 2017	Kemasukan 2018	Kemasukan 2019	Kemasukan 2020
	KREDIT	KREDIT	KREDIT	KREDIT
KURSUS TERAS TEKNOLOGI KEJURUTERAAN	**123**	**123**	**123**	**123**
KURSUS KEPERLUAN UNIVERSITI	**19**	**18**	**18**	**18**
a) Keusahawanan Kejuruteraan	2	2	2	2
b) Kemahiran Berfikir	2	2	-	2
c) Pengantar Falsafah	-	-	2	-
d) Bahasa Melayu Universiti	2	2	2	2
e) Bahasa Inggeris Persediaan	2*	2*	2*	2*
f) Bahasa Inggeris Untuk Komunikasi Umum	2**	2**	2**	2**
g) Bahasa Inggeris Untuk Komunikasi Teknikal	2	2	2	2
h) Tamadun Islam dan Tamadun Asia (TITAS)	2	2	2	-
i) Hubungan Etnik	2	2	2	-
j) Falsafah dan Isu Semasa	-	-	-	2
k) Penghayatan Etika dan Peradaban	-	-	-	2
l) Kemahiran & Teknologi Dalam Komunikasi	2	2	2	2
m) Ko-Kurikulum	3	2	2	2
n) Opsyen	2	2	2	2
JUMLAH	**142**	**141**	**141**	**141**

Penerangan:
*1. * - Kursus ini wajib kepada pelajar yang mendapat Band 1 atau 2 dalam MUET*
- Merupakan kursus audit
*2. ** - Kursus ini wajib kepada pelajar yang mendapat Band 3 dalam MUET*

Jadual 1(c): Struktur Program Sarjana Muda Teknologi

KURSUS	Kemasukan 2019	Kemasukan 2020
	KREDIT	KREDIT
KURSUS TERAS TEKNOLOGI	**106**	**106**
KURSUS KEPERLUAN UNIVERSITI	**18**	**18**
a) Keusahawanan Kejuruteraan	2	2
b) Pengantar Falsafah	2	-
c) Kemahiran Berfikir	-	2
d) Bahasa Melayu Universiti	2	2
e) Bahasa Inggeris Persediaan	2*	2*
f) Bahasa Inggeris Untuk Komunikasi Umum	2**	2**
g) Bahasa Inggeris Untuk Komunikasi Teknikal	2	2
h) Tamadun Islam dan Tamadun Asia (TITAS)	2	-
i) Hubungan Etnik	2	-
j) Falsafah dan Isu Semasa	-	2
k) Penghayatan Etika dan Peradaban	-	2
l) Ko-Kurikulum	2	2
m) Bahasa Ketiga	2	2
JUMLAH	**124**	**124**

Penerangan:
*1. * - Kursus ini wajib kepada pelajar yang mendapat Band 1 atau 2 dalam MUET*
- Merupakan kursus audit
*2. ** - Kursus ini wajib kepada pelajar yang mendapat Band 3 dalam MUET*

Jadual 1(d): Struktur Program Sarjana Muda Perniagaan (Keusahawanan Kejuruteraan)

KURSUS	Kemasukan 2017	Kemasukan 2018	Kemasukan 2019	Kemasukan 2020
	KREDIT	KREDIT	KREDIT	KREDIT
KURSUS TERAS PERNIAGAAN	**72**	**72**	**94**	**94**
KURSUS TERAS ELEKTIF	**30**	**33**	**12**	**12**
KURSUS KEPERLUAN UNIVERSITI	**18**	**17**	**14**	**14**
a) Keusahawanan Kejuruteraan	2	2	2	2
b) Kemahiran Berfikir	2	2	-	2
c) Pengantar Falsafah	-	-	2	-
d) Bahasa Melayu Universiti	2	2	2	2
e) Bahasa Inggeris Persediaan	2*	2*	2*	2*
f) Bahasa Inggeris Untuk Komunikasi Umum	2**	2**	2**	2**
g) Bahasa Inggeris Akademik	2	2	2	2
h) Tamadun Islam dan Tamadun Asia (TITAS)	2	2	2	-
i) Hubungan Etnik	2	2	2	-
j) Falsafah dan Isu Semasa	-	-	-	2
k) Penghayatan Etika dan Peradaban	-	-	-	2
l) Komunikasi Dalam Perniagaan	3	3	-	-
m) Ko-Kurikulum	3	2	2	2
JUMLAH	**120**	**122**	**120**	**120**

Penerangan:
*1. * - Kursus ini wajib kepada pelajar yang mendapat Band 1 atau 2 dalam MUET*
- Merupakan kursus audit
*2. ** - Kursus ini wajib kepada pelajar yang mendapat Band 3 dalam MUET*

Jadual 1(e): Struktur Program Sarjana Muda Perniagaan (Perniagaan Antarabangsa)

KURSUS	Kemasukan 2017	Kemasukan 2018	Kemasukan 2019	Kemasukan 2020
	KREDIT	KREDIT	KREDIT	KREDIT
KURSUS TERAS PERNIAGAAN	**74**	**77**	**91**	**91**
KURSUS TERAS ELEKTIF	**30**	**27**	**14**	**14**
KURSUS KEPERLUAN UNIVERSITI	**18**	**17**	**15**	**15**
a) Keusahawanan Kejuruteraan	2	2	-	-
b) Kemahiran Berfikir	2	2	-	2
c) Pengantar Falsafah	-	-	2	-
d) Bahasa Melayu Universiti	2	2	2	2
e) Bahasa Inggeris Persediaan	2*	2*	2*	2*
f) Bahasa Inggeris Untuk Komunikasi Umum	2**	2**	2**	2**
g) Bahasa Inggeris Akademik	2	2	2	2
h) Tamadun Islam dan Tamadun Asia (TITAS)	2	2	2	-
i) Hubungan Etnik	2	2	2	-
j) Falsafah dan Isu Semasa	-	-	-	2
k) Penghayatan Etika dan Peradaban	-	-	-	2
l) Komunikasi Dalam Perniagaan	3	3	-	-
m) Pengurusan Masa	-	-	3	3
n) Ko-Kurikulum	3	2	2	2
JUMLAH	**122**	**121**	**120**	**120**

Penerangan:
*1. * - Kursus ini wajib kepada pelajar yang mendapat Band 1 atau 2 dalam MUET*
- Merupakan kursus audit
*2. ** - Kursus ini wajib kepada pelajar yang mendapat Band 3 dalam MUET*

Jadual 1(f): Struktur Program Sarjana Muda Komunikasi Media Baharu

KURSUS	Kemasukan 2017	Kemasukan 2018	Kemasukan 2019	Kemasukan 2020
	KREDIT	KREDIT	KREDIT	KREDIT
KURSUS TERAS MEDIA BAHARU	**87**	**96**	**96**	**96**
KURSUS ELEKTIF	**15**	**9**	**9**	**9**
KURSUS KEPERLUAN UNIVERSITI	**18**	**18**	**18**	**18**
a) Kemahiran Berfikir	2	2	2	2
b) Pengantar Falsafah	-	-	2	-
c) Bahasa Melayu Universiti	3	2	2	2
d) Bahasa Inggeris Persediaan	2*	2*	2*	2*
e) Bahasa Inggeris Untuk Komunikasi Umum	2**	2**	2**	2**
f) Bahasa Inggeris Akademik	2	2	2	2
g) Tamadun Islam dan Tamadun Asia (TITAS)	2	2	2	-
h) Hubungan Etnik	2	2	2	-
i) Falsafah dan Isu Semasa	-	-	-	2
j) Penghayatan Etika dan Peradaban	-	-	-	2
k) Bahasa Asing	4	2	2	2
l) Ko-Kurikulum	3	2	2	2
m) Kursus Opsyen	-	2	2	2
JUMLAH	**120**	**123**	**123**	**123**

Penerangan:
*1. * - Kursus ini wajib kepada pelajar yang mendapat Band 1 atau 2 dalam MUET*
- Merupakan kursus audit
*2. ** - Kursus ini wajib kepada pelajar yang mendapat Band 3 dalam MUET*

Jadual 1(g): Struktur Program Diploma Kejuruteraan

KURSUS	Kemasukan 2017	Kemasukan 2018	Kemasukan 2019	Kemasukan 2020
	KREDIT	KREDIT	KREDIT	KREDIT
KURSUS TERAS	**83**	**81**	**81**	**81**
KURSUS KEPERLUAN UNIVERSITI	**19**	**14**	**14**	**14**
a) Keusahawanan Kejuruteraan	2	2	2	2
b) Bahasa Melayu	2	2	2	2
c) Bahasa Inggeris Komunikasi I	2	2	2	2
d) Bahasa Inggeris Komunikasi II	2	2	2	2
e) Bahasa Inggeris Komunikasi III	-	2	2	2
f) Tamadun Islam dan Tamadun Asia (TITAS)	2	-	-	-
g) Kemahiran Komunikasi	2	-	-	-
h) Hubungan Etnik	2	-	-	-
i) Pengajian Malaysia II	-	2	2	-
j) Falsafah dan Isu Semasa	-	-	-	2
k) Badan Beruniform	5	2	2	2
l) Matematik Awalan	-	2***	2***	2***
JUMLAH	**102**	**95**	**95**	**95**

Penerangan:
*1. * - Kursus ini wajib kepada pelajar yang mendapat D dan kebawah dalam subjek matematik peringkat SPM*
Merupakan kursus audit.
*2. ** - Kursus ini wajib kepada pelajar yang mendapat Band 3 dalam MUET*

JENIS-JENIS KURSUS

1.KURSUS KEPERLUAN UNIVERSITI
Kursus Keperluan Universiti ialah kursus-kursus di luar pengkhususan pelajar. Kursus-kursus ini ditawarkan oleh Pusat Sains Liberal. Semua kursus ini wajib diambil dan pelajar perlu lulus dengan gred C sebagai syarat untuk pengijazahan. Kursus-kursus tersebut ialah:

a.Keusahawanan Kejuruteraan (UUW224) - (2 kredit)
Semua pelajar wajib mengambil kursus Keusahawanan Kejuruteraan. Pelajar digalakkan mengambil kursus-kursus lain di dalam kategori 'keusahawanan', di mana unit yang dikumpul boleh dikira sebagai Kursus Opsyen.

b.Kemahiran Berfikir (UUW322) - (2 kredit)
Semua pelajar wajib mengambil kursus Kemahiran Berfikir dan wajib lulus sekurang-kurangnya C. Kursus ini ditawarkan kepada semua pelajar tempatan dan antarabangsa dan akan ditawarkan pada setiap semester.

c.Falsafah dan Isu Semasa (UUW130) – (2 kredit)
Semua pelajar wajib mengambil kursus ini. Kursus ini ditawarkan kepada pelajar tempatan dan antarabangsa dengan mengikut kepada struktur kursus dalam penawaran kurikulum program masing-masing.

d.Penghayatan Etika dan Peradaban (UVW131) – (2 kredit)
Semua pelajar wajib mengambil kursus ini. Kursus ini ditawarkan kepada pelajar tempatan dan antarabangsa dengan mengikut kepada struktur kursus dalam penawaran kurikulum program masing-masing. Pelajar perlu mendapat sekurang-kurangnya gred minimum lulus (C).

e.Kemahiran & Teknologi Dalam Komunikasi (PUW122/UUT122) – (2 kredit)
Semua pelajar program kejuruteraan wajib mengambil kursus PUW122/ UUT122 Kemahiran Teknologi Dalam Komunikasi. Kod kursus PUW122 diambil oleh pelajar program-program Kejuruteraan Teknologi. Manakala, kod kursus UUT122 diambil oleh pelajar program-program Kejuruteraan. Kursus ini ditawarkan kepada pelajar tempatan dan antarabangsa dengan mengikut kepada struktur kursus dalam penawaran kurikulum program masing-masing.

f.Bahasa Melayu Universiti (UVW410) - (2 kredit)
Kursus ini wajib diambil oleh semua pelajar tempatan (termasuk pelajar antarabangsa daripada negara-negara di mana bahasa Melayu diamalkan sebagai bahasa kebangsaan atau bahasa pertuturan mereka, seperti pelajar dari Indonesia, Brunei dan Singapura).

g.*Bahasa Inggeris Persediaan (UVA101) – (2 kredit)
Pelajar dengan salah SATU kriteria berikut perlu mendaftar kursus ini,
- Memperolehi keputusan MUET Band 1 atau 2.
- Memperolehi keputusan MUET Band 3 bagi Program EPPP / (pelajar antarabangsa sahaja)
- Memperolehi keputusan TOEFL 459/ IELTS 3.5 ke bawah (pelajar / pascasiswazah sahaja)

h.Bahasa Inggeris untuk Komunikasi Umum (UVW201) – (2 kredit)**
Pelajar dengan salah SATU kriteria berikut perlu mendaftar kursus ini,
- Memperolehi keputusan MUET Band 3.
- Lulus Bahasa Inggeris Persediaan (UVA 101) dengan minimum gred C

i.Bahasa Inggeris Untuk Komunikasi Teknikal (UVW312) /Bahasa Inggeris Akademik (UVW313) - (2 kredit)
Semua pelajar wajib mengambil kursus Bahasa Inggeris untuk Komunikasi Teknikal (bagi program Sarjana Muda Kejuruteraan dan Sarjana Muda Teknologi Kejuruteraan) atau kursus Bahasa Inggeris Akademik (bagi program Sarjana Muda Perniagaan dan Sarjana Muda Komunikasi Media Baharu). Bagaimanapun, bergantung kepada keputusan MUET, pelajar-pelajar diwajibkan mengikuti beberapa kursus Bahasa Inggeris lain terlebih dahulu sebelum dibenarkan mengambil kursus Bahasa Inggeris untuk Komunikasi Teknikal atau kursus Bahasa Inggeris Akademik seperti ditunjukkan dalam Jadual 2.

Pelajar yang memperolehi Band 1 atau 2 dalam MUET diwajibkan terlebih dahulu mengambil Bahasa Inggeris Asas (Foundation English) iaitu kursus 2 unit tidak berkredit (audit) dan perlu mendapat kelulusan minimum Gred C sebelum dibenarkan mengambil kursus Bahasa Inggeris Umum (English for

General Purposes) sebanyak 2 unit dan kursus Bahasa Inggeris untuk Komunikasi Teknikal (English for Technical Communication) atau Bahasa Inggeris Akademik (English for Academic Purposes) sebanyak 2 unit. Gred Lulus minimum bagi semua kursus Bahasa Inggeris ialah gred C.

Bagi pelajar yang memperolehi Band 3 dalam MUET diwajibkan mengambil mengambil kursus Bahasa Inggeris Umum (English for General Purposes) iaitu kursus 2 unit sebelum dibenarkan mengambil kursus Bahasa Inggeris untuk Komunikasi Teknikal (English for Technical Communication) atau Bahasa Inggeris Akademik (English for Academic Purposes). Pelajar yang memperolehi Band 3 dalam MUET tidak perlu mengambil kursus Bahasa Inggeris Asas (Foundation English).

Pelajar yang memperolehi Band 4 atau 5 dalam MUET pula hanya diwajibkan mengambil kursus Bahasa Inggeris untuk Komunikasi Teknikal (English for Technical Communication) atau Bahasa Inggeris Akademik (English for Academic Purposes). Pelajar yang memperolehi Band 4 atau 5 dalam MUET tidak perlu mengambil Bahasa Inggeris Asas (Foundation English) atau kursus Bahasa Inggeris Umum (English for General Purposes).

Bagi pelajar yang mendapat Band 1, 2 dan 3, dua (2) unit yang diperolehi melalui kursus Bahasa Inggeris Umum (English for General Purposes) boleh dikira sebagai Kursus Opsyen. Kursus Opsyen lain juga dibuka kepada pelajar yang mendapat MUET band 1,2 dan 3 untuk memberi nilai tambah kepada pelajar. Walau bagaimanapun, jumlah kredit bergraduat bagi pelajar yang mendapat MUET band 1,2 dan 3 yang mengambil Kursus Opsyen (selain kursus Bahasa Inggeris Umum yang telah dikira sebagai Kursus Opsyen) akan menjadi 139 unit bagi program Ijazah Kejuruteraan dan 144 unit bagi program Teknologi Kejuruteraan. Pelajar yang mendapat Band 4 dan 5 dalam MUET wajib mengambil Kursus Opsyen.

Jadual 2: Kursus Bahasa Inggeris Wajib

Band MUET	KURSUS BAHASA INGGERIS WAJIB			
	UVA101 Bahasa Inggeris Persediaan (Tidak Berkredit)	UVW201 Bahasa Inggeris untuk Komunikasi Umum	UVW312 Bahasa Inggeris untuk Komunikasi Teknikal / UVW313 Bahasa Inggeris Akademik	Kursus Opsyen (Bahasa Asing)
BAND 1 & 2	/	/	/	Pendaftaran dibuka kepada para pelajar
BAND 3		/	/	
BAND 4			/	/

Nota:
UVA 101- Bahasa Inggeris Persediaan merupakan kursus baharu yang ditawarkan kepada pelajar Kohort 2018/2019 dan seterusnya.

UVW 201-Bahasa Inggeris untuk Komunikasi Umum merupakan kursus baharu yang ditawarkan kepada pelajar Kohort 2018/2019 dan seterusnya

UVW 312-Bahasa Inggeris untuk Komunikasi Teknikal (ditawarkan kepada pelajar bagi program Sarjana Muda Kejuruteraan dan Sarjana Muda Teknologi Kejuruteraan

UVW313- Bahasa Inggeris Akademik (ditawarkan kepada pelajar bagi program Sarjana Muda Perniagaan dan Sarjana Muda Komunikasi Media Baharu).

j.Kursus Ko-Kurikulum - (2 kredit)
Semua pelajar sarjana muda diwajibkan untuk mengumpul sekurang-kurangnya 2 unit kursus kokurikulum sepanjang pengajian di UniMAP dan 1 unit badan beruniform perlu diambil pada semester 1 tahun pertama pengajian. Manakala, 1 unit kursus bukan badan beruniform perlu diambil pada semester 2 tahun pertama pengajian. Pelajar mestilah melengkapkan pakej kursus badan beruniform yang didaftar. Bagi pelajar yang mengambil pakej badan beruniform lebih daripada 2 unit, tidak perlu mengambil kursus kokurikulum bukan badan beruniform.

k.Badan Beruniform - (2 kredit)
Semua pelajar diploma diwajibkan untuk mengambil dua (2) unit kursus kokurikulum Badan Berunifrom secara berpakej. Dua (2) unit kursus ini perlu diambil pada semester pertama (1) dan semester kedua (2) tahun pertama pengajian.

l.Kursus Opsyen
Kursus Opsyen bertujuan untuk memberi nilai tambah kepada pelajar. Bagi pelajar yang memperolehi Band 4, 5 dan 6 dalam MUET mereka dikecualikan daripada mengambil kursus UVW201 Bahasa Inggeris untuk Komunikasi Umum dan dikehendaki mengambil kursus opsyen untuk mendapat kredit bagi memenuhi syarat pengijazahan.

Terdapat EMPAT (4) kursus opsyen universiti yang boleh dipilih untuk memenuhi jam kredit pelajar terutama yang mendapat pengecualian kredit. Walau bagaimanapun, hanya DUA (2) kursus ditawarkan secara bergilir-gilir untuk setiap tawaran semester. Semua kursus opsyen universiti perlu mendapat sekurang-kurangnya gred minimum lulus (C). Kursus-kursus opsyen universiti ialah:

i.Komunikasi Korporat (UUW125) – (2 kredit)
Kursus UUW125 Komunikasi Korporat ini ditawarkan kepada pelajar tempatan dan antarabangsa dengan mengikut kepada penawaran secara bergiliran untuk setiap semester. Pelajar perlu mendapat sekurang-kurangnya gred minimum lulus (C).

ii. Psikologi Industri (UUW126) – (2 kredit)
Kursus UUW126 Psikologi Industri ini ditawarkan kepada pelajar tempatan dan antarabangsa dengan mengikut kepada penawaran secara bergiliran untuk setiap semester. Pelajar perlu mendapat sekurang-kurangnya gred minimum lulus (C).

iii.Komunikasi & Pengurusan Konflik (UUW127) – (2 kredit)
Kursus UUW127 Komunikasi & Pengurusan Konflik ini ditawarkan kepada pelajar tempatan dan antarabangsa dengan mengikut kepada penawaran secara bergiliran untuk setiap semester. Pelajar perlu mendapat sekurang-kurangnya gred minimum lulus (C).

iv.Pengurusan Sumber Manusia (UUW128) – (2 kredit)
Kursus UUW128 Pengurusan Sumber Manusia ini ditawarkan kepada pelajar tempatan dan antarabangsa dengan mengikut kepada penawaran secara bergiliran untuk setiap semester. Pelajar perlu mendapat sekurang-kurangnya gred minimum lulus (C).

2.KURSUS TERAS PROGRAM
Kursus Teras Program terdiri daripada kursus-kursus yang wajib diambil oleh semua pelajar. Kursus-kursus ini menjadi keperluan utama untuk pengijazahan. Pelajar yang gagal mana-mana kursus teras mesti mengulanginya dan lulus sebelum layak dipertimbangkan untuk pengijazahan.

3.KURSUS ELEKTIF
Pelajar boleh memilih kursus Elektif berdasarkan minat mereka dalam bidang-bidang tertentu.

4.KURSUS PRA-SYARAT
Kursus Pra-syarat merupakan kursus yang wajib diambil dan lulus oleh pelajar, sebelum dibenarkan mendaftar kursus yang berikutnya. Pelajar yang gagal dalam kursus pra-syarat boleh mengambil semula kursus pra-syarat tersebut seiring dengan kursus yang berikutnya (dalam semester sama), namun hendaklah memohon dan mendapatkan kelulusan Dekan Fakulti.

PENDEKATAN PEMBELAJARAN DAN PENGAJARAN DI UniMAP

Kebanyakan Kursus Teras yang ditawarkan merangkumi komponen teori dan komponen praktikal dengan nilaian jam pertemuan seperti berikut:

1.Komponen Teori
Satu (1) unit komponen Teori adalah bersamaan dengan 1 jam kuliah/tutorial/bacaan seminggu atau 14 jam dalam satu semester.

2.Komponen Praktikal
Satu (1) unit komponen Praktikal bagi program Kejuruteraan adalah bersamaan 2 jam pertemuan dalam seminggu atau 28 jam pertemuan dalam 1 semester. Satu (1) unit komponen Praktikal bagi program Teknologi Kejuruteraan adalah bersamaan 3 jam pertemuan dalam seminggu atau 42 jam pertemuan dalam 1 semester.

Bagi kebanyakan Kursus Teras, pelajar perlu menjalani projek mini dan menduduki peperiksaan atau viva pada penghujung semester.

Komponen praktikal terdiri daripada bentuk-bentuk pembelajaran dan pengajaran berikut:

1.Pembelajaran di dalam makmal - sepasukan pelajar yang terdiri dari 2-3 orang, menjalankan satu eksperimen. Di dalam beberapa program makmal asas, setiap pelajar menjalankan eksperimen secara individu (1:1) dan bukannya dalam pasukan.

2.Pembelajaran menggunakan Teaching Factory – sepasukan pelajar yang terdiri dari 5-6 orang menjalankan sesebuah larian proses (process run) dengan menggunakan peralatan skala sebenar yang digunakan di industri.

3.E-pembelajaran – pendekatan pembelajaran yang diperkukuhkan dengan ICT, yang melengkapkan pendekatan pembelajaran konvensional. Pelajar mempelajari kursus atau topik-topik tertentu menggunakan modul yang boleh diakses dari laman web UniMAP. Modul mengandungi nota kuliah dalam bentuk multimedia, yang merangkumi audio, video, grafik, animasi, simulasi, permainan, dan pelbagai lagi aktiviti berbentuk interaksi.

4.Pendedahan kepada industri – pelajar menjalankan lawatan ke industri selama tempoh masa tertentu beberapa kali sepanjang pengajiannya di UniMAP. Ini termasuklah program InTra (Latihan Industri), Keusahawanan Industri, dan lain-lain lagi.

LATIHAN INDUSTRI

Latihan Industri merupakan salah satu syarat/kursus wajib Universiti bagi setiap pelajar Universiti Malaysia Perlis (UniMAP) sebelum dianugerahkan pengijazahan. Latihan Industri ini memberi peluang kepada pelajar-pelajar Universiti merasai konsep pembelajaran dan pengajaran serta pengalaman industri dalam dunia pekerjaan sebelum menempuhi alam pekerjaan kelak. Disamping itu juga, dengan kemahiran dan pengetahuan yang telah diadaptasikan dapat memenuhi hasrat dan keperluan kebolehpasaran graduan demi kemajuan negara.

Tujuan utama Latihan Industri dilaksanakan adalah:-

i. Menyemai sikap profesional di kalangan pelajar.
ii. Menyedarkan pelajar tentang kepentingan dan kaitan yang kuat antara latihan industri, makmal/amali dan teori yang dipelajari.
iii. Memberi pendedahan awal kepada pelajar tentang persekitaran dan keadaan di industri serta amalannya. Pelajar berpeluang melengkapkan diri sebagai bekalan untuk menghadapi cabaran akan datang, baik di dalam pengajian akademik mahupun rintangan yang mendatang.

Kursus Latihan Industri peringkat UniMAP terbahagi mengikut bidang pengajian seperti berikut;

Bidang Pengajian	Kredit	Tempoh Latihan Industri
Sarjana Muda Kejuruteraan	4	10 Minggu
Sarjana Muda Teknologi Kejuruteraan	12	24 Minggu
Sarjana Muda Teknologi	12	24 Minggu
Sarjana Muda Perniagaan (Perniagaan Antarabangsa)	4	8 Minggu
Sarjana Muda Perniagaan (Keusahawan Kejuruteraan)	4	10 Minggu
Sarjana Muda Komunikasi Media Baharu	6	12 Minggu
Diploma Kejuruteraan	6	16 Minggu

Jam pertemuan selama 8 jam sehari selama 5 hari dalam seminggu (dengan perkiraan 8 jam sehari x 5 hari = 40 jam seminggu) adalah dianggap sebagai jam penilaian (waktu bekerja yang ditetapkan oleh organisasi/ syarikat).

Bengkel Kepimpinan Latihan Industri akan diselaraskan terlebih dahulu sebelum pelajar menjalani latihan industri. Melalui bengkel ini, pelajar akan diberikan taklimat mengenai proses penyediaan diri sebelum memasuki alam industri. Tidak ketinggalan juga, sesi dialog pelajar bersama industri yang mana pihak universiti akan menjemput pakar-pakar luar (dari industri) untuk membentangkan dan berkongsikan pengalaman mengenai industri secara menyeluruh.

PROGRAM INKUBATOR PERNIAGAAN

Pendekatan Pembelajaran dan Pengajaran (P&P) untuk program Sarjana Muda Perniagaan (Kepujian) (Keusahawanan Kejuruteraan) bukan sahaja meliputi kuliah dan tutorial tetapi juga latihan praktikal melalui Program Inkubator Perniagaan. Semasa cuti semester pada semester ke-4, pelajar akan mengambil bahagian dalam Program Perniagaan Inkubator selama 8 minggu. Program ini mewakili 4 jam kredit daripada jumlah keseluruhan jam kredit yang ditawarkan.

Melalui Program Inkubator Perniagaan ini, para pelajar akan dibimbing oleh syarikat-syarikat yang terlibat secara langsung dalam penghasilan dan pembangunan produk yang mungkin membawa kepada pengkomersilan. Lebih menarik lagi, syarikat-syarikat yang terlibat ini adalah tergolong dalam kategori “start up” dengan melibatkan perniagaan baru, perniagaan yang mempunyai perkembangan yang pantas dan perniagaan yang bertujuan untuk membawa produk inovatif ke pasaran sedia ada. Para pelajar dapat mengetahui bagaimana idea dan inovasi boleh membawa kepada proses penghasilan sesuatu produk. Pada akhir Program Inkubator Perniagaan, pelajar dikehendaki menyediakan satu laporan mengenai pengalaman mereka sepanjang Program Inkubator Perniagaan yang telah mereka jalani dalam syarikat-syarikat “start up” terpilih.

Program Inkubator Perniagaan ini mempunyai jalinan kerjasama yang rapat dengan “National Incubator Network Association (NINA)” dan turut bergabung dengan Association of Asean Business Incubation (AABI). Antara ahli-ahli pertubuhan ini termasuklah Technology Park Malaysia, Perbadanan Pembangunan Teknologi Malaysia, SIRIM dan Kulim Technology Park Corporation. UniMAP bekerjasama rapat dengan pertubuhan-pertubuhan ini untuk menjamin kejayaan program tersebut.

KOD KURSUS

Setiap kursus yang ditawarkan mempunyai kod yang tersendiri. Untuk pengajian program Kejuruteraan, Teknologi Kejuruteraan, Perniagaan dan Komunikasi Media Baharu, kod bagi sesebuah kursus diringkaskan dalam Jadual **4(a), 4(b)** dan **4(c)** di bawah:

Jadual 4(a): Abjad Pertama;
Peringkat Pengajian/Jenis program yang ditawarkan

Abjad Pertama di dalam Kod	Jenis Program
E	Sarjana Muda Kejuruteraan
B	Sarjana Muda Perniagaan
P	Sarjana Muda Teknologi Kejuruteraan
V	Sarjana Muda Teknologi
K	Sarjana Muda Komunikasi Media Baharu
U	Kursus Umum (Subjek ini boleh diambil oleh pelajar dari semua program pengajian)
D	Diploma Kejuruteraan

Jadual 4(b): Abjad Kedua;
Pusat Pengajian yang Menawarkan Kursus

Abjad Kedua di dalam Kod	Pusat Pengajian
E	PPK Sistem Elektrik
M	PPK Mikroelektronik
K	PPK Komputer & Perhubungan
N	PPK Mekatronik
B	PPK Bahan
P	PPK Pembuatan
R	PPK Bioproses
A	PPK Alam Sekitar
D	Pusat Pengajian Teknologi Kejuruteraan Mekanikal
G	Pusat Pengajian Teknologi Kejuruteraan Elektronik
L	Pusat Pengajian Teknologi Kejuruteraan Elektrik
S	Pusat Pengajian Teknologi Kejuruteraan Awam
T	Pusat Pengajian Teknologi Kejuruteraan Kimia
C	Pusat Kejuruteraan
Q	Institut Matematik Kejuruteraan
I	Pusat Kerjasama Industri dan Agensi Kerajaan
F	Pusat Pengajian Inovasi Perniagaan & Teknousahawan
U	Pusat Pengajian Pembangunan Insan dan Teknokomunikasi
V	Pusat Bahasa Antarabangsa
Z	Pusat Ko-kurikulum

Jadual 4(c): Abjad Ketiga;
Kursus Teras atau Kursus Keperluan Universiti;

Abjad Ketiga di dalam Kod	Jenis Kursus
T	Kursus Teras/Elektif
W	Kursus Keperluan Universiti
A	Kursus Audit
M	Kursus Mobiliti

Tiga angka terakhir bagi sesebuah kod kursus mewakili perkara-perkara berikut iaitu angka pertama adalah aras/tahap kursus, angka kedua dan ketiga adalah nombor kursus.

Kod bagi sesebuah kursus diringkaskan dalam **Jadual 5** di bawah:

Jadual 5: Kod Kursus

A	B	C	1	2	3	4	ANGKA	DESKRIPSI
↓	↓	↓	↓	↓	↓	↓		
↓	↓	↓	↓	↓	↓	→	4	Unit/Kredit
↓	↓	↓	↓	↓	└	→	3	Kelompok Kursus. (Penentuan kelompok kursus ditentukan oleh Pusat Pengajian masing-masing)
↓	↓	↓	↓	└	→	→	2	
|	|	|	└	→	→	→	1	Aras/ Tahap Kursus program Sarjana Muda
↓	↓	└	→	→	→	→	JENIS KURSUS	Sila rujuk **Jadual 4(c)**
↓	└	→	→	→	→	→	PUSAT PENGAJIAN	Sila rujuk **Jadual 4(b)**
└	→	→	→	→	→	→	PERINGKAT PENGAJIAN	Sila rujuk **Jadual 4(a)**

PRA-PENDAFTARAN KURSUS

Pra-pendaftaran kursus adalah suatu sistem yang membolehkan pelajar membuat pra-pendaftaran ''atas talian '' untuk kursus-kursus di semester seterusnya pada tempoh masa yang lebih awal. Tempoh masa yang ditetapkan untuk pra-pendaftaran ini adalah sebelum bermula cuti semester pada semester semasa. Semua pelajar (Aktif/Percubaan/Berhutang) DIWAJIBKAN melakukan proses pra-pendaftaran ini.

Pelajar dikehendaki mendaftar pada tarikh yang ditetapkan. Kursus yang perlu didaftarkan adalah kursus yang akan diambil pada semester akan datang (semua kursus termasuk Ko-kurikulum). Pelajar dikehendaki berjumpa Rakan Pendamping Siswa (RPS) terlebih dahulu sebelum membuat Pra-pendaftaran kursus secara atas talian. Pelajar yang gagal mendaftar dalam tempoh yang ditetapkan, akan menyebabkan pendaftaran rasmi kursus bagi semester hadapan terjejas berikutan keutamaan pendaftaran kursus diberi kepada pelajar yang membuat proses pra-pendaftaran. Pelajar digalakkan untuk mencetak slip pra-pendaftaran ini sebagai bukti pendaftaran dan tidak perlu mendapatkan pengesahan daripada RPS.

PENDAFTARAN KURSUS

Semua pelajar yang aktif adalah diwajibkan mendaftar kursus untuk setiap semester. Pendaftaran kursus ini dilakukan secara dalam talian (online) oleh semua pelajar. Pendaftaran kursus mesti dibuat mengikut tarikh yang telah ditetapkan seperti hebahan yang dikeluarkan oleh Unit Kemasukan dan Rekod Pelajar melalui emel dan portal.

Pelajar adalah diwajibkan untuk bertemu dan berbincang dengan Rakan Pendamping Siswa (RPS) berkaitan kursus-kursus yang perlu didaftar. Pelajar perlu membawa bersama slip pendaftaran kursus untuk disahkan oleh RPS dalam sistem pada sesi tersebut. Kursus-kursus yang didaftarkan tanpa mendapat pengesahan dari RPS adalah dianggap tidak sah. Sekiranya berlaku perubahan pada pendaftaran kursus sama ada pelajar menambah, menggugur atau tarik diri kursus dalam tempoh yang ditetapkan, pelajar perlu mendapatkan pengesahan semula daripada RPS.

Pelajar yang gagal mendaftar kursus dalam tempoh masa yang ditetapkan adalah tertakluk kepada penalti berjumlah RM50. Pendaftaran lewat tidak boleh melebihi minggu ketiga (3) semester. Pelajar perlu mengisi Borang HEA(B)-02[b] (Borang Pendaftaran Kursus Lewat) dan mesti memperolehi kelulusan daripada Dekan falkulti.

Manakala pelajar yang baru mendaftar bagi satu-satu sidang akademik baru akan mendaftar secara online pada tarikh yang dinyatakan pada Minggu Suaikenal mengikut Fakulti masing-masing. Pelajar akan

diberi taklimat tentang kursus, dalam Minggu Suaikenal tersebut di Fakulti masing-masing.

Adalah menjadi tanggungjawab pelajar untuk menyemak dan memastikan bahawa semua butir-butir yang dinyatakan dalam Slip Pendaftaran Kursus adalah betul. Sebarang permohonan pendaftaran kursus/ penambahan kursus / pengguguran kursus / tarik diri di luar tempoh yang ditetapkan tanpa sebab-sebab yang boleh diterima oleh Universiti, boleh dikenakan denda kecuali pelajar yang mempunyai alasan yang tertentu sahaja akan dipertimbangkan oleh Dekan Fakulti. Pelajar tidak dibenarkan membuat pendaftaran kursus/penambahan kursus/pengguguran kursus/tarik diri kursus semasa minggu peperiksaan.

Pelajar yang tidak mendaftar kursus maksimum 2 semester berturut-turut tanpa sebarang alasan boleh ditamatkan pengajian dengan menggunakan Borang HEA(B)-09 (Borang Penamatan Pengajian Pelajar).

Pelajar yang telah ditamatkan pengajian dan merayu untuk menyambung semula pengajian perlu menulis surat rayuan permohonan kemasukan kepada Naib Canselor melalui Dekan Fakulti (perakuan Dekan diperlukan). Penalti RM100 akan dikenakan kepada pelajar bagi setiap rayuan kemasukan semula yang diluluskan.

1.Pendaftaran Kursus Pelajar Berstatus Aktif

Pelajar berstatus Aktif boleh mendaftar kursus secara online tidak melebihi 22 unit dan tidak kurang daripada 10 unit kecuali pelajar yang mengikuti Latihan Industri dan pelajar Semester Akhir yang akan menamatkan pengajian. Pelajar yang ingin mendaftar melebihi 22 unit perlu mendapatkan kebenaran daripada RPS dengan kelulusan daripada Dekan Fakulti.

Keterangan mengenai Pendaftaran Kursus pelajar berstatus Aktif diringkaskan seperti di **Jadual 6** di bawah:

Jadual 6: Ringkasan Pendaftaran Kursus Pelajar Berstatus Aktif

Status Pelajar	Kredit Minimum	Kredit Maksimum
Pelajar Aktif	10	22
Pelajar Aktif yang mengambil kursus Latihan Indutri (LI) atau Projek Tahun Akhir (FYP)	10	28

*Pelajar yang tidak memngambil kursus LI atau FYP boleh mengambil kursusu melebilihi 22 kreadit dgn kelulusn Dekan falkulti terlebih dahulu.

2.Pendaftaran Kursus Pelajar Percubaan [P]

Pelajar dengan status Percubaan tidak dibenarkan untuk mendaftar sendiri secara dalam talian (online). Pelajar ini perlu bertemu dengan RPS mereka untuk mendapatkan nasihat dan pengesahan daripada Dekan serta perlu juga mengisi Borang HEA(B)-02[a] (Borang Pendaftaran Kursus: Status Percubaan) sebelum menyerahkannya kepada Penolong Pendaftar Fakulti untuk didaftarkan. Hanya Penolong Pendaftar Fakulti atau Unit Kemasukan & Rekod sahaja yang boleh mendaftarkan kursus bagi pelajar ini. Jumlah unit yang dibenarkan untuk Pelajar Percubaan adalah seperti **Jadual 7** berikut:

Jadual 7: Ringkasan Pendaftaran Kursus Pelajar Percubaan [P]

Status Pelajar	Kredit Minimum	Kredit Maksimum
Percubaan (P1)	10	12
Percubaan (P2)	8	10

PENAMBAHAN / PENGGUGURAN / TARIK DIRI KURSUS

1.Tambah Kursus

a)Tempoh yang dibenarkan untuk penambahan kursus adalah sehingga minggu ke-2 minggu pembelajaran

b)Pelajar yang lewat mendaftar perlu mengisi Borang HEA(B)-02[b] (Borang Pendaftaran Kursus Lewat) dan menyerahkannya kepada Peno long Pendaftar Fakulti untuk dikemaskini dalam sistem. Permohonan untuk tambah kursus adalah tertakluk kepada kelulusan dan kekosongan kuota.

2.Gugur Kursus

a)Tempoh yang dibenarkan untuk menggugurkan kursus adalah sehingga minggu ke-7 minggu pembelajaran.

b)Pelajar perlu mengisi Borang HEA(B)-03 (Borang Permohonan Gugur Kursus). Borang perlu ditandatangani oleh pensyarah kursus, Dekan Fakulti dan diserahkan kepada Penolong Pendaftar Fakulti untuk dikemaskini dalam sistem.

3.Tarik Diri Kursus (TD)

a)Pelajar dengan persetujuan Pensyarah Kursus dan Dekan Fakulti boleh memohon untuk menarik diri daripada kursus yang telah didaftarkan pada semester yang berkenaan tidak lewat dari hari akhir bekerja pada minggu ke-12 minggu pembelajaran. Pelajar yang ingin menarik diri daripada kursus perlulah mengisi Borang HEA(B)-04 (Borang Permohonan Tarik Diri Kursus)

b)Kebenaran untuk pelajar menarik diri daripada mengikuti sesuatu kursus adalah tertakluk kepada jumlah unit minimum, kecuali dengan kebenaran Dekan.

c)Status Tarik Diri (TD) akan dicatatkan dalam rekod pendaftaran kursus dan transkrip akademik pelajar. Walau bagaimanapun, gred tidak akan diambil kira dalam pengiraan PNG dan PNGK.

PERTUKARAN PROGRAM PENGAJIAN

Permohonan pertukaran program pengajian pelajar bermaksud permohonan seseorang pelajar untuk menukar program pengajian sama ada program pengajian yang ditawarkan dalam Fakulti yang sama atau pertukaran program sedia ada kepada program pengajian yang ditawarkan oleh Fakulti yang lain atas sebab-sebab tertentu yang diperakukan oleh Dekan Fakulti yang berkaitan.

Pertukaran program pengajian tidak digalakkan kerana ia melibatkan penukaran agihan sumber yang sudah dirancang dengan rapi pada awal sesuatu sidang akademik. Walau bagaimanapun, permohonan rayuan pertukaran program pengajian boleh dipertimbangkan dengan alasan-alasan yang kukuh sahaja dan tertakluk kepada syarat-syarat seperti berikut:

1. Pertukaran program pengajian mestilah dipohon dalam tempoh dua (2) semester pertama pengajian di UniMAP. Permohonan pertukaran program pengajian boleh dilakukan seawal semester 1 pengajian. Sekiranya permohonan diluluskan, status pelajar dengan program baharu akan berkuatkuasa pada semester yang berikutnya. Pelajar perlu mengisi Borang HEA(B)-06 Permohonan Pertukaran Program Pengajian.
2. Bagi pelajar yang mendapat penajaan dan pembiayaan, pelajar mestilah memaklumkan dan mendapatkan kelulusan daripada penaja masing-masing terlebih dahulu sebelum membuat pemohonan.
3. Pertukaran program pengajian adalah tidak dibenarkan kepada pemohon yang statusnya telah kembali aktif setelah berjaya dalam permohonan rayuan kemasukan semula.
4. Permohonan pertukaran program hanya dibenarkan sekali sahaja sepanjang tempoh pengajian
5. Kebenaran untuk pertukaran program pengajian adalah tertakluk kepada perakuan Dekan Fakulti asal dan persetujuan Dekan Fakulti yang dipohon, perakuan Pengarah Pusat Pengurusan Akademik serta kelulusan Naib Canselor atau Timbalan Naib Canselor (Akademik dan Antarabangsa)

PENANGGUHAN PENGAJIAN

Penangguhan pengajian adalah kebenaran kepada pelajar untuk tidak mengikuti pengajian pada sesuatu semester atas alasan-alasan tertentu yang dibenarkan Universiti.

Permohonan penangguhan pengajian dibenarkan kepada pelajar yang mempunyai masalah kesihatan dan disahkan sakit oleh Hospital Kerajaan/ Doktor Panel Universiti / Pusat Kesihatan UniMAP sahaja. Bagi kes-kes tertentu sijil sakit yang bukan daripada Hospital Kerajaan atau Doktor Panel Universiti perlu mendapat perakuan Pusat Kesihatan UniMAP. Permohonan yang diasaskan selain daripada masalah kesihatan boleh dipertimbangkan sekiranya mempunyai alasan yang munasabah dan mendapat kelulusan Naib Canselor/Timbalan Naib Canselor (Akademik & Antarabangsa).

Pelajar yang memohon untuk menangguhkan pengajian perlu mengisi Borang HEA(B)-07 (Borang Permohonan Tangguh Pengajian) yang boleh didapati di Fakulti. Permohonan perlu mendapat perakuan dan kelulusan yang berikut:

1. Perakuan Rakan Pendamping Siswa (RPS),
2. Perakuan Dekan Fakulti,
3. Perakuan Pengarah Pusat Pengurusan Akademik, dan
4. Kelulusan Naib Canselor atau Timbalan Naib Canselor (Akademik &Antarabangsa)

Borang pemohonan penangguhan pengajian pelajar perlu dikemukakan sebelum minggu ketujuh (7) pengajian. Pemohonan selepas minggu ketujuh (7) hanya dibenarkan atas sebab kesihatan atau kes-kes tertentu yang mendapat kelulusan Naib Canselor/Timbalan Naib Canselor (Akademik & Antarabangsa).

Pelajar tidak dibenarkan menangguhkan pengajian melebihi 2 semester berturut-turut kecuali dengan kelulusan Naib Canselor/Timbalan Naib Canselor (Akademik & Antarabangsa). Bagi kes selain sebab kesihatan, pelajar hanya dibenarkan pulang/keluar daripada universiti setelah permohonan penangguhan pengajian mendapat kelulusan universiti. Sekiranya pelajar telah pulang sebelum kelulusan diperoleh, ia adalah di bawah tanggungjawab pelajar sendiri.

Bagi pelajar yang menangguhkan pengajian atas sebab kesihatan/sakit atau untuk alasan-alasan yang dibenarkan, semester berkenaan tidak akan diambil kira dalam pengiraan semester yang digunakan untuk pengijazahan (Tanpa Penalti). Bagi kes Tanpa Penalti, kursus yang didaftarkan pada semester tersebut akan digugurkan, dan sekiranya terdapat keputusan peperiksaan yang telah disahkan pada peringkat Majlis Peperiksaan Universiti (MPU), keputusan peperiksaan tersebut juga akan terbatal.
Pelajar yang menangguhkan pengajian atas sebab selain daripada sebab kesihatan, semester berkenaan akan diambil kira dalam pengiraan semester yang digunakan untuk pengijazahan (Dengan Penalti) kecuali dengan kebenaran Naib Canselor/Timbalan Naib Canselor (Akademik & Antarabangsa). Bagi kes Dengan Penalti, kursus yang didaftarkan pada semester tersebut tidak akan digugurkan dan akan diambil kira dalam semester. Sebarang keputusan peperiksaan yang telah disahkan pada peringkat MPU juga tidak terbatal dan akan tertera dalam transkrip akademik pelajar.

Pelajar akan diberikan amaran secara bertulis oleh Fakulti sekiranya didapati tidak mendaftar pada sesuatu semester tanpa memberi sebarang permohonan penangguhan pengajian. Pelajar yang tidak memberi sebarang maklum balas dalam sesuatu tempoh mencapai 2 semester berturut-turut boleh ditamatkan penggajian dan disahkan berhenti daripada universiti.

PENARAFAN PELAJAR

Taraf akademik pelajar diukur dengan sistem Purata Nilai Gred (PNG) sepanjang pengajian di universiti. Seseorang pelajar yang berjaya mendapat sekurang-kurangnya 2.00 bagi PNG pada satu-satu semester diberi taraf 'Aktif' (A) dan boleh meneruskan pengajian dalam semester yang berikutnya. Pelajar juga dikehendaki mendapatkan Purata Nilai Gred Kumulatif (PNGK) sekurang-kurangnya 2.00 untuk berijazah.

Pelajar dengan PNG kurang daripada 2.00 pada satu-satu semester akan di beri taraf PERCUBAAN 1 (P1). Taraf PERCUBAAN 2 (P2) pula diberikan kepada pelajar yang mendapat PNG kurang daripada 2.00 bagi dua semester berturut-turut. Jika pelajar masih mendapat kurang dari 2.00 bagi PNG semester berikutnya pula, pelajar berkenaan tidak dibenarkan meneruskan pengajian, melainkan PNGK pelajar tersebut melebihi 2.00 dan pihak universiti memperakukannya. Pihak universiti berkuasa menamatkan pengajian mana-mana pelajar yang didapati tidak memenuhi prestasi dan kemajuan akademik yang ditetapkan.

TEMPOH MINIMUM / MAKSIMUM PENGAJIAN PELAJAR

Pelajar Sarjana Muda Kejuruteraan dan Sarjana Muda Teknologi Kejuruteraan perlu menamatkan program pengajian dalam tempoh masa yang telah ditetapkan, iaitu minimum 8 semester (4 tahun) dan tempoh maksimum 14 semester (7 tahun). Walau bagaimanapun, bagi pelajar yang memperolehi pengecualian kredit, tempoh maksimum yang dibenarkan adalah tidak boleh kurang daripada 6 semester (3 tahun) dan tidak lebih daripada 12 semester (6 tahun). Manakala pelajar Sarjana Muda Perniagaan, Sarjana Muda Komunikasi Media Baharu dan Diploma Kejuruteraan, perlu menamatkan program pengajian dalam tempoh masa minimum 6 semester (3 tahun) dan tempoh maksimum 10 semester (5 tahun).

Tempoh Minimum atau Maksimum pengajian pelajar adalah seperti berikut:

Program Pengajian	Minimum (Semester)	Maksimum (Semester)
Sarjana Muda Kejuruteraan	8	14
Sarjana Muda Teknologi Kejuruteraan	8	14
Sarjana Muda Teknologi	7	12
Sarjana Muda Perniagaan	6	10
Sarjana Muda Komunikasi Media Baharu	6	10
Diploma Kejuruteraan	6	10

SEMESTER TAMBAHAN

Semester Tambahan ditawarkan kepada pelajar-pelajar yang mahu mengulang kursus-kursus yang gagal pada semester biasa, tertakluk kepada syarat dan kelulusan oleh Senat Universiti. Tempoh Semester Tambahan merangkumi empat(4) minggu pembelajaran dan satu(1) minggu peperiksaan sahaja. Cuti pertengahan semester dan ulangkaji tidak diperuntukkan untuk semester ini.

Pelajar wajib mendaftarkan kursus dan pendaftaran hendaklah tidak melebihi 9 unit per semester dan terhad kepada 16 unit berdaftar untuk keseluruhan tahun pengajian. Pembelajaran dan pengajaran adalah dalam bentuk tutorial selama 4 minggu dan kehadiran pelajar dalam tutorial yang dikendalikan juga diwajibkan dan kedatangan adalah direkodkan.

Syarat-syarat kelayakan mengikuti Semester Tambahan adalah:

1. Kursus yang ditawarkan dalam Semester Tambahan layak dimohon oleh pelajar yang mendapat:
   a. Pelajar yang mendapat gred D dan ke bawah untuk Kursus Teras; ATAU
   b. Pelajar yang mendapat gred C- dan ke bawah untuk Kursus Wajib Universiti;
   DAN
   c. Lulus penilaian berterusan dengan markah 40% bagi kursus-kursus yang berkaitan.
2. Kebenaran untuk mengambil Semester Tambahan bagi tujuan membaiki gred (D+ atau C- bagi Kursus Teras) hanya akan diberikan kepada pelajar tahun akhir sahaja
3. Pelajar yang mendapat gred F* dan X tidak layak untuk mendaftar Semester Tambahan.
4. Semester Tambahan hanya boleh diduduki oleh pelajar yang telah mendaftar dan membayar yuran sahaja. Tiada rayuan pengecualian bayaran dibenarkan untuk membolehkan pelajar membuat pendaftaran.
5. Pelajar yang tiada hutang tertunggak sahaja boleh memohon kursus Semester Tambahan. Tiada rayuan pengecualian bayaran dibenarkan untuk membolehkan pelajar membuat permohonan.
6. Pelajar yang terlibat dengan latihan industri semasa semester tambahan berlangsung tidak dibenarkan untuk mengikuti semester tambahan.

PEMINDAHAN KREDIT

Pemindahan kredit ditakrifkan sebagai pengiktirafan sejumlah kredit yang telah diperolehi oleh seseorang pelajar UniMAP atau IPT lain. Terdapat 2 kategori pemindahan kredit iaitu:

i. Pemindahan Kredit Vertikal atau Pengecualian Kredit
Pemindahan kredit daripada peringkat rendah ke peringkat yang lebih tinggi. Gred dan mata gred bagi kursus yang terlibat TIDAK akan diambil kira dalam pengiraan PNG dan PNGK pelajar.

ii. Pemindahan Kredit Horizontal
Pemindahan kredit daripada program di tahap kelayakan yang sama seperti daripada diploma ke diploma ATAU sarjana muda ke sarjana muda. Gred dan mata gred bagi kursus yang terlibat AKAN diambil kira dalam pengiraan PNG dan PNGK pelajar.

Syarat umum pemindahan pemindahan kredit adalah:

i. Gred lulus – Gred lulus minimum bagi kursus yang layak dipertimbangkan untuk pemindahan kredit ialah Gred C atau 2.00 (Program Kejuruteraan, Teknologi dan Teknologi Kejuruteraan) dan Gred B atau 3.00 (Program Perniagaan dan Program Sains Sosial).

ii. Nilai kredit – nilai kredit bagi kursus yang layak dipertimbangkan untuk pemindahan kredit mesti sama atau lebih tinggi dari dengan nilai kredit kursus yang dipohon.

iii. Kesetaraan kandungan kursus-kursus yang terlibat dengan pemindahan kredit mestilah tidak kurang daripada 80%.

SISTEM PEPERIKSAAN DAN PENILAIAN

Peperiksaan bertulis diadakan pada hujung semester. Setiap pelajar mestilah terlebih dahulu memenuhi syarat-syarat kuliah, tutorial, amali dan sebagainya sebelum layak menduduki peperiksaan. Tempoh peperiksaan adalah seperti berikut :

Jadual 8: Tempoh Peperiksaan

Nilai Kursus	Tempoh Peperiksaan
1 kredit	2 jam
2 – 4 kredit	3 jam

Keputusan peperiksaan pelajar ditentukan berdasarkan penilaian secara berterusan dari komponen kerja kursus dan peperiksaan bertulis. Sumbangan kerja kursus adalah 100% jika sesebuah kursus itu keseluruhannya berbentuk makmal. Kerja kursus biasanya merangkumi tugasan, laporan makmal dan ujian. Penilaian prestasi pelajar adalah berdasarkan kepada gred abjad dan mata penilaian seperti berikut

Jadual 9: Gred Abjad dan Mata Penilaian

Gred *Gred*	Nilai Gred *Grade Point*	Status *Status*
A	4.00	Lulus *Pass*
A-	3.75	
B+	3.50	
B	3.00	
B-	2.75	
C+	2.50	
C	2.00	
C-	1.75	Lulus Bersyarat *Conditional Pass*
D+	1.50	
D	1.00	Gagal *Fail*
D-	0.75	
F	0.00	

Gred LULUS untuk sesuatu kursus adalah tertakluk kepada keperluan kursus seperti yang berikut:-

i. Bagi kursus Wajib Universiti, Gred LULUS adalah Gred C dan ke atas (Gred A hingga C)

ii. Bagi kursus Teras, Gred D+ dan C- adalah dikira sebagai LULUS BERSYARAT (syarat dinyatakan dalam bahagian iii).

iii .Pelajar yang telah memenuhi kredit terkumpul untuk tujuan pengijazahan dan PNGK terakhir kurang daripada 2.00, maka pelajar dikehendaki mengulang mana-mana kursus Teras yang mendapat D+ atau C- untuk memastikan PNGK mencapai sekurang-kurangnya 2.00.

Jadual 10: Pengiraan GPA dan CGPA:

	KURSUS	KREDIT	NILAI GRED [NG]	GRED [G]	JUMLAH NG
	EKT121	3	3.75	A-	11.25
	EMT102	4	2.50	C+	10.00
	EMT111	4	3.50	B+	14.00
	EMT112	4	4.00	A	16.00
	EQT102	3	1.75	C-	5.25
	EUT122	2	2.75	B-	5.50
		20			62.00
PNG = 62.00/20 = 3.10					
	ECT200	3	3.50	B+	10.50
	EKT212	4	2.00	C	8.00
	EKT230	4	4.00	A	16.00
	EKT240	4	3.50	B+	14.00
	EQT203	3	3.75	A-	11.25
		18			59.75
PNG = 59.75/18 = 3.32					

$$PNGK = \frac{\text{Jumlah NG Terkumpul}}{\text{Jumlah Bil. Kredit Terkumpul}} = \frac{62.00 + 59.75}{20 + 18} = 3.20$$

*Terma unit yang digunakan digantikan dengan terma kredit.

RAYUAN SEMAKAN SEMULA KEPUTUSAN PEPERIKSAAN

Atas sebab-sebab tertentu, pelajar mungkin ingin memohon untuk penyemakan dijalankan ke atas keputusan peperiksaan akhir semester pelajar. Pelajar hanya dibenarkan memohon menyemak semula keputusan peperiksaan akhir semester dalam tempoh 10 hari selepas keputusan rasmi peperiksaan dikeluarkan oleh Pusat Pengurusan Akademik. Permohonan selepas tempoh ini tidak akan dipertimbangkan.

Pelajar perlu menghantar Borang HEA (C)-02 (a) (Borang Rayuan Semakan Semula Keputusan Peperiksaan) kepada Unit Peperiksaan & Pengijazahan (UPP), Bahagian Pengurusan Akademik, Pusat Pengurusan Akademik. Borang rayuan hendaklah dikemukakan dalam tempoh 10 hari bermula dari hari keputusan rasmi diumumkan. Pelajar perlu mengisi borang dalam dua (2) salinan. Satu (1) salinan adalah untuk simpanan pelajar.

Kadar bayaran rayuan ialah RM50 untuk setiap kursus.

PENGGUNAAN BAHASA INGGERIS

Bahasa Melayu adalah bahasa rasmi universiti. Walau bagaimanapun Bahasa Inggeris digunakan secara meluas dalam proses pembelajaran dan pengajaran. Ini adalah untuk membantu pelajar dalam kerjaya mereka. Bagi kursus-kursus yang diajar dalam bahasa Inggeris, peperiksaan akan dijalankan dalam bahasa yang sama.

SISTEM RAKAN PENDAMPING SISWA (RPS)

Sistem Penasihatan Akademik menjadi penghubung antara pelajar dengan pensyarah untuk berbincang dan membuat keputusan berkenaan rancangan pengajian pelajar. Walaupun pelajar mendaftar sendiri secara dalam talian (on-line), pelajar perlu berjumpa dengan Rakan Pendamping Siswa (RPS) untuk mendapatkan nasihat semasa tempoh pendaftaran.

RPS adalah satu sistem di mana staf akademik menyelia sekumpulan kecil pelajar sepanjang tempoh pengajian pelajar di UniMAP. 'Penyeliaan' di sini melibatkan perjumpaan yang kerap secara tidak formal, di mana pelajar boleh bersantai dengan staf yang berperanan sebagai "'rakan" bagi membincangkan isu-isu akademik dan sosial yang berkenaan dengan mereka. Pelajar yang mempunyai prestasi akademik yang tidak memuaskan boleh merujuk kepada RPS sebagai 'mentor', dan pelajar tersebut menjadi 'mentee', di mana ini akan benar-benar membantu pelajar dalam setiap perkara yang memerlukan penyelesaian.

BAHAGIAN PENGURUSAN AKADEMIK , PUSAT PENGURUSAN AKADEMIK (AMC)

Bahagian Pengurusan Akademik ini bertanggungjawab untuk mengendalikan urusan-urusan yang berkaitan kemasukan pelajar, pemprosesan data dan rekod pelajar, peperiksaan dan pengijazahan pelajar dan Senat Universiti.
Unit-unit yang terdapat di Bahagian Pengurusan Akademik terbahagi kepada:

1. Unit Kemasukan dan Rekod Pelajar
   Unit Kemasukan dan Rekod Pelajar bertanggungjawab untuk mengendalikan urusan yang berkaitan dengan kemasukan pelajar dan pemprosesan data dan rekod pelajar. Antara tugas dan tanggungjawab unit ini adalah:
   i. Mengendalikan secara keseluruhan proses pengambilan dan pendaftaran pelajar dalam negara pada peringkat ijazah pertama dan diploma.
   ii. Mengendalikan proses pengambilan dan pendaftaran pelajar antarabangsa pada peringkat ijazah pertama.
   iii. Mengurus dan mengendalikan aspek pemprosesan data dalam Sistem Maklumat Pelajar.

iv. Menguruskan rekod peribadi pelajar dan status pelajar terma suk permohonan penangguhan pengajian dan pertukaran pro gram pengajian pelajar.
v. Menguruskan pendaftaran kursus pelajar secara online bagi se tiap semester pengajian.
vi. Menguruskan proses pengecualian unit dan pemindahan kredit pelajar.

2.Unit Peperiksaan dan Pengijazahan

Unit Peperiksaan dan Pengijazahan bertanggungjawab untuk mengendalikan dan memantau perjalanan Peperiksaan Akhir Semester dan perkara-perkara yang berkaitan dengannya. Antara tugas dan tanggungjawab unit ini adalah seperti berikut:

i. Mengeluarkan Pekeliling Peperiksaan kepada Fakulti.
ii. Mengeluarkan Jadual Waktu Peperiksaan untuk Program Diploma dan Ijazah.
iii. Menguruskan Peperiksaan Akhir Semester dalam jangkamasa yang ditetapkan.
iv. Menjadi Sekretariat kepada Majlis Peperiksaan Universiti.
v. Menguruskan pemprosesan data peperiksaan mengunakan Sistem Maklumat Pelajar.
vi. Mengeluarkan keputusan peperiksaan akhir semester.
vii. Menguruskan proses rayuan pelajar untuk menyemak semula keputusan peperiksaan.
viii. Mengeluarkan Transkrip Akademik selepas Konvokesyen.

Bagi fungsi pengijazahan, unit ini mengendalikan urusan pengijzahan dan konvokesyen pelajar. Antara bidang tugas unit ini adalah seperti berikut:

i. Menyemak kelayakan pengijazahan untuk pelajar tahun akhir serta mengeluarkan surat penamatan pengajian dan kelayakan pengijazahan untuk pelajar yang layak bergraduat.
ii. Sekretariat konvokesyen universiti
iii. Menyelaraskan jemputan serta pinjaman dan pemulangan pakaian konvokesyen
iv. Mengendalikan urusan peminjaman dan pemulangan jubah staf akademik
v. Menguruskan proses penyediaan dan penyerahan skrol pengijazahan kepada graduan.
vi. Merekod dan mengemaskini data siswazah.

3.Unit Senat

Unit Senat bertanggungjawab untuk mengendalikan urusan yang berkaitan dengan Senat Universiti. Antara tugas dan tanggungjawab yang dijalankan adalah:

i. Merancang aktiviti Senat dan Jawatankuasa di bawahnya, untuk memberi khidmat Urusetia dan menyelaraskannya den gan pihak-pihak lain yang berkaitan, dalam penawaran pro gram-program sedia ada dan baru.
ii. Menyediakan Kalendar Akademik, menguruskan senarai penawaran kursus serta berurusan dengan Kementerian Pendi dikan Malaysia (KPM) dan Jabatan Perkhidmatan Awam (JPA) mengenai penawaran program baru, penubuhan pusat pengaji an/Jabatan dan Unit.
iii. Menguruskan pencalonan penerima Ijazah Kehormat

Alamat:

Bahagian Pengurusan Akademik
Pusat Pengurusan Akademik (AMC)
Universiti Malaysia Perlis
Aras Bawah, Bangunan Canselori
Kampus Alam UniMAP Pauh Putra
02600 Arau PERLIS.

DIREKTORI

Pejabat Timb. Naib Canselor (Akademik & Antarabangsa)	04-941 4159
Pusat Pengurusan Akademik (AMC)	04-94 4158/4157
Bahagian Pengurusan Akademik (AMD)	
Unit Kemasukan dan Rekod Pelajar	04-941 4056
Unit Peperiksaan dan Pengijazahan	04-941 4057
Unit SENAT	04-941 4060
Jabatan Bendahari	04-941 4020/4021/4022

THE ACADEMIC SYSTEM

The Bachelor of Engineering and The Bachelor of Engineering Technology curriculum are designed to be completed in 4 years, the Bachelor of Technology are designed to be complete within 3 ½ years while The Bachelor in Business, The Bachelor of New Media Communication and Diploma are to be completed in 3 years with each academic year divided into Semester I and Semester II. Each semester consists of 14 study weeks. Examination will be held at the end of the semester.

To graduate, students also need to pass all courses and obtain the required number of credits according to their respective study programmes as well as a GCPA of at least 2.00.

PROGRAMME STRUCTURE

The programme structures for the Bachelor of Engineering, Bachelor of Engineering Technology, Bachelor of Technology, Bachelor of Business and Bachelor of New Media Communication programmes are shown in Table 1(a), 1(b), 1(c), 1(d), 1(e), 1(f) and 1(g). Students are required to complete 136 units for Bachelor of Engineering, 141 units for Bachelor of Engineering Technology, 124 units for Bachelor of Technology, 120 units for Bachelor of Business, 123 units for Bachelor of New Media Communication and 95 units for Diploma in order to graduate.

Table 1(a): Programme Structure for the Bachelor of Engineering

COURSES	Intake 2017	Intake 2018	Intake 2019	Intake 2020
	CREDIT	CREDIT	CREDIT	CREDIT
ENGINEERING CORE COURSES	**120**	**120**	**120**	**120**
UNIVERSITY REQUIREMENT COURSES	**17**	**16**	**16**	**16**
a) Engineering Entrepreneurship	2	2	2	2
b) Thinking Skills	2	2	-	2
c) Introduction of Philosophy	-	-	2	-
d) University Malay Language	2	2	2	2
e) Preparatory English	2*	2*	2*	2*
f) English For General Communication	2**	2**	2**	2**
g) English For Technical Communication	2	2	2	2
h) Islamic and Asian Civilization (TITAS)	2	2	2	-
i) Ethnic Relations	2	2	2	-
j) Philosophy & Current Issues	-	-	-	2
k) Appreciation Ethnic and Civilization	-	-	-	2
l) Co-Curriculum	3	2	2	2
m) Optional Course	2	2	2	2
TOTAL	**137**	**136**	**136**	**136**

Descriptions:

1. **- This course is compulsary for student who obtained Band 1 or Band 2 in MUET*
   - Audit course
2. *** - This couse is compulsary for student who obtained Band 3 in MUET.*

Table 1(b): Programme Structure for the Bachelor of Engineering Technology

COURSES	Intake 2017	Intake 2018	Intake 2019	Intake 2020
	CREDIT	CREDIT	CREDIT	CREDIT
ENGINEERING TECHNOLOGY CORE COURSES	**123**	**123**	**123**	**123**
UNIVERSITY REQUIREMENT COURSES	**19**	**18**	**18**	**18**
a) Engineering Entrepreneurship	2	2	2	2
b) Thinking Skills	2	2	-	2
c) Introduction of Philosophy	-	-	2	-
d) University Malay Language	2	2	2	2
e) Preparatory English	2*	2*	2*	2*
f) English For General Communication	2**	2**	2**	2**
g) English For Technical Communication	2	2	2	2
h) Islamic and Asian Civilization (TITAS)	2	2	2	-
i) Ethnic Relations	2	2	2	-
j) Philosophy & Current Issues	-	-	-	2
k) Appreciation Ethnic and Civilization	-	-	-	2
l) Skills & Technology in Communication	2	2	2	2
m) Co-Curriculum	3	2	2	2
n) Optional Course	2	2	2	2
JUMLAH	**142**	**141**	**141**	**141**

Descriptions:

*1. *- This course is compulsary for student who obtained Band 1 or Band 2 in MUET*

- Audit course

*2. ** - This couse is compulsary for student who obtained Band 3 in MUET.*

Table 1(c): Programme Structure for the Bachelor Technology

COURSES	Intake 2019	Intake 2020
	CREDIT	CREDIT
TECHNOLOGY CORE COURSES	**106**	**106**
UNIVERSITY REQUIREMENT COURSES	**18**	**18**
a) Engineering Entrepreneurship	2	2
b) Introduction of Philosophy	2	-
c) Thinking Skills	-	2
d) University Malay Language	2	2
e) Preparatory English	2*	2*
f) English For General Communication	2**	2**
g) English For Technical Communication	2	2
h) Islamic and Asian Civilization (TITAS)	2	-
i) Ethnic Relations	2	-
j) Philosophy & Current Issues	-	2
k) Appreciation Ethnic and Civilization	-	2
l) Co-Curriculum	2	2
m) Third Language	2	2
TOTAL	**124**	**124**

Descriptions:
*1. *- This course is compulsary for student who obtained Band 1 or Band 2 in MUET*
- Audit course
*2. ** - This couse is compulsary for student who obtained Band 3 in MUET.*

Table 1(d): Programme Structure for the Bachelor of Business (Engineering Entrepreneurship)

COURSES	Intake 2017	Intake 2018	Intake 2019	Intake 2020
	CREDIT	CREDIT	CREDIT	CREDIT
BUSINESS CORE COURSES	**72**	**72**	**94**	**94**
CORE ELECTIVES COURSES	**30**	**33**	**12**	**12**
UNIVERSITY REQUIREMENT COURSES	**18**	**17**	**14**	**14**
a) Engineering Entrepreneurship	2	2	2	2
b) Thinking Skills	2	2	-	2
c) Introduction of Philosophy	-	-	2	-
d) University Malay Language	2	2	2	2
e) Preparatory English	2*	2*	2*	2*
f) English For General Communication	2**	2**	2**	2**
g) English For Academic Purpose	2	2	2	2
h) Islamic and Asian Civilization (TITAS)	2	2	2	-
i) Ethnic Relations	2	2	2	-
j) Philosophy & Current Issues	-	-	-	2
k) Appreciation Ethnic and Civilization	-	-	-	2
l) Business Communication	3	3	-	-
m) Co-Curriculum	3	2	2	2
TOTAL	**120**	**122**	**120**	**120**

Descriptions:
*1. *- This course is compulsary for student who obtained Band 1 or Band 2 in MUET*
- Audit course
*2. ** - This couse is compulsary for student who obtained Band 3 in MUET.*

Table 1(d): Programme Structure for the Bachelor of Business (International Business)

COURSES	Intake 2017	Intake 2018	Intake 2019	Intake 2020
	CREDIT	CREDIT	CREDIT	CREDIT
BUSINESS CORE COURSES	**74**	**77**	**91**	**91**
CORE ELECTIVES COURSES	**30**	**27**	**14**	**14**
UNIVERSITY REQUIREMENT COURSES	**18**	**17**	**15**	**15**
a) Engineering Entrepreneurship	2	2	-	-
b) Thinking Skills	2	2	-	2
c) Introduction of Philosophy	-	-	2	-
d) University Malay Language	2	2	2	2
e) Preparatory English	2*	2*	2*	2*
f) English For General Communication	2**	2**	2**	2**
g) English For Academic Purpose	2	2	2	2
h) Islamic and Asian Civilization (TITAS)	2	2	2	-
i) Ethnic Relations	2	2	2	-
j) Philosophy & Current Issues	-	-	-	2
k) Appreciation Ethnic and Civilization	-	-	-	2
l) Business Communication	3	3	-	-
m) Time Management	-	-	3	3
n) Co-Curriculum	3	2	2	2
TOTAL	**122**	**121**	**120**	**120**

Descriptions:

1. **- This course is compulsary for student who obtained Band 1 or Band 2 in MUET*
   - *Audit course*
2. *** - This couse is compulsary for student who obtained Band 3 in MUET.*

Table 1(e): Programme Structure for the Bachelor of New Media

COURSES	Intake 2017	Intake 2018	Intake 2019	Intake 2020
	CREDIT	CREDIT	CREDIT	CREDIT
NEW MEDIA COMMUNICATION CORE COURSES	**87**	**96**	**96**	**96**
ELECTIVES COURSES	**15**	**9**	**9**	**9**
UNIVERSITY REQUIREMENT COURSES	**18**	**18**	**18**	**18**
a) Thinking Skills	2	2	2	2
b) Introduction of Philosophy	-	-	2	-
c) University Malay Language	3	2	2	2
d) Preparatory English	2*	2*	2*	2*
e) English For General Communication	2**	2**	2**	2**
f) English For Academic Purpose	2	2	2	2
g) Islamic and Asian Civilization (TITAS)	2	2	2	-
h) Ethnic Relations	2	2	2	-
i) Philosophy & Current Issues	-	-	-	2
j) Appreciation Ethnic and Civilization	-	-	-	2
k) Foreign Language	4	2	2	2
l) Co-Curriculum	3	2	2	2
m) Optional Course	-	2	2	2
TOTAL	**120**	**123**	**123**	**123**

Descriptions:

1. **- This course is compulsary for student who obtained Band 1 or Band 2 in MUET*
   - *Audit course*
2. *** - This couse is compulsary for student who obtained Band 3 in MUET.*

Table 1(f): Programme Structure for the Diploma of Engineering

COURSES	Intake 2017	Intake 2018	Intake 2019	Intake 2020
	CREDIT	CREDIT	CREDIT	CREDIT
DIPLOMA CORE COURSES	**83**	**81**	**81**	**81**
UNIVERSITY REQUIREMENT COURSES	**19**	**14**	**14**	**14**
a) Engineering Entrepreneurship	2	2	2	2
b) Malay Language	2	2	2	2
c) Communicative English I	2	2	2	2
d) Communicative English II	2	2	2	2
e) Communicative English III	-	2	2	2
f) Islamic and Asian Civilization (TITAS)	2	-	-	-
g) Communication Skills	2	-	-	-
h) Ethnic Relations	2	-	-	-
i) Malaysia Studies II	-	2	2	-
j) Philosophy & Current Issues	-	-	-	2
k) Uniform Bodies	5	2	2	2
l) Preliminary Mathematics	-	2***	2***	2***
TOTAL	**102**	**95**	**95**	**95**

Descriptions:
*1. ***- This course is compulsary for student who obtained D and below in Mathematics at SPM level*
- Audit course

TYPES OF COURSES

1.UNIVERSITY REQUIREMENT COURSES

The University Core Courses are courses which are NOT the student's major. These courses are offered by the Centre for Liberal Sciences and the Centre for Co-Curriculum. All these courses are compulsory and students need to pass these courses with grade C or above in order to graduate. The University Core Courses are:

a.Engineering Entrepreneurship (UUW224) - (2 credit)
All students are required to enroll in Engineering Entrepreneurship course. Along with this course, students are advised to take other courses in the Entrepreneurship Category too, of which the total enrolled units will be able to cover the Optional Course requirement.

b.Thinking Skills (UUW322) - (2 credit)
All students are required to take this course and must pass with grade C or above. This course is offered to all local and international students and will be offered every semester.

c.Philosophy & Current Issues (UUW130) – (2 credit)
All students are required to take UUW130 Philosophy & Current Issues. This course is offered to local and international students.

d.Appreciation of Ethnics and Civilizations (UUW131) – (2 credit)
Appreciation of Ethnics and Civilizations course is compulsory for all students.

e.Skills & Technology in Communication (PUW122/UUT122) –(2 credit)
All engineering students must take PUW122/UUT122 Skills & Technology in Communication course. PUW122 course code is taken by students of Technology Engineering programmes. Meanwhile, UUT122 course code is taken by students of Engineering programmes. This course is offered to local and international students.

f.University Malay Language (UVW410) - (2 credit)
This course is compulsory for all students INCLUDING international students from countries where Malay Language is used as their national language or spoken language, e.g. students from Indonesia, Brunei and Singapore.

g.* Preparatory English (UVA101) – (2 credit)
Students with ONE of the following criteria must register for this course,
- Obtained either Band 1 or Band 2 for Malaysian University English Test (MUET)

- Obtained MUET Band 3 for the English and Pre-Preparatory Programme (EPPP) **[applicable to International student only]

- Scored below 459 for TOEFL/ scored below 3.5 for IELTS (*optional and applicable to postgraduate students ONLY)

h.English for General Communication (UVW201) – (2 units)**
Students with ONE of the following criteria must register for this course,
- Obtained Band 3 in Malaysian University English Test (MUET)
- Passed UVA101 Preparatory English with minimum grade C

i.English for Technical Communication (UVW312) / English for Academic Purposes (UVW313) - (2 credit)
All students are required to take English for Technical Communication (Bachelor of Engineering, Bachelor of Engineering Technology and Bachelor of Technology) or English for Academic Purposes (for the Bachelor of Business and Bachelor of Communication New Media) courses. However, depending on their MUET results, students are required to attend some other English language courses before they are allowed to take English for Technical Communication or English for Academic Purposes as shown in Table 2.

Students who obtained Band 1 or 2 in MUET must first take and pass Preparatory English which is a 2-unit non-accredited (audit) course and with a minimum of Grade C, before being allowed to take 2 units of English for General Purposes/English for General Communication and another 2 units of English for Technical Communication or English for Academic Purposes. A minimum pass grade for all courses in English is grade C.

Students who obtained Band 3 in MUET are required to take and pass 2 units of English for General Communication before being allowed to take English for Technical Communication or English for Academic Purposes. Students who obtained Band 3 in MUET do not have to take the Preparatory English course.

Students who obtained Band 4, 5 or 6 in MUET are only required to take English for Technical Communication or English for Academic Purposes. Students who obtained Band 4, 5 or 6 in MUET do not have to take Preparatory English or English for General Communication cources.

For students who obtained Band 1, 2 and 3, two (2) units obtained via English for General Communication will be calculated as an Optional Course. Other Optional Courses are also open to students with MUET band 1,2 and 3. However, the number of credits for graduation for students with MUET band 1,2 and 3 taking Optional Courses (other than English for General Purposes/English for General Communication which was previously accounted as an Optional Course) will be 139 units for Engineering programme and 144 units for Engineering Technology programme. Students who have obtained Band 4, 5 and 6 in MUET must take any other Optional Courses.

Table 2: English Compulsory Courses

MUET Band	ENGLISH COMPULSORY COURSES			
	UVA101 Preparatory English (Non-accredited)	UVW 201 English for General Communication	UVW312 English for Technical Communication / UVW313 English for Academic Purposes.	Optional Courses (Foreign Languages)
BAND 1 & 2	/	/	/	Registration is open to students
BAND 3		/	/	
BAND 4			/	/

Note:
UVA 101- Preparatory English Course is a new course offered for Cohort 2018/2019 and later.

UVW 201- English for General Communication is a new course offered for Cohort 2018/2019 and later.

UVW 312-English for Technical Communication (offered for Bachelor of Engineering, Bachelor of
Engineering Technology & Bachelor of Tecnology students)

UVW313-English for Academic Purposes (offered for the Bachelor of Business & Bachelor of Communication New Media students)

j.Co-Curriculum Courses (2 credit)
All degree students are required to collect at least 2 units for Co-Curriculum during their study at UniMAP. One (1) unit is to be collected from Uniformed Bodies, whereby the first unit needs to be taken in Semester I (in the First Year of study). Another 1 unit in non-uniformed course should be taken in Semester 2 (in the First Year of study). Students must complete a uniformed course package. However, for students taking Uniformed Bodies packages with more than 2 units, it is not necessary to take the non-uniformed courses.

k.Uniform Bodies – (2 credit)
All diploma students are required to take two (2) Uniformed Bodies co-curricular course units in packages. Two (2) units of this course should be taken in the first semester (1) and the second semester (2) of the first year of study.

l.Optional Courses
Optional courses are courses outside the field of specialization that add value to students.
For student who obtained Band 4, 5 and 6 in Malaysian University English Test (MUET), they are exempted from taking UVW201 English for General Communication course and are required to take an optional course to earn credit for graduation.

There are four(4) optional courses that can be selected to meet the credit hours of student especially those who get credit exemption. However only two(2) courses are offered for each semester. All students must pass with grade C or above.

i. Corporate Communication (UUW125)-2 credit
This course is offered to all local and international students.
ii. Industrial Psychology (UUW126)- 2 credit
This course is offered to all local and international students.
iii. Communication & Conflict Management (UUW127)-2 credit

This course is offered to all local and international students.

iv. Human Resource Management (UUW128) – 2 credit
This course is offered to all local and international students.

2.PROGRAMME CORE COURSES
Core Courses are courses specific to a programme that must be taken by students. These courses are part of the requirements for graduation. Students who fail these Core Courses must repeat them and pass before they can graduate.

3.ELECTIVE COURSES
Students can choose Elective Courses based on their interests.

4.PREREQUISITE COURSES
All students MUST take and pass prerequisite courses set before registering for any subsequent courses. Student who fail the prerequisite courses and intend to take them together with the subsequent courses in the same semester, must apply to, and obtain the approval of the Dean of the faculty. Note, however, that prerequisite and subsequent courses cannot be taken together in the same semester for language courses.

TEACHING AND LEARNING APPROACHES AT UniMAP

Many of the Core Courses offered include Theory Component and Practical Component, the values of contact hours for each are detailed below:

1.Theory Component
One (1) unit of Theory Component is equivalent to 1 hour of lecture/ tutorial/reading per week or 14 hours per semester.

2.Practical Component
One (1) unit of Practical Component for Engineering programme is equivalent to 2 contact hours per week or 28 hours per semester. One (1) unit of Practical Component for Engineering Technology programme is equivalent to 3 contact hours per week or 42 hours per semester.

For most Core Courses, students are required to complete a mini project and sit for an examination or a Viva Voce at the end of the semester.

The Practical Components consist of the following teaching and learning modes:

i.Lab Intensive Learning – two or three students carry out an experiment in a group. In some basic lab intensive programmes, each student will conduct an experiment individually (1:1) and not in a group.

ii.Teaching Factory Learning – five to six students carry out a process run in a group using actual scale equipment used in industry.

iii.E-Learning – Learning approach that is reinforced using ICT to complement the conventional approach. Students obtain access to course modules and topics via the UniMAP website. The modules consist of lecture notes in multimedia format such as audio, video, graphic, animation, simulation, games and other interactive activities.

iv.Exposure to Industry – Students will make multiple visits to industry for a certain period of time throughout their study at UniMAP. These include InTra (Industrial Training), Industrial Entrepreneurship Exposure and others.

INDUSTRIAL TRAINING

Industrial Training is one of the University compulsory courses for student of University Malaysia Perlis (UniMAP) before graduating. The Industrial Trainig Course gives an opportunity for students to experience the working llife at industrial world for the preparation in the future. In

addition, the adaptation of industrial experience will meet the needs of graduate employment worldwide and the progress of the country.

The main objectives of the Industrial Training are to:

1. Instil professionalism in students
2. Raise students' awareness on the importance and connection between industrial and lab-intensive training, and engineering theories.
3. Provide students with early exposure to industrial environment and practices. Students also are given the opportunity to equip themselves with the necessary skills and knowledge needed in their respective academic and training fields.

UniMAP's Industrial Training Courses are divided into the following fields of study;

Field of Study	Credit	Indsutrial Training Period
Bachelor of Engineering	4	10 Weeks
Bachelor of Engineering Technology	12	24 Weeks
Bachelor of Technology	12	24 Weeks
Bachelor of Business (International Business)	4	8 Weeks
Bachelor of Business (Engineering Entreprenuership)	4	10 Weeks
Bachelor of New Media Communication	6	12 Weeks
Diploma in Engineering	6	16 Weeks

Contact hours of 8 hours a day for 5 days a week (with estimated 8 hours a day x 5 days = 40 hours a week) is considered an assessment hour (working hours set by the organization / company).

Industrial Training Leadership Workshop will be coordinated in advance before students undergo industrial training. Through this workshop, students will be briefed on the process of self-preparation before entering the industrial world. Not to be missed is the student dialogue session with the industry where the experts (from the industry) will be invited to present and share experiences about the industry as a whole.

BUSINESS INCUBATOR PROGRAMME

The teaching and learning approach for Bachelor of Business (Hons) (Engineering Entrepreneurship) program not only covers lectures and tutorials but also practical training through the Business Incubator Program. During the semester break of the 4th semester, students will participate in an 8-week Business Incubator Program which accounted for 4 credit hours.

Through this Business Incubator Program, students will be guided by companies directly involved in product development that may potentially lead to commercialization. Furthermore, companies involved are in the "start-up" category involving new businesses, fast-paced businesses and businesses aimed at bringing innovative products to the existing markets. Students can find out how ideas and innovations can lead to a product development process. At the end of the Business Incubator Program, students are required to provide a report on their experience throughout the Business Incubator Program that they have undergone in selected start-up companies.

The Business Incubator Program has close collaboration with the National Incubator Network Association (NINA) and also collaborates with the Association of Asean Business Incubation (AABI). Participating bodies in this establishment include Technology Park Malaysia, Malaysia Technology Development Corporation, SIRIM and Kulim Technology Park Corporation. UniMAP works closely with these organizations to ensure the success of the program.

COURSE CODE

Each course is assigned a code. For Bachelor of Engineering, Bachelor of Engineering Technology, Bachelor of Business and Bachelor of New Media Communications programmes, the codes are summarised in Tables 4(a), 4(b) and 4(c) below:

Table 4(a): First Alphabet;
Types of programmes offered at the Bachelor Degree level.

First alphabet in the code	Types of programmes offered
E	Bachelor of Engineering
B	Bachelor of Business
P	Bachelor of Engineering Technology
V	Bachelor of Technology
K	Bachelor of New Media Communication
U	General Course (This subject can be taken by students from all programmes)

Table 4(b): Second Alphabet;
Courses offered by faculties

Second alphabet in the code	Faculty offering courses
E	School of Electrical Systems Engineering
M	School of Microelectronic Engineering
K	School of Computer & Communication Engineering
N	School of Mechatronic Engineering
B	School of Material Engineering
P	School of Manufacturing Engineering
R	School of Bioprocess Engineering
A	School of Environmental Engineering
D	School of Mechanical Engineering Technology
G	School of Electronic Engineering Technology
L	School of Electrical Engineering Technology
S	School of Civil Engineering Technology
T	School of Chemical Engineering Technology
C	Engineering Centre
Q	Institute of Engineering Mathematics
I	Centre for Industrial and Governmental Collaboration
F	Centre of Business Innovation and Technopreneurship (PPIPT)
U	School of Human Development and Techonocommunication (iKOM)
V	Centre for International Languages
Z	Co-Curriculum Centre

Table 4(c): Third Alphabet - University's Requirements and Core Courses;

Third alphabet in the code	Types of Courses (University Requirement or Core Courses)
T	Core Courses
W	University Requirements Courses
A	Audit Courses
M	Mobility Courses

The three numbers which follow the Alphabet Codes represent the following; The first number represents the level of course. The second and third represent numbers assigned to the course. The codes are simplified in Table 5.

A	B	C	1	2	3	4	NUMBERS	DESCRIPTION
↓	↓	↓	↓	↓	↓	↓		
↓	↓	↓	↓	↓	↓	→	4	Units/Credits
↓	↓	↓	↓	↓	∟	→	3 Course numbers. (The course number is determined by each School)	
↓	↓	↓	↓	∟	→	→	2	
|	|	|	∟	→	→	→	1	Level of courses: • 1= 1st year subjects, • 2= 2nd year subjects, • 3= 3rd year subjects, • 4= 4th year subjects,
↓	↓	∟	→	→	→	→	**TYPE OF COURSE** Refer Table **4(c)**	
↓	∟	→	→	→	→	→	**FACULTIES**	Refer Table **4(b)**
∟	→	→	→	→	→	→	**TYPE OF PROGRAMME**	Refer Table **4(a)**

PRE-REGISTRATION

Pre-registration is a system that enable students to pre-register their courses online for all the courses to be taken in the following semesters at an earlier period. The pre-registration period is set before the semester break of each semester. All students (Active/P1 or P2 Status/With Outstanding Fees) ARE REQUIRED to perform the pre-registration process.

Students MUST pre-register before the end of the pre-registration period. Courses to be registered are courses to be taken in the following semester (all courses including Curriculum Courses). Students are encouraged to consult with their Rakan Pendamping Siswa (RPS) before pre-registering their courses online. Students who fail to pre-register their courses within the set time will risk their official registration being adversely affected, as priority will be given to those who have pre-registered. Students are encouraged to print their pre-registration slip as a proof of registration. Verification from their RPS will not be required at this stage.

COURSE REGISTRATION

All active students are required to register for courses allocated for each semester. The courses should be registered online by all students. Course registration must be completed within the dates specified by the Student Admissions and Records Unit via email or the UniMAP Portal.

Students are required to discuss with their Rakan Pendamping Siswa (RPS) regarding courses that they will have to register for each semester. Students must bring the registration slip for verification by the RPS in the system during the discussion session. Course registration without RPS verification is considered INVALID. If there are any changes in student course registration, i.e. add, drop or withdraw courses within the prescribed period, the student must also obtain verification from the RPS.

Students who fail to register within the prescribed period shall be subject to a penalty of RM50. Late registration must not exceed the 3rd week of the semester. Students must complete the HEA(B)-02[b] Late Registration Form and obtain approval from the Dean.

New students will register online on the specified date during the orientation week according to their faculty. Students will be briefed by their faculty on their programme courses during the orientation week.

Students are responsible for checking and ensuring that all the particulars stated in their Course Registration Slips are correct. Student who applied to add/drop/withdraw registration after the prescribed period without reasons accepted by the university may be fined. Registration after the prescribed period will only be considered by the Dean of the Faculty for students with specific reasons. Students are not allowed to register add/drop/withdraw during the examination weeks.

Students who do not register for a maximum of 2 consecutive semesters without any reason can be terminated through the submission of the HEA(B)-09 Termination of Study Form.

Students who have been terminated and wish to place an appeal to resume their studies may do so by submitting an appeal letter to the Vice-Chancellor through the Dean (Dean's verification required). A penalty of RM100 will be imposed on students whose application for re-admission has been approved.

5.Active Student Course Registration

All "Active" students are allowed to register for not more than 22 units and not less than ten 10 units except for those who are involved in Industrial Training and the Final Year Project. Student who wish to register for more than 22 units, need to obtain approval from their RPS and verification by the Dean. Table 6 below summarises the units that students can register for each semester based on their status:

Table 6: Summary of Units for Active Student

Student Status	Minimum Credit	Maximum Credit
Active Student	10	22
Active student with Industrial Training (LI) and Final Year Project (FYP)	10	28

*** Students who do not take FYP or LI can take more than 22 credits but with the approval from the Dean.

6.Probation Student Course Registration (P)

Student with the "Probation" status are not allowed to register online by themselves. The students must meet their RPS to obtain confirmation from the Dean. They also need to complete the HEA(B)-02[a] Course Registration Form: Probation Status before handing it to the Assistant Registrar. Only the Assistant Registrar of Faculty/Admissions and Student Records Unit is allowed to register the subjects for the students in this case. The numbers of units allowed is as in Table 7 below:

Table 7: Summary of Units for Probation Student

Student Status	Minimum Credit	Maximum Credit
Probation (P1)	10	12
Probation (P2)	8	10

ADD COURSES / DROP COURSES / COURSE WITHDRAWAL

1.Adding Courses

a. The time period allowed for the adding of courses is up to week 2 (week of study).

b. Late students are required to fill in the HEA(B)-02[b] Late Course Registration Form and submit it to the Assistant Registrar of the Faculty to be updated in the system. Applications for additional courses are subject to quota approval and vacancy.

2.Dropping Courses

a. The time period allowed to drop courses is up to week 7 (week of study).

b. Students must use the HEA(B)-03 Drop Courses Application Form to be signed by the course lecturer, Dean of the Faculty and submit it to the Assistant Registrar of the Faculty to be updated in the system.

3.Course Withdrawal (TD)

a. With the consent of course lecturer and Dean of the Faculty, a student may apply to withdraw from a course registered in a semester no later than the last working day of week 12 (week of study). To apply for a withdrawal from a course, the student must fill in HEA(B)-04 Withdrawal Courses Application Form.

b. Permission to allow students to withdraw from a course is subject to the minimum units allowed except with permission from the Dean.

c. Withdrawal status (TD) will be recorded in the record of regis tration and academic transcript. However, the grade will not be included to contribute towards the GPA and CGPA.

TRANSFER OF PROGRAMME

Student application for transfer of programme is an application by the student to transfer from their current study programme to either another programme offered by the same Faculty or to an existing programme offered by another Faculty for specific reasons as certified by the Dean of the related Faculty.
Students are not recommended to change programmes as it involves distribution of resources that have been planned at the beginning of each academic session. However, an appeal to change programme can be considered based on certain conditions:

1. The programme transfer must be applied within the first two (2) semesters of study at UniMAP. The application can be done as early as the first semester of academic session. If the application is approved, the student's status with regards to the new programme will take place in the following semester. The student will have to complete the HEA(B)-06 Change of Programme Application Form.

2. Students who are under sponsorship and funding must inform and get approval from their respective sponsors before applying.
3. The programme transfer is not allowed for students whose Active status has been restored upon a successful re-admission Appeal.
4. The programme transfer is only allowed once during the student's entire study period.
5. Permission for programme transfer is subject to the approval of the Dean of the original Faculty and consent of the Dean of the Faculty applied for, endorsement by the Director of the Academic Management Centre and approval of the Vice Chancellor or Deputy Vice Chancellor (Academic and International).

POSTPONEMENT OF STUDY

Postponement of study is permission granted to students for not attending studies in a semester for reasons permitted by the university.

Postponement of study is permitted for students who have health complications and illnesses which has been verified by government hospitals or the University panel of doctors or Pusat Kesihatan UniMAP. For certain cases, students who present medical certificates from hospitals other than those mentioned, must obtain endorsement from Pusat Kesihatan UniMAP. An application made due to reasons other than ill health may be considered if it is reasonable and approved by the Vice Chancellor / Deputy Vice Chancellor (Academic and International).

Students can apply for postponement of study by filling in the HEA(B)-07 Postponement of Study Application Form which can be obtained from the Registrar or their Faculty. Application must be:

a) Recommended by the Rakan Pendamping Siswa (RPS)
b) Recommended by the Dean of Faculty
c) Recommended by the Director of Academic Management and
d) Approved by the Vice Chancellor / Deputy Vice Chancellor (Academic and International).

Application for a postponement of study should be submitted before the 7th week of the semester. Application made after that period will only be allowed for medical reasons and other reasons with the approval of the the Vice Chancellor / Deputy Vice Chancellor (Academic and International).

Students are not allowed to postpone their studies for more than 2 semesters consecutively except with the approval of the Vice Chancellor / Deputy Vice Chancellor (Academic and International). In cases not related to health complications, students are only allowed to leave the university after the application for postponement is approved by the university. Students who leave the university before the approval is allowed to do so at their own risk.

For students who postpone their studies due to health complications, the current semester in which he or she is registered will not be counted for graduation (without penalty). For cases without penalty, courses registered in the particular semester will be dropped and results verified by the Majlis Peperiksaan Universiti (MPU) (if any), will be cancelled.

Students who postpone their study due to reasons OTHER than health complications, the current semester in which he or she is registered will be taken into account for graduation (with penalty) unless permitted with the approval of the Vice Chancellor / Deputy Vice Chancellor (Academic and International). For cases with penalties, courses registered in the particular semester will not be dropped and will be taken into account for that semester. Results verified by the Majlis Peperiksaan Universiti (MPU) are valid and will appear in the academic transcript.

A warning letter will be issued to students who do not register for the present semester without submitting any applications to postpone their

studies. Students who fail to submit an application for the postponement of studies within a period consecutive up to 2 semester can be terminate and quit from university.

STUDENT GRADING

A student's academic performance is measured using the Grade Point Average (GPA) system throughout the university academic session. A student who obtains at least a 2.00 for their GPA in a semester will be awarded the 'Active' (A) status and will be allowed to continue to the next semester. Students are also required to obtain minimum Cumulative Grade Point Average (CGPA) of 2.00 in order to graduate.

Students with GPA lower than 2.00 in a semester, will be given the Probation 1 (P1) status. The Probation 2 (P2) status is given to students with GPA lower than 2.00 for two consecutive semesters. If the GPA of the student is still lower than 2.00 for the following semester, the student will not be allowed to continue his/her studies, unless the CGPA of those students exceeded 2.00 and with the University approval. The University authorities have the right to terminate any student who does not perform and fulfil the academic requirements stated by the university.

MINIMUM AND MAXIMUM PERIOD OF STUDY

Bachelor of Engineering and Bachelor of Engineering Technology students have to complete their study within the duration given, which is a minimum 8 semesters (4 years) or the maximum 14 semesters (7 years). However, for students who are given credit exemptions, the duration given to complete their study cannot be less than 6 semesters (3 years) and not more than 12 semesters (6 years). Bachelor of Business, Bachelor of New Media Communication and Diploma students should complete their studies within a minimum of 6 semesters (3 years) and a maximum of 10 semesters (5 years).

The minimum and maximum period of study is as follow:

Programme	Minimum (Semester)	Maximum (Semester)
Bachelor of Engineering	8	14
Bachelor of Engineering Technology	8	14
Bachelor of Technology	7	12
Bachelor of Business	6	10
Bachelor of New Media Communication	6	10
Diploma	6	10

ADDITIONAL SEMESTER

The Additional Semester are offered to students who wish to repeat failed courses in the regular semester, subject to conditions and approval by the University Senate. Additional semester period includes four (4) weeks of study and one (1) week of exams. Mid-semester break and revision week are not provided for this semester.
Students must register for courses and enrollment must not exceed 9 units per semester and be limited to 16 units registered for the entire academic year. Learning and teaching are in the form of a 4-week tutorial and student attendance in the tutorial is also required and attendance is recorded.
The eligibility requirements for the Additional Semester are:

1. Courses offered in the Additional Semester are eligible for students who have:
   i) Student who obtained a grade D and below for Core Courses; OR
   ii) Student who obtained grade C- and below for University Requirement Courses; AND
   iii) Obtain a passing mark for continuous assessment with a score of 40% for relevant courses
2. Permission to take Additional Semester for the purpose of grade improvement (D+ or C- for Core Courses) will only be given to final year students.
3. Students who have F * and X grades are not eligible to enroll in additional semesters.
4. Additional Semester can only be taken by students who have registered and paid the fees. Students are not able to apply for exemption in payment when registering.
5. Only students without any outstanding debt could apply for Additional Semester. No payment exemption appeals are allowed when applying.
6. Student engaged in industrial training during the Additional Semester are not allowed to attend the Additional Semester.

Students are required to enroll in additional semester courses provided:

1. Student has paid outstanding fees.
2. Students explain additional semester fees by the end of the second week of tuition in the Additional Semester (before the results of the 2nd semester examination are announced).

CREDIT TRANSFER

Credit Transfer is defined as the recognition of the amount of credit earned by a student in UniMAP or at other Institutions of Higher Learning. There are 2 categories of credit transfer:

1. Vertical Credit Transfer @ Credit Exemption
   Credit transfer from a lower level to a higher level course. Grades and grade points for the courses involved will NOT be taken into the calculation of student's GPA and CGPA.
2. Horizontal Credit Transfer
   Credit transfer from programmes at the same level of qualification such as from diploma to diploma OR bachelor degree programme to bachelor degree programme. Grades and grade points for the courses involved WILL be taken into calculation of student's GPA and CGPA.

The general terms for credit transfer are:

1. Pasing grades - the minimum passing grades for the courses eligible for credit transfer are Grade C or 2.00 (for Engineering programmes, Engineering Technology programmes and Technology programmes) and grade B or 3.00 (For Business Programmes and Social Science Programme).
2. Credit Value – the credit value of the course eligible for credit transfer must be the same or higher than the credit value of the course applied for credit transfer by the student.
3. The content of the course must have at least 80% similarities to the course for which credit transfer is applied for.

EXAMINATION AND EVALUATION SYSTEM

Written examination is conducted at the end of the semester. Every student must fulfil the requirements for lecture, tutorial, practicum and other requirements before being eligible to sit for an exam. The duration for the exams is as follows:

Table 8: Examination Duration

Course Value	Examination Duration
1 credit	2 hours
2 – 4 credit	3 hours

Students' examination results are based on coursework components and written examination. A coursework carries the value of 100% if the entire course is lab structured. Coursework consists of assignments, lab reports and tests. Students' achievement is based on letter grades and points as follows:

Table 9– Letter grades and points

Gred	*Grade Point*	*Status*
A	4.00	*Pass*
A-	3.75	
B+	3.50	
B	3.00	
B-	2.75	
C+	2.50	
C	2.00	
C-	1.75	*Conditional Pass*
D+	1.50	
D	1.00	*Fail*
D-	0.75	
F	0.00	

The passing grade of a course is subject to the requirement of the course as follows;

i. For compulsary courses, the passing grade is Grade C and above (Grade A –C)

ii. For core courses, Grade D+ and C- are counted as Conditional Pass (refer section iii)

iii. Student who met the accumulated credit for graduation and final CGPA less than 2.00, then student are required to repeat any Core courses taht get D+ or C- to ensure a CGPA reaches at least 2.00.

Table 10 - Calculation of GPA and CGPA:

	COURSE	CREDIT	GRADE VALUE [NG]	GRADE [G]	TOTAL NG
	EKT121	3	3.75	A-	11.25
	EMT102	4	2.50	C+	10.00
	EMT111	4	3.50	B+	14.00
	EMT112	4	4.00	A	16.00
	EQT102	3	1.75	C-	5.25
	EUT122	2	2.75	B-	5.50
		20			62.00
	GPA = 62.00/20 = 3.10				
	ECT200	3	3.50	B+	10.50
	EKT212	4	2.00	C	8.00
	EKT230	4	4.00	A	16.00
	EKT240	4	3.50	B+	14.00
	EQT203	3	3.75	A-	11.25
		18			59.75
	GPA = 59.75/18 = 3.32				

CGPA = Total Accumulated Grade Value / Total Accumulated Credit

= (62.00 + 59.75) / (20 + 18)

= 3.20

* the unit terms previously used are replaced with credit terms.

APPEAL FOR EXAMINATION RESULTS REVISION

In certain cases, a student might wish to apply for a revision of their examination results. Students are only allowed to appeal for a revision within the duration of 10 days after the examination results are officially released by the Academic Management Centre (AMC). Application after this duration will not be considered.

Students must submit the HEA(C)-02 (a) form (Appeal for Review of Examination Results) to the Examination & Graduation Unit, Academic Management Division, and Academic Management Centre (AMC). The appeal form must be submitted within the period of 10 days after the official result is announced. Students will have to fill in their details in two (2) copies, one

of which is the student copy.

Students will be charged RM50 per course for each course appealed.

ENGLISH LANGUAGE USE

Malay is the official language of the university. However English is used widely in the teaching and learning process at UniMAP. This is to help students in their future career. For courses that are taught in English, the examination will be conducted in the same language.

BUDDY SYSTEM (RAKAN PENDAMPING SISWA)

Buddy System (Rakan Pendamping Siswa) or RPS is a system which connects students and lecturers to allow them to discuss and decide on students' study plan. Even though course registration is done via online by students, they are advised to meet their RPS during the registration exercise for advisory purposes.

In the system, an academic staff supervises a small group of students for the whole duration of the students' study period at UniMAP. 'Supervision' here entails frequent meetings under informal settings, where students are able to discuss about academic and social issues with their lecturers who act as a 'buddy' to them. Students who have unsatisfactory academic performance may refer to their RPS as a mentor, and the student is a 'mentee'.

ACADEMIC MANAGEMENT DIVISION, ACADEMIC MANAGEMENT CENTRE (AMC)

Academic Management Division (AMD) serve a service-oriented function and is responsible for managing undergraduate affairs including admission and student records, examination and graduation. The Division also function as secretariat for the University Senate.
Academic Management Division consist of:

1.Admissions and Student Records Unit

This unit is responsible for handling matters relating to the admis sion and student records. Some of its functions are:

a) Handling recruitment and enrolment of local students for first de gree and diploma;
b) Handling recruitment and enrolment of international students for first degree and diploma;
c) Managing admission process, updating academic data and stu dent records in the Student Information System;
d) Managing the process of quitting study, deferment of study and exchange of programs;
e) Managing student course registration for each semester; and
f) Managing credit exemption process.

2.Examinations and Graduation Unit

This unit is responsible for examination and graduation. For examinations this unit operates and monitors the Final Examinations and matters related to it. Some of its duties are as follows:

a) Issue the Examination Circular to Schools/ Centres/ Institutes;
b) Issue the Examination Schedules for Diploma and Degree Pro grams;
c) Manage the Final Examination within a specified time frame;
d) Manage the processing of exam data using the Student Informa tion System;
e) Secretariat to the University Examination Council;
f) Release the result of a Final Examination;
g) Manage student appeal process to revise the result of examina tion; and
h) Issue academic transcripts after the Convocation.

For the purpose of graduations, this unit handles student gradua tions and convocations. Some of its duties are as follows:

iv. Check the graduation eligibility for final year students and issue a graduation confirmation letter and qualification of graduate students eligible for graduation,
v. Convocation secretariat,

vi. Manage invitation as well as borrowing and returning process of convocation robe,
vii. Manage the process of preparation and submission of graduation scrolls to graduates, and
viii. Record and update graduate data.

3.The Senate Unit
This unit acts as secretariat to the Senate in dealing with matters relating to the affairs of the Senate. Some of its duties are:

a) Committees of the Senate and plan activities under it, in addition to co-ordinate matters relating to the other parties concerned;
b) Academic Calendar provides for recognition and approval of the Senate; and
c) Managing the nomination of Honorary Degree recipients.

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2. Sarjana Muda Kejuruteraan Mekatronik dengan Kepujian
3. Sarjana Muda Teknologi Kejuruteraan Elektrik (Kuasa Industri) dengan Kepujian
4. Sarjana Muda Teknologi Kejuruteraan Elektrik (Teknologi Robotik dan Automasi) dengan Kepujian
5. Sarjana Muda Teknologi Penyelenggaraan Sistem Elektrik dengan Kepujian
6. Diploma Kejuruteraan Elektrik
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UR4522001
Diploma in Electrical Engineering

Programme Educational Objective (PEO)

PEO 1
To raise graduates who are competent in their respective engineering fields as exhibited through career development.

PEO 2
To raise graduates who involved and contribute to the society.

PEO 3
To raise graduates who pursue education opportunity continually

PEO 4
To raise graduates who contribute through innovation and entrepreneurship.

Programme Outcomes (PO)

PO1
Knowledge: Apply knowledge of applied mathematics, applied science, engineering fundamentals and an engineering specialization to wide practical procedures and practices.

PO2
Problem analysis: Identify and analyse well-defined engineering problems reaching substantiated conclusions using codified methods of analysis specific to their field of activity.

PO3
Design/development of solutions: Design solutions for well-defined technical problems and assist with the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

PO4
Investigation: Conduct investigations of well-defined problems; locate and search relevant codes and catalogues, conduct standard tests and measurements.

PO5
Modern Tool Usage: Apply appropriate techniques, resources, and modern engineering and IT tools to well-defined engineering problems, with an awareness of the limitations.

PO6
The Engineer and Society: Demonstrate knowledge of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technician practice and solutions to well-defined engineering problems.

PO7
Environment and Sustainability: Understand and evaluate the sustainability and impact of engineering technician work in the solution of well-defined engineering problems in societal and environmental contexts.

PO8
Ethics: Understand and commit to professional ethics and responsibilities and norms of technician practice.

PO9
Individual and Team Work: Function effectively as an individual, and as a member in diverse technical teams.

PO10
Communications: Communicate effectively on well-defined engineering activities with the engineering community and with society at large, by being able to comprehend the work of others, document their own work, and give and receive clear instructions.

PO11
Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member or leader in a technical team and to manage projects in multidisciplinary environments.

PO12
Life-Long Learning: Recognise the need for, and have the ability to engage in independent updating in the context of specialised technical knowledge.

CURRICULUM STRUCTURE DIPLOMA IN ELECTRICAL ENGINEERING
ACADEMIC SESSION (2020/2021)

YEAR	FIRST		SECOND		THIRD	
SEMESTER	I	II	III	IV	V	VI
Engineering Core Courses (81)	DKA 104/2 Preliminary Mathematics	DQT 101/3 Mathematics 1	DQT 102/3 Mathematics II	DQT 203/3 Mathematics III	DET 308/3 Power System II	DIT361/6 Industrial Training
	DET 116/3 Basic Computer Programming	DET 101/3 Electric Circuit Fundamental I	DET 202/3 Electric Circuit Fundamental II	DET 203/3 Electrical Instrumentation & Measurement	DET 309/3 Power Electronic	
	DCT 100/2 Basic Engineering Skills	DET 113/3 Digital System	DET 214/3 Programmable Logic Controller	DET 205/3 Electrical Machine & Applications II	DET 310/3 Power System Commissioning & Maintenance Practice	
	DMT 114/2 Engineering Science	DET 115/3 Electronic Devices	DET 204/3 Electrical Machine & Applications I	DET 206/3 Power System I	DET 351/3 Semestral Project	
	DUT123/2 IT & Communication Skills	DET 119/3 Microcontroller	DET 218/3 Analogue Electronics	DET 207/3 Electrical Installation Design	DET 320/3 Industrial Electrical Safety and Quality, Management	
	DET 111/3 Engineering Drawing			DET 212/3 Control Principle		
81	12	15	15	18	15	6
University Requirement Courses (14)	DVW 101/2 English 1	DVW 201/2 English 2	DVW 301/2 English 3			
		DVW 410/2 Malay Language	DUW 129/2 Falsafah Dan Isu Semasa		DUW 224/2 Engineering Entrepreneurship	
	DZW XXX/1 Badan Beruniform 1	DZW XXX/1 Badan Beruniform 1				
14	3	5	4	0	2	
95	15	20	19	18	17	6

Notes:
DKA104/2 Preliminary Mathematics : Prerequisite for SPM-level Additional Mathematics with grade D.

UR4523001
Diploma in Mechatronic Engineering

Programme Educational Objective (PEO)

PEO 1
To raise graduates who are competent in their respective engineering fields as exhibited through career development.

PEO 2
To raise graduates who involved and contribute to the society.

PEO 3
To raise graduates who pursue education opportunity continually

PEO 4
To raise graduates who contribute through innovation and entrepreneurship.

Programme Outcomes (PO)

PO1
Knowledge: Apply knowledge of applied mathematics, applied science, engineering fundamentals and an engineering specialization to wide practical procedures and practices.

PO2
Problem analysis: Identify and analyse well-defined engineering problems reaching substantiated conclusions using codified methods of analysis specific to their field of activity.

PO3
Design/development of solutions: Design solutions for well-defined technical problems and assist with the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

PO4
Investigation: Conduct investigations of well-defined problems; locate and search relevant codes and catalogues, conduct standard tests and measurements.

PO5
Modern Tool Usage: Apply appropriate techniques, resources, and modern engineering and IT tools to well-defined engineering problems, with an awareness of the limitations.

PO6
The Engineer and Society: Demonstrate knowledge of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technician practice and solutions to well-defined engineering problems.

PO7
Environment and Sustainability: Understand and evaluate the sustainability and impact of engineering technician work in the solution of well-defined engineering problems in societal and environmental contexts.

PO8
Ethics: Understand and commit to professional ethics and responsibilities and norms of technician practice.

PO9
Individual and Team Work: Function effectively as an individual, and as a member in diverse technical teams.

PO10
Communications: Communicate effectively on well-defined engineering activities with the engineering community and with society at large, by being able to comprehend the work of others, document their own work, and give and receive clear instructions.

PO11
Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member or leader in a technical team and to manage projects in multidisciplinary environments.

PO12
Life-Long Learning: Recognise the need for, and have the ability to engage in independent updating in the context of specialised technical knowledge.

CURRICULUM STRUCTURE DIPLOMA IN MECHATRONIC ENGINEERING
ACADEMIC SESSION (2020/2021)

YEAR	FIRST		SECOND		THIRD	
SEMESTER	I	II	III	SEMESTER	I	II
ENGINEERING CORE COURSES (81)	DKA104/2 Preliminary Mathematics	DQT101/3 Mathematics I	DQT102/3 Mathematics II	DQT203/3 Mathematics III	DNT351/3 Semestral Project	DIT361/6 Industrial Training
	DCT100/2 Basic Engineering Skills	DNT113/3 Electrical Circuit	DNT233/3 Thermo Fluids	DNT241/3 Pneumatics and Hydraulics	DNT352/3 Industrial Automation and Robotics	
	DNT111/2 Engineering Drawing	DNT122/3 Applied Mechanics	DNT235/3 Basic Electrical Technology	DNT242/3 Machine Mechanism Elements	DNT354/3 Control Principles	
	DNT112/2 Basic Engineering Science	DNT123/2 Computer Aided Drafting (CAD)	DNT236/3 Engineering Materials	DNT245/3 Sensors & Measurements	DNT355/3 Manufacturing Process	
	DNT126/3 Basic Computer Programming	DNT128/3 Digital System	DNT238/3 Analogue Electronics	DNT246/3 Microcontroller and Interfaces	DNT333/3 Industrial Safety and Quality Management	
	DUT123/2 IT & Communication Skills	DNT134/2 Mechatronics Workshop Practice		DNT253/3 Programmable Logic Controller (PLC)		
81	11	16	15	18	15	6
UNIVERSITY REQUIREMENT COURSES (14)	DVW101/2 Communicative English I	DVW201/2 Communicative English II	DVW301/2 Communicative English III		DUW224/2 Engineering Entrepreneurship	
	DVW410/2 Malay Language		DUW129/2 Philosophy and Current Issues			
	DZWXXX/1 Badan Beruniform 1	DZWXXX/1 Badan Beruniform 2				
14	5	3	4	0	2	
95	16	19	19	18	17	6

Note:
DKA104/2 Preliminary Mathematics : Prerequisite Mathematics I (DQT101/3) for SPM-level Additional Mathematics with grade D.

UR6522001
Bachelor of Electrical Engineering with Honours

Programme Educational Objective (PEO)

PEO1
Graduates who have demonstrated career advancement in the field of Electrical Engineering or related engineering field.

PEO2
Graduates who are involved in a professional body or society.

PEO3
Graduates who pursue life-long learning

Programme Outcome (PO)

PO1
Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization respectively to the solution of complex engineering problems.

PO2
Identify, formulate, conduct research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO3
Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental consideration.

PO4
Conduct investigation of complex engineering problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

PO5
Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations.

PO6
Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problem.

PO7
Understand and evaluate the sustainability and impact of professional engineering work in the solutions of complex engineering problems in societal and environmental contexts including ability to have entrepreneurship skills.

PO8
Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

PO9
Function effectively as an individual, and as a member or leader in diverse teams and multi-disciplinary settings.

PO10
Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11
Recognise the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PO12
Demonstrate knowledge and understand of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects in multidisciplinary environments.

CURRICULUM STRUCTURE
BACHELOR OF ELECTRICAL ENGINEERING WITH HONOURS (2020/2021)

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	I	II	III	IV	V	VI		VII	VIII
Discipline Core (103 Units)	EET111/2 Engineering Science	EET109/3 Electronic Devices	EET204/3 Instrumentation and Measurements	EET203/4 Microcontroller Systems Design	EET301/4 Power System Engineering	EET304/3 Communication System Engineering	EIT302/4 Industrial Training	EET417/3 High Voltage Engineering	EET416/3 Electrical Drives
	EET140/3 Electric Circuit I	EET110/3 Basic Computer Programming	EET205/4 Analog Electronics	EET207/3 Signals and Systems	EET302/3 Control Systems Engineering	EET307/4 Power Electronics I		EETXXX/3 Elective I	EETXXX/3 Elective III
	EET142/2 Introduction to Electrical Engineering	***EET141/3 Electric Circuit II	EET209/4 Digital Electronics	EET208/3 Electrical Power Technology	EET303/3 Electromagnetic Theory	EET308/3 Power System Analysis		EETXXX/3 Elective II	EETXXX/3 Elective IV
			***EET240/3 Electric Circuit III		EET306/4 Electrical Machine	EET334/1 Engineering Team Project I		***EET447/2 Engineering Team Project II	
						EET432/3 Electrical Energy Utilization		EET445/2 Final Year Project I	***EET446/4 Final Year Project II
								EET448/3 Management for Engineers	EET442/2 Professional Engineers
Common Core (17 Units)	EQT101/3 Engineering Mathematics I	EQT102/3 Engineering Mathematics II	EQT203/3 Engineering Mathematics III	EQT271/3 Engineering Statistics					
		ECT111/3 Engineering Skills		UUT122/2 Skills and Technology in Communication					
University Required	*UVA101/0 Prepatory English	*UVW201/2 English for General Communication		*UVW312/2 English for Technical Communication	*UVWXXX/2 Option				
	**UVW410/2 University Malay Language								
	UUW130/2 Philosophy and Current Issues				UUW322/2 Thinking Skills	UUW224/2 Engineering Entrepreneurship			
	UUW131/2 Appreciation of Ethics & Civilizations								
	UZWXXX/1 Co-curriculum	UZWXXX/1 Co-curriculum							
136	17	18	17	17	16	16	4	16	15
Total Units for Graduation 136									

***Compulsory and optional courses according to MUET Results**

MUET	UVA101/0	UVW201/2	UVW312/2	UVWXXX/2
Band 2	Compulsory	Compulsory	Compulsory	Optional
Band 3		Compulsory	Compulsory	Optional
Band 4, 5 and 6			Compulsory	Compulsory

Band 2 & 3 students may take Option course but will graduate with 138 Credits.

*****Courses with prerequisite**

Course	Prerequisite
EET141/3	EET140/3
EET240/3	EET141/3
EET447/2	EET334/1
EET446/4	EET445/2

**** Course specific for local or international student**

Local	International
UVW410/2 University Malay Language	UVW110/2 Basic Malay Language

List of Elective Courses

Area	Course Code	Course Name	Semester Offered
Electrical Power	EET411/3	Power System Operation and Control	7
	EET412/3	Electrical Machine Design	
	EET414/3	Substation Design	8
	EET462/3	Electrical Installation Design	
Renewable Energy and Control	EET426/3	Power Electronics II	7
	EET431/3	Electrical Energy System	
	EET427/3	Industrial Electronic Control	8
	EET433/3	Renewable Energy System	

UR6523003
Bachelor of Mechatronic Engineering with Honours

Programme Educational Objective (PEO)

PEO1
Graduates who have demonstrated career advancement in the field of Electrical Engineering or related engineering field.

PEO2
Graduates who are involved in a professional body or society.

PEO3
Graduates who pursue life-long learning

Programme Outcome (PO)

PO1
Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

PO2
Identify, formulate, conduct research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO3
Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations

PO4
Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions

PO5
Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations.

PO6
Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems.

PO7
Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts including ability to have entrepreneurship skills.

PO8
Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

PO9
Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO10
Communicate effectively on complex engineering activities with the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.

PO11

Recognise the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PO12
Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work as a member and leader in a team, to manage projects and in multi-disciplinary environments.

CURRICULUM STRUCTURE
BACHELOR OF MECHATRONIC ENGINEERING WITH HONOURS

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	I	II	III	IV	V	VI		VII	VIII
ENGINEERING CORE COURSES (101 Units)	ENT187/3 Electric Circuit Theory	ENT162/4 Analog Electronics	ENT286/3 Instrumentation & Measurements	ENT267/3 Design of Machinery	ENT365/3 Control Engineering I	ENT375/4 Control Engineering II	EIT302/4 Industrial Training	ENT445/2 Final Year Project I	ENT446/4 Final Year Project II
	ENT141/3 Engineering Statics	ENT142/3 Engineering Dynamics	ENT281/3 Signals & Systems	ENT222/3 Electromagnetic Field Theory	ENT366/3 Machine Vision	ENT376/3 Mechatronic Systems Design I		ENT476/4 Mechatronic Systems Design II	ENT490/3 Management Production & Quality Control
	ENT189/3 Computer Programming	ENT186/3 Computer Aided Drawing	ENT262/4 Digital Logic Design	ENT269/4 Embedded System and Interfacing	ENT367/3 Fluid Power Systems	ENT383/3 Network & Communication Engineering		ENT 471/4 Automation	Elective II/3
		ECT111/3 Engineering Skills	ENT266/3 Engineering Materials	ENT270/3 Principle of Thermofluids	ENT368/4 Electrical Machines & Power Systems	ENT377/3 Robotic Systems		Elective I/3	
NON ENGINEERING CORE COURSES (17 Units)	EQT101/3 Engineering Mathematics I	EQT 102/3 Engineering Mathematics II	EQT203/3 Engineering Mathematics III	EQT 271/3 Engineering Statistics				ENT442/2 Professional Engineers	ENT443/3 Management for Engineers
UNIVERSITY REQUIREMENT (18 Units)	UUW 130/2 Philosophy and Current Issues	UZWXXX/1 Co-Curriculum		UVW312/2 English for Technical Communication	UVW410/2 University Malay Language or ***UVW110/2 Basic Malay Language	UUT122/2 Skills and Technology in Communication		UUW322/2 Thinking Skills	
	UZWXXX/1 Co-Curriculum	UUWXXX/2 Option or **UVW201/2 English for General Communication			UUW224/2 Engineering Entrepreneurship	UUW131/2 Appreciation of Ethics and Civilization			
	*UVA101/2 Preparatory English								
	15	19	16	18	17	17	4	17	13
Total Units for Graduation 136									

Electives:
Elective I: ENT493/3 Advanced Control System/ ENT469/3 Vibration Control/ ENT477/3 Power Electronics/ ENT486/3 Mobile Robotics/ ENT491/3 Robotic Control
Elective II: ENT479/3 Advanced Sensing/ ENT499/3 Digital Signal Processing & Applications/ ENT497/3 Artificial Intelligence in Engineering/ ENT478/3 Computational Intelligence/ ENT480/3 Machine Learning
* Uncredited. Compulsory to students with MUET Band 1 and 2 only. This course is a prerequisite to UVW201 English for General Communication.
**Compulsory to students with MUET Band 3 or less. This course is a prerequisite to UVW312 English for Technical Communication. ***For international students only.

UR6522002
Bachelor of Electrical Engineering Technology (Industrial Power) with Honours

Programme Educational Objective (PEO)

PEO 01
Engineering technology graduates engaged in the field of civil/electrical/electronic/chemical/mechanical engineering technology as demonstrated through career advancement.

PEO 02
Engineering technology graduates who are members and contribute to professional society.

PEO 03
Engineering technology graduates embracing in life-long learning or pursuing continuing education opportunities

PEO 04
Engineering technology graduates who are technopreneurs

Programme Outcome (PO)

PO1
Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialisation to defined and applied engineering procedures, processes, systems or methodologies; (SK1 to SK4)

PO2
Identify, formulate, research literature and analyse broadly-defined engineering problems reaching substantiated conclusions using analytical tools appropriate to their discipline or area of specialisation; (SK1 to SK4)

PO3
Design solutions for broadly-defined engineering technology problems and contribute to the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations; (SK5)

PO4
Conduct investigations of broadly-defined problems; locate, search and select relevant data from codes, data bases and literature, design and conduct experiments to provide valid conclusions; (SK8)

PO5
Select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to broadly-defined engineering problems, with an understanding of the limitations; (SK6)

PO6
Demonstrate understanding of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technology practice and solutions to broadly-defined engineering problems; (SK7)

PO7
Understand the impact of engineering technology solutions of broadly-defined engineering problems in societal and environmental context and demonstrate knowledge of and need for sustainable development; (SK7)

PO8
Understand and commit to professional ethics and responsibilities and norms of engineering technology practice; (SK7)

PO9
Function effectively as an individual, and as a member or leader in diverse technical teams;

PO10
Communicate effectively on broadly-defined engineering activities with the engineering community and with society at large, by being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions;

PO11
Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member and leader in a team and to manage projects in multidisciplinary environments;

PO12
Recognize the need for, and have the ability to engage in independent and life-long learning in specialist technologies.

CURRICULUM STRUCTURE
BACHELOR OF ELECTRICAL ENGINEERING TECHNOLOGY (INDUSTRIAL POWER) WITH HONOURS (2020/2021)

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEMESTER	I	II	III	IV	V	VI	VII	VIII
Discipline Core (108 Units) (31 Courses)	PLT 101/3 Computer Programming	PLT 105/3 Electric Circuit Theory I	PLT 201/3 Electric Circuit Theory II	PLT 205/4 Electrical Machines Technology I	PLT 301/4 Electrical Machines Technology II	PLT 340/4 Final Year Project I	PLT 440/6 Final Year Project II	PIT 404/12 Industrial Training
	PLT 102/2 Computer Aided Drafting	PLT 106/3 Digital Electronics	PLT 202/3 Measurement & Instrumentation	PLT 206/3 Microcontroller System	PLT 302/3 Electrical Installation I	PLT 306/3 Electrical Installation II	PLT 401/3 Power System Protection & Switchgear	
	PCT 111/3 Engineering Skills I	PLT 107/3 Electronics I	PLT 203/3 Electronics II	PLT 207/3 Power Electronic	PLT 303/3 Electrical Drives	PLT 307/3 Programmable Logic Controller	PLT XXX/3 Elective II	
	PLT 104/3 Engineering Science	PLT 108/3 Engineering Skills II	PLT 204/3 Electromagnetic Field Theory	PLT 208/3 Communication System	PLT 304/4 Electrical Power System	PLT XXX/3 Elective I	PLT XXX/3 Elective III	
				PLT 209/3 Signal & Systems	PLT 305/3 Control System Technology			
Common Core (15 Units) (5 Courses)	PQT 111/3 Mathematics for Engineering Technology I	PQT 112/3 Mathematics for Engineering Technology II	PQT 213/3 Mathematics for Engineering Technology III			PTT 333/3 Engineering Technology Management	PTT 444/3 Engineering Technologist in Society	
University Required (18 Units) (12 Courses)	UUW 322/2 Thinking Skills	*UVA 101/0 Preparatory English	UVW201/2 English for General Communication	UUW 224/2 Engineering Entrepreneurship	UUW 131/2 Appreciation of Ethics & Civilizations	UUT 122/2 Skills & Technology in Communication		
	UUW 130/2 Philosophy and Current Issues	UVW 410/2 University Malay Language	UUW XXX/2 Option Subject (Foreign Language)	UVW 312/2 English for Technical Communication				
	UZW XXX/1 Co-curriculum	UZW XXX/1 Co-curriculum						
141	19	18	17	20	19	18	18	12
Total Units for Graduation 141								

*Compulsory and optional courses according to MUET Results

MUET	UVA 101/0	UVW 201/2	UVW 312/2	UVW XXX/2
Band 2	Compulsory	Compulsory	Compulsory	Optional
Band 3		Compulsory	Compulsory	Optional
Band 4, 5 and 6			Compulsory	Compulsory

Band 2 & 3 students may take Option course but will graduate with 143 Credits

**Course specific for local or international student

Local	International
UVW 410/2 University Malay Language	UVW 110/2 Basic Malay Language

List of Elective Course

Elective	Course Code	Course Name	Semester Offered
I	PLT 308/3	Power Quality	6
	PLT 309/3	Substation Engineering	
II	PLT 402/3	Industrial Automation	7
	PLT 403/3	High Voltage Technology	
III	PLT 404/3	Renewable Energy System	7
	PLT 405/3	Energy Efficiency & Management	

UR6523006
Bachelor of Electrical Engineering Technology (Robotic & Automation Technology) with Honours

Programme Educational Objective (PEO)

PEO 01
Engineering technology graduates engaged in the field of civil/electrical/electronic/chemical/mechanical engineering technology as demonstrated through career advancement.

PEO 02
Engineering technology graduates who are members and contribute to professional society.

PEO 03
Engineering technology graduates embracing in life-long learning or pursuing continuing education opportunities

PEO 04
Engineering technology graduates who are technopreneurs

Programme Outcome (PO)

PO1
Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialisation to defined and applied engineering procedures, processes, systems or methodologies; (SK1 to SK4)

PO2
Identify, formulate, research literature and analyse broadly-defined engineering problems reaching substantiated conclusions using analytical tools appropriate to their discipline or area of specialisation; (SK1 to SK4)

PO3
Design solutions for broadly-defined engineering technology problems and contribute to the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations; (SK5)

PO4
Conduct investigations of broadly-defined problems; locate, search and select relevant data from codes, data bases and literature, design and conduct experiments to provide valid conclusions; (SK8)

PO5
Select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to broadly-defined engineering problems, with an understanding of the limitations; (SK6)

PO6
Demonstrate understanding of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technology practice and solutions to broadly-defined engineering problems; (SK7)

PO7
Understand the impact of engineering technology solutions of broadly-defined engineering problems in societal and environmental context and demonstrate knowledge of and need for sustainable development; (SK7)
PO8

Understand and commit to professional ethics and responsibilities and norms of engineering technology practice; (SK7)

PO9
Function effectively as an individual, and as a member or leader in diverse technical teams;

PO10
Communicate effectively on broadly-defined engineering activities with the engineering community and with society at large, by being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions;

PO11
Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member and leader in a team and to manage projects in multidisciplinary environments;

PO12
Recognize the need for, and have the ability to engage in independent and life-long learning in specialist technologies.

CURRICULUM STRUCTURE
BACHELOR OF ELECTRICAL ENGINEERING TECHNOLOGY
(ROBOTIC AND AUTOMATION TECHNOLOGY) WITH HONOURS (2020/2021)

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEM	I	II	III	IV	V	VI	VII	VIII
Discipline Core	PLT 101/3 Computer Programming	PLT 105/3 Electric Circuit Theory I	PLT 201/3 Electric Circuit Theory II	PLT 206/3 Microcontroller System	PLT 303/3 Electrical Drives	PLT 340/4 Final Year Project I	PLT 440/6 Final Year Project II	PIT 404 INDUSTRIAL TRAINING
	PLT 102/2 Computer Aided Drafting	PLT 106/3 Digital Electronics	PLT 202/3 Measurement & Instrumentation	PLT 207/3 Power Electronic	PLT 305/3 Control System Technology	PLT 307/3 Programmable Logic Controller	Elective II/3	
	PCT 111/3 Engineering Skills I	PLT 107/3 Electronics I	PLT 203/3 Electronics II	PLT 208/3 Communication System	PLT 223/3 Machine Design	PLT 322/3 Industrial Process Control	Elective III/3	
	PLT 104/3 Engineering Science	PLT 108/3 Engineering Skills II	PLT 221/3 Principles of Thermo-Fluid & Materials	PLT 209/3 Signal & Systems	PLT 224/3 Pneumatics & Hydraulic Systems	PLT 326/3 Industrial Automation		
				PLT 222/3 Applied Mechanics	PLT 321/3 Industrial Networking	PLT 327/3 Industrial Robotics		
						Elective I/3		
Common Core	PQT 111/3 Mathematics for Engineering Technology I	PQT 112/3 Mathematics for Engineering Technology II	PQT 213/3 Mathematics for Engineering Technology III		PTT 333/3 Engineering Technology Management		PTT 444/3 Engineering Technologist in Society	
University Required	UUW 131/2 Appreciation of Ethics and Civilization							
	UUW 322/2 Thinking Skills	**UVW201/2 English for General Communication	UVW 410/2 University Malay Language	UUW 224/2 Engineering Entrepreneurship	UUT 122/2 Skills & Technology in Communication		UUW XXX/2 Option Subject (Foreign Language)	
	*UVA 101/0 Preparatory English	UUW 130/2 Philosophy and Current Issues		UVW 312/2 English for Technical Communication				
	UZW XXX/1 Co-Curricular Activity	UZW XXX/1 Co-Curricular Activity						
M: 2-3	19	20	17	19	20	19	15	12
M: 4-6	19	18	17	19	20	19	17	12
Total Units for Graduation = 141								

Elective 1	Elective 2	Elective 3
A1. PLT 341/3 Digital Control System	B1. PLT 423/3 Material Handling and Identification	C1. PLT 422/3 Mechatronics Systems
A2. PLT 328/3 Robotic Control	B2. PLT 424/3 Automated Guided Vehicle	C2. PLT 425/3 Vision Systems

UR6522003
Bachelor of Technology in Electrical System Maintenance with Honours

Programme Educational Objective (PEO)

PEO 1
To produce electrical system maintenance technologist that perform maintenance related work including electrical maintenance, facility manager, and energy manager.

PEO 2
To produce technopreneurs in electrical related technology.

PEO 3
To produce relevant, respected and referred professionals in electrical maintenance technology.

Programme Outcomes (PO)

PO1
Apply knowledge of technology fundamentals to broadly-defined procedures processes, systems and methodologies in electrical system maintenance.

PO2
Able to suggest and apply latest tools and techniques to solve broadly-defined problems.

PO3
Demonstrate strong analytical and critical thinking skills to solve broadly-defined problems in electrical system maintenance.

PO4
Able to communicate and articulate effectively in both verbal and written among technologist communities and society at large.

PO5
Demonstrate understanding of the societal related issues and the consequent responsibilities relevant to broadly-defined technology practices.

PO6
Recognize the needs for professional development and to engage independent lifelong learning in specialist technologists.

PO7
Demonstrate an awareness of management and technopreneurship practices in real perspective.

PO8
Demonstrate professionalism and social and ethical consideration.

PO9
Demonstrate leadership quality, mentoring and work effectively in diverse teams.

CURRICULUM STRUCTURE
BACHELOR OF TECHNOLOGY IN ELECTRICAL SYSTEM MAINTENANCE WITH HONOURS
(2020/2021)

YEAR	FIRST			SECOND			THIRD			FOURTH
SEMESTER	I	II	III	IV	V	VI	VII	VIII	VII	VIII
COMMON CORE	VLT111/4 Electrical System Drafting and Simulation	VLT121/5 Solar PV installation and Maintenance		VLT231/5 Building Electrical System Maintenance	VLT241/5 Electrical Machine & Drive System Integration		VLT351/5 Industrial Machinery Control System Design	VLT361/4 Maintenance Management System (MMS)		VLT411/12 Industrial Training
	VLT112/4 Technical Reporting	VLT122/5 Switchboard Maintenance and Calibration		VLT232/5 Renewable Energy System Maintenance	VLT242/5 Energy Efficiency Optimization		VLT352/5 Monitoring system Integration	VLT362/4 Project Planning and Execution	VLT371/6 FYP 2	
	VLT113/5 Electrical System Measurement & Testing	VLT123/3 Professional Practices		VLT233/5 Generator System Maintenance	VLT243/3 Collegiality Interaction and Management		VLT353/4 Industrial Data Analysis	VLT363/4 FYP 1		
					VLT244/4 Capstone Technopreneur 1		VLT354/4 Capstone Technopreneur 2			
	13	13		15	17		18	12	6	12
UNIVERSITY CORE	UZWXXX/1 Co-Curriculum 1	UZWXXX/1 Co-Curriculum 2		**UVWXXX/ 2 Third Language	UUW224/2 Engineering Entrepreneurs hip		UUW131/2 Appreciation of Ethics and Civilizations			
	UVW410/2 University Malay Language	UUW130/2 Philosophy and Current Issues		UVW312/2 English for Technical Communication						
	UUW322/2 Thinking skills	UVW201/2 English for General Communication								
	*UVA101/2 Preparatory English									
	5	5		4	2		2			
TOTAL CREDIT PER SEMESTER	18	18		19	19		20	12	6	12
TOTAL CREDIT FOR GRADUATION						124				

Note:*Uncredited. Compulsary to students with MUET Band 1 only. **UVWXXX/2:Jerman,Mandarin or Japanese

LIST OF COURSES:
ENGINEERING COURSES

EET111	SAINS KEJURUTERAAN [ENGINEERING SCIENCE]
EET140	LITAR ELEKTRIK 1 [ELECTRIC CIRCUIT I]
EET142	PENGENALAN KEPADA KEJURUTERAAN ELEKTRIK [INTRODUCTION TO ELECTRICAL ENGINEERING]
EET109	PERANTI ELEKTRONIK [ELECTRONIC DEVICES]
EET110	ASAS PENGATURCARAAN KOMPUTER [BASIC COMPUTER PROGRAMMING]
EET141	LITAR ELEKTRIK II [ELECTRIC CIRCUIT II]
EET204	INSTRUMENTASI DAN PENGUKURAN [INSTRUMENTATION AND MEASUREMENTS]
EET205	ELEKTRONIK ANALOG [ANALOG ELECTRONICS]
EET209	ELEKTRONIK DIGIT [DIGITAL ELECTRONICS]
EET240	LITAR ELEKTRIK III [ELECTRIC CIRCUIT III]
EET203	REKABENTUK SISTEM MIKROPENGAWAL [MICRO CONTROLLER SYSTEMS DESIGN]
EET207	ISYARAT DAN SISTEM [SIGNALS AND SYSTEMS]
EET208	TEKNOLOGI KUASA ELEKTRIK [ELECTRICAL POWER TECHNOLOGY]
EET301	KEJURUTERAAN SISTEM KUASA [POWER SYSTEM ENGINEERING]
EET302	KEJURUTERAAN SISTEM KAWALAN [CONTROL SYSTEMS ENGINEERING]
EET303	TEORI ELEKTROMAGNETIK [ELECTROMAGNETIC THEORY]
EET306	MESIN ELEKTRIK [ELECTRICAL MACHINE]
EET304	KEJURUTERAAN SISTEM PERHUBUNGAN [COMMUNICATION SYSTEM ENGINEERING]
EET307	ELEKTRONIK KUASA I [POWER ELECTRONICS I]
EET308	ANALISIS SISTEM KUASA [POWER SYSTEM ANALYSIS]
EET334	PROJEK KEJURUTERAAN BERKUMPULAN I [ENGINEERING TEAM PROJECT I]
EET432	PENGGUNAAN TENAGA ELEKTRIK [ELECTRICAL ENERGY UTILIZATION]
EET417	KEJURUTERAAN VOLTAN TINGGI [HIGH VOLTAGE ENGINEERING]
EET447	PROJEK KEJURUTERAAN BERKUMPULAN II [ENGINEERING TEAM PROJECT II]
EET445	PROJEK TAHUN AKHIR I [FINAL YEAR PROJECT I]
EET448	PENGURUSAN UNTUK JURUTERA [MANAGEMENT FOR ENGINEERS]
EET416	PEMACU ELEKTRIK [ELECTRICAL DRIVES]
EET446	PROJEK TAHUN AKHIR II [FINAL YEAR PROJECT II]
EET442	JURUTERA PROFESIONAL [PROFESSIONAL ENGINEERS]
EET411	OPERASI SISTEM KUASA & KAWALAN [POWER SYSTEM OPERATION & CONTROL]
EET412	REKABENTUK MESIN ELEKTRIK [ELECTRICAL MACHINE DESIGN]
EET414	REKABENTUK PENCAWANG [SUBSTATION DESIGN]
EET462	[ELECTRICAL INSTALLATION DESIGN]
EET426	ELEKTRONIK KUASA II [POWER ELECTRONIC II]

EET431	[ELECTRICAL ENERGY SYSTEM]
EET427	KAWALAN ELEKTRONIK INDUSTRI [INDUSTRIAL ELECTRONIC CONTROL]
EET433	SISTEM TENAGA BOLEH BAHARU [RENEWABLE ENERGY SYSTEM]
ENT141	STATIK KEJURUTERAAN [ENGINEERING STATICS]
ENT142	DINAMIK KEJURUTERAAN [ENGINEERING DYNAMICS]
ENT162	ELEKTRONIK ANALOG [ANALOG ELECTRONICS]
ENT186	LUKISAN TERBANTU KOMPUTER [COMPUTER AIDED DRAWING]
ENT187	TEORI LITAR ELEKTRIK [ELECTRIC CIRCUIT THEORY]
ENT189	PENGATURCARAAN KOMPUTER [COMPUTER PROGRAMMING]
ENT189	PENGATURCARAAN KOMPUTER [COMPUTER PROGRAMMING]
ENT222	TEORI MEDAN ELEKTROMAGNETIK [ELECTROMAGNETIC FIELD THEORY]
ENT262	REKABENTUK LOGIK DIGIT [DIGITAL LOGIC DESIGN]
ENT266	PRINSIP-PRINSIP BAHAN KEJURUTERAAN [ENGINEERING MATERIALS]
ENT267	REKABENTUK JENTERA [DESIGN OF MACHINERY]
ENT269	SISTEM TERBENAM DAN PENGANTARAMUKA [EMBEDDED SYSTEM AND INTERFACING]
ENT270	PRINSIP-PRINSIP TERMOBENDALIR [PRINCIPLE OF THERMOFLUIDS]
ENT281	ISYARAT DAN SISTEM [SIGNALS AND SYSTEMS]
ENT286	INSTRUMENTASI DAN PENGUKURAN [INSTRUMENTATION & MEASUREMENTS]
ENT365	KEJURUTERAAN KAWALAN I [CONTROL ENGINEERING I]
ENT366	PENGLIHATAN MESIN [MACHINE VISION]
ENT367	SISTEM KUASA BENDALIR [FLUID POWER SYSTEMS]
ENT368	JENTERA ELEKTRIK DAN SISTEM KUASA [ELECTRICAL MACHINES & POWER SYSTEMS]
ENT375	KEJURUTERAAN KAWALAN II [CONTROL ENGINEERING II]
ENT376	REKABENTUK SISTEM MEKATRONIK I [MECHATRONIC SYSTEMS DESIGN I]
ENT383	KEJURUTERAAN KOMUNIKASI DAN RANGKAIAN [NETWORK & COMMUNICATION ENGINEERING]
ENT445	PROJEK TAHUN AKHIR I [FINAL YEAR PROJECT I]
ENT446	PROJEK TAHUN AKHIR II [FINAL YEAR PROJECT II]
ENT471	AUTOMASI [AUTOMATION]
ENT476	REKABENTUK SISTEM MEKATRONIK II [MECHATRONIC SYSTEMS DESIGN II]
ENT486	ROBOTIK BERGERAK [MOBILE ROBOTICS]
ENT490	PENGURUSAN PENGELUARAN DAN KUALITI KAWALAN [MANAGEMENT PRODUCTION AND QUALITY CONTROL]
ENT493	SISTEM KAWALAN TERMAJU [ADVANCED CONTROL SYSTEMS]

ENT497	KECERDIKAN BUATAN DALAM KEJURUTERAAN [ARTIFICIAL INTELLIGENCE IN ENGINEERING]
ENT499	PEMPROSESAN ISYARAT DIGITAL DAN APLIKASI [DIGITAL SIGNAL PROCESSING & APPLICATIONS]
PLT101	PENGATURCARAAN KOMPUTER [COMPUTER PROGRAMMING]
PLT102	LUKISAN BERBANTU KOMPUTER [COMPUTER AIDED DRAFTING]
PLT104	SAINS KEJURUTERAAN [ENGINEERING SCIENCE]
PLT105	TEORI LITAR ELEKTRIK 1 [ELECTRIC CIRCUIT THEORY I]
PLT106	ELEKTRONIK DIGIT [DIGITAL ELECTRONICS]
PLT107	ELEKTRONIK 1 [ELECTRONICS I]
PLT108	KEMAHIRAN KEJURUTERAAN II [ENGINEERING SKILLS II]
PLT201	TEORI LITAR ELEKTRIK 2 [ELECTRIC CIRCUIT THEORY II]
PLT202	PERALATAN DAN PENGUKURAN [INSTRUMENTATION AND MEASUREMENT]
PLT203	ELEKTRONIK II [ELECTRONIC II]
PLT204	TEORI MEDAN ELEKTRIK [ELECTROMAGNETIC FIELD THEORY]
PLT205	TEKNOLOGI MESIN ELEKTRIK I [ELECTRICAL MACHINES TECHNOLOGY I]
PLT206	SISTEM MIKROPENGAWAL [MICROCONTROLLER SYSTEM]
PLT207	ELEKTRONIK KUASA [POWER ELECTRONICS]
PLT208	SISTEM KOMUNIKASI [COMMUNICATION SYSTEM]
PLT209	ISYARAT DAN SISTEM [SIGNAL AND SYSTEM]
PLT221	PERINSIP THERMO-BENDALIR DAN BAHAN [PRINCIPLES OF THERMOFLUID AND MATERIALS]
PLT222	MEKANIK GUNAAN [APPLIED MECHANICS]
PLT223	REKABENTUK MESIN [MACHINE DESIGN]
PLT224	SISTEM PNEUMATIK & HIDRAULIK [PNEUMATICS & HYDRAULIC SYSTEMS]
PLT301	ELECTRICAL MACHINES TECHNOLOGY II [ELECTRICAL MACHINES TECHNOLOGY II]
PLT302	ELECTRICAL INSTALLATION I [ELECTRICAL INSTALLATION I]
PLT303	ELECTRICAL DRIVES [ELECTRICAL DRIVES]
PLT304	ELECTRICAL POWER SYSTEM [ELECTRICAL POWER SYSTEM]
PLT305	CONTROL SYSTEM TECHNOLOGY [CONTROL SYSTEM TECHNOLOGY]
PLT306	ELECTRICAL INSTALLATION II [ELECTRICAL INSTALLATION II]
PLT307	PROGRAMMABLE LOGIC CONTROLLER (PLC) [PROGRAMMABLE LOGIC CONTROLLER (PLC)]
PLT308	POWER QUALITY [POWER QUALITY]
PLT309	SUBSTATION ENGINEERING [SUBSTATION ENGINEERING]
PLT321	RANGKAIAN INDUSTRI [INDUSTRIAL NETWORKING]
PLT322	KAWALAN PROCESS INDUSTRI [INDUSTRIAL PROCESS CONTROL]
PLT326	AUTOMASI INDUSTRI [INDUSTRIAL AUTOMATION]

PLT327	ROBOTIK INDUSTRI [INDUSTRIAL ROBOTICS]
PLT328	ROBOTIC CONTROL [ROBOTIC CONTROL]
PLT340	FINAL YEAR PROJECT I [FINAL YEAR PROJECT I]
PLT341	DIGITAL CONTROL [DIGITAL CONTROL]
PLT401	POWER SYSTEM PROTECTION & SWITCHGEAR [POWER SYSTEM PROTECTION & SWITCHGEAR]
PLT402	INDUSTRIAL AUTOMATION [INDUSTRIAL AUTOMATION]
PLT403	HIGH VOLTAGE TECHNOLOGY [HIGH VOLTAGE TECHNOLOGY]
PLT404	RENEWABLE ENERGY SYSTEM [RENEWABLE ENERGY SYSTEM]
PLT405	ENERGY EFFICIENCY & MANAGEMENT [ENERGY EFFICIENCY & MANAGEMENT]
PLT422	SISTEM MEKATRONIK [MECHATRONICS SYSTEM]
PLT423	PENGENDALIAN DAN PENGENALPASTIAN BAHAN [MATERIAL HANDLING AND IDENTIFICATION]
PLT424	KENDERAAN BERPANDU AUTOMATIK [AUTOMATED GUIDED VEHICLE]
PLT425	SISTEM PENGLIHATAN [VISION SYSTEM]
PLT440	FINAL YEAR PROJECT II [FINAL YEAR PROJECT II]
VLT111	LAKARAN DAN SIMULASI SISTEM ELEKTRIK [ELECTRICAL SYSTEM DRAFTING AND SIMULATION]
VLT112	PELAPORAN TEKNIKAL [TECHNICAL REPORTING]
VLT113	PENGUJIAN DAN PENGUKURAN SISTEM ELEKTRIK [ELECTRICAL SYSTEM MEASUREMENT AND TESTING]
VLT231	PENYELENGGARAAN SISTEM ELEKTRIK BANGUNAN [BUILDING ELECTRICAL SYSTEM MAINTENANCE]
VLT232	PENYELENGGARAAN SISTEM TENAGA BOLEH DIPERBAHARUI [RENEWABLE ENERGY SYSTEM MAINTENANCE]
VLT233	PENYELENGGARAAN SISTEM PENJANA [GENERATOR SYSTEM MAINTENANCE]
DET101	ASAS LITAR ELEKTRIK I [ELECTRIC CIRCUIT FUNDAMENTAL I]
DET111	LUKISAN KEJURUTERAAN [ENGINEERING DRAWING]
DET113	SISTEM DIGIT [DIGITAL SYSTEM]
DET115	PERANTI ELEKTRONIK [ELECTRONIC DEVICES]
DET116	ASAS PENGATURCARAAN KOMPUTER [BASIC COMPUTER PROGRAMMING]
DET119	MIKROPENGAWAL [MICROCONTROLLER]
DET202	ASAS LITAR ELEKTRIK II [ELECTRIC CIRCUIT FUNDAMENTAL II]
DET203	PENGUKURAN ELEKTRIK & INSTRUMENTASI [ELECTRICAL INSTRUMENTATION AND MEASUREMENT]
DET204	MESIN ELEKTRIK & APLIKASI I [ELECTRICAL MACHINES & APPLICATION I]
DET205	MESIN ELEKTRIK & APLIKASI II [ELECTRICAL MACHINE & APPLICATIONS II]
DET206	SISTEM KUASA I [POWER SYSTEM I]
DET207	REKABENTUK PEMASANGAN ELEKTRIK [ELECTRICAL INSTALLATION DESIGN]
DET212	PRINSIP KAWALAN [CONTROL PRINCIPLES]
DET214	PENGAWAL LOGIK BOLEH ATURCARA [PROGRAMMABLE LOGIC CONTROLLER]

DET218	ELEKTRONIK ANALOG [ANALOGUE ELECTRONIC]
DET308	SISTEM KUASA II [POWER SYSTEM II]
DET309	ELEKTRONIK KUASA) [POWER ELECTRONICS]
DET310	AMALAN PERTAULIAHAN & PENYELENGGARAAN SISTEM ELEKTRIK [POWER SYSTEM COMMISSIONING AND MAINTENANCE PRACTICES]
DET320	KESELAMATAN INDUSTRI, PENGURUSAN KUALITI DAN ETIKA [INDUSTRIAL SAFETY, QUALITY MANAGEMENT AND ETHICS]
DET351	PROJEK SEMESTRAL [SEMESTRAL PROJECT]
DNT111	LUKISAN KEJURUTERAAN [ENGINEERING DRAWING]
DNT112	ASAS SAINS KEJURUTERAAN [BASIC ENGINEERING SCIENCE]
DNT113	LITAR ELEKTRIK [ELECTRICAL CIRCUIT]
DNT122	MEKANIK GUNAAN [APPLIED MECHANICS]
DNT123	LUKISAN BERBANTU KOMPUTER [COMPUTER AIDED DRAFTING (CAD)]
DNT126	ASAS PENGATURCARAAN KOMPUTER [BASIC COMPUTER PROGRAMMING]
DNT128	SISTEM DIGIT [DIGITAL SYSTEM]
DNT134	AMALAN BENGKEL MEKATRONIK [MECHATRONICS WORKSHOP PRACTICE]
DNT233	THERMO-BENDALIR [THERMO-FLUIDS]
DNT235	ASAS TEKNOLOGI ELEKTRIK [BASIC ELECTRICAL TECHNOLOGY]
DNT236	KEJURUTERAAN BAHAN [MATERIALS ENGINEERING]
DNT238	ELEKTRONIK ANALOG [ANALOGUE ELECTRONICS]
DNT241	ELEKTRO PNEUMATIK DAN HIDRAULIK [ELECTRO PNEUMATICS AND HYDRAULICS]
DNT242	ELEMEN MEKANISMA MESIN [MACHINE MECHANISM ELEMENTS]
DNT245	PENGUKURAN & PENDERIA [SENSORS AND MEASUREMENTS]
DNT246	MIKROPENGAWAL & PENGANTARAMUKA [MICROCONTROLLER AND INTERFACE]
DNT253	PENGAWAL LOGIK BOLEH ATURCARA (PLC) [PROGRAMMABLE LOGIC CONTROLLER]
DNT333	KESELAMATAN INDUSTRI & PENGURUSAN KUALITI [INDUSTRIAL SAFETY AND QUALITY MANAGEMENT]
DNT351	PROJEK SEMESTRAL [SEMESTRAL PROJECT]
DNT352	AUTOMATAN INDUSTRI DAN ROBOTIK [INDUSTRIAL AUTOMATION AND ROBOTICS]
DNT354	PRINSIP KAWALAN [CONTROL PRINCIPLES]
DNT355	PROSES-PROSES PEMBUATAN [MANUFACTURING PROCESS]

COURSE SYLLABUS:

EET111 SAINS KEJURUTERAAN [ENGINEERING SCIENCE]
No of Credits: 2

Course Synopsis:
This course aims to introduce to the Electrical Engineering students the knowledge on the principles of material engineering and thermal fluid. It includes aspects related to material engineering, thermodynamics and fluid mechanics.

Course Outcomes:
CO1 - Ability to describe, calculate and solve problems related to structure, mechanical, electrical and magnetic properties of material.
CO2 - Ability to identify the various properties of fluids and solve problems related to fluids statics.
CO3 - Ability to solve and explain problem on basic concepts of thermodynamics in First Law and Second Law of Thermodynamics.

EET140 LITAR ELEKTRIK 1 [ELECTRIC CIRCUIT I]
No of Credits: 3

Course Synopsis:
This is an introductory circuit course that is devoted to DC circuits. It covers fundamental laws, resistive circuits, analytical techniques, passive and active elements. Students will be introduced to theorems such as Mesh, Nodal, Thevenin and Norton with dependent sources and special cases. The last chapter will cover the Magnetic Circuits principle.

Course Outcomes:
CO1 - Apply, calculate and measure the concepts of charge, current, voltage, power in electric circuits.
CO2 - Apply, analyze or evaluate linear circuits using basic laws, methods of analysis, and circuit theorems.
CO3 - Discuss, construct and simulate linear circuits using simulation tool.

EET142 PENGENALAN KEPADA KEJURUTERAAN ELEKTRIK [INTRODUCTION TO ELECTRICAL ENGINEERING]
No of Credits: 2

Course Synopsis:
This course serves as a general introduction to electrical engineering programs offered by the School of Electrical Systems Engineering. In this course, students will be exposed to attributes of an electrical engineer from both academic and practical points of view. Some skills and knowledge that are necessary in the engineering world will be introduced here. Students will obtain a clearer overview of the benefits, excitements and challenges of being an electrical engineering student and a professional electrical engineer in the near future. Furthermore, students shall identify, discuss and analyze critically contemporary issues affecting mankind and his environment.

Course Outcomes:
CO1 - Ability to distinguish the principles and processes related to engineering education including fundamental knowledge in accordance with the scope and career of an electrical engineer.
CO2 - Ability to communicate effectively through effective presentation and technical report writing.
CO3 - Ability to analyse the output of a project with comprehensive project background, procedure and conclusion of the project undertaken.

EET109 PERANTI ELEKTRONIK [ELECTRONIC DEVICES]
No of Credits: 3

Course Synopsis:
This course provides introduction to the basic operating principles and applications of discrete electronic devices and circuits. The course content starts with the fundamental solid-state principles and continues the discussions with the constructions and characteristics of diode,zener diode Bipolar Junction Transistor (BJT) and Enhancement Metal Oxide Semiconductor Field Effect Transistor (E-MOSFET)

The application of diodes focusses on the basic power supply circuits whereas the applications of the transistors focus on the DC analysis of amplifier and switch.

The course also introduce the importants of data sheet and important parameter which need to refer during circuit analysis

Course Outcomes:
CO1 - Ability to explain and differentiate the fundamental concepts of electronic devices.
CO2 - Ability to explain and calculate the basic operations of electronic devices such as diode, BJT and various types of FET.
CO3 - Ability to analyse the basic biasing circuits using datasheet.

EET110 ASAS PENGATURCARAAN KOMPUTER [BASIC COMPUTER PROGRAMMING]
No of Credits: 3

Course Synopsis:
One of the aspects of a good engineer is to have the capability of integrating the hardware and the software, thus an electrical engineer should be competence in programming. This course introduces basic programming using high level language (C language). The main objective of this course is to prepare the students with the ability of problem solving with programming, familiarize with the programming tools such as organization chart, flowchat and pseudo code and then to implement them by developing C program

Course Outcomes:
CO1 - Ability to differentiate programming concepts and principles.
CO2 - Ability to solve engineering related problems using computer programming techniques.
CO3 - Ability to design and evaluate computer programs by using programming techniques and tools

EET141 LITAR ELEKTRIK II [ELECTRIC CIRCUIT II]
No of Credits: 3

Course Synopsis:
Basically this introductory circuit course to AC circuits. It covers fundamental concepts of passive and active elements in chapter 1. Chapter 2 and 3 cover on introduces in phasors, sinusiodal steady state analysis using previous analythical techniques under sinusoidal steady state excitation. In Chapter 4 introduce the power calculation and power factor corrections and RMS values. The last chapter will covered Magnatecic circuit principle and mutual inductance.

Course Outcomes:
CO1 - Ability to apply the concept of capacitors and inductors
CO2 - Ability to calculate, analyze and perform sinusoidal steady state analysis and power calculation using complex impedance and phasor representations.
CO3 - Ability to apply the principles of electromagnetic and analyze magnetically coupled.

EET204 INSTRUMENTASI DAN PENGUKURAN [INSTRUMENTATION AND MEASUREMENTS]
No of Credits: 3

Course Synopsis:
This course is aimed at providing an overview of modern instrumentation and measurement techniques. It is devided into four main topics namely the fundamentals of electronic instrumentation and measurement systems; the working principles and application of sensors and transducers; principles and application of signal conditioning circuits including bridges, amplifiers and filters and finally display, data acquisition and interfacing techniques.

Course Outcomes:
CO1 - Ability to define, describe and analyze the elements of a complete electronic instrumentation and measurement system
CO2 - Ability to explain and apply the working principles of various

sensors and signal conditioning/ processing techniques in instrumentation and measurements

CO3 - Ability to describe and analyze display systems, data acquisition systems and computer interfacing techniques in instrumentation and measurements.

EET205 ELEKTRONIK ANALOG [ANALOG ELECTRONICS]
No of Credits: 3

Course Synopsis:
This course exposes the student the basic knowledge in analog electronic. The exposure encompasses DC and AC analysis, frequency analysis and simple design of small-signal amplifiers. This course offers the students an exposure to the theory and applications of op-amp and frequency response. The basic principles of oscillator are also discussed. furthermore, the students will also learn in depth about active filters and voltage regulators.

Course Outcomes:
CO1 - Ability to design the basic amplifier circuits. (BJT, FET and operational amplifier).
CO2 - Ability to analyze various types of filters.
CO3 - Ability to design and explain basic types of voltage regulators.

EET209 ELEKTRONIK DIGIT [DIGITAL ELECTRONICS]
No of Credits: 3

Course Synopsis:
The aim of this course is to introduce students to the basic knowledge in the digital electronics. This course focuese the introduction and discussion of the fundamental of digital circuit design and analysis. The lectures cover the following topics: Numbering System, Algebraic Switching, Boolean Function, Combinational Logic Design and Sequential Logic Design.

Course Outcomes:
CO1 - Ability to apply the basic principles of numbering system and Algebraic Switching for complex digital electronics system.
CO2 - Ability to design and innovate logic circuit using Boolean algebra and combinational logic design techniques.
CO3 - Ability to design digital system project applications using sequential logic design techniques.

EET240 LITAR ELEKTRIK III [ELECTRIC CIRCUIT III]
No of Credits: 3

Course Synopsis:
This course offers the students an expourse to the theories and concept of First Order and Second Order Response of RLC circuit,Frequency response of AC circuits,Fourier series,Fourier Transform and two port network.The students will also be though on the skills to analse linear electric circuit.

Course Outcomes:
CO1 - Ability to explain and analyze special types of circuit such as two port network and response of 1st& 2nd order on RL & RC circuit.
CO2 - Ability to analyze the concepts of frequency response for AC circuits.
CO3 - Ability to analyze electric circuits using Fourier Series and Fourier Transform for the circuit comprising passive elements.

EET203 REKABENTUK SISTEM MIKROPENGAWAL [MICROCONTROLLER SYSTEMS DESIGN]
No of Credits: 4

Course Synopsis:
The aims of this course is to study the PIC microcontroller architecture, its programming language and basic interfacing with input and output devices. These knowledge are gathered and aplied to design a simple microcontroller based system.

Course Outcomes:
CO1 - Ability to interface and design a basic microcontroller based system.
CO2 - Ability to analyse and write a microcontroller programming

language in C program.

CO3 - Discuss, construct and simulate linear circuits using simulation tool.

EET207 ISYARAT DAN SISTEM [SIGNALS AND SYSTEMS]
No of Credits: 3

Course Synopsis:
This course aims to introduce students the basic of signals and systems. To learn how certain input to a system will produce the required output. To understand signal spectrum concept and the method being utilized to analyze signal and its relations.

Course Outcomes:
CO1 - Ability to identify type and analyze waveform of the signals and its characteristics in engineering systems
CO2 - Ability to evaluate the signals and analyze the process of the systems
CO3 - Ability to calculate and determine the system response using variable methods

EET208 TEKNOLOGI KUASA ELEKTRIK [ELECTRICAL POWER TECHNOLOGY]
No of Credits: 3

Course Synopsis:
In electrical power technology course, student will be exposed to the concept of three-phase system, electromagnetism and magnetic circuit. The next part includes principles and operation of single-phase and three-phase transformer. At the end of these practical lab session, they are asked to prepare lab report on the experiments they have carried out and submit for assessment.

Course Outcomes:
CO1 - Ability to evaluate parameters of the three phase system
CO2 - Ability to solve electromagnetism problem and analyze its application in magnetic circuit
CO3 - Ability to analyze the principles and performance of single-phase and three-phase transformer

EET301 KEJURUTERAAN SISTEM KUASA [POWER SYSTEM ENGINEERING]
No of Credits: 4

Course Synopsis:
This course intends to give students fair knowledge of power system engineering which covers the topics of generation, transmission and distribution systems. The subtopics that will be emphasized are such as the per-unit system, transmission line parameters and models, load characteristics, fault and protection system.

Course Outcomes:
CO1 - Ability to differentiate types and operation of power system generations in groups.
CO2 - Ability to explain and solve load characteristics, distribution system components and protection system in power system.
CO3 - Ability to calculate and analyze the transmission line parameters and models, per-unit system and symmetrical fault.

EET302 KEJURUTERAAN SISTEM KAWALAN [CONTROL SYSTEMS ENGINEERING]
No of Credits: 3

Course Synopsis:
This is an introduction course to control systems engineering. Students will be exposed to the mathematical modeling for electrical, electro-mechanical as well as mechanical systems using block diagram, transfer functions, and signal-flow graphs. They will conduct system performance analysis in time and frequency domain. The course also covers system compensation design using PID and lead-lag controllers. This also includes a mini project/assignment for the system analysis and controller design.

Course Outcomes:
CO1 - Ability to produce mathematical model from physical systems (electrical/mechanical/block diagram) by employing suitable techniques such as Mason's law, Laplace transform and etc.
CO2 - Ability to analyze system's response in time or frequency domain and analyze control system problems by utilizing control system graphical tools such as root locus or bode plot.
CO3 - Ability to design and evaluate appropriate controller/s through system compensation in performing control system analysis.

EET303 TEORI ELEKTROMAGNETIK [ELECTROMAGNETIC THEORY]
No of Credits: 3

Course Synopsis:
The purpose of this course is to learn the basic theory and analysis of electromagnetic. Student should be able to understand the basic concept of electrostatics, magnetostatics and dynamics. Student should also understand the theory and application of transmission line.

Course Outcomes:
CO1 - Ability to analyze the concept of vector analysis in electromagnetic theory
CO2 - Ability to investigate and analyze the concept of electrostatic and magnetic field.
CO3 - Ability to relate and evaluate the conceppt of electromagnetic in transmission line analysis

EET306 MESIN ELEKTRIK [ELECTRICAL MACHINE]
No of Credits: 4

Course Synopsis:
Primarily this Electrical Machines course can be divided into three parts. Part 1, begins by reviewing the basic concept of electromechanical conversion and transformers. Part 2, consisting of theoretical and performance analysis of DC machines, i.e. DC motors and DC Generators. Part 3 will cover the theoretical and performance analysis of single/three-phase AC machines which consist of Induction motor and Synchronous generators and also special motors.

Course Outcomes:
CO1 - Ability to analyze a standard equivalent circuit model and evaluate the characteristic of DC Machines.
CO2 - Ability to analyze a standard equivalent circuit model and evaluate the characteristic of Induction Machines.
CO3 - Ability to analyze a standard equivalent circuit model and evaluate the characteristic of Synchronous Machines.

EET304 KEJURUTERAAN SISTEM PERHUBUNGAN [COMMUNICATION SYSTEM ENGINEERING]
No of Credits: 3

Course Synopsis:
This subject will cover all the basic principles and concepts of communication system including the basic elements of communications, signal analysis, amplitude modulation, angle modulations and digital modulations, as well as transmission channels and medium. In addition, introductions to signal propagations and calculations of signal to noise ratio are also introduced to relate the student with real application.

Course Outcomes:
CO1 - Ability to illustrate basic principles of communication systems and the essential of communication system in real world.
CO2 - Ability todifferentiatethe different types of modulation.
CO3 - Ability to evaluatenoise in communication system.

EET307 ELEKTRONIK KUASA I [POWER ELECTRONICS I]
No of Credits: 4

Course Synopsis:
EET 307 introduces Power Electronics as a Multidisciplinary & Interdisciplinary Applications Orientated Technology emphasising on the main criterion of energy efficiency. Power electronic concept and devices, including circuit topologies and usages of diodes, transistors and MOSFET

are introduced to grasp the basic understanding of the core of this course. Following, AC-DC, AC-AC, DC-DC and DC-AC converters performances, including operational features and waveform analysis, are developed from theory followed by laboratory simulations.

Course Outcomes:

CO1 - Ability to analyse operation, applications area and the need for design efficiency of power electronic systems.
CO2 - Ability to calculate and analyse parameters for power rectifier, SCR, Triac and power transistors.
CO3 - Ability to analyse and evaluate AC-DC converter, AC-AC converter and DC-DC converter.

EET308 ANALISIS SISTEM KUASA [POWER SYSTEM ANALYSIS]
No of Credits: 3

Course Synopsis:
This course can be divided into four parts. Part 1 consisting of topic introduction to power system, the main problem in power system, single line diagram, representation of power system, calculation of per-unit system on power system's component, consisting of topic bus admittance and impedance matrix. Part II consisting of topic on power flow solution by means of Gauss-Seidel, Newton-Raphson, Decoupled and Fast-Decoupled method. Part III consisting of topic symmetrical fault, symmetrical component and unsymmetrical fault. Part IV consisting of topic Analyze Transient Stability with Equal Area and Step by Step method.

Course Outcomes:

CO1 - Ability to evaluate power flow with Gauss-Seidel, Newton-Raph son and Fast-Decoupled methods.
CO2 - Ability to analyze fault current in symmetrical and unsymmetrical fault
CO3 - Ability to evaluate problem in stability system

EET334 PROJEK KEJURUTERAAN BERKUMPULAN I [ENGINEERING TEAM PROJECT I]
No of Credits: 1

Course Synopsis:
This course introduces the engineering project which is compulsory to each third year student that inclined towards engineering designing. The student will be given an engineering problem based on real situation and need to solve in a team. The students can gain an expertise by problem solving, investigation, entrepreneurship, report writing and effective presentation from this course.

Course Outcomes:

CO1 - Ability to combineengineering knowledge and solve engineering design problem in team work.
CO2 - Ability to design a proper process to produce creative and innovative solution.
CO3 - Ability to demonstrate effective communication, report writing, presentation and entrepreneur skills.

EET432 PENGGUNAAN TENAGA ELEKTRIK [ELECTRICAL ENERGY UTILIZATION]
No of Credits: 3

Course Synopsis:
To introduce students to the energy efficiency and conservation in order to reduce energy costs and promote economic and environmental sustainability.

Course Outcomes:

CO1 - Ability to analyse energy management, standards and safety aspect of efficient electrical energy utilization.
CO2 - Ability to synthesize solution to problems related to demand side management and economic aspect of efficient energy equipment.
CO3 - Ability to design and evaluate energy saving solution based on electrical energy audits

EET417 KEJURUTERAAN VOLTAN TINGGI [HIGH VOLTAGE ENGINEERING]
No of Credits: 3

Course Synopsis:
This course will introduce the students about insulating materials and their applications, breakdown phenomena in insulating material such as solids, liquids, and gases. The course will alsogeneration and measurement of high d.c., a.c. and impulse voltages and currents, overvoltage phenomena, insulation coordination, high voltage testing techniques and testing of apparatus and equipment.

Course Outcomes:
CO1 - Ability to analyze the various breakdown mechanism and applications of vacuum, liquid, solid and composite dielectrics.
CO2 - Ability to evaluate generations and measurements of high voltage AC, DC and impulse generator.
CO3 - Ability to analyze the over-voltage phenomena, insulation coordination in power system, types of high voltage testing for electrical apparatus and non-destructive testing of materials.

EET447 PROJEK KEJURUTERAAN BERKUMPULAN II [ENGINEERING TEAM PROJECT II]
No of Credits: 2

Course Synopsis:
This course introduces the engineering project which is compulsory to each fourth year student that inclined towards engineering designing. The student will be given an engineering problem based on real situation and need to solve in a team. The students can gain an expertise by problem solving, investigation, entrepreneurship, report writing and effective presentation from this course.

Course Outcomes:
CO1 - Ability to combineengineering knowledge and solve engineering design problem in team work.
CO2 - Ability to design a proper process to produce creative and innovative solution.
CO3 - Ability to demonstrate effective communication, report writing, presentation and entrepreneur skills.

EET445 PROJEK TAHUN AKHIR I [FINAL YEAR PROJECT I]
No of Credits: 2

Course Synopsis:
Small-scaled research project that inclined towards designing is necessary for each final-year student. The student will be given an engineering problem (or encourage to identify on their own) and gain expertise by problem solving, investigation, research writing and effective presentation of the research outcome in the form of thesis and seminar. The area of research is mainly on power electronics, high voltage, electrical power system & machine design.

Course Outcomes:
CO1 - Ability to apply and integrate theory and practical to solve the engineering problems.
CO2 - Ability to develop suitable research methodology for the project.
CO3 - Ability to develop a project proposal and progress report in technical.
CO4 - Ability to present and defend effectively project findings to selected audience.

EET448 PENGURUSAN UNTUK JURUTERA [MANAGEMENT FOR ENGINEERS]
No of Credits: 3

Course Synopsis:
This course aims to teach students on how to apply project management skills when undertaking projects and to provide basic tools of engineering economy to enable the students to carry out professional quality economic evaluations. At the end of the course, students will be able to identify and discuss issues and challenges faced by engineers relating to project management in the current economic scenarios

Course Outcomes:
CO1 - Ability to analyse, evaluate and integrate the process of project management, develops work plans, do cost estimation and perform project evaluation.
CO2 - Ability to analyse and evaluate economic scenarios and integrate decision making process to engineering project and business venture.

EET416 PEMACU ELEKTRIK [ELECTRICAL DRIVES]
No of Credits: 3

Course Synopsis:
This course aims to equip students with the knowledge of DC and AC electrical drive systems which are commonly used in industries. The course covers the basic components of electrical drive systems and the speed control of the drive systems. The dynamics and braking of the drive systems will also be introduced.

Course Outcomes:
CO1 - Ability to explain, calculate, and evaluate the converter parameters for controlling AC motor drives.
CO2 - Ability to explain, calculate, and evaluate the converter parameters for controlling the DC motor drives.
CO3 - Ability to explain, calculate, and evaluate the dynamics and braking of DC and AC electrical drive systems.

EET446 PROJEK TAHUN AKHIR II [FINAL YEAR PROJECT II]
No of Credits: 4

Course Synopsis:
Small-scaled research project that inclined towards designing is necessary for each final-year student. The student will be given an engineering problem (or encourage to identify on their own) and gain expertise by problem solving, investigation, research writing and effective presentation of the research outcome in the form of thesis and seminar. The area of research is mainly on power electronics, high voltage, electrical power system & machine design.

Course Outcomes:
CO1 - Ability to apply and integrate theory and practical to solve the engineering problems.
CO2 - Ability to develop suitable research methodology for the project.
CO3 - Ability to conclude a complete project in a technical report (dissertation).
CO4 - Ability to present and defend effectively project findings to selected audience.

EET442 JURUTERA PROFESIONAL [PROFESSIONAL ENGINEERS]
No of Credits: 2

Course Synopsis:
This course aims to explain the main concepts in engineering ethics, engineering sustainability, risk management and occupational safety and health as well as to expose the students to basic of law in the engineering context. The materials will be of introductory nature to enable engineers to appreciate factors that have to be taken into account in decision-making.At the end of the course, students will be able to identify and discuss issues and challenges faced by engineers relating to engineering ethics, engineering sustainability, risk management and to understand the legal requirements related to engineering field.

Course Outcomes:
CO1 - Ability to identify and evaluate the issues and challenges of engineering ethics.
CO2 - Ability to explain the engineering sustainability impact in societal and environmental context and propose solutions to the sustainable development issues.
CO3 - Ability to explain and evaluate hazards, risk management, occupational safety & health (OSHA) and procedures of legal on engineering issues.

EET411 OPERASI SISTEM KUASA & KAWALAN [POWER SYSTEM OPERATION & CONTROL]
No of Credits: 3

Course Synopsis:
This course aims to provide further understanding power system operation and control. It mainly focuses on various aspects in operation of power system such as energy source and transfer, power plant operation and characterisics, optimal dispatch of generation, unit commitment, power system control, interconnected power systems and high voltage direct current (HVDC) system.

Course Outcomes:
CO1 - Ability to analyze energy generation, power system behavior, economics of generating costs and optimal dispatch of power generation with and without transmission losses.
CO2 - Ability to analyze unit commitment in thermal power plant and to evaluate power system control of power system network.
CO3 - Ability to analyze interconnection and operation of generators in parallel with large power system and tie-line interchange between interconnected utilities.

EET412 REKABENTUK MESIN ELEKTRIK [ELECTRICAL MACHINE DESIGN]
No of Credits: 3

Course Synopsis:
This course covers the importance of magnetic materials to be employed in various electric machines and the fundamental of magnetic circuit; meanwhile, experimentally study the characteristics of different steel materials. The design principle of the static electric machine, i.e. transformer is included, and analysis the performance of transformer. In addition, this course consists the fundamental design of rotating electric machines, included the induction machine and permanent magnet synchronous machine. The laboratory test upon the characteristic of electric machine and its performance are also included. This course also comprises the heating and cooling methods in electric machine. Additionally, the design principle, simulation, performance prediction, and evaluation of electric machine using Finite Element Method (FEM) are encompassed.

Course Outcomes:
CO1 - Ability to analyze magnetic materials and magnetic circuits for electrical machine.
CO2 - Ability to determine the transformer design and evaluate its performance.
CO3 - Ability to design the electrical machine and evaluate its performance.

EET414 REKABENTUK PENCAWANG [SUBSTATION DESIGN]
No of Credits: 3

Course Synopsis:
This course to introduce aspects of the fundamentals and considerations of substations design, configuration and design of busbar and safety requirement. This course describe the functions of various substation main equipments, substation auxliary included protection design against internal and external fault. The student also learn how to measure soil resistivity and resistance grounding, substations grounding design, futhermore calculation of the ground grid substation. Latter in this course, student will learn and practice how to test and to do maintainance of the substation equipment parts.

Course Outcomes:
CO1 - Ability to classify type of substation and explain fundamentals and considerations of substations design
CO2 - Ability to describe operation, maintainance, selection and functions of substation equipments part and ability to design simple busbar
CO3 - Ability to measure resistivity and grounding resistance and ability to design and analysis ground grid substation and safety requirement
CO4 - Ability to identify and calculate parameters in protections system of substation equipment coursed by internal and external fault
CO5 - Ability to calculate capacity and service area substation and explain testing and commissioning method of substation equipment

EET462 [ELECTRICAL INSTALLATION DESIGN]
No of Credits:

Course Synopsis:
This course is designed to provide electrical engineers with the application skills needed in modern electrical engineering practice. This course uses a combination of theory and practical case studies to demonstrate and reinforce the principles. Students in this course are expected to work through the case studies. The case studies are based on actual ainstallations and projects. The course topic include:

1) introduction to electrical installation design.
2) final circuit and load estimation.
3) lighting system.
4) switchgear, protection devices and power factor correcctions.
5) cable selection and wiring system.
6) earthing system

Course Outcomes:
CO1 - Ability to apply the IEEE Regulations and MS IEC Standards
CO2 - Ability to design solution for low voltage electrical installation system in indoor and outdoor of the building.
CO3 - Ability to evaluate low voltage electrical system.

EET426 ELEKTRONIK KUASA II [POWER ELECTRONIC II]
No of Credits: 3

Course Synopsis:
Efficient power management system are essential for the proper operation of all modern electronic system. EET426 provides an in-depth study of switched mode power supplies (SMPS) and includes topology variations, operational modes and control strategies, performance analysis including the effects of parasitic elements and waveform analysis. Design aspects include understanding manufacturer's data, co-relating data to select power semiconductors and passive components, thermal management and EMC compliance.

Course Outcomes:
CO1 - Ability to explain and classify the topologies, parameters of related components and thermal management in SMPS.
CO2 - Ability to interpret and analyze the rectification techniques, SMPS waveforms, SMPS control system and modes control.
CO3 - Ability to analyze and evaluate device performance for SMPS topologies.

EET431 [ELECTRICAL ENERGY SYSTEM]
No of Credits:

Course Synopsis:
This course introduces students to the enrgy sources technology and develops understanding of a number of different type of energy sources whose outputs are suitable for conversion into electrical power generation with emphasis on renewable energy resources. The class will then analyse and evaluate the economic, social and environmental inpact in renewable energy implementation. The new technology of power system transmission and distribution and the interconnection of renewable energy sources to grid also will be investigated. World wide future steps towords sustainability electric supply system, policy and constraint in renewable energy implementation also will be discussed and exposed to the students.

Course Outcomes:
CO1 - Ability to analyze the conventional energy system and potential renewable resources
CO2 - Ability to investigate and evaluate the economic, social and environmental inpact in renewable energy implementation.
CO3 - Ability to synthesize the transmission and distribution technology in power system and renewable energy system

EET427 KAWALAN ELEKTRONIK INDUSTRI [INDUSTRIAL ELECTRONIC CONTROL]
No of Credits:

Course Synopsis:
This course will have a wide explosure about industrial electronics control to the students. The course will be coverege of components, circuits, instruments, equipments and control technique used in industrial automatic systems. At beginning of this couse the topics will bé covered are basic principle of industrial electronics controt and interfacing devices. The interfacing devices will give wide explosure fo the student regarding of operational amplifiers, signal processors, opfo-elecironic interface devices, fransducers, detection sensors, actuafor, digitat fo analog converter and analog to digital converter, The next part of this course will coverage the design of controller, proportional controll, proportional integral contro}, proportional integral derivative control, presure control and temperature control. The servo and stepper motor coniroi design that used in a variety of industrial automation application are also covered in this course. Typical applications of these motors are rotary table control, pen positioning and precise position controll will be studied in this course. The student will be expose to programmable fogic controler (PLC), PLC components, PLC programming and operational procedure. The PLC capable fo perform more complex mofion and process

Course Outcomes:
CO1 - Ability to explain and calculate operational amplifiers, opto-electronic, signal processor, interfacing devices, transducers, detection sensors and actuator, digital and analog controller, temperature control, and flow control related to industrial electronic control applications.
CO2 - Ability to explain, analyze and design motor controller for industrial electronic control applications.
CO3 - Ability to explain and design ladder diagram to perform a specified operation using PLC programming in applications of industrial electronic control.

EET433 SISTEM TENAGA BOLEH BAHARU [RENEWABLE ENERGY SYSTEM]
No of Credits: 3

Course Synopsis:
This course will have a wide explosure about industrial electronics control to the students. The course will be coverege of components, circuits, instruments, equipments and control technique used in industrial automatic systems. At beginning of this couse the topics will bé covered are basic principle of industrial electronics controt and interfacing devices. The interfacing devices will give wide explosure fo the student regarding of operational amplifiers, signal processors, opfo-elecironic interface devices, fransducers, detection sensors, actuafor, digitat fo analog converter and analog to digital converter, The next part of this course will coverage the design of controller, proportional controll, proportional integral contro}, proportional integral derivative control, presure control and temperature control. The servo and stepper motor coniroi design that used in a variety of industrial automation application are also covered in this course. Typical applications of these motors are rotary table control, pen positioning and precise position controll will be studied in this course. The student will be expose to programmable fogic controler (PLC), PLC components, PLC programming and operational procedure. The PLC capable fo perform more complex mofion and process

Course Outcomes:
CO1 - Ability to explain and calculate operational amplifiers, opto-electronic, signal processor, interfacing devices, transducers, detection sensors and actuator, digital and analog controller, temperature control, and flow control related to industrial electronic control applications.
CO2 - Ability to explain, analyze and design motor controller for industrial electronic control applications.
CO3 - Ability to explain and design ladder diagram to perform a specified operation using PLC programming in applications of industrial electronic control.

ENT141 STATIK KEJURUTERAAN [ENGINEERING STATICS]
No of Credits: 3

Course Synopsis:
The objective of the course is to look into problems related to mechanics concepts in static conditions. This course deals with balanced force systems applied to rigid-bodies that are at rest. Methods to determine support reactions and relationships between internal and external forces, as well as internal force distribution will be introduced in this course. This course is important as it serves as pre-requisite and fundamental in later engineering courses.

Course Outcomes:
CO1 - Ability to draw and use the Free Body Diagram (FBD) to solve static problems.
CO2 - Ability to solve Two Dimensional (2-D) static problems.
CO3 - Ability to solve Three Dimensional (3-D) static problems.

ENT142 DINAMIK KEJURUTERAAN [ENGINEERING DYNAMICS]
No of Credits: 3

Course Synopsis:
The objective of the course is to enable students to evaluate problems related to mechanics concepts in dynamic condition. The course covers topics of force and acceleration, work and energy, and also impulse and momentum for both kinematics of a particle and planar kinetics of a rigid body problems.

Course Outcomes:
CO1 - Ability to analyze problems related to rectilinear kinematics, law of motions, and also concepts mechanics and vector mechanics.
CO2 - Ability to evaluate problems related to kinematics of particle, involving force and acceleration, work and energy, and also impulse and momentum.
CO3 - Ability to evaluate problems related to planar kinetics or a rigid body, involving force and acceleration, work and energy, and also impulse and momentum.

ENT162 ELEKTRONIK ANALOG [ANALOG ELECTRONICS]
No of Credits: 4

Course Synopsis:
This course is designed to introduce basic concepts of semiconductor electronics and its applications. The course helps students to apply analogue theories for testing, designing and developing of electronic circuits

Course Outcomes:
CO1 - Ability to perform the analysis on characteristics of semiconductor devices
CO2 - Ability to design and evaluate analogue circuits by using semiconductor devices
CO3 - Ability to solve circuitry problems in a group.

ENT186 LUKISAN TERBANTU KOMPUTER [COMPUTER AIDED DRAWING]
No of Credits: 3

Course Synopsis:
This course provides the foundation for mechatronic engineering students to acquire and apply the language of engineering graphics to visibly communicate engineering intent that follow good engineering conventions and practices. In this course, drafting technique using CAD software will be introduced to model 2-D and 3-D engineering drawings which including sketching techniques, multi-view projections, pictorial, sectional and auxiliary view representation and dimensioning techniques. The use of solid modeling software to capture design intent and generate engineering drawings gives the opportunity to apply this knowledge for engineering design projects.

Course Outcomes:
CO1 - Ability to draft technical drawings using computer aided design software.
CO2 - Ability to design and construct 3D model using computer aided design software.
CO3 - Ability to analyze the designed models.

ENT187 TEORI LITAR ELEKTRIK [ELECTRIC CIRCUIT THEORY]
No of Credits: 3

Course Synopsis:
This course provide the fundamentals of electrical elements, basic laws such as Kirchorff's law, Nodal analysis, Thevenin's law and also circuit theorem i.e. mesh analysis, nodal analysis and superposition theorem. The syllabus covers a calculation of current, voltage and power in ac circuits by using phasor approach, and follows by the study of the mutual Inductance and transient response in RC, RL and RLC circuits

Course Outcomes:
CO1 - Ability to solve DC problems using basic laws and circuit theorem
CO2 - Ability to solve AC problems using basic laws and circuit theorem
CO3 - Ability to design and evaluate basic circuits to meet specifications

ENT189 PENGATURCARAAN KOMPUTER [COMPUTER PROGRAMMING]
No of Credits: 3

Course Synopsis:
This course is designed to introduce the fundamentals of Computer Programming. It provides an introduction to the principles of procedural programming, data types, control structures, data structures and functions, data representation on the machine level. This course also introduces the basic concepts of object oriented programming. At the end of this course students should be able to write, debug and document well-structured C applications applied to Mechatronic Engineering

Course Outcomes:
CO1 - Ability to define the basic programming techniques.
CO2 - Ability to apply suitable programming technique to solve a given problem.
CO3 - Ability to develop and analyze computer program in C and C++ for Mechatronic Applications

ENT189 PENGATURCARAAN KOMPUTER [COMPUTER PROGRAMMING]
No of Credits: 3

Course Synopsis:
This course is designed to introduce the fundamentals of Computer Programming. It provides an introduction to the principles of procedural programming, data types, control structures, data structures and functions, data representation on the machine level. This course also introduces the basic concepts of object oriented programming. At the end of this course students should be able to write, debug and document well-structured C applications applied to Mechatronic Engineering

Course Outcomes:
CO1 - Ability to design the basic programming techniques
CO2 - Ability to apply suitable programming technique to solve a given problem.
CO3 - Ability to develop and analyze computer programs in C and C++ for Mechatronic Applications.

ENT222 TEORI MEDAN ELEKTROMAGNETIK [ELECTROMAGNETIC FIELD THEORY]
No of Credits: 3

Course Synopsis:
The course provides a fundamental knowledge on electromagnetic. Student will be exposed to basic postulates of electrostatic and electromagnetic fields and able to solve related problems. On
completion of this course, students should have a firm grasp of basic electromagnetic and identify their characteristic in different situations.

Course Outcomes:
CO1 - Ability to formulate and solve problems in electromagnetism using appropriate mathematical techniques.
CO2 - Ability to apply Maxwell's Equation to solve electromagnetism problems.

CO3 - Ability to solve electromagnetism problems associated with application in electrical and electronic.

ENT262 REKABENTUK LOGIK DIGIT [DIGITAL LOGIC DESIGN]
No of Credits: 4

Course Synopsis:
This course is designed to introduce the basic principle of digital systems and digital circuit design with analysis. Lecture and practical will cover the following: Algebra Boolean, Numbering system, Basic Logic Gate, Combinational Logic Circuit Design, Bi-stable Memory Devices and Sequential Circuits Design

Course Outcomes:
CO1 - Ability to explain the concepts of digital electronic system
CO2 - Ability to analyze the combinational logic circuit
CO3 - Ability to analyze the sequential logic circuit.
CO4 - Ability to apply the digital electronic components in Mechatronic engineering applications.

ENT266 PRINSIP-PRINSIP BAHAN KEJURUTERAAN [ENGINEERING MATERIALS]
No of Credits: 3

Course Synopsis:
This course introduces students to the engineering materials fundamentals including the engineering materials application, atomic bonding, crystal structure, mechanical and physical properties, corrosion mechanism, microstructural analysis, phase diagram, ferrous and non-ferrous alloys, polymer and advance materials.

Course Outcomes:
CO1 - Ability to compare types of material families (metal, polymer, ceramic, and composite) and describe material structure
CO2 - Ability to analyze, calculate, and compare various material characteristic and properties such as mechanical, electrical, magnetic, and optical properties
CO3 - Ability to analyze material reliability in terms of material life cycle, oxidation and corrosion mechanism.

ENT267 REKABENTUK JENTERA [DESIGN OF MACHINERY]
No of Credits: 3

Course Synopsis:
This course enables the students to comprehend and identify theoretical design as well as the machine elements that need to be considered in machine design process. This course also encourages the students to think as a machine designer. The concept and principle of machine design taught will be applied in designing machine, focusing on the outcome of innovative student thinking.

Course Outcomes:
CO1 - Ability to discuss, apply, and organize the concept and principle of design process
CO2 - Ability to discuss, apply, and organize machine elements and analyze position, velocity and acceleration of a point in a linkage
CO3 - Ability to analyze, and construct machine elements to develop a mechanism
CO4 - Ability to apply, analyze and sketch mechanism design (linkage synthesis).

ENT269 SISTEM TERBENAM DAN PENGANTARAMUKA [EMBEDDED SYSTEM AND INTERFACING]
No of Credits: 4

Course Synopsis:
The aim of this course is to enable the students to learn the concepts and requirements, as well as design a self-contained embedded system. This includes the study on the characteristics of embedded systems, hardware and software development, single chip microcontroller and programming techniques in C language and developing an embedded system application.

Course Outcomes:
CO1 - Ability to comprehend the theory and basic architecture of embedded system
CO2 - Ability to write a structured program in C language for embedde system application
CO3 - Ability to choose and apply input output devices to embedded system for interfacing.
CO4 - Ability to evaluate and develop a self-contained embedded system application

ENT270 PRINSIP -PRINSIP TERMOBENDALIR [PRINCIPLE OF THERMOFLUIDS]
No of Credits: 3

Course Synopsis:
The objective of the course is to expose the students to the fundamental principles of fluid mechanic, thermodynamic and heat transfer. In Fluid Mechanics attention will be given to the fundamental principles of fluid mechanics and definition, fluid statics, fluid dynamics, and flow over bodies. In Thermodynamics focus is on the fundamental principles of thermodynamics and definition, the Zeroth law, the first law and the 2nd law. In Heat Transfer, different modes through conduction, convection and radiation to be covered.

Course Outcomes:
CO1 - Ability to explain and analyze the fundamental principles of fluid mechanics.
CO2 - Ability to explain and solve fundamental principles of thermodynamics related problems
CO3 - Ability to analyze the fundamental principles of heat transfer

ENT281 ISYARAT DAN SISTEM [SIGNALS AND SYSTEMS]
No of Credits: 3

Course Synopsis:
This course provides the basics of different types of signals, transformation techniques and communication system. In addition, the students are also exposed to the design of Linear Time Invariant system and its characteristics in this course. Various signal transformation methods on two different domains (time and frequency) such as Fourier series, Fourier transform, Z Transform and Laplace transform is also studied. At the end of this course, the students are able to analyze different types of signals using numerous transformation techniques and evaluate its performance.

Course Outcomes:
CO1 - Ability to comprehend the concept and identify specific type of signals and systems
CO2 - Ability to analyze the signal using time and frequency domain techniques
CO3 - Ability to develop and formulate a system using both time-domain and frequency-domain techniques.

ENT286 INSTRUMENTASI DAN PENGUKURAN [INSTRUMENTATION & MEASUREMENTS]
No of Credits: 3

Course Synopsis:
This course provides the knowledge of measurement and instrumentation with various transducers and techniques involving physical phenomena. This includes an overview of general measurement system, errors and signal characteristics, followed by diverse type of sensors and their application in measuring electronics signal, temperatures, humidity, displacement as well as velocity and acceleration, force, torques strain and stress and also the flow rate measurement. The use of computer for interfacing application is also covered in this course.

Course Outcomes:
CO1 - Ability to explain basic concepts of transducers, sensors and measurement techniques and errors in measurement
CO2 - Ability to apply interfacing concept between transducers, computer and signals obtained from measurement techniques.
CO3 - Ability to design measurement system using suitable sensors and transducers

ENT365 KEJURUTERAAN KAWALAN I [CONTROL ENGINEERING I]
No of Credits: 3

Course Synopsis:
This course introduces the basic concepts and techniques involved in designing a control system. It covers the system mathematical modelling, time and frequency responses analysis of dynamical systems, performance specifications and controller design. This course will emphasizes on the use of MATLAB software for the system performance analysis and controller design.

Course Outcomes:
CO1 - Ability to develop mathematical models of physical systems.
CO2 - Ability to evaluate time response of first-order and second-order systems.
CO3 - Ability to evaluate frequency response of first-order and second-order systems.
CO4 - Ability to design and evaluate PID and lead-lag controllers.

ENT366 PENGLIHATAN MESIN [MACHINE VISION]
No of Credits: 3

Course Synopsis:
This course is designed to introduce the basic concepts of machine vision and provide an understanding of the concepts of vision as well as image acquisition and processing. Basic techniques for classification and neural network will also be introduced. The course also helps the students to develop the ability of designing machine vision systems for industrial applications.

Course Outcomes:
CO1 - Ability to formulate the components of machine vision systems, as well as image acquisition and sampling techniques.
CO2 - Ability to relate color image processing, morphological image processing and segmentation techniques.
CO3 - Ability to design machine vision module utilizing image processing concepts and classification methods.

ENT367 SISTEM KUASA BENDALIR [FLUID POWER SYSTEMS]
No of Credits: 3

Course Synopsis:
This course is designed to provide students with fundamentals of fluid power systems, components, and devices specific to industrial, commercial, and mobile power equipment applications such as pumps, valves, actuators, electrical controls, and troubleshooting techniques. It teaches the fundamentals of fluid power and provides details on the design and operation of hydraulic and pneumatic components, circuits, and systems. Students are expected to acquire knowledge of physical behavior of pneumatics and hydraulics control system, the pneumatics and hydraulics components and applications. Knowledge on theory acquired in lecture is also enhanced with a practical work conducted in laboratory.

Course Outcomes:
CO1 - Ability to analyse the requirements and the relationship between pressure, force and control properties of pneumatics, hydraulic valves and cylinders.
CO2 - Ability to design pneumatic and hydraulic system for various applications.
CO3 - Ability to design and evaluate electro-pnematic and electro - hydraulic system for various industrial applications.

ENT368 JENTERA ELEKTRIK DAN SISTEM KUASA [ELECTRICAL MACHINES & POWER SYSTEMS]
No of Credits: 4

Course Synopsis:
This course introduces theories and applications of: 1) Fundamentals, operating principles and performance analysis of Electromechanical drives, which consists of DC and AC machines and stepper motor, 2) Three phase circuit and industrial motor control and 3) Introduction to power system consisting components of electrical generation, transmission and distribution.

Course Outcomes:
CO1 - Ability to explain operating principle and components integrating electrical machines and power system.
CO2 - Ability to analyze performance characteristics of a particular electrical machines and power system.
CO3 - Ability to design electrical drive for specific applications.

ENT375 KEJURUTERAAN KAWALAN II [CONTROL ENGINEERING II]
No of Credits: 4

Course Synopsis:
This course introduces the state space in control engineering to the students. This includes system modelling in state space, state space representation in difference forms and more importantly the controller and observer design. The state space analysis also considers the digital control systems with the introduction to sampled-data system and controller and observer design in digital system. A thorough studies on non-linear system is presented at the end of the course.

Course Outcomes:
CO1 - Ability to develop and analyze the state-space model for a continuous-time.
CO2 - Ability to synthesize the sampled data system and digital control theory.
CO3 - Ability to design controllers and observer via state-space to meet the desired system performance specifications for the continuous-time and discrete-time system.
CO4 - Ability to comprehend and analyze the concept of nonlinear system.

ENT376 REKABENTUK SISTEM MEKATRONIK I [MECHATRONIC SYSTEMS DESIGN I]
No of Credits: 3

Course Synopsis:
This course focuses on the methodologies, processes and elements for the design an integrated mechatronic system. It covers the philosophy of product system design including needs identification, conceptual generation and selection and embodiment design, for an optimum mechatronics system. It also reviews all elements of a mechatronic system and introduces the first part of the mechatronic system design project.

Course Outcomes:
CO1 - Ability to acquire information from a variety of sources and apply design process to develop solutions based on knowledge and constraints using engineering analysis tools and software.
CO2 - Ability to evaluate solution that meets customer needs with consideration to patents/codes/ standards for a design safety/ cultural/ societal/ environmental/and human factors.
CO3 - Ability to design a mechatronic system by intergrating sensor, transducer, actuator and microcontroller .

ENT377 SISTEM ROBOTIK [ROBOTICS SYSTEMS]
No of Credits: 4

Course Synopsis:
This course is designed to introduce various aspects of robotics such as the types of robots, capabilities, characteristics, robot trajectory and software, kinematic analysis, principles of inverse kinematics, robot sensors and drive mechanisms, robot work cell analysis and various industrial applications.

Course Outcomes:
CO1 - Ability to choose suitable robots for specific industrial application.
CO2 - Ability to analyse object manipulations by robots for an industrial manufacturing.
CO3 - Ability to design sensor integrated robot control system.
CO4 - Ability to analyse and scheduling a robot work cell for a maximum productivity.

ENT383 KEJURUTERAAN KOMUNIKASI DAN RANGKAIAN [NETWORK & COMMUNICATION ENGINEERING]
No of Credits: 3

Course Synopsis:
This subject will cover all the basic principles and concepts of communication system including the basic elements of communications, signal analysis, amplitude modulation, angle modulations and digital modulations, as well as transmission channels and medium. In addition, introductions to signal propagations and calculations of signal to noise ratio are also introduced to relate the students with real world applications.

Course Outcomes:
CO1 - Ability to explain the principle of network and communication systems
CO2 - Ability to obtain mathematical model of modulation
CO3 - Ability to apply principle of various types of network and communication systems
CO4 - Ability to select equipments for the industrial network and communication technology

ENT445 PROJEK TAHUN AKHIR I [FINAL YEAR PROJECT I]
No of Credits: 2

Course Synopsis:
In this course, students will be applying the knowledge they have learned throughout this programme by implementing them in a research project which is carried out for two semesters. In the first semester, focus is given on the preparation of work schedule, identifying the objectives, and writing the research methodology. Students are expected to begin project work according to the planned schedule.

Course Outcomes:
CO1 - Ability to identify research problems, develop techniques for information gathering and conduct literature review.
CO2 - Ability to conduct investigative research and select approriate methodology to solve research based engineeting issues(s)/ problem(s)

ENT446 PROJEK TAHUN AKHIR II [FINAL YEAR PROJECT II]
No of Credits: 4

Course Synopsis:
In this course, students will be applying the knowledge they have learned throughout this programme by implementing them in a research project which is carried out for two semesters. In the second semester, focus is given on the project work (experiments, simulation,etc), analysis of results and final report writing. Students are expected to complete project work according to the planned schedule.

Course Outcomes:
CO1 - Ability to identify research problems, develop techniques for information gathering and conduct literature review.
CO2 - Ability to conduct investigative research and select approriate methodology to solve research based engineeting issues(s)/ problem(s)
CO3 - Ability to delover individual abalysis and judgement in research findings and capable of being assessed independently.
CO4 - Ability yo utilize approriate modern technology/tools in conducting research.
CO5 - Ability to preppare and delover both written and oral presentation effectively by using computers and multimedia technology.

ENT471 AUTOMASI [AUTOMATION]
No of Credits: 4

Course Synopsis:
This course aims to convey the knowledge of automation technologies. It combines the automation technology principles and its relationship with assembly process and system, the element of sensor, actuator and drive technology as an input/output component in automation technology. It also covers automation technology and technique in terms of hardware and software control, the automation technology issues in design, engi-

neering analysis, planning, tooling and manufacturing

Course Outcomes:
CO1 - Ability to perform analyzes on automation in a production system
CO2 - Ability to perform analyzes and evaluate on elements of an automation system.
CO3 - Ability to design and evaluate the automation system for an optimum performance in various applications.

ENT476 REKABENTUK SISTEM MEKATRONIK II [MECHATRONIC SYSTEMS DESIGN II]
No of Credits: 4

Course Synopsis:
This course focuses on the design of an integrated mechatronic system and it is a continuation from Mechatronic System Design I. The students are expected to design a mechatronic system to solve real engineering problems on selected predefined scope, including economic and sustainability analysis, under the guidance of project supervisor.

Course Outcomes:
CO1 - Ability to acquire information from a variety of sources and apply design process to develop solutions based on knowledge and constraints using engineering analysis tools and software.
CO2 - Ability to design and solve complex mechatronic engineering problem.
CO3 - Ability to evaluate solution that meets customer and financial needs with consideration to patents/codes/ standards for a design safety/ cultural/ societal/ environmental/and human factors.
CO4 - Ability to communicate effectively via written, oral presentation and demonstration of the design solution.
CO5 - Ability to function in a team for the successful delivery of design project

ENT486 ROBOTIK BERGERAK [MOBILE ROBOTICS]
No of Credits: 3

Course Synopsis:
This course introduces the students the concepts and design of robot mechanisms with a study on their kinematics and dynamics aspects. The course also introduces the principles and applications of Mobile Robotics.

Course Outcomes:
CO1 - Ability to analyse the moving mechanisms of mobile robots such as wheeled, walking, swimming, flying and climbing robots.
CO2 - Ability to analyse the force-torque requirements of mobile robots and evaluate the servo and stepper motor specifications.
CO3 - Ability to design and evaluate the requirements of sensors and control systems for the mobile robot mechanisms & various autonomous guidance systems used in mobile robots.

ENT490 PENGURUSAN PENGELUARAN DAN KUALITI KAWALAN [MANAGEMENT PRODUCTION AND QUALITY CONTROL]
No of Credits: 3

Course Synopsis:
This course offers comprehensive contents about production and operation management in manufacturing, services and quality. Production and operation management is the process of managing people and resources in order to create a quality product or a service. Also, this course about linear programming, operation strategies, forecasting, developing products, quality, inventory and maintenance.

Course Outcomes:
CO1 - Ability to manage the management and techniques used on the manufacturing.
CO2 - Ability to evaluate production processes.
CO3 - Ability to perform calculations relating to the application of the quality and techniques used.

ENT493 SISTEM KAWALAN TERMAJU [ADVANCED CONTROL SYSTEMS]
No of Credits: 3

Course Synopsis:
The aim of this course is to introduce state-space design, non-linear system and digital control. Students also will be exposed to other control methods, like robust control, predictive control and optimal control.

Course Outcomes:
CO1 - Ability to analyze the concepts of state-space design, non-linear system and digital control
CO2 - Ability to derive state-space description from continuous-time and discrete-time systems
CO3 - Ability to design sate-feedback and digital controller
CO4 - Ability to evaluate Robust Control, Optimal Control methods.

ENT497 KECERDIKAN BUATAN DALAM KEJURUTERAAN [ARTIFICIAL INTELLIGENCE IN ENGINEERING]
No of Credits: 3

Course Synopsis:
This course is designed to introduce the fundamentals of Artificial Intelligence (AI). It provides an introduction to definitions of human and artificial intelligence. The students will be exposed to fuzzy systems, artificial neural networks and evolutionary computation. At the end of this course students should know a few major techniques in AI and ability to build simple intelligent systems applied to Mechatronic Engineering.

Course Outcomes:
CO1 - Ability to perform analysis and examine the right AI techniques for simple applications
CO2 - Ability to perform analysis on different types of AI techniques
CO3 - Ability to design and evaluate AI techniques for Mechatronics Applications.

ENT499 PEMPROSESAN ISYARAT DIGITAL DAN APLIKASI [DIGITAL SIGNAL PROCESSING & APPLICATIONS]
No of Credits: 3

Course Synopsis:
This course is designed to introduce the concepts of digital signal processing and to help the students to explore the theory and applications of digital signal processing. The course also helps the students to develop the ability of analyze and manipulate digital signals.

Course Outcomes:
CO1 - Ability to do the analisys of analogue and digital signals in time domain
CO2 - Ability to do analysis of analogue and digital signals in frequency domain
CO3 - Ability to design digital filter in signal processing
CO4 - Ability to use signal processing tools in a specific signal processing application

PLT101 PENGATURCARAAN KOMPUTER [COMPUTER PROGRAMMING]
No of Credits: 3

Course Synopsis:
One of the aspects of a good engineer is to have the capability of integrating the hardware and the software, thus an electrical engineer should be competence in programming. This course introduces basic programming using high level language (C language). The main objective of this course is to prepare the students with the ability of problem solving with programming, familiarize with the programming tools such as organization chart, flowchart and pseudo code and then to implement them by developing C program.

Course Outcomes:
CO1 – Ability to differentiate programming concepts and principles
CO2 - Ability to apply programming techniques and tools such as flowchart and pseudo code to design computer programs

CO3 - Ability to construct and solve engineering related problems using computer programming techniques.

PLT102 LUKISAN BERBANTU KOMPUTER [COMPUTER AIDED DRAFTING]
No of Credits: 2

Course Synopsis:
The main objective of this course is to expose the Bachelor Engineering Technology students with skills of Computer Aided Drafting and its application. This course is an extension from manual hand drawing into the usage of AutoCAD software which focuses on product design in 2D and 3D.

Course Outcomes:
CO1 - Ability to APPLY fundamental concepts of Computer Aided Drafing and develop electrical wiring for engineering drawing.
CO2 - Ability to illustrate engineering drawing by using proper techniques.
CO3 - Ability to use of Computer Aided Drafting to construct a simple roduct design and apply to engineering areas

PLT104 SAINS KEJURUTERAAN [ENGINEERING SCIENCE]
No of Credits: 3

Course Synopsis:
This course aims to introduce to the Electrical Engineering students the knowledge on the principles of material engineering and thermal fluid. It includes aspects related to material engineering, thermodynamics and fluid mechanics.

Course Outcomes:
CO1 - Ability to apply the Mechanical, Electrical and Magnetic properties of materials. engineering related problems.
CO2 - Ability to analyze using concepts and principles of Fluid Statics, Bernoulli and Energy Equations.
CO3 - Ability to design using concepts and principles of First Law and Second Law of Thermodynamics.

PLT105 TEORI LITAR ELEKTRIK 1 [ELECTRIC CIRCUIT THEORY I]
No of Credits: 3

Course Synopsis:
This course covers topics of introduction to the DC circuit's covers fundamental laws and theorems. Students also get knowledge about AC circuits that introduces phasors and sinusoidal steady state analysis. This course intends to give the students knowledge on understanding three-phase balance systems.

Course Outcomes:
CO1 - Ability to EXPLAIN important equations to solve problems in DC circuits.
CO2 - Ability to ANALYZE the first and second order circuit containing passive elements, DC sources and switches using differential equations.
CO3 - Ability to EVALUATE circuit parameters containing sinusoidal steady-state sources using complex impedances and phasor representations.

PLT106 ELEKTRONIK DIGIT [DIGITAL ELECTRONICS]
No of Credits: 3

Course Synopsis:
The aim of this course is to introduce students to the basic knowledge in the digital electronics. This course focuses the introduction and discussion of the fundamental of digital circuit design and analysis. The lectures cover the following topics: Numbering System, Algebraic Switching, Boolean Function, Combinational Logic Design and Sequential Logic Design.

Course Outcomes:
CO1 - Ability to APPLY the basic principles of numbering system and algebraic switching in digital electronics.
CO2 - Ability to ANALYZE and optimize logic circuit using Boolean functions and Karnaugh maps.
CO3 - Ability to DESIGN digital system application using combinational and sequential logic design techniques.

PLT107 ELEKTRONIK 1 [ELECTRONICS I]
No of Credits: 3
Course Synopsis:
Modules whlch ore Eosic Worl<shop, Mochlnlng, Wlring, PCB Design, PLC, AutoCAD ond fechnical.

Course Outcomes:
CO1 - Ability to explain and differentiate the fundamental concepts of electronic Devices.
CO2 - Ability to analyze the basic operations of electronic devices such as diode, BJT and various types of FET
CO3 - Ability to design and evaluate the basic biasing circuits

PLT108 KEMAHIRAN KEJURUTERAAN II [ENGINEERING SKILLS II]
No of Credits: 3

Course Synopsis:
This is the core subject which is 100% practical and carried out 3 units credit hours. This course contains modules to provide students with engineering skills such as electrical Computer Aided Drafting (CAD), electrical domestic wiring, Printed Circuit Board (PCB) fabrication and computer assemble, formatting and networking.

Course Outcomes:
CO1 - Ability to design and construct the basic skills and standard practiced of domestic electrical wiring.
CO2 - Ability to design and construct the basic skills and standard practiced of PCB and electronic component fitting
CO3 - Ability to apply and construct the basic skills and standard practiced of computer assemble and networking

PLT201 TEORI LITAR ELEKTRIK 2 [ELECTRIC CIRCUIT THEORY II]
No of Credits: 3

Course Synopsis:
This course will introduce the students to the Laplace and Fourier Transform concept. The student also will expose to analyse the electrical circuit by using Laplace and Fourier Transform. The concepts of mutual inductance, frequency response of AC circuit and two port networks would also be covered to the students.

Course Outcomes:
CO1 - Ability to EXPLAIN and ANALYZE special types of circuit such as mutual inductance and two port networks.
CO2 - Ability to ANALYZE and EVALUATE electric circuits using Laplace Transform for the circuit comprising passive elements.
CO3 - Ability to ANALYZE the concepts of frequency response for AC circuits and CONSTRUCT Bode plot for various types of transfer function.
CO4 - Ability to ANALYZE and EVALUATE electric circuits using Fourier Series and Fourier Transform for the circuit comprising passive elements.

PLT202 PERALATAN DAN PENGUKURAN [INSTRUMENTATION AND MEASUREMENT]
No of Credits: 3

Course Synopsis:
This course covers the basic concepts of modern measurement and instrumentation system. It is divided into several main topics namely the fundamentals of electronics instrumentation and measurement system, the working principles and application of sensors and transducers, principles and application of signal conditioning circuit including bridges, amplifier and filters, and finally display, data acquisition and interfacing techniques

Course Outcomes:
CO1 - Ability to define, describe and ANALYZE the lements of a complete electronic instrumentation and measurement system.
CO2 - Ability to define, describe and ANALYZE types of error, statistical, regression and correlation, standard and calibration of the instrumentation and measurements.
CO3 - Ability to DESIGN and apply the working principles of various sensors and signal conditioning/ processing techniques in

instrumentation and measurements.

CO4 - Ability to describe and ANALYZE display systems, data acquisition system and computer interfacing techniques in instrumentation and measurement.

PLT203 ELEKTRONIK II [ELECTRONIC II]
No of Credits: 3

Course Synopsis:
This course is the continuous of concepts of electronic circuit in the Electronic I. This course intends to give the students knowledge on Bipolar Junction Transistor (BJT) and Field Effect Transistor (FET), Power Amplifier, Operation Amplifier, Op-Amp Application, Feedback Circuit and Voltage Regulator.

Course Outcomes:
CO1 - Ability to analyze small-signal models and frequency response of basic amplifier circuits. (BJT, FET and operational amplifier).
CO2 - Ability to design ideal operational amplifier circuits and various classes of active filters with given design specifications.
CO3 - Ability to analyze basic types of voltage regulators

PLT204 TEORI MEDAN ELEKTRIK [ELECTROMAGNETIC FIELD THEORY]
No of Credits: 3

Course Synopsis:
The purpose of this course is to learn the basic theory and analysis of electromagnetic field. Student should be able to understand the basic concept of vector, theory of electrostatics and magnetostatics. It also covers the theory and application of transmission line.

Course Outcomes:
CO1 - Ability to analyse the concept of vector analysis in electromagnetic theory
CO2 - Ability to investigate and analyse the concepts of electrostatic.
CO3 - Ability to design and analyse the concepts of magnetostatic.
CO4 - Ability to relate and evaluate the concept of electromagnetic in transmission line analysis

PLT205 TEKNOLOGI MESIN ELEKTRIK I [ELECTRICAL MACHINES TECHNOLOGY I]
No of Credits: 4

Course Synopsis:
Electrical Machines Technology I is intended to give the students deep knowledge about magnetic circuits, electromagnetic, electromechanical, transformer, and DC machine. This course focuses on the following concepts: The practical and laboratory work are designed to give the students the practical perspective of electromagnetic, transformer and DC machine. Practical based on experiments are the main practical work for the students in this course. They are given the opportunity to fully utilize the current available facilities to realize the knowledge of practical electromagnetic, transformer, and DC machine.

Course Outcomes:
CO1 - Ability to APPLY the basic concept of electromagnetism into electrical machines
CO2 - Ability to SYNTHESIS the performance of transformer
CO3 - Ability to EVALUATE the performance of DC motor
CO4 - Ability to ANALYZE the performance of DC generator

PLT206 SISTEM MIKROPENGAWAL [MICROCONTROLLER SYSTEM]
No of Credits: 3

Course Synopsis:
The aims of this course is to study the PIC microcontroller architecture, its programming using C language and basic interfacing with input and output devices. These knowledge are gathered and applied to design a simple microcontroller based system.

Course Outcomes:
CO1 - Ability to ANALYZE a microcontroller programming language in C

program
CO2 - Ability to EXAMINE the input and output devices with microcontroller.
CO3 - Ability to DESIGN a simple application on a microcontroller based system.

PLT207 ELEKTRONIK KUASA [POWER ELECTRONICS]
No of Credits: 3

Course Synopsis:
This course introduces Power Electronics concepts as a multidisciplinary and interdisciplinary applications oriented technology emphasizing the main criterion of electrical energy conversion. AC-DC, AC-AC, DC-DC and DC-AC converter performance via waveform analyses. This course also introduces an awareness of Electromagnetic Compatibility (EMC) Legislation and the effects of Power Electronic Systems on Power Quality. Design aspects include understanding manufacturer's data, co-relating data to select power semiconductors and passive components, thermal management and EMC compliance.

Course Outcomes:
CO1 - Ability to analyze operation and applications of power electronic devices and addressing the needs of EMC requirements.
CO2 - Ability to evaluate the performance of AC-DC and AC-AC converters.
CO3 - Ability to evaluate the performance of DC-DC and DC-AC converters.

PLT208 SISTEM KOMUNIKASI [COMMUNICATION SYSTEM]
No of Credits: 3

Course Synopsis:
This subject will cover all the basic principles and concepts of communication system including the basic elements of communications such as modulation techniques (amplitude modulation, angle modulations and digital modulations), transmission channels and medium. In addition, signal propagations and noise in communication system will be discussed.

Course Outcomes:
CO1 - Ability to DISTINGUISH the basic requirement of communication systems and the essential of communication system.
CO2 - Ability to DIFFERENTIATE the different types of modulation.
CO3 - Ability to DESIGN and ANALYZE noise in communication system.

PLT209 ISYARAT DAN SISTEM [SIGNAL AND SYSTEM]
No of Credits: 3

Course Synopsis:
This course aims to introduce students the basic of signals and systems. To learn how to analyze the waveform of signals and its characteristic in engineering system. To understand signal spectrum concept, determine the process of the systems and evaluate systems response using various methods.

Course Outcomes:
CO1 - Ability to analyze waveform of the signals and its characteristic in engineering systems.
CO2 - Ability to analyze signals and determine the process of the systems
CO3 - Ability to evaluate the system response using variable methods.

PLT221 PERINSIP THERMO-BENDALIR DAN BAHAN [PRINCIPLES OF THERMOFLUID AND MATERIALS]
No of Credits: 3

Course Synopsis:
This course aims to introduce students the basic knowledge of mechanical properties of materials such as tensile, compreesive, shear and strains and torsional deformation. Students also get knowledge about static fluid and energy equation for flow problems. This course is also internals to give students knowledge and understanding on the basic concepts of refrigerators and heat engine problems. Upon completion, fluid mechanics and thermodynamics. The concept is emphasized by some laboratory works.

Course Outcomes:

CO1 - Ability to analyze the Mechanical properties of materials such as tensile, compressive, shear stresses & strains, and torsional deformation.
CO2 - static fluid and energy equation for fluid flow problems.
CO3 - Ability to evaluate and compare on basic concepts of refrigerators and heat engine problems.

PLT222 MEKANIK GUNAAN [APPLIED MECHANICS]
No of Credits: 3

Course Synopsis:

This course is to expose students in the field of mechanics engineering. It covers the threories and application aspects in mechanics rigid body. Students get knowledge about the importance in choosing coordinate system and the exchange component in vector mechanics. This course is also intends to give students knowledge and understanding the kinematics of force and acceleration. The concept is emphasized by some laboratory works.

Course Outcomes:

CO1 - Ability to apply the concepts of engineering mechanics.
CO2 - Ability to analyze the importance in choosing coordinate system and the exchange of component in vector mechanics.
CO3 - Ability to develop dynamic problems of engineering mechanics, kinematic study and acceleration.

PLT223 REKABENTUK MESIN [MACHINE DESIGN]
No of Credits: 3

Course Synopsis:

This course allows student understand and identify the design theories including the mechanical elements which is considered in the mechanical design process. The course begins with understanding the design fundamental. The objective of the course is to provide students with concepts and principles of mechanical design that is required in design. Emphasis is given to the application of Computer Aided Engineering and Design in synthesizing elements and material selection within mechanical system design. The basic element of dynamics will understand such as kinematics, machine mechanism, velocity and acceleration analysis. The component of machine design will include shaft, bearing, gear systems, power screw, belts and chain, shafts and bearings maybe added. Students will be exposed to the laboratory work and research using the latest design software.

Course Outcomes:

CO1 - Ability to apply the concept and principle of design process with appropriate material in mechanical design.
CO2 - Ability to analyze position, velocity and acceleration of a point in a linkage.
CO3 - Ability to evaluate machine elements to develop a mechanism.

PLT224 SISTEM PNEUMATIK & HIDRAULIK [PNEUMATICS & HYDRAULIC SYSTEMS]
No of Credits: 3

Course Synopsis:

This course is designed to provide students with fundamentals of pneumatic and hydraulic control systems both; in theory and practice. Students are expected to acquire knowledge of physical behavior of pneumatics and hydraulics control system, the pneumatics and hydraulics components and applications. Knowledge on theory acquired in lecture is also enhanced with a practical work conducted in laboratory.

Course Outcomes:

CO1 - Ability to demonstrate pneumatic System and the compress air fundamental, the relationship betweenvpressure, force and pneumatic cylinder characteristics.
CO2 - Ability to analyze the fundamental of hydraulic power unit and the relationship between pressure, force and speed for hydraulic valves and cylinder.
CO3 - Ability to create electro-pneumatics/ hydraulics system using electrical devices control fluid.

PLT301 ELECTRICAL MACHINES TECHNOLOGY II [ELECTRICAL MACHINES TECHNOLOGY II]
No of Credits: 4

Course Synopsis:
Electrical Machines Technology II is intended to give the students deep knowledge about single phase and three phase induction motor, synchronous machine, motor starter, testing and maintenance of electrical machines. The practical and laboratory work are designed to give the students the practical perspective of the three phase AC motor, open and fix motor, star-delta starter and testing the AC motor.

Course Outcomes:
CO1 - Ability to develop and explain the three phase induction motor and single phase induction motor and its application to electrical machines
CO2 - Ability to apply and explain the synchronous generator and synchronous motor and its application to the electrical machines.
CO3 - Ability to classify and analyze the motor starter method for AC Machines.
CO4 - Ability to apply related testing, maintenance and software tools in understanding the principle of electrical machines.

PLT302 ELECTRICAL INSTALLATION I [ELECTRICAL INSTALLATION I]
No of Credits: 3

Course Synopsis:
This course provides the student an exposure of electrical installation design for low voltage application up to 11 kV. It introduce the student for electrical symbol diagram, final circuit and load calculation, lighting design, protection system, power factor correction, cable sizing and earthing system. Student also is exposes to the testing and inspection for electrical installation.

Course Outcomes:
CO1 - Ability to APPLY the IEE Regulations.
CO2 - Ability to explain and ANALYSE the general characteristics of an electrical installation
CO3 - Ability to DESIGN and SELECT of electrical installation apparatus for low voltage application.
CO4 - Ability to ANALYSE actual working drawings of electrical project.

PLT303 ELECTRICAL DRIVES [ELECTRICAL DRIVES]
No of Credits: 3

Course Synopsis:
This course provides the student an exposure application of Power Electronics for electric motor drives. It emphasize on fundamental concepts of power electronic drives, speed control of DC motor including single phase half-wave and full-wave AC to DC converter. The speed control of AC motor also will dicsuss including frequency control, stator voltage control and voltage frequency (v/f) control. The aspects of dynamic braking of DC and AC Motors, load characteristic and matching drives to load also discussed.

Course Outcomes:
CO1 - Ability to EVALUATE converters parameters for controlling DC motor drives.
CO2 - Ability to EVALUATE converters parameters for controlling AC motor drives.
CO3 - Ability to DESIGN the dynamic load operation.
CO4 - Ability to ANALYSE the breaking to the drive requirement.

PLT304 ELECTRICAL POWER SYSTEM [ELECTRICAL POWER SYSTEM]
No of Credits: 4

Course Synopsis:
This course intends to give students fair knowledge of power system engineering which covers the topics of generation, transmission and distribution systems. The sub-topics that will be emphasized are such as the

per-unit system, transmission line parameters and models, load characteristics, representations of components in power systems, symmetrical fault and unsymmetrical fault.

Course Outcomes:

CO1 - Ability to DEMOSTRATE type and operation of power system generation in groups.
CO2 - Ability to ANALYZE single-line diagram problem using the per-unit system
CO3 - Ability to ANALYZE transmission line parameters and models in power system.
CO4 - Ability to ANALYZE the load characteristics and the distribution system components in power system
CO5 - Ability to EVALUATE symmetrical fault and unsymmetrical fault in power system.

PLT305 CONTROL SYSTEM TECHNOLOGY [CONTROL SYSTEM TECHNOLOGY]
No of Credits: 3
Course Synopsis:
This is an introduction course to control systems engineering. Students will be exposed to the mathematical modeling for electrical, electro-mechanical as well as mechanical systems using block diagram, transfer functions, and signal-flow graphs. They will conduct system performance analysis in time and frequency domain. The course also covers system compensation design using PID and lead-lag controllers.

Course Outcomes:

CO1 - Ability to PRODUCE various mathematical models from physical systems by employing suitable techniques such as Mason's Law and Laplace Transform
CO2 - Ability to ANALYSE system response to test inputs in time or frequency domain.
CO3 - Ability to ANALYSE control system problems by utilizing control system graphical tools such as root locus or bode plot.
CO4 - Ability to EVALUATE appropriate controller and analysing system's time and frequency domain.

PLT306 ELECTRICAL INSTALLATION II [ELECTRICAL INSTALLATION II]
No of Credits: 3

Course Synopsis:
This is an introduction course to control systems engineering. Students will be exposed to the mathematical modeling for electrical, electro-mechanical as well as mechanical systems using block diagram, transfer functions, and signal-flow graphs. They will conduct system performance analysis in time and frequency domain. The course also covers system compensation design using PID and lead-lag controllers.

Course Outcomes:

CO1 - Ability to EXPLAIN the fundamental operations of diesel generator system.
CO2 - Ability to EVALUATE the operation of generators in parallel and design the synchronizing system for parallel generator.
CO3 - Ability to apply and DESIGN the uninterrupted power supply.
CO4 - Ability to explain and PROPOSE the bust duct and performing all necessary calculations
CO5 - Ability to DESIGN the lightning protection system for commercial buildings and facilities.

PLT307 PROGRAMMABLE LOGIC CONTROLLER (PLC) [PROGRAMMABLE LOGIC CONTROLLER (PLC)]
No of Credits: 3

Course Synopsis:
The student will be expose to programmable logic controller (PLC), PLC components, PLC programming and operational procedure. PLC capable to perform more complex motion and process control applications. The course covers historical background, uses PLCs, product ranges, benefits numbering system codes and logic concept pertaining to PLCs. The student will develop an understanding of the PLC central processing unit, input-output system, programming and peripheral devices, and

programming languages and will developed skills in programming and documenting on a cross section of industrial PLCs.

Course Outcomes:
CO1 - Ability to APPLY the basic concepts of PLC and its application in industrial control application.
CO2 - Ability to CONSTRUCT a simpler timer/counter and special instruction programming, editing and program observation.
CO3 - Ability to EXPLAIN ladder diagram that will perform a specified operation using PLC programming.
CO4 - Ability to DESIGN a specified operation using PLC programming in application of industrial electronic control.

PLT308 POWER QUALITY [POWER QUALITY]
No of Credits: 3

Course Synopsis:
This course covers topics of power quality in power system. The student is exposed to problems in power system such as voltage sags, transient and harmonics. This course will also covers mitigation or preventive method in power quality issue.

Course Outcomes:
CO1 - Ability to ANALYSE power quality disturbances and typical problems associated with power quality disturbances.
CO2 - Ability to ANALYSE the typical equipment that either causes or is susceptible to electrical power quality disturbances.
CO3 - Ability to ANALYSE problems on harmonic distortion, voltage sags and transient switching over voltage on electrical power systems.
CO4 - Ability to DESIGN filters to reduce harmonic distortion.

PLT309 SUBSTATION ENGINEERING [SUBSTATION ENGINEERING]
No of Credits: 3

Course Synopsis:
The student will be expose to programmable logic controller (PLC), PLC components, PLC programming and operational procedure. PLC capable to perform more complex motion and process control applications. The course covers historical background, uses PLCs, product ranges, benefits numbering system codes and logic concept pertaining to PLCs. The student will develop an understanding of the PLC central processing unit, input-output system, programming and peripheral devices, and programming languages and will developed skills in programming and documenting on a cross section of industrial PLCs.

Course Outcomes:
CO1 -
CO2 - Ability to EVALUATE measure resistivity and grounding resistance and substation safety requirement.

PLT321 RANGKAIAN INDUSTRI [INDUSTRIAL NETWORKING]
No of Credits: 3

Course Synopsis:
This course is designed to introduce the principles of network and communication system along with its applications in communication and other modern equipments. At the end of the course, the students are expected to provide clear understanding in fundamental concept of communication system and relate the principles to various applications in the industry. Students will learn the data communications and IP networks, then the field of industrial data communications. It includes Quality of Service (QoS), Real-Time Transmission, copper cable, Fiber Optics cable, Industrial Ethernet, Wireless Ethernet, Modbus, DeviceNet and Profibus.

Course Outcomes:
CO1 - Ability to describe and explain the principle of network and communication system
CO2 - Ability to differentiate principle of various types of network and communication systems.
CO3 - Ability to design system for industrial network and communication technology.

PLT322 KAWALAN PROCESS INDUSTRI [INDUSTRIAL PROCESS CONTROL]
No of Credits: 3

Course Synopsis:
This course aims to convey the knowledge of classical control systems, advance classical control method, state space representation of continuous-time system, continuous-time response and performance, specifications, state space analysis and design, advance state space control system and projects based on problems.

Course Outcomes:
CO1 - Ability to apply the concepts of control system in state-space and digital control.
CO2 - Ability to analyze the state-space representation of discrete-time systems.
CO3 - Ability to evaluate the performance of control systems design in state-space.

PLT326 AUTOMASI INDUSTRI [INDUSTRIAL AUTOMATION]
No of Credits: 3

Course Synopsis:
This course aims to convey the knowledge and application of industrial automation technologies. It combines the automation technology principles and its relationship with assembly process and system, the element of sensor, actuator and drive technology as an input/output component in automation technology. It also covers an industrial application in automation technology and technique in terms of hardware and software control, the automation technology issues in design, engineering analysis, planning, tooling and manufacturing.

Course Outcomes:
CO1 - Ability to apply the automation technology principles and its relationship with assembly process and material handling system.
CO2 - Ability to analyze automation components such as sensor, actuator and drive/motion system.
CO3 - Ability to evaluate automation controller system using PLC and analyze the PLC applications.
CO4 - Ability to apply the principles of SCADA systems and the concept of CAD, CAM and CIM

PLT327 ROBOTIK INDUSTRI [INDUSTRIAL ROBOTICS]
No of Credits: 3

Course Synopsis:
This Course is designed to introduce several of robotics such as the Types of robots, Capabilities, Characteristics, Robot Control Systems and Software, Kinematics Analysis, Principles of Inverse Kinematics, Robot Sensors and Drive mechanism, Robot Work Dell Design and Various industrial Applications.

Course Outcomes:
CO1 - Ability to apply suitable robots for specific industrial applications
CO2 - Ability to analyze object manipulations by robots for an industrial manufacturing and designs sensor integrated robot system.
CO3 - Ability to develop and scheduling a robot work cell for a maximum productivity.

PLT328 ROBOTIC CONTROL [ROBOTIC CONTROL]
No of Credits: 3

Course Synopsis:
This Course is designed to analyze and determine the kinematic and dynamic models of robots and control systems design motion and strength. The student will be able to use analysis tools and computer-aided design of control systems in the tasks usual analysis, simulation and controller design. The student will have knowledge to analyze, design and implement advanced robotic applications.

Course Outcomes:
CO1 - Ability to explain and describe the fundamental concepts of

robotics and applications.
CO2 - Ability to analyze and design the operation of sensors, robots control and robotic programming.
CO3 - Ability to evaluate object manipulations by robots for an intelligent system in industrial manufacturing.

PLT340 FINAL YEAR PROJECT I [FINAL YEAR PROJECT I]
No of Credits: 4

Course Synopsis:
This course consists of lectures and independent study on the techniques of conducting laboratory and/or field experiments. The students are guided on the techniques and implementation of research and monitored based on the research plan, data analysis, interpretation and conclusion. The students are required to write, submit and defend their thesis to the internal examiners.

Course Outcomes:
CO1 - Ability to design and construct theory and practical to solve the engineering problems.
CO2 - Ability to construct suitable research methodology for the project.
CO3 - Ability to write and revise a project proposal and progress report in technical with organized arrangement.
CO4 - Ability to defend effectively project constructed to influence the audience by applying technical andscientific knowledge.

PLT341 DIGITAL CONTROL [DIGITAL CONTROL]
No of Credits: 3

Course Synopsis:
The digital control systems considered are mostly linear and time invariant, although nonlinear and/or time varying systems are occasionally included in this subject. Digital control systems are control systems in which one or more variable can change only at discrete instants of time. Digital control systems differ from continuous time control systems in that signals for a digital control system is in sampled data form or in discrete form.

Course Outcomes:
CO1 - Ability to apply the concept of discrete-time transfer function, block diagram and sampled data and signal.
CO2 - Ability to analyse the time response and stability of discrete system.
CO3 - Ability to design the digital control systems using transfer function technique.

PLT401 POWER SYSTEM PROTECTION & SWITCHGEAR [POWER SYSTEM PROTECTION & SWITCHGEAR]
No of Credits: 3

Course Synopsis:
This course introduces varieties of circuit breakers, isolator, earthing switch, bus-bar and relays for protection of generators, motor, transformers from sort circuit, over voltage and other hazards caused by internal and external faults. This course also describes various neutral grounding of the equipment related to protection system.

Course Outcomes:
CO1 - Ability to ANALYZE the restriking phenomenon, operation and selection of switchgear equipment
CO2 - Ability to EVALUATE the abnormal condition on equipment, application, choice of protective relay correctly.
CO3 - Ability to ANALYZE causes of overvoltage, evaluate application of arrester to equipment protection the related insulation coordination problems and necessity of earthing neutral.
CO4 - Ability to DESIGN the neutral grounding concept and performance.

PLT402 INDUSTRIAL AUTOMATION [INDUSTRIAL AUTOMATION]
No of Credits: 3

Course Synopsis:
This course exposes the student the the advance automation concept in the industries as this subject will combine the basic PLC application into motion control, pneumatic and hydraulic system. This course has

been designed to provide the advanced PLC skills covering theories and practices.

Course Outcomes:

CO1 - Ability to apply the automation technology principles and its relationship with assembly process and material handling system.
CO2 - Ability to analyze automation components such as sensor, actuator and drive/motion system.
CO3 - Ability to evaluate automation controller system using PLC and analyze the PLC applications.
CO4 - Ability to apply the principles of SCADA systems and explain the concept of CAD, CAM and CIM

PLT403 HIGH VOLTAGE TECHNOLOGY [HIGH VOLTAGE TECHNOLOGY]
No of Credits: 3

Course Synopsis:

This course will introduce the students about insulating materials and their applications, breakdown phenomena in insulating material such as solids, liquids, and gases. The course will also generation and measurement of high d.c., a.c. and impulse voltages and currents, high voltage testing techniques and testing of apparatus and equipment.

Course Outcomes:

CO1 - Ability to EXPLAIN the introduction to high voltage technology.
CO2 - Ability to ANALYZE the various breakdown mechanism and applications of vacuum, liquid, solid and composite dielectrics
CO3 - Ability to DIFFERENTIATE the applications of insulating materials in power transformers and in rotating machines
CO4 - Ability to EVALUATE generations and measurements of high voltage AC, DC and impulse generator
CO5 - Ability to DIFFERENTIATE types of high voltage testing for electrical.

PLT404 RENEWABLE ENERGY SYSTEM [RENEWABLE ENERGY SYSTEM]
No of Credits: 3

Course Synopsis:

This course will introduce students with conversion, storage, integration and economic assessment techniques for renewable energy systems. This course also enables students to assess and design basic system configuration of renewable energy technologies for both standalone and grid-connected power generation.

Course Outcomes:

CO1 - Ability to IDENTIFY the operation of renewable energy.
CO2 - Ability to ANALYZE the operation and control of wind turbine technology
CO3 - Ability to EVALUATE the principles of solar energy.
CO4 - Ability to DESIGN and EVALUATE appropriate system configuration based on solar PV.

PLT405 ENERGY EFFICIENCY & MANAGEMENT [ENERGY EFFICIENCY & MANAGEMENT]
No of Credits: 3

Course Synopsis:

This course exposes the students to national and world economic perspectives on energy in term of economics, problems and current status of energy. Through plans and operation for energy management and energy efficient equipments, student will learn on how efficient energy can be achieved. At the end of this course, students will be exposed to the techniques for energy audit such as analyzing energy consumptions and estimate a solution for energy saving programs.

Course Outcomes:

CO1 - Ability to apply and utilize electricity tariff and energy management calculation in Malaysia
CO2 - Ability to analyze the element of energy management and its effective tools.

CO3 - Ability to evaluate a solution to problem related demand side management and energy saving solution based on electrical energy audits.
CO4 - Ability to synthesize the energy efficiency of electrical systems and its conservation potential.

PLT422 SISTEM MEKATRONIK [MECHATRONICS SYSTEM]
No of Credits: 3

Course Synopsis:
This course aims to analysis, evaluate and construct the basic knowledge of mechatronics system. Students are expected to acquire effectiveness of knowledge to valuing of measurement and actuation system of mechatronic. Knowledge on theory acquired in lecture is also enhanced with response and mechanism practice conducted in laboratory.

Course Outcomes:
CO1 - Ability to analyze measurement systems using sensors/ transducers and relevant conditioning circuits.
CO2 - Ability to evaluate actuation systems using pneumatic, hydraulic, mechanical and electrical circuit elements.
CO3 - Ability to construct input/output systems using PLC, microprocessors and microcontroller

PLT423 PENGENDALIAN DAN PENGENALPASTIAN BAHAN [MATERIAL HANDLING AND IDENTIFICATION]
No of Credits: 3

Course Synopsis:
This course introduces important concepts of material handling and identification and their applications in automation systems. The concept include introduction to material transport system, conveyor system, storage system, automated storage system, automated identification and data technology, industrial robot.

Course Outcomes:
CO1 - Ability to analyze the material handling system and its relationship with assembly process.
CO2 - Ability to evaluate the material transport system.
CO3 - Ability to create the conveyor, storage and automated storage system

PLT424 KENDERAAN BERPANDU AUTOMATIK [AUTOMATED GUIDED VEHICLE]
No of Credits: 3

Course Synopsis:
This course introduces the students the concepts and design of wheeled and walking robot mechanisms with a study on their kinematics and dynamics aspects. The course also introduces the principles and applications of Autonomous Guided Vehicles (AGV).

Course Outcomes:
CO1 - Ability to demonstrate the moving mechanisms of mobile robots such as wheeled, walking, swimming, flying and climbing robots.
CO2 - Ability to analyze the force-torque requirements of mobile robots and deciding the servo and stepper motor specifications.
CO3 - Ability to design the requirements of sensors and control systems for the wheeled robot mechanisms

PLT425 SISTEM PENGLIHATAN [VISION SYSTEM]
No of Credits: 3

Course Synopsis:
This course is designed to introduce the basic concepts of machine vision and provide an understanding of the concepts of vision as well as image acquisition and processing. Basic techniques for classification and neural network will also be introduced. The course also helps the students to develop the ability of designing machine vision systems for industrial applications.

Course Outcomes:
CO1 - Ability to apply the components of machine vision systems, as well as image acquisition and sampling techniques

CO2 - Ability to analyze color image processing, morphological image processing and segmentation techniques.
CO3 - Ability to design machine vision module utilizing image processing concepts and classification methods.

PLT440 FINAL YEAR PROJECT II [FINAL YEAR PROJECT II]
No of Credits: 6

Course Synopsis:
This course will introduce students with conversion, storage, integration and economic assessment techniques for renewable energy systems. This course also enables students to assess and design basic system configuration of renewable energy technologies for both standalone and grid-connected power generation.

Course Outcomes:
CO1 - Ability to APPLY and integrate theory and practical to solve the engineering problems.
CO2 - Ability to DEVELOP suitable research methodology for the project.
CO3 - Ability to DEVELOP a project proposal and progress report in technical report.
CO4 - Ability to present and DEFEND effectively project progress to selected audience.
CO5 - Ability to IDENTIFY commercialization potential for proposed project.

VLT111 LAKARAN DAN SIMULASI SISTEM ELEKTRIK [ELECTRICAL SYSTEM DRAFTING AND SIMULATION]
No of Credits: 4

Course Synopsis:
The main objective of this course is to expose students with skills of applying Computer Aided Drafting and its application. This course provides the student an exposure of electrical installation design for low voltage application. It introduces the student with electrical symbol, design lighting and switch socket outlet (S/S/O) required and design schematic diagram for Distribution Board, Sub Switch Board and Main Switch Board.

Course Outcomes:
CO1 - APPLY general characteristic of electrical installation into the concepts of Computer Aided Drafting and Orcad
CO2 - DESIGN electrical installation apparatus for low voltage application
CO3 - ANALYSE actual working drawings of electrical project.

VLT112 PELAPORAN TEKNIKAL [TECHNICAL REPORTING]
No of Credits: 4

Course Synopsis:
Technical reporting course is learn about a formal report designed to convey technical information in a clear an d easily accessible format. Technical report is a document describes the process, progress or result of technical or state of technical problem.It also learn how to make recommendation and conclusions of a project. Technical report is a review process, it is often limited to within the originating organization. Students compose, design, revise, and edit effective reports, descriptions, instructions, and employment documents. Emphasizes precise use of language and graphics to communicate complex technical and procedural information safely, legally and ethically.

Course Outcomes:
CO1 - Ability to reading, interpreting, analyzing, and evaluating complex technical and professional documents and visuals
CO2 - Ability to produce reports and proposal that inform, persuade and provide information
CO3 - Ability to apply the value of good writing and presenting communications.

VLT113 PENGUJIAN DAN PENGUKURAN SISTEM ELEKTRIK [ELECTRICAL SYSTEM MEASUREMENT AND TESTING]
No of Credits: 5

Course Synopsis:
This course covers the fundamentals circuit analysis such as Kirchoff's laws, parallel and series circuits. This course provides an introduction to the fundamentals of measurement standards, measurement errors, operation of electrical measuring instruments and their testing and calibration. In addition, this course also covers the used of potentiometer for measurement of resistance and voltmeter and ammeter calibrations. Measuring earth resistance for electrical grounding systems as well as insulation resistance and leakage current test are among the topics that will be covered in this course. Overall, it emphasizes the principles and analytical models used by engineers and technologists to design, develop and test electrical systems.

Course Outcomes:
CO1 - Demonstrate proper safety procedures industrial project
CO2 - Ability to evaluate the problem of electrical devices with standard tests and measurements
CO3 - Ability to analyse the relevant parameter measurement

VLT231 PENYELENGGARAAN SISTEM ELEKTRIK BANGUNAN [BUILDING ELECTRICAL SYSTEM MAINTENANCE]
No of Credits: 5

Course Synopsis:
This course covers tools and maintenance tasks that can develop knowledge of basic building maintenance tools and materials, applied skills and techniques, industry health and safety standards, and preventive maintenance and troubleshooting practices in the building trades and facilities maintenance fields.

Course Outcomes:
CO1 - DESCRIBE the safe practice of electrical systems used in buildings maintenance tasks
CO2 - PERFORM basic preventive and reactive maintenance procedures for residential homes, apartments, and appliances
CO3 - PROPOSE the quantitative methods to common building maintenance tasks

VLT232 PENYELENGGARAAN SISTEM TENAGA BOLEH DIPERBAHARUI [RENEWABLE ENERGY SYSTEM MAINTENANCE]
No of Credits: 5

Course Synopsis:
This course covers the fundamentals of renewable energy technologies such as solar, wind, hydro, biomass and fuel cells. Student will be taught about the principal of operation and maintenance of renewable energy systems. Students will also be exposed to the practical works for maintance of renewable energy systems. These include diagnose, maintenance and repair of solar panel, inverter, connector box, induction generator, diesel generator, control system, fire fighting system. Apart of the course implementation, there will be a seminar organised related to these renewable energy technology (Industrial talk).

Course Outcomes:
CO1 - DESCRIBE the fundamentals, main characteristics and main components of different renewable energy sources and systems
CO2 - PERFORM maintenance activities in a cost effective manner so that meet specific energy demands and have a minimal impact on the environment
CO3 - PROPOSE simple techno-economical assessments and compare environmental assessments of renewable energy systems

VLT233 PENYELENGGARAAN SISTEM PENJANA [GENERATOR SYSTEM MAINTENANCE]
No of Credits: 5

Course Synopsis:
This course covers the operation, maintenance and service of the DC and AC generator system. The DC and AC generator and its function in electrical system is introduced. The principle of control system, instrument and metering, as well as generator protection system are included. This course comprised of the maintenance strategy for DC and AC generator system according to standard, which includes the preventive maintenance. Also, this course encompasses the servicing method for DC and AC generator that related to fault diagnosis.

Course Outcomes:
CO1 - APPLY generator system in term of governing, load sharing and synchronizing
CO2 - PERFORM maintenance strategy for diesel generator system according to standard
CO3 - PROPOSE servicing method for diesel generator component parts

DET101 ASAS LITAR ELEKTRIK I [ELECTRIC CIRCUIT FUNDAMENTAL I]
No of Credits: 3

Course Synopsis:
This course can be divided into two parts. Part I, consisting of chapter 1 through 3, is devoted to DC circuits. It covers fundamental laws and theorems, methods of circuit analysis and circuit theorems involving DC circuits. Part 2, consisting of chapter 4 through 5, deals with ac circuits. It introduces phasors, RLC circuits, circuit analysis in ac, ac power calculations and power factor correction.

Course Outcomes:
CO1 - Able to explain the concepts of charge, current, voltage, power, operation and elementary application of resistors, capacitors, inductors, ideal current and voltage source in electrical circuit and its basic laws.
CO2 - Able to analyze linear circuits based on nodal analysis which is based on application of Kirchhoff's Current Law (KCL), and mesh analysis which is based on application of Kirchhoff's Voltage Law (KVL).
CO3 - Able to analyze and make decision in complex linear circuits on how to simplify the circuit analysis using circuit theorem which includes Thevenin's and Norton's Theorems, superposition, source transformation and maximum power transfer

DET111 LUKISAN KEJURUTERAAN [ENGINEERING DRAWING]
No of Credits: 3

Course Synopsis:
The main objective of this course is to expose the Diploma Engineering students with basic concept of engineering skills and its application. This course will help students to identify and familiarize with types of projection and sketches used in engineering drawing and also learn about tools used in computer-aided drafting. From manual hand drawing to the usage of AutoCAD software, students will be able to further understand the proper ways in dimensioning and will be able to translate information from a good engineering drawing. AutoCAD software will focus more on product design in 2D.

Course Outcomes:
CO1 - Able to identify basic skills of engineering drawing in engineering related problems.
CO2 - Able to illustrate engineering drawing in well-defined engineering practices.
CO3 - Ability to apply suitable drawing techniques, skills and engineering tools to well-defined engineering activities
CO4 - Able to perform in group/teams to illustrate engineering drawing

DET113 SISTEM DIGIT [DIGITAL SYSTEM]
No of Credits: 3

Course Synopsis:
This course introduces students to the fundamentals of digital electronic circuit's familiarization through exposure of basic logic gates. The course then develops students to appreciate simple digital applications such as arithmetic combinational logic circuit. Flip-flops and its basic application are introduces in the later part of the course then followed by Shift Register and Counter. Students are expected to design a simple digital system and can demonstrate their understanding in Mini Project.

Course Outcomes:
CO1 - Able to demonstrate theoretical concepts of digital system
CO2 - Able to analyze mathematical models to solve digital circuit configuration.
CO3 - Able to design digital circuit for various digital applications.
CO4 - Able to perform in group to design digital circuit

DET115 PERANTI ELEKTRONIK [ELECTRONIC DEVICES]
No of Credits: 3

Course Synopsis:
This course introduces basic semiconductor devices such as diode, Bipolar Junction Transistor (BJT) and Field-Effect Transistor (FET) theory. The syllabus consists of understanding the principles and operation of semiconductor devices and investigates the applications of these devices.
Its also consist solving BJT and FET parameters using various type of biasing.

Course Outcomes:
CO1 - Able to determine diode applications as rectifiers, limiters, clampers and multipliers
CO2 - Able to analyze Bipolar Junction Transistor (BJT) and Field Effect Transistor (FET) operation and biasing
CO3 - Able to evaluate diode operation by understanding the theory of semiconductor materials

DET116 ASAS PENGATURCARAAN KOMPUTER [BASIC COMPUTER PROGRAMMING]
No of Credits: 3

Course Synopsis:
In this course, students learn computer system introduction, problem solving analysis and programming concept including variables, operator, control structure, function, array, file processing, structure and pointer. Student also learn how to write programming using C language and solve engineering related problem using computer programming technique.

Course Outcomes:
CO1 - Able to discuss programming concept and principle
CO2 - Able to use computer for coding, compiling, executing and debugging computer software program
CO3 - Able to solve engineering related problems using computer programming techniques
CO4 - Able to design program using flowchart and pseudocode

DET119 MIKROPENGAWAL [MICROCONTROLLER]
No of Credits: 3

Course Synopsis:
The aim of this course is to study the Intel 8051 Microcontroller architecture and relate that knowledge to the design of microcontroller based systems. This includes the design technique using internal I/O interfacing, internal memory and introduction to interrupt configuration for the systems. The study of 8051 instruction set and various software development tools are also emphasized as the knowledge are needed in the designing of controller-based systems.

Course Outcomes:
CO1 - Able to discuss the theory and basic architecture of microcontroller.

CO2 - Able to write program using assembly language.
CO3 - Able to demonstrate microcontroller interfacing to the I/O devices.
CO4 - Able to develop a simple application based on microcontroller system.

DET202 ASAS LITAR ELEKTRIK II [ELECTRIC CIRCUIT FUNDAMENTAL II]
No of Credits: 3

Course Synopsis:
This course will introduce the students to the AC Circuit, methods of circuit analysis and application of circuit law. Students also will be exposed to the magnetic circuit and two port networks. Lastly it will cover the balanced three phase system in AC circuit.

Course Outcomes:
CO1 - Able to identify and explain the electrical component and electrical rules in AC circuit
CO2 - Able to analyze AC circuit using method of circuit analysis
CO3 - Able to analyze AC circuit using two port networks parameter
CO4 - Able to analyze basic magnetic circuit using the mesh analysis and dot determination
CO5 - Able to create a balanced three phase system in AC circuit

DET203 PENGUKURAN ELEKTRIK & INSTRUMENTASI [ELECTRICAL INSTRUMENTATION AND MEASUREMENT]
No of Credits: 3

Course Synopsis:
The ability of electrical and computer engineering students to make measurements is vital to an understanding of the physical world, especially for electrical sites. Measurement provides an understanding of electrical phenomena and instruments are tools for measurement. The topics that discussed in this instrumentation and measurement course are: error and data manipulation, DC Ammeter, DC Voltmeters, AC meters, Ohmmeters, Multimeters, Bridges, Oscilloscopes, and sensor transducer.

Course Outcomes:
CO1 - Able to apply the basic principles of measurement and instrumentation to minimise error
CO2 - Able to categorize the sensors and transducer for measurement of non- electrical quantity
CO3 - Able to evaluate the DC bridges and AC bridges in the electrical measurement
CO4 - Able to design the system of DC ammeter, DC voltmeter, AC meter and oscilloscope in electrical measurement

DET204 MESIN ELEKTRIK & APLIKASI I [ELECTRICAL MACHINES & APPLICATION I]
No of Credits: 3

Course Synopsis:
Basically this course can be divided into five main topics. Topic 1 are transformer which cover basic construction, equivalent circuits, phasor diagram, per unit system, efficiency and voltage regulation, open circuit test and short circuit test, instrument transformer. Topic 2 are three phase transformer which cover basic construction, open circuit test and short circuit test, the three phase transformer connections, the parallel transformer operations, the cooling types, tap changer and their operations and the principle operation of autotransformer, Topic 3 basically on DC machine fundamentals. Topic 4 covers direct current motors which cover basic, construction, equivalent circuit, magnetizing curve, separately excited and shunt motor, series motor and compound dc motor. Topic 5 is focus DC generator which cover basic the principles, the equivalent circuit, the terminal characteristic and control terminal voltage. Topic 6 basically on AC machine fundamentals, while last topic covers on three phase induction machine which include basic construction and operations, modes of operation, speed control and selection of induction motor . Lab intensive for 2 hours once a week covers all the topics.

Course Outcomes:

CO1 - Able to apply the principle, standard equivalent circuit and fundamental equations describing the behavior of various general purpose DC machines

CO2 - Able to analyze the principle, standard equivalent circuit and fundamental equations describing the behavior of a three-phase induction motor

CO3 - Able to construct the principle, standard equivalent circuit and fundamental equations the behavior of single phase and three-phase transformers

DET205 MESIN ELEKTRIK & APLIKASI II [ELECTRICAL MACHINE & APPLICATIONS II]
No of Credits: 3

Course Synopsis:

Basically this course can be divided into five main topics. Topic 1 is focus on three phase transformer connections which include principles operations, functions, equivalent circuit and it characteristics.
Topic 2 covers principles operation, equivalent circuits and terminal characteristics of DC generator.Topic 3 covers on single phase induction motor which include principle operations, equivalent circuit and typical application and it characteristics. Topic 4 covers principle operation, equivalent circuit, power and torque, parameter and effect of load change of synchronous motor. Topic 5 covers the introduction to motor starter and last topic covers testing and maintenance of electrical machines.

Course Outcomes:

CO1 - Ability to describe the operational characteristics of DC generator, single phase induction motor and synchronous motor

CO2 - Ability to analyze the various types of single phase induction motors and to choose the best motor for given application

CO3 - Ability to formulate the industrial applications of transformer and electrical machines

CO4 - Ability to develop the test equipment and practices commonly used in motor starter

DET206 SISTEM KUASA I [POWER SYSTEM I]
No of Credits: 3

Course Synopsis:

This course covers topics of introduction and basic analysis to power generation, transmission line parameters study and symmetry & unsymmetrical faults study. This course intends to give the students fair knowledge about electrical power system which focuses on the following concepts: fundamental theory lectures, lab-intensive works in order to strengthen student's understanding, knowledge and expose them to the real practical applications.

Course Outcomes:

CO1 - Able to apply the principle of typical power generation plants and their operation concept in electrical power system.

CO2 - Able to employ knowledge of power transmission line and their element's parameters concept.

CO3 - Able to calculate the faults in symmetrical and asymmetrical component of power system

CO4 - Able to design the capacitance of power factor with analysis on the theoretical concept of power in three phase AC circuit

DET207 REKABENTUK PEMASANGAN ELEKTRIK [ELECTRICAL INSTALLATION DESIGN]
No of Credits: 3

Course Synopsis:

This course is designed and structured to provide electrical assistant engineers /technical assistant with the application skills needed in modern electrical engineering practice. This course uses a combination of theory and practical 'hands on' case studies to demonstrate and reinforce the principles. Students in this course are expected to work through the case studies. The case studies are based on actual installations and projects.

Course Outcomes:
CO1 - Ability to design an electrical Installation on lighting system and final circuit of a building based on JKR and IES standard.
CO2 - Ability to design electrical installation on Switchgear and Capacitor Bank of a building based on IEC standard.
CO3 - Ability to design electrical installation on cables and protection of a building based on IEC and IEE standard
CO4 - Prepare actual working drawings of electrical project

DET212 PRINSIP KAWALAN [CONTROL PRINCIPLES]
No of Credits: 3

Course Synopsis:
This course provides students with a background of control principles in various engineering applications. Throughout this course, students will learn the basic mathematical tools such as Laplace transform, transfer function, block diagram, signal flow graph, mathematical modeling of dynamic systems, time response analysis, stability of linear system, root locus and frequency domain analysis. The laboratory will be used to aid the students understanding of the concept introduced.

Course Outcomes:
CO1 - Able to demonstrate theoretical concepts of control systems
CO2 - Able to produce mathematical models from multiple subsystems (block diagrams/signal flow graphs) and from mechanical/ electrical systems
CO3 - Able to evaluate stability for a given system using Routh-Hurwitz stability criterion
CO4 - Able to analyse system's time and frequency-domain with response to test inputs
CO5 - Able to produce a root locus plot and bode plot

DET214 PENGAWAL LOGIK BOLEH ATURCARA [PROGRAMMABLE LOGIC CONTROLLER]
No of Credits: 3

Course Synopsis:
This course deals with the basic operation, application and programming industrial control system, concentrating on the industrial microprocessor programmable logic controller (PLC). The course covers historical background, uses of PLCs, product ranges, benefits numbering system codes and logic concepts pertaining to PLCs. The student will develop an understanding of the PLC central processing unit, input-output systems, programming and peripheral devices, and programming languages and will develop skills in programming and documenting on a cross section of industrial PLCs. Much time will be spend in the lab working on different kinds of industrial PLCs.

Course Outcomes:
CO1 - Able to explain the types of components in an electrical controller.
CO2 - Able to apply the basic concepts of PLC and its applications in industrial control application.
CO3 - Able to construct a timer/counter and special instruction programming, editing and program observation.

DET218 ELEKTRONIK ANALOG [ANALOGUE ELECTRONIC]
No of Credits: 3

Course Synopsis:
This course introduces the application and analysis of Bipolar Junction Transistor (BJT) and Field Effect Transistor (FET) and the usage in amplifier as well as power amplifier circuit.

Course Outcomes:
CO1 - Able to differentiate between the classes of power amplifier
CO2 - Able to analyze the electrical characteristics of BJTs as multistage

CO3 - Able to demonstrate the operation of BJTs and FETs with the circuit configurations as an amplifier

DET308 SISTEM KUASA II [POWER SYSTEM II]
No of Credits: 3

Course Synopsis:
This course covers topics of introduction and basic analysis to economics of generations, transmission line modeling study, power system protection study and introduction to components of transmission & distribution system in Malaysia. This course intends to give the students fair knowledge about electrical power system which focuses on the following concepts: fundamental theory lectures, lab-intensive works in order to strengthen student's understanding and knowledge. At the end of this course, student should be complete one assignment on related topics.

Course Outcomes:
CO1 - Able to demonstrate theoretical concepts of economics of generations
CO2 - Able to analyze the short, medium and long line models of transmission line.
CO3 - Able to propose power system protection in electrical power system.
CO4 - Able to demonstrate components of transmission and distribution system.

DET309 ELEKTRONIK KUASA) [POWER ELECTRONICS]
No of Credits: 3

Course Synopsis:
This course introduces the students to the Power Electronics as a Multidisciplinary & Interdisciplinary Applications Orientated Technology emphasizing the main criterion of energy efficiency. AC-DC, AC-AC, DC- DC and DC-AC converter operation and performance, including waveform analysis, is developed from theoretical analysis, simulation and laboratories.

Course Outcomes:
CO1 - Able to explain power electronics system, devices and its applications
CO2 - Able to solve basic power computations in power electronics
CO3 - Able to analyze basic power electronics converter

DET310 AMALAN PERTAULIAHAN & PENYELENGGARAAN SISTEM ELEKTRIK [POWER SYSTEM COMMISSIONING AND MAINTENANCE PRACTICES]
No of Credits: 3

Course Synopsis:
This course is to provide students with clear understanding of maintenance and commissioning practice of electrical power system equipment. It will cover both practical and theoretical information on the maintenance and testing of transformer, circuit breaker, protective relay and other electrical equipment. In practical session students will be divided to several groups to carry out laboratory experiments. Student will also gain knowledge regarding standard documentation, policy, investigation technique and data analysis prior to the commissioning. In addition, students will be exposed to standard apparatus and equipment used by utility for commencing maintenance and commissioning work.

Course Outcomes:
CO1 - Able to analyze primary and secondary parameter of distribution substation components
CO2 - Able to analyze commissioning and testing data
CO3 - Able to propose correct setting and parameter for testing equipment and power system components
CO4 - Able to apply electrical power system equipment testing

DET320 KESELAMATAN INDUSTRI, PENGURUSAN KUALITI DAN ETIKA [INDUSTRIAL SAFETY, QUALITY MANAGEMENT AND ETHICS]
No of Credits: 3

Course Synopsis:
This course gives an exposure to students to understand industrial safety standards and guidelines, quality management concept and various quality tools that allow students to understand the general picture of both areas which are being practiced by industries towards Industry 4.0. At the end of this course, students are expected to engage in ethics while working and able to identify suitable quality techniques and tools to be implemented in production management and can apply industrial safety standards in real industrial environment.

Course Outcomes:
CO1 - Able to explain fundamentals of industrial safety and quality management towards Industry 4.0
CO2 - Able to analyze the industrial hazards and electrical hazards
CO3 - Able to select suitable techniques and tools in quality management
CO4 - Able to demonstrate ethics in industrial safety and quality management

DET351 PROJEK SEMESTRAL [SEMESTRAL PROJECT]
No of Credits: 3

Course Synopsis:
This course is a small-scale research projects for final year students and expected to complete within the same semester. The projects are based on solving the engineering problems by understanding the problems, troubleshooting, identify, solve and finally report writing for the documentation purposes. The projects are related to Electrical Power, Power Electronics, Instrumentation and Electronic based.

Course Outcomes:
CO1 - Able to identify solution based on problem study
CO2 - Able to design engineering solution utilizing an engineering practice
CO3 - Able to perform an engineering project
CO4 - Able to write a technical report and communicate in oral presentation

DNT111 LUKISAN KEJURUTERAAN [ENGINEERING DRAWING]
No of Credits: 2

Course Synopsis:
Objective of this course is to provide exposure and skills to Engineering Diploma holders in basic Engineering Drawing and its engineering applications. The course will cover the detail of Engineering Drawing for beginners before going in depth on projection systems followed by oblique and isometric sketches. Knowledge in dimensioning and geometrical tolerance will enhance student's ability in interpreting and assessing information from basic raw data of an engineering drawing. Undergraduate students will also have the advantage to experience practical engineering drawing projects for familiarity from conceptual exposures and classroom theories.

Course Outcomes:
CO1 - Ability to apply basic skills of engineering drawing in mechatronic engineering related problems.
CO2 - Ability to illustrate engineering drawing by using proper techniques.
CO3 - Ability to use engineering drawing knowledge and apply to engineering field.
CO4 - Ability to perform in group/teams to illustrate engineering drawing.

DNT112 ASAS SAINS KEJURUTERAAN [BASIC ENGINEERING SCIENCE]
No of Credits: 2

Course Synopsis:
This course offers comprehensive contents about fundamentals of basic engineering science knowledge. Students are expected to acquire knowledge of physical and science phenomena, which is the basic of engineering field. Theories, principles, and standard units are covered in each syllabus for better understanding in this course.

Course Outcomes:
CO1 - Able to calculate the principal and basic concept of physics in engineering system.
CO2 - Able to determine the concept of physics to solve the variety of problems
CO3 - Able to perform in group/teams to solve the variety of problems and demonstrate the solution.

DNT113 LITAR ELEKTRIK [ELECTRICAL CIRCUIT]
No of Credits: 3
Course Synopsis:
This course is designed to provide students with fundamentals of electrical circuit, both in theory and practice. Students are expected to acquire knowledge and able to explain basic concept and law of electric elements, able to select and apply electrical circuit theorem, and able to explain and apply basic concept of AC circuit analysis. Knowledge on theory acquired in lecture is also enhanced with practical works conducted in laboratory.

Course Outcomes:
CO1 - Able to solve the basic concept of electrical circuits problems.
CO2 - Able to analyze the sinusoidal steady state circuit problems
CO3 - Able to construct electrical circuits using circuit theorems and basic laws.
CO4 - Able to perform in group/teams to construct electrical circuit, apply and demonstrate the knowledge in electrical circuit application.

DNT122 MEKANIK GUNAAN [APPLIED MECHANICS]
No of Credits: 3

Course Synopsis:
Able to perform in group/teams to
construct electrical circuit, apply and demonstrate the knowledge in electrical circuit application.

Course Outcomes:
CO1 - Able to analyze the resultant of force from a system of forceand forces - moment problems.
CO2 - Able to analyze the equilibrium in particle and rigid body problems.
CO3 - Able to develop the kinematics and kinetics study for particles.
CO4 - Able to apply and demonstarat the knowledge in applied mechanics application

DNT123 LUKISAN BERBANTU KOMPUTER [COMPUTER AIDED DRAFTING (CAD)]
No of Credits: 2

Course Synopsis:
The main objective of this course is to expose the Diploma Engineering students with skills of Computer Aided Drafting and its application. This course is an extension from manual hand drawing into the usage of CAD software which focuses on product design in 2D and 3D.

Course Outcomes:
CO1 - Ability to apply fundamental concepts of Computer Aided Drafting in mechatronic engineering related problems.
CO2 - Ability to illustrate engineering drawing by using proper techniques.
CO3 - Ability to use of Computer Aided Drafting to construct a simple product design and apply to engineering areas.
CO4 - Ability to perform in group/teams to illustrate 2D and 3D modeling.

DNT126 ASAS PENGATURCARAAN KOMPUTER [BASIC COMPUTER PROGRAMMING]
No of Credits: 3

Course Synopsis:
The aim of this course is to enable the students to learn the computer system concepts and requirements, problem solving analysis and programming concept including variables, operator, control structure, function, array, file manipulation, structure and pointer.

Course Outcomes:
CO1 - Able to define and describe programming concepts and principles.
CO2 - Able to write computer programs using programming techniques and tools.
CO3 - Able to solve problems using computer programming techniques.

DNT128 SISTEM DIGIT [DIGITAL SYSTEM]
No of Credits: 3

Course Synopsis:
In this course the students will be exposed to the basic principle introduction of digital systems, digital circuit design and analysis. Lecture and practical will cover Algebra Boolean, Numbering system, Basic Logic Gate, Combinational Logic Circuit Design, Sequential Circuits Design and counter application.

Course Outcomes:
CO1 - Able to explain the concept of digital system.
CO2 - Able to analyze the combinational and sequential logic circuits.
CO3 - Able to design simple circuits and system of basic digital electronics.
CO4 - Able to perform in group/teams to construct digital circuit and demonstatrate its function and application.

DNT134 AMALAN BENGKEL MEKATRONIK [MECHATRONICS WORKSHOP PRACTICE]
No of Credits: 2

Course Synopsis:
The objective of the course is to prepare the students with the skills in mechanical, electrical and electronics practices. The syllabus includes two mini projects; mechanical based and electrical/electronic based. In both mini projects, the students need to implement the knowledge that includes the practice of metrology, welding, metal sheet, wiring and soldering. The whole subjects will combine with other important technical elements such as technical design and knowledge on handling safety at work.

Course Outcomes:
CO1 - Ability to apply mechanical skills to complete tasks and problems given.
CO2 - Ability to apply electrical and electronic skills to complete tasks and problems given.
CO3 - Ability to work individually as well as in groups to complete a given task.

DNT233 THERMO-BENDALIR [THERMO-FLUIDS]
No of Credits: 3

Course Synopsis:
This course is designed to provide a background of the fundamental principles and engineering applications of thermodynamics, heat transfer and fluid mechanics. These three areas collectively make up the field of thermal sciences but are traditionally taught as separate courses. However, in this course sequence, the three areas are presented together. Topics covered include, but are not limited to: fundamentals of thermodynamics, application of the laws of thermodynamics to various systems; various modes of heat transfer under steady state conditions; fluids static and dynamics; law of conservation of mass Bernoulli's equation; flow in pipes. Knowledge on theory acquired in lecture is also enhanced with a practical work conducted in laboratory.

Course Outcomes:
CO1 - Able to describe the concept of fluid mechanics, thermodynamics and heat transfer.
CO2 - Able to adapt various law s of fluid mechanics, thermodynamics and heat transfer in engineering problems.
CO3 - Able to demonstrate the fundamental principle of of fluid mechanics, thermodynamics and heat transfer.

DNT235 ASAS TEKNOLOGI ELEKTRIK [BASIC ELECTRICAL TECHNOLOGY]
No of Credits: 3

Course Synopsis:
The objective of the course is to introduce the students with the fundamental concepts of electric circuits, electrical supply systems and installations, magnetic and electromagnetic, inductance, capacitance and AC circuit, three-phase system, basic principles of electrical machines, DC and AC electrical machines, transformer and electrical safety. The laboratory will be used to enhance understanding of the concept introduced.

Course Outcomes:
CO1 - Able to apply concept electrical circuits and magnetic circuits to solve engineering problems.
CO2 - Able to solve the characteristics of three-phase circuits and electromagnetic
CO3 - Able to solve the basic principles of the electrical machines and transformer
CO4 - Able to develop the concept of basic electrical technology in industrial applications.

DNT236 KEJURUTERAAN BAHAN [MATERIALS ENGINEERING]
No of Credits: 3

Course Synopsis:
To introduce some fundamentals of materials engineering, relationship between structures and properties of materials and phase diagram.

Course Outcomes:
CO1 - Able to calculate the mechanical properties in engineering applications
CO2 - Able to disscuss on the fundamental concept of materials engineering.
CO3 - Able to organize appropriate processes for selected material to use in current engineering applications
CO4 - Able to perform in group/teams to solve the problems and demonstrate the solution.

DNT238 ELEKTRONIK ANALOG [ANALOGUE ELECTRONICS]
No of Credits: 3

Course Synopsis:
This course is designed to provide students with fundamentals of electronic devices, circuit and applications, both in theory and practice. Students are expected to acquire knowledge of semiconductor, diode and application, bipolar junction transistor (BJT) and its biasing, field effect transistor (FET) and its biasing and the applications of these devices. Knowledge on theory acquired in lecture is also enhanced with a practical work conducted in laboratory.

Course Outcomes:
CO1 - Able to explain the theory of semiconductor materials and selected electronic devices.
CO2 - Able to analyze diode applications in analogue electronic circuit.
CO3 - Able to design transistor circuit and applications as amplifier
CO4 - Able to construct electronic circuit, apply and demonstrate the knowledge in analogue electronic circuit application.

DNT241 ELEKTRO PNEUMATIK DAN HIDRAULIK [ELECTRO PNEUMATICS AND HYDRAULICS]
No of Credits: 3

Course Synopsis:
This course is designed to provide students with fundamentals of pneu-

matic and hydraulic control systems both; in theory and practice. Students are expected to acquire knowledge of physical behaviour of pneumatics and hydraulics control system, the pneumatics and hydraulics components and applications. Knowledge on theory acquired in lecture is also enhanced with a practical work conducted in laboratory.

Course Outcomes:

CO1 - Able to descri be the concepts of Pneumatic & Hydraulic Systems.
CO2 - Able to desi gn the Pneumatic/hydraulic Systems that related to industrial applications.
CO3 - Able to construct a pneumatics and hydraulic circuit

DNT242 ELEMEN MEKANISMA MESIN [MACHINE MECHANISM ELEMENTS]
No of Credits: 3

Course Synopsis:

The objective of the course is to prepare the students with the skills and knowledge in machine mechanism disciplines. The practical syllabus includes power transmission elements, shaft and bearing, drive gear, flexible element drive, camshaft and follower and also linkages system. The whole subjects will combine with other important technical elements such as mechanical design and international standard that need to be followed in design. With the help of practical projects, the students will obtain a better perspective on the subjects of their studies because they will confront the problems of implementation of what they have learnt in their mechatronics courses.

Course Outcomes:

CO1 - Able to create new point o fview in the design philosophies for machine design.
CO2 - Able to disscuss in teams on the general types and the characteristics of mechanical drive elements.
CO3 - Able to calculate the mechanism of mechanical elements and mobility of mechanical system.
CO4 - Able to perform in group/teams to solve the Laboratory problems and demonstrate the solution.

DNT245 PENGUKURAN & PENDERIA [SENSORS AND MEASUREMENTS]
No of Credits: 3

Course Synopsis:

This course is designed to provide students with fundamentals of measurement systems; in theory and practice. Students are expected to acquire knowledge of basic measurement circuits; resistance-based transducers; magnetic-based transducers; capacitance-based transducers; self-generating transducers; electrochemical transducers; semiconductor transducers; mechanical transducers in flow measurement, pressure, force and weight; interfacing with computer and data input. Knowledge on theory acquired in lecture is also enhanced with a practical work conducted in laboratory.

Course Outcomes:

CO1 - Able to apply the basic concepts of transducers, sensors and measurement.
CO2 - Able to suggest the suitable transducers and sensors for various measurement purposes.
CO3 - Able to justify the measurement techniques.

DNT246 MIKROPENGAWAL & PENGANTARAMUKA [MICROCONTROLLER AND INTERFACE]
No of Credits: 3

Course Synopsis:

This course is designed to provide students with fundamentals of microcontroller and the hardware both; in theory and practice. Students are expected to acquire knowledge of programming, electronic components and applications. Knowledge on theory acquired in lecture is also enhanced with a practical work conducted in laboratory.

Course Outcomes:
CO1 - Able to apply the theory and basic architecture of microcontroller.
CO2 - Able to construct the program using assembly language.
CO3 - Able to contruct the interfacing between microcontroller and the I/O devices.
CO4 - Able to design an application based on microcontroller system.

DNT253 PENGAWAL LOGIK BOLEH ATURCARA (PLC) [PROGRAMMABLE LOGIC CONTROLLER]
No of Credits: 3

Course Synopsis:
This course deals with the basic operation, application and programming of the integrated industrial control system, concentrating on the industrial microprocessor programmable logic controller (PLC). The course covers historical background, uses of PLCs, product ranges, and benefits numbering systems and codes and logic concepts pertaining to PLCs. The student will develop an understanding of the PLC central processing unit, input-output systems, programming and peripheral devices, and programming languages and will develop skills in programming and documenting on a cross section of industrial PLCs.

Course Outcomes:
CO1 - Able to explain the type of components in an electrical controller.
CO2 - Able to apply the basic concept of PLC and its applications in industrial control application
CO3 - Able to design PLC programming, editing and program observation
CO4 - Able to perform in group/teams to solve the problems and demonstrate the solution.

DNT333 KESELAMATAN INDUSTRI & PENGURUSAN KUALITI [INDUSTRIAL SAFETY AND QUALITY MANAGEMENT]
No of Credits: 3

Course Synopsis:
This course gives an exposure to students to understand industrial safety standards and guidelines, quality management concept and various quality tools that allow students to understand the general picture of both areas which are being practiced by industries. At the end of this course, students are expected to be able to identify suitable quality techniques and tools to be implemented in production management and can apply Industrial Safety standards in real industrial environment.

Course Outcomes:
CO1 - Able to define and understand fundamentals of Industrial Safety and Quality Management
CO2 - Able to apply techniques and tools of Quality Management
CO3 - Able to evaluate safety issues and problems using Safety standards and tools
CO4 - Able to demonstrate knowledge and apply the ethics.

DNT351 PROJEK SEMESTRAL [SEMESTRAL PROJECT]
No of Credits: 3

Course Synopsis:
This course is a semester-long project for final year diploma students. The project serves to demonstrate the skills and engineering knowledge acquired by the students throughout their studies. It also provides a platform to integrate practical knowledge with theory through group and individual work. The projects will be based on solving engineering problems which include understanding and identify the problems concerned, troubleshooting, fabrication work and come out with possible solution. Students are required to seek and discuss with supervisor about the problems concerns. This course offer soft skills building in communication skill and ability to share knowledge via presentation. Beyond that, student are capable to transfer knowledge in form of report writing at the end of semester.

Course Outcomes:
CO1 - Able to identify solution based on problem study.
CO2 - Able to design engineering solution utilizing an engineering practice.
CO3 - Able to perform an engineering project.
CO4 - Able to write a technical report and communicate in oral presentation.

DNT352 AUTOMATAN INDUSTRI DAN ROBOTIK [INDUSTRIAL AUTOMATION AND ROBOTICS]
No of Credits: 3

Course Synopsis:
The objective of the course is to introduce practical robotics and automation technology in industrial applications. This course covers basic principles of robotics, classification of robots and mechanisms, components of robots, basic control systems, robot programming, intelligent systems and automation. Knowledge on theory acquired in lectures is also enhanced with practical work conducted in laboratory.

Course Outcomes:
CO1 - Able to identify type of robots and apply basic principles to robot applications.
CO2 - Able to identify and apply different types of actuators, sensors and control systems of robots.
CO3 - Able to explain the robotics applications, safety and to operate a simple automation systems

DNT354 PRINSIP KAWALAN [CONTROL PRINCIPLES]
No of Credits: 3

Course Synopsis:
This course provides students with a background of control principles in various engineering applications. Throughout this course, students will learn the basic mathematical tools such as Laplace transform, transfer function, block diagram, signal flow graph, mathematical modelling of dynamic systems, time response analysis, stability of linear system, root locus and frequency domain analysis. The laboratory will be used to aid the students understanding of the concept introduced.

Course Outcomes:
CO1 - Able to develop mathematical model for specific system based on physical laws.
CO2 - Able to analyze the time domain of mathematical model for specific system.
CO3 - Able to analyze the frequency domain of mathematical model for specific system.
CO4 - Able to analyze and demonstrate the knowledge in control principle application.

DNT355 PROSES-PROSES PEMBUATAN [MANUFACTURING PROCESS]
No of Credits: 3

Course Synopsis:
This course is an introduction of manufacturing processes and techniques used in industry to convert raw materials into finished or semi-finished part. This includes the study on the characteristics of manufacturing processes such as forming, casting, moulding, rapid prototyping, non-conventional machining and also fabrication of electronic devices. The influence of materials and processing parameters in understanding individual processes are also highlighted.

Course Outcomes:
CO1 - Able to choose raw materials for manufacturing processes.
CO2 - Able to compare the manufacturing processes for a finished product.
CO3 - Able to design proper machine techniques or methods to complete a particular manufacturing process.
CO4 - Able to apply and demonstrate the knowledge in manufacturing process.

FAKULTI TEKNOLOGI KEJURUTERAAN ELEKTRONIK

PROGRAMMES OFFERED:

1. Sarjana Muda Kejuruteraan Mikroelektronik dengan Kepujian
2. Sarjana Muda Kejuruteraan Komputer dengan Kepujian
3. Sarjana Muda Kejuruteraan Elektronik Perubatan dengan Kepujian
4. Sarjana Muda Kejuruteraan Elektronik dengan Kepujian
5. Sarjana Muda Teknologi Kejuruteraan Elektronik (Sistem Elektronik) dengan Kepujian
6. Sarjana Muda Teknologi Kejuruteraan Elektronik (Reka Bentuk Telekomunikasi Elektronik) dengan Kepujian
7. Sarjana Muda Teknologi Kejuruteraan Elektronik (Reka Bentuk Rangkaian Elektronik) dengan Kepujian
8. Sarjana Muda Teknologi Automasi Elektronik Industri dengan Kepujian
9. Diploma Kejuruteraan Komputer
10. Diploma Kejuruteraan Elektronik

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UR4523002
Diploma in Computer Engineering

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PEO 1
To raise graduates who are competent in their respective engineering fields as exhibited through career development.

PEO 2
To raise graduates who involved and contribute to the society.

PEO 3
To raise graduates who pursue education opportunity continually

PEO 4
To raise graduates who contribute through innovation and entrepreneurship.

Programme Outcomes (PO)

PO1
Knowledge: Apply knowledge of applied mathematics, applied science, engineering fundamentals and an engineering specialization to wide practical procedures and practices.

PO2
Problem analysis: Identify and analyse well-defined engineering problems reaching substantiated conclusions using codified methods of analysis specific to their field of activity.

PO3
Design/development of solutions: Design solutions for well-defined technical problems and assist with the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
PO4
Investigation: Conduct investigations of well-defined problems; locate and search relevant codes and catalogues, conduct standard tests and measurements.

PO5
Modern Tool Usage: Apply appropriate techniques, resources, and modern engineering and IT tools to well-defined engineering problems, with an awareness of the limitations.

PO6
The Engineer and Society: Demonstrate knowledge of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technician practice and solutions to well-defined engineering problems.

PO7
Environment and Sustainability: Understand and evaluate the sustainability and impact of engineering technician work in the solution of well-defined engineering problems in societal and environmental contexts.

PO8
Ethics: Understand and commit to professional ethics and responsibilities and norms of technician practice.

PO9
Individual and Team Work: Function effectively as an individual, and as a member in diverse technical teams.

PO10
Communications: Communicate effectively on well-defined engineering activities with the engineering community and with society at large, by being able to comprehend the work of others, document their own work, and give and receive clear instructions.

PO11
Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member or leader in a technical team and to manage projects in multidisciplinary environments.

PO12
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CURRICULUM STRUCTURE
DIPLOMA IN COMPUTER ENGINEERING, ACADEMIC SESSION (2020/2021)

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SEMESTER	I	II	I	II	I	II
Kursus Teras Kejuruteraan (81)	DKA104/2 Matematik Awalan	DQT101/3 Matematik I	DQT102/3 Matematik II	DQT203/3 Matematik III	DKT311/3 Kejuruteraan Perisisan	DIT361/6 Latihan Industri
	DKT111/3 Prinsip Litar Elektrik	DKT122/3 Sistem Digital I	DKT212/3 Sistem Digital II	DKT217/3 Sistem Komputer	DKT313/3 Sistem Kawalan	
	DKT113/3 Fizik Kejuruteraan	DKT123/3 Teknologi Elektrik	DKT214/3 Litar Elektronik	DKT221/3 Prinsip Sistem Pengoperasian	DKT319/3 Instrumentasi Elektronik	
	DKT121/3 Asas Pengaturcaraan Komputer	DKT124/3 Peranti Elektronik	DKT215/3 Prinsip Isyarat dan Sistem	DKT223/3 Sistem Pangkalan Data	DKT318/3 Keselamatan Industri, Pengurusan Kualiti dan Etika	
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	DUT123/2 IT dan Kemahiran Komunikasi			DKT226/3 Asas Kejuruteraan Perhubungan		
81	13	14	15	18	15	6
Kursus Keperluan Universiti (14)	DVW410/2 Bahasa Melayu	DUW224/2 Keusahawanan Kejuruteraan	DVW301/2 Bahasa Inggeris Komunikasi III			
	DVW101/2 Bahasa Inggeris Komunikasi I	DVW201/2 Bahasa Inggeris Komunikasi II	DUW129/2 Falsafah dan Isu Semasa			
	DZWXXX/1 Badan Beruniform 1	DZWXXX/1 Badan Beruniform 2				
14	5	5	4	0	0	0
95	18	19	19	18	15	6

Note:
DKA104/2 Matematik Awalan : Prasyarat Matematik I (DQT101/3) bagi yang mendapat gred D untuk Matematik Tambahan peringkat SPM

UR4523003
Diploma in Electronic Engineering

Programme Educational Objective (PEO)

PEO 1
To raise graduates who are competent in their respective engineering fields as exhibited through career development.

PEO 2
To raise graduates who involved and contribute to the society.

PEO 3
To raise graduates who pursue education opportunity continually

PEO 4
To raise graduates who contribute through innovation and entrepreneurship.

Programme Outcomes (PO)

PO1
Knowledge: Apply knowledge of applied mathematics, applied science, engineering fundamentals and an engineering specialization to wide practical procedures and practices.

PO2
Problem analysis: Identify and analyse well-defined engineering problems reaching substantiated conclusions using codified methods of analysis specific to their field of activity.

PO3
Design/development of solutions: Design solutions for well-defined technical problems and assist with the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

PO4
Investigation: Conduct investigations of well-defined problems; locate and search relevant codes and catalogues, conduct standard tests and measurements.

PO5
Modern Tool Usage: Apply appropriate techniques, resources, and modern engineering and IT tools to well-defined engineering problems, with an awareness of the limitations.

PO6
The Engineer and Society: Demonstrate knowledge of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technician practice and solutions to well-defined engineering problems.

PO7
Environment and Sustainability: Understand and evaluate the sustainability and impact of engineering technician work in the solution of well-defined engineering problems in societal and environmental contexts.

PO8
Ethics: Understand and commit to professional ethics and responsibilities and norms of technician practice.

PO9
Individual and Team Work: Function effectively as an individual, and as a member in diverse technical teams.

PO10
Communications: Communicate effectively on well-defined engineering activities with the engineering community and with society at large, by being able to comprehend the work of others, document their own work, and give and receive clear instructions.

PO11
Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member or leader in a technical team and to manage projects in multidisciplinary environments.

PO12
Life-Long Learning: Recognise the need for, and have the ability to engage in independent updating in the context of specialised technical knowledge.

CURRICULUM STRUCTURE
DIPLOMA IN ELECTRONIC ENGINEERING ACADEMIC SESSION (2020/2021)

TAHUN	PERTAMA		KEDUA		KETIGA	
SEMESTER	I	II	I	II	I	II
Kursus Teras Kejuruteraan (81)	DKA104/2 Matematik Awalan	DQT101/3 Matematik I	DQT102/3 Matematik II	DQT203/3 Matematik III	DMT351/3 Projek Semestral	DIT361/6 Latihan Industri
	DMT114/2 Sains Kejuruteraan	DMT121/3 Peranti Elektronik	DMT231/3 Elektronik Analog	DMT241/3 Pengantar Bentangan Litar Terkamir	DMT352/3 Instrumentasi Elektronik	
	DMT112/3 Teori Litar I	DMT122/3 Teori Litar II	DMT232/3 Asas Mesin Elektrik	DMT242/3 Fabrikasi Wafer	DMT353/3 Pengenalan Kepada Pengawal Aturcara Logik	
	DCT100/2 Kemahiran Asas Kejuruteraan	DMT124/3 Asas Digit I	DMT233/3 Asas Digit II	DMT243/3 Pembungkusan Elektronik	DMT354/3 Pengenalan Kepada Sistem Kawalan	
	DMT113/2 Lukisan Kejuruteraan	DMT125/2 Sains Bahan	DMT234/3 Fizik Semikonduktor dan Peranti	DMT244/3 Analisis Kegagalan		
	DMT123/3 Pengenalan Kepada Pengaturcaraan Komputer	DMT126/2 Keselamatan, Kualiti dan Etika di Industri		DMT245/3 Pengenalan Kepada Mikropengawal		
	DUT123/2 IT dan Kemahiran Komunikasi					
81	14	16	15	18	12	**6**
Kursus Keperluan Universiti (14)	DVW410/2 Bahasa Melayu	DVW201/2 Bahasa Inggeris Komunikasi II	DVW301/2 Bahasa Inggeris Komunikasi III	DUW224/2 Keusahawanan Kejuruteraan	DUW129/2 Falsafah dan Isu Semasa	
	DVW101/2 Bahasa Inggeris Komunikasi I	DZWXXX/1 Badan Beruniform 2				
	DZWXXX/1 Badan Beruniform 1					
14	5	3	4	0	**2**	**0**
95	**19**	**19**	**19**	**18**	**14**	**6**

Note:
DKA104/2 Matematik Awalan : Prasyarat Matematik I (DQT101/3) bagi yang mendapat gred D untuk Matematik Tambahan peringkat SPM

UR6523001
Bachelor of Microelectronic Engineering with Honours

Programme Educational Objective (PEO)

PEO 1
Graduates who have demonstrated career advancement in the field of Microelectronic Engineering or related engineering field.

PEO 2
Graduates who are involved in a professional body or society.

PEO 3
Graduates who pursue lifelong learning.

Programme Outcomes (PO)

PO 1
Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems

PO 2
Identify, formulate, conduct research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences

PO 3
Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations

PO 4
Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusion

PO 5
Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations

PO 6
Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems

PO 7
Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts including ability to have entrepreneurship skills

PO 8
Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice

PO 9
Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

PO 10
Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11
Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change

PO12
Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multi-disciplinary environments.

CURRICULUM STRUCTURE
BACHELOR OF MICROELECTRONIC ENGINEERING WITH HONOURS (2020/2021)

YEAR	YEAR 1		YEAR 2		YEAR 3			YEAR 4	
SEMESTER	I	II	III	IV	V	VI		VII	VIII
Engineering Core (104)	EMT114/3 Introduction to Electric Circuits	EMT124/3 Fundamental of Electrical Engineering	EMT282/3 Principles of Engineering Materials	EMT243/3 Introduction to IC Design	EMT353/3 Digital Integrated Circuit Design	EMT360/3 Control Engineering	EIT 302/4 Industrial Training	EMT445/2 Final year Project	EMT446/4 Final Year Project
	ECT111/3 Engineering Skills	EMT125/3 Digital Electronic Principles I	***EMT235/3 Digital Electronic Principles II	EMT245/3 Introduction to Microprocessor Design	EMT357/3 Fundamental of Microelectronic Fabrication	EMT367/3 Microelectronic Fabrication		EMT470/3 Semiconductor Packaging	EMT454/3 Nanoelectronic Engineering
	EMT181/3 Physics for Electronics	EMT115/3 Programming Language	EMT272/3 Semiconductor Fundamental	***EMT238/3 Electromagnetic Theory	EMT358/3 Communication Engineering	EMT369/3 Power Electronic		EMT475/3 Computer Organization Architecture	EMT488/3 Digital Signal Processing
	EMT116/3 Electronic Devices	EMT182/3 Analog Electronic I	EMT293/3 Signal Analysis	***EMT283/3 Analog Electronic II	EMT352/3 Advanced Devices	EMT381/4 Microelectronic Design Project		EMT478/3 Instrumentation	EMT480/3 Reliability and Failure Analysis
								EMT490/3 Micro-Electro-Mechanical Systems	
Non-Eng. (19)	EQT101/3 Engineering Mathematics I	EQT102/3 Engineering Mathematics II	EQT203/3 Engineering Mathematics III	EQT271/3 Engineering Statistics	EMT341/3 Management for Engineers	EMT342/2 Professional Engineers			
		UUW129/2 Introduction of Philosophy							
University Required (16)	**UVW410/2 University Malay Language	*UVA101/2 Preparatory English	*UVW201/2 English for General Commuication	*UVW312/2 English for Technical Communication		UUW224/2 Engineering Entrepreneurship		**UUW131/2 Appreciation of Ethics and Civilization	**UUW130/2 Philosophy and Current Issues
	UZWXXX/1 Co-Curiculum	UZWXXX/1 Co-Curiculum			UUT122/2 Skills and Technology in Communication				
139	18	18	17	17	17	17	4	16	15
Total Units for Graduation 139									

*Compulsory and optional courses according to MUET Results

MUET	UVA101/2 (Uncredited)	UVW201/2	UVW312/2	Option/2
Band 2	Compulsory	Compulsory	Compulsory	Optional
Band 3		Compulsory	Compulsory	Optional
Band 4,5 and 6			Compulsory	Compulsory

**Course specific to local or international student

Local	International
UUW130/2 Philosophy and Current Issues	UUW237/2 Malaysian Cultures
UUW131/2 Appreciation of Ethics and Civilization	UUW239/2 Malaysian Studies
UVW410/2 University Malay Language	UVW110/2 Basic Malay Language

***Courses with prerequisite

Course	Prerequisite
EMT235/3	EMT125/3
EMT283/3	EMT182/3
EMT238/3	EQT101/3

UR6523002
Bachelor of Computer Engineering With Honours

Programme Educational Objective (PEO)

PEO 1
Graduates who have demonstrated career advancement in the field of Computer Engineering or related engineering field

PEO 2
Graduates who are involved in a professional body or society

PEO 3
Graduates who pursue life-long learning

Programme Outcomes (PO)

PO 1
Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to the solution of complex engineering problems.

PO 2
Identify, formulate, research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences. (WK1 to WK4)

PO 3
Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations. (WK5)

PO 4
Conduct investigations of complex problems using research- based knowledge (WK8) and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

PO 5
Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations. (WK6)

PO 6
Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems. (WK7)

PO 7
Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts including ability to have entrepreneurship skills. (WK7)

PO 8
Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice. (WK7)

PO 9
Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

PO 10
Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11
Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PO12
Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environment

CURRICULUM STRUCTURE
BACHELOR OF COMPUTER ENGINEERING WITH HONOURS

SEMESTER	FIRST		SECOND		THIRD			FOURTH	
	I	II	III	IV	V	VI		VII	VIII
Engineering Core (97)	EKT101/4 Electric Circuit Theory	EKT119/3 Electric Circuit II		EKT242/3 Electromagnetic Theory	EKT315/4 Electronic Instrumentation and Measurement	EKT322/4 Embedded System Design	EIT 302/4 Industrial Training	EKT445/2 Final Year Project I	EKT446/4 Final Year Project II
	EKT120/4 Computer Programming	EKT104/4 Analog Electronic Circuits I	EKT214/4 Analog Electronic Circuits II	EKT232/3 Signals and Systems	EKT358/3 Communication Systems	EKT318/3 Modern Control Systems		EKT435/3 Modern Operating System	EKT424/4 Real Time System
	EKT102/3 Basic Electronic Engineering	EKT124/3 Digital Electronics I	EKT221/4 Digital Electronics II	EKT222/4 Microprocessor Systems	EKT336/3 Computer Networks	EKT360/3 Group Design Project		Program Elective I /3	Open Elective/3
		EKT103/3 Electrical Engineering	EKT224/3 Algorithm and Data Structures	EKT243/3 Object-oriented Programming	EKT353/3 Principle of Digital Signal Processing	EKT303/4 Principle of Computer Architecture		Program Elective II /3	
Non Engineering Core (19)	EQT101/3 Engineering Mathematics I	EQT102/3 Engineering Mathematics II	EQT221/3 Discrete Mathematics and Linear Algebra	EQT272/3 Probability and Statistic	EKT346/3 Management for Engineers	EKT342/2 Professional Engineers			UUT122/2 Skills and Technology in Communication
University Required (16)	UZWXXX/1 Co-curriculum	UZWXXX/1 Co-curriculum	UVW201/2^ English for General Communication		UVW312/2 English for Technical Communication	UVW410/2* University Malay Language		UUW322/2 Thinking Skills	UUW224/2 Engineering Entrepreneurship
	UUW130/2 Philosophy and Current Issues		UVWXXX/2^^ Option Subjects			UVW110/2** Basic Malay Language		UUW 131/2 Appreciation of Ethics and Civilization	
132	17	17	16	16	18	18	4	16	14
Total Units for Graduation 132 + 4 (Industrial Training)= 136									

Elective I & II (select any 2 courses): EKT 460 Image Processing, EKT421 Software Engineering, EKT474 Internet of Things, EKT466 Artificial Intelligence, EKT465 Optical Communication Systems

Open Elective (select 1 course): EKT 450 Mobile Communication System, EKT434 Network Programming, EKT473 Introduction to Data Analytic

Notes: *Applicable for Local Students ** Applicable for Foreign Students
UVA101/2 Foundation English : Pre-requisite for UVW201/2 English for General Communication, Applicable for MUET Band 2, IEC Level "Below Intermediate". This course is offered in the second semester of the first year.

UVW201/2^ English for General Communication : Applicable for MUET Band 3, IEC Level "Intermediate and above", UVA101/2 Foundation English Grade "C and above"
UVWXXX/2^^ Option Subjects : Applicable for MUET Band 4 and above, TOEFL "525 and above", IELTS "5.5 and above

UR6523004
Bachelor of Biomedical Electronic Engineering with Honours

Programme Educational Objective (PEO)

PEO 1
Graduates who have demonstrated career advancement in the field of Biomedical Electronic Engineering or related

PEO 2
Graduates who are involved in a professional body or society.

PEO 3
Graduates who pursue lifelong learning.

Programme Outcomes (PO)

PO 1
Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems

PO 2
Identify, formulate, conduct research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences

PO 3
Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations

PO 4
Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions

PO 5
Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations

PO 6
Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems

PO 7
Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts including ability to have entrepreneurship skills

PO 8
Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice

PO 9
Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings

PO 10
Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions

PO 11
Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change

PO 12
Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments

CURRICULUM STRUCTURE
BACHELOR OF BIOMEDICAL ELECTRONIC ENGINEERING WITH HONOURS

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	I	II	III	IV	V	VI		VII	VIII
Engineering Core (94)	ENT114/3 Circuit Theory	ENT110/3 Computer Programming	ENT207/3 Engineering Mechanics	ENT219/3 Biomaterials	ENT320/3 Mechanics of Materials	ENT316/3 Principles of Communication Systems	EIT 302/4 Industrial Training	ENT445/2 Final Year Project I	ENT446/4 Final Year Project II
	ECT111/3 Engineering Skills	ENT115/3 Analogue Electronics I	ENT216/3 Analogue Electronics II	ENT222/3 Electromagnetic Field Theory	ENT310/4 Linear Control System	ENT323/3 Electrical Machines & Drives		ENTXXX/3 Elective I	ENTXXX/3 Elective II
		ENT116/3 Digital Electronic Principles	ENT217/3 Principles of Signals & Systems	ENT218/3 Biomechanics	ENT321/3 Safety Standard and Ethics in Biomedical Engineering	ENT325/2 Design Project I		ENT415/3 Bioinstrumentation II	ENT418/3 Artificial Organs Engineering
			ENT224/2 Engineering Drawing and Computer Aided Design	ENT265/4 Microcontrollers & Interfaces	ENT324/3 Digital Signal Processing & Applications	ENT390/3 Bioinstrumentation I		ENT413/3 Medical Imaging	
					ENT319/3 Thermofluids			ENT417/3 Design Project II	
Non Engineering Core (26)	EQT101/3 Engineering Mathematics I	EQT102/3 Engineering Mathematics II	EQT203/3 Engineering Mathematics III			EQT271/3 Engineering Statistics		ENT442/2 Professional Engineers	ENT443/3 Management for Engineers
	ENT111/4 Anatomy & Physiology	ENT160/3 Biochemistry							
	UUT122/2 Skills and Technology in Communication								
University Requirement (16)	*UVA101/2 Preparatory English	UUWXXX/2 Option or **UVW201/2 English for General Communication	**UUW131/2 Appreciation of Ethics and Civilization**	UVW312/2 English for Technical Communication		UVW410/2 University Malay Language ***UVW110/2 Basic Malay Language			
			UUW224/2 Engineering Entrepreneurship	**UUW322/3 Thinking Skills**					
	UZWXXX/1 Co-Curriculum	UZWXXX/1 Co-Curriculum							
	UUW130/2 Philosophy and Current Issues								
	18	18	18	17	16	16	4	16	13
Total Units for Graduation 136									

Instrumentation) : ENT406/3 Medical Robotics, ENT405/3 Biosensors & BioMEMS, ENT4XX/3 Electronic Therapeutics, ENT4XX/3 Advanced Control System.
* Uncredited. Compulsory to students with MUET Band 1 and 2 only. This course is a prerequisite to UVW201 English for General Communication.
**Compulsory to students with MUET Band 3 or less. This course is a prerequisite to UVW312 English for Technical Communication.
*** For International student

UR6523005
Bachelor of Electronic Engineering with Honours

Programme Educational Objective (PEO)

PEO 1
Graduates who have demonstrated career advancement in the field of Biomedical Electronic Engineering or related

PEO 2 Graduates who are involved in a professional body or society.

PEO 3 Graduates who pursue lifelong learning.

Programme Outcomes (PO)

PO 1
Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

PO 2
Identify, formulate, conduct research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO 3
Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

PO 4
Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

PO 5
Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations.

PO 6
Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems.

PO 7
Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts including ability to have entrepreneurship skills.

PO 8
Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

PO 9
Function effectively as an individual, and as a member or leader in diverse teams and in multi disciplinary settings.

PO 10
Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11
Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PO 12
Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environment.

CURRICULUM STRUCTURE
BACHELOR OF ELECTRONIC ENGINEERING WITH HONOURS

YEAR	YEAR 1		YEAR 2		YEAR 3			YEAR 4	
SEMESTER	I	II	III	IV	V	VI		VII	VIII
Engineering Core (104)	EMT114/3 Introduction to Electric Circuits	EMT124/3 Fundamental of Electrical Engineering	EMT282/3 Principles of Engineering Materials	EMT243/3 Introduction to IC Design	EMT353/3 Digital Integrated Circuit Design	EMT360/3 Control Engineering	EIT 302/4 Industrial Training	EMT445/2 Final year Project	EMT446/4 Final Year Project
	ECT111/3 Engineering Skills	EMT125/3 Digital Electronic Principles I	***EMT235/3 Digital Electronic Principles II	EMT245/3 Introduction to Microprocessor Design	EMT355/3 Microcontroller	EMT363/3 VLSI Design		EMT463/3 MEMS Design and Fabrication	EMT483/3 System on Chip
	EMT181/3 Physics for Electronics	EMT115/3 Programming Language	EMT272/3 Semiconductor Fundamental	***EMT238/3 Electromagnetic Theory	EMT358/3 Communication Engineering	EMT369/3 Power Electronic		EMT475/3 Computer Organization Architecture	EMT488/3 Digital Signal Processing
	EMT116/3 Electronic Devices	EMT182/3 Analog Electronic I	EMT293/3 Signal Analysis	***EMT283/3 Analog Electronic II	EMT368/3 Reliability andTestability in Integrated Circuit Design	EMT382/4 Electronic Design Project		EMT478/3 Instrumentation	EMT480/3 Reliability and Failure Analysis
								EMT479/3 Analogue Integrated Circuit Design	
Non-Eng. (19)	EQT101/3 Engineering Mathematics I	EQT102/3 Engineering Mathematics II	EQT203/3 Engineering Mathematics III	EQT271/3 Engineering Statistics	EMT341/3 Management for Engineers	EMT342/2 Professional Engineers			
					UUT122/2 Skills and Technology in Communication				
University Required (16)		UUW322/2 Thinking Skill				UUW224/2 Engineering Entrepreneurship		**UUW131/2 Appreciation of Ethics & Civilization	**UUW130/2 Philosophy and Current Issues
	**UVW410/2 University Malay Language	*UVA101/2 Preparatory English (Uncredited)	*UVW201/2 English for General Commuication	*UVW312/2 English for Technical Communication					
	UZWXXX/1 Co-Curiculum	UZWXXX/1 Co-Curiculum							
139	18	18	17	17	17	17	4	16	15
Total Units for Graduation 139									

*Compulsory and optional courses according to MUET Results

**Course specific to local or international student

***Courses with prerequisite

Local	International
UUW234/2 Malaysian Civilizations	UUW237/2 Malaysian Cultures
UUW235/2 Ethnic Relations	UUW239/2 Malaysian Studies
UVW410/2 University Malay Language	UVW110/2 Basic Malay Language

MUET	UVA101/2 (Uncredited)	UVW201/2	UVW312/2	Option/2
Band 2	Compulsory	Compulsory	Compulsory	Optional
Band 3		Compulsory	Compulsory	Optional
Band 4,5 and 6			Compulsory	Compulsory

Course	Prerequisite
EMT235/3	EMT125/3
EMT283/3	EMT182/3
EMT238/3	EQT101/3

UR6523007
Bachelor of Electronic Engineering Technology (Electronic System) with Honours

Programme Educational Objective (PEO)

PEO 1
Engineering technology graduates engaged in the field of electronic engineering technology as demonstrated through career advancement.

PEO 2
Engineering technology graduates who are members and contribute to professional society

PEO 3
Engineering technology graduates embracing in life-long learning or pursuing continuing education opportunities.

PEO 4
Engineering technology graduates who are technopreneurs.

Programme Outcomes (PO)

PO 1
Knowledge: apply knowledge of mathematics, science, engineering fundamentals and an engineering specialisation to defined and applied engineering procedures, processes, systems or methodologies; (SK1 to SK4)

PO 2
Problem analysis: Identify, formulate, research literature and analyse broadly-defined engineering problems reaching substantiated conclusionsusing analytical tools appropriate to their discipline or area of specialisation; (SK1 to SK4)

PO 3
Design/ development of solutions: Design solutions for broadly- defined engineering technology problems and contribute to the design of systems,b-components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations; (SK5)

PO 4
nvestigation: Conduct investigations of broadly-defined problems; locate, search and select relevant data from codes, data bases and literature, design and conduct experiments to provide valid conclusions; (SK8)

PO 5
Modern Tool Usage: Select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to broadly-defined engineering problems, with an understanding of the limitations; (SK6)

PO 6
The Engineer and Society: Demonstrate understanding of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technology practice and solutions to broadly-defined engineering problems; (SK7)

PO 7
Environment and Sustainability: Understand the impact of engineering technology solutions of broadly-defined engineering problems in societal and environmental context and demonstrate knowledge of and need for sustainable development; (SK7)

PO 8
Ethics: Understand and commit to professional ethics and responsibilities and norms of engineering technology practice; (SK7)

PO 9
Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse technical teams;

PO 10
Communications: Communicate effectively on broadly-defined engineering activities with the engineering community and with society at large, by being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions;

PO 11
Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member and leader in a team and to manage projects in multidisciplinary environments;

PO 12
Life Long Learning: Recognize the need for, and have the ability to engage in independent and life-long learning in specialist technologies.

CURRICULUM STRUCTURE
BACHELOR OF ELECTRONIC ENGINEERING TECHNOLOGY (ELECTRONIC SYSTEM) WITH HONOURS

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEM	I	II	III	IV	V	VI	VII	VIII
Discipline Core	PGT 101/3 Electric Circuit Principles	PGT 105/3 Electrical Engineering Technology	PGT 211/3 Electromagnetic Theory	PGT 213/3 Analogue Electronics II	PGT 301/3 Communication System	PGT 300/4 Final Year Project I	PGT 400/6 Final Year Project II	PIT 404 INDUSTRIAL TRAINING
	PGT 102/3 Engineering Science	PGT 104/3 Digital Electronics	PGT 201/3 Microprocessor	PGT 206/3 Computer Architecture	PGT 320/3 Power Electronics	PGT 312/3 Modern Control Systems	PGT 420/3 Instrumentation	
	PGT 103/3 Computer Technology	PGT 106/3 C Programming	PGT 202/3 Analogue Electronics I	PGT 220/3 VLSI Design	PGT 321/3 VLSI System Design	PGT 310/3 Digital Signal Processing	Elective 3/3	
	PGT 120/3 Engineering Material	PGT107/2 Writing in Engineering Technology	PGT207/3 Object Oriented Programming	PGT 205/3 Signal & Systems	PGT 322/3 Microcontroller	Elective 1/3	Elective 4/3	
						Elective 2/3		
Common Core	PQT 111/3 Mathematics for Engineering Technology I	PQT 112/3 Mathematics for Engineering Technology II	PQT 213/3 Mathematics for Engineering Technology III	PQT 274/3 Statistics for Engineering Technology	PTT 333/3 Engineering Technology Management	PTT 444/3 Engineering Technologist in Society		
	PCT 111/3 Engineering Skills							
University Required		UVW 410/2 University Malay Language	UUW 224/2 Engineering Entrepreneurs hip	UUW 131/2 Appreciation of Ethics and Civilization	UVW 312/2 English for Technical Communication			
		PUW 122/2 Skills & Technology in Communication	**UVW201/2 English for General Purposes OR	UUW130/2 Philosophy and Currents Issues	UUW 322 /2 Thinking Skills			
		UVA101/0 Preparatory English	UUW XXX/2 Option Subject (Foreign Language)					
	UZW XXX/1 Co-Curricular Activity	UZW XXX/1 Co-Curricular Activity						
M: 2-3	19	19	19	19	19	19	15	12
M: 4-6	19	19	19	19	19	19	15	12
Total Units for Graduation = 141								
Elective 1			Elective 2			Elective 3		
A1. PGT 334/3 Nanosystem Design			B1. PGT 430/3 Micro-Electro-Mechanical System			C1. PGT 310/3 Digital Signal Processing		
A2. PGT 323/3 Verification on Chip			B2. PGT 421/3 Semiconductor Testing			C2. PGT 431/3 Optoelectronic System		

Notes:
MUET Band 2: UVA 111/0 Preparatory English > UVW 211 English for General Purpose> UVW 312 English for Technical Communication, *Option Subject is NOT COMPULSORY
MUET Band 3: UVW 211/2 English for General Purpose > UVW 312/2 English for Technical Communication, *Option Subject is NOT COMPULSORY
MUET Band 4 and above: UVW 312 English for Technical Communication, *Option Subject is COMPULSORY

UR6523008
Bachelor of Electronic Engineering Technology (Electronic Telecommunication Design) with Honours

Programme Educational Objective (PEO)

PEO 1
Engineering technology graduates engaged in the field of electronic engineering technology as demonstrated through career advancement.

PEO 2
Engineering technology graduates who are members and contribute to professional society

PEO 3
Engineering technology graduates embracing in life-long learning or pursuing continuing education opportunities.

PEO 4
Engineering technology graduates who are technopreneurs.

Programme Outcomes (PO)

PO 1
Knowledge: apply knowledge of mathematics, science, engineering fundamentals and an engineering specialisation to defined and applied engineering procedures, processes, systems or methodologies; (SK1 to SK4)

PO 2
Problem analysis: Identify, formulate, research literature and analyse broadly-defined engineering problems reaching substantiated conclusions using analytical tools appropriate to their discipline or area of specialisation; (SK1 to SK4)

PO 3
Design/ development of solutions: Design solutions for broadly-defined engineering technology problems and contribute to the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations; (SK5)

PO 4
Investigation: Conduct investigations of broadly-defined problems; locate, search and select relevant data from codes, data bases and literature, design and conduct experiments to provide valid conclusions; (SK8)

PO 5
Modern Tool Usage: Select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to broadly-defined engineering problems, with an understanding of the limitations; (SK6)

PO 6
The Engineer and Society: Demonstrate understanding of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technology practice and solutions to broadly-defined engineering problems; (SK7)

PO 7
Environment and Sustainability: Understand the impact of engineering technology solutions of broadly-defined engineering problems in societal and environmental context and demonstrate knowledge of and need for sustainable development; (SK7)

PO 8
Ethics: Understand and commit to professional ethics and responsibilities and norms of engineering technology practice; (SK7)

PO 9
Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse technical teams;

PO 10
Communications: Communicate effectively on broadly-defined engineering activities with the engineering community and with society at large, by being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions;

PO 11
Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member and leader in a team and to manage projects in multidisciplinary environments;
PO 12
Life Long Learning: Recognize the need for, and have the ability to engage in independent and life-long learning in specialist technologies.

CURRICULUM STRUCTURE
BACHELOR OF ELECTRONICENGINEERING TECHNOLOGY (ELECTRONIC TELECOMMUNICATION DESIGN) WITH HONOURS

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEM	I	II	III	IV	V	VI	VII	VIII
Discipline Core	PGT 110/3 Multimedia Systems	PGT 104/3 Digital Electronics	PGT 210/3 Measurement & Instrumentation	PGT 206/3 Computer Architecture	PGT 301/3 Communication System	PGT 300/4 Final Year Project I	PGT 400/6 Final Year Project II	PIT 404 INDUSTRIAL TRAINING
	PGT 101/3 Electric Circuit Principles	PGT 105/3 Electrical Engineering Technology	PGT 211/3 Electromagnetic Theory	PGT 212/3 Electronic Communication Technology	PGT 310/3 Digital Signal Processing	PGT 313/2 Digital Communication Technology	PGT 410/3 Satellite Technology	
	PGT 102/3 Engineering Science	PGT 106/3 C Programming	PGT 201/3 Microprocessor	PGT 205/3 Signal & Systems	PGT 315/3 RF and Microwave Technology	PGT 314/3 Optical Technology	Elective 2/3	
	PGT 103/3 Computer Technology	PGT107/2 Writing in Engineering Technology	PGT 202/3 Analogue Electronics I	PGT 213/3 Analogue Electronics II	PGT 312/3 Modern Control Systems	PGT 311/3 Antenna and Propagation	Elective 3/3	
						Elective 1/3		
Common Core	PQT 111/3 Mathematics for Engineering Technology I PCT 111/3 Engineering Skills	PQT 112/3 Mathematics for Engineering Technology II	PQT 213/3 Mathematics for Engineering Technology III	PQT 274/3 Statistics for Engineering Technology	PTT 333/3 Engineering Technology in Management	PTT 444/3 Engineering Technologist in Society		
University Required		UVW 410/2 University Malay Language	UUW 224/2 Engineering Entrepreneurship	UUW 131 /2 Appreciation of Ethnics and Civilizations	UUW 322 /2 Thinking Skill			
		PUW122 Skills & Technology in Communication	UVW201/2 English for General Communication OR	UUW130 Philosophy and Current Issues	UVW 312/2 English for Technical Communication			
		UVA101/0 Preparatory English	UUW XXX/2 Option Subject (Foreign Language)					
	UZW XXX/1 Co-Curricular Activity	UZW XXX/1 Co-Curricular Activity						
M: 2-3	19	19	19	19	19	19	15	12
M: 4-6	19	19	19	19	19	19	15	12
Total Units for Graduation = 141								

Elective 1	Elective 2	Elective 3
A1. PGT 316 Mobile and Wireless Communications	B1. PGT 411 Electronic and RF Circuit Design	C1. PGT 404 Artificial Intelligence
B1. PGT 322 Microcontroller	B2. PGT 412 Wireless Internetworking Technology	C2. PGT 402 Mobile Computing

Notes:
MUET Band 2: UVA 111/0 Preparatory English > UVW 201/2 English for General Communication> UVW 312/2 English for Technical Communication, *Option Subject is NOT COMPULSORY
MUET Band 3: UVW 201/2 English for General Communication > UVW 312/2 English for Technical Communication, *Option Subject is NOT COMPULSORY
MUET Band 4 and above: UVW 312/2 English for Technical Communication, *Option Subject is COMPULSORY

UR6523009
Bachelor of Electronic Engineering Technology (Electronic Network Design) with Honours

Programme Educational Objective (PEO)

PEO 1
Engineering technology graduates engaged in the field of electronic engineering technology as demonstrated through career advancement.

PEO 2
Engineering technology graduates who are members and contribute to professional society

PEO 3
Engineering technology graduates embracing in life-long learning or pursuing continuing education opportunities.

PEO 4
Engineering technology graduates who are technopreneurs.

Programme Outcomes (PO)

PO 1
Knowledge: apply knowledge of mathematics, science, engineering fundamentals and an engineering specialisation to defined and applied engineering procedures, processes, systems or methodologies; (SK1 to SK4)

PO 2
Problem analysis: Identify, formulate, research literature and analyse broadly-defined engineering problems reaching substantiated conclusions using analytical tools appropriate to their discipline or area of specialisation; (SK1 to SK4)

PO 3
Design/ development of solutions: Design solutions for broadly-defined engineering technology problems and contribute to the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations; (SK5)

PO 4
Investigation: Conduct investigations of broadly-defined problems; locate, search and select relevant data from codes, data bases and literature, design and conduct experiments to provide valid conclusions; (SK8)

PO 5
Modern Tool Usage: Select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to broadly-defined engineering problems, with an understanding of the limitations; (SK6)

PO 6
The Engineer and Society: Demonstrate understanding of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technology practice and solutions to broadly-defined engineering problems; (SK7)

PO 7
Environment and Sustainability: Understand the impact of engineering technology solutions of broadly-defined engineering problems in societal and environmental context and demonstrate knowledge of and need for sustainable development; (SK7)

PO 8
Ethics: Understand and commit to professional ethics and responsibilities and norms of engineering technology practice; (SK7)

PO 9
Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse technical teams;

PO 10
Communications: Communicate effectively on broadly-defined engineering activities with the engineering community and with society at large, by being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions;

PO 11
Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member and leader in a team and to manage projects in multidisciplinary environments;

PO 12
Life Long Learning: Recognize the need for, and have the ability to engage in independent and life-long learning in specialist technologies.

CURRICULUM STRUCTURE
BACHELOR OF ELECTRONIC ENGINEERING TECHNOLOGY (ELECTRONIC NETWORK DESIGN) WITH HONOURS

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEM	I	II	III	IV	V	VI	VII	VIII
Discipline Core	PGT 100/3 Networking Fundamentals	PGT 104/3 Digital Electronics	PGT 207/3 Object Oriented Programming	PGT 204/3 Internetworking Technology I	PGT 301/3 Communication System	PGT 300/4 Final Year Project I	PGT 400/6 Final Year Project II	PIT 404 INDUSTRIAL TRAINING
	PGT 101/3 Electric Circuit Principles	PGT 105/3 Electrical Engineering Technology	PGT 201/3 Microprocessor	PGT 205/3 Signal & Systems	PGT 302/3 Embedded Software Technology	PGT 305/3 Network Management	PGT 401/3 Network Security Technology	
	PGT 102/3 Engineering Science	PGT 106/3 C Programming	PGT 202/3 Analogue Electronics I	PGT 206/3 Computer Architecture	PGT 200/3 Operating Systems	PGT 306/3 Network Modelling	Elective 2/3	
	PGT 103/3 Computer Technology	PGT107/2 Writing in Engineering Technology	PGT 203/3 Database Management Systems	PGT 303/3 Data Structures	PGT 304/3 Internetworking Technology II	PGT 307/3 Programming for Networking	Elective 3/3	
						Elective 1/3		
Common Core	PQT 111/3 Mathematics for Engineering Technology I	PQT 112/3 Mathematics for Engineering Technology II	PQT 213/3 Mathematics for Engineering Technology III	PQT 274/3 Statistics for Engineering Technology	PTT 333/3 Engineering Technology Management	PTT 444/3 Engineering Technologist in Society		
	PCT 111/3 Engineering Skills							
University Required		UVW 410/2 University Malay Language	UUW 224/2 Engineering Entrepreneurship	UUW 130/2 Philosophy and Current Issues	UUW 322/2 Thinking Skill			
		PUW 122/2 Skills & Technology in Communication	**UVW201/2 English for General Purposes OR	UUW 131/2 Appreciation of Ethics and Civilization	UVW 312/2 English for Technical Communication			
		UVA101/0 Preparatory English	UUW XXX/2 Option Subject (Foreign Language)					
	UZW XXX/1 Co-Curricular Activity	UZW XXX/1 Co-Curricular Activity						
M: 2-3	19	19	19	19	19	19	15	
M: 4-6	19	19	19	19	19	19	15	12

Total Units for Graduation = 141

Elective 1	Elective 2	Elective 3
A1. PGT 402 Mobile Computing	B1. PGT 308 CCNA	C1. PGT 309 Cloud Infrastructure and Services
A2. PGT 424 IOT Technology	B2. PGT 404 Artificial Intelligent	C2. PGT 403 Web Programming

Notes:
MUET Band 2: UVA 101/0 Preparatory English > UVW 201 English for General Purpose> UVW 312 English for Technical Communication, *Option Subject is NOT COMPULSORY
MUET Band 3: UVW 201/2 English for General Purpose > UVW 312/2 English for Technical Communication, *Option Subject is NOT COMPULSORY
MUET Band 4 and above: UVW 312 English for Technical Communication, *Option Subject is COMPULSORY

UR6523011
Bachelor of Technology in Industrial Electronic Automation with Honours

Programme Educational Objective (PEO)

PEO 1
To produce industrial electronic automation technologist who can perform automation tasks and solve problems in automation work.

PEO 2
To produce technopreneurs in electronic related technology.

PEO 3
To produce relevant, respected and referred professionals in industrial electronic automation technology.

Programme Outcomes (PO)

PO 1
Apply knowledge of technology fundamentals to broadly-defined procedures processes, systems and methodologies in industrial electronic automation.

PO 2
Able to suggest and apply latest tools and techniques to solve broadly-defined problems.

PO 3
Demonstrate strong analytical and critical thinking skills to solve broadly-defined problems in industrial electronic automation.

PO 4
Able to communicate and articulate effectively in both verbal and written among technologist communities and society at large.

PO 5
Demonstrate understanding of the societal related issues and the consequent responsibilities relevant to broadly-defined technology practices.

PO 6
Recognize the needs for professional development and to engage independent lifelong learning in specialist technologists.

PO 7
Demonstrate an awareness of management and technopreneurship practices in real perspective.

PO 8
Demonstrate professionalism and social and ethical consideration.

PO 9
Demonstrate leadership quality, mentoring and work effectively in diverse teams.

CURRICULUM STRUCTURE
BACHELOR OF TECHNOLOGY IN INDUSTRIAL ELECTRONIC AUTOMATION WITH HONOURS

YEAR	FIRST			SECOND			THIRD			FOURTH
SEMESTER	I	II		III	IV		V	VI	VII	VIII
COMMON CORE	VGT111/2 Technology Skill and Development in Electronic Automation I	VGT121/4 Technology Skill and Development in Electronic Automation II		VGT211/2 Technology Data Acquisition and Analysis I	VGT221/4 Technology Data Acquisition and Analysis II		VGT311/4 Technology System Optimization II	VGT321/5 System Integration Designing	VGT331/6 Final Year Project II	VGT411/12 Industrial Training
	VGT112/5 Product Development Technology	VGT122/2 Network, Switching and Routing		VGT212/5 Flexible Manufacturing System II	VGT222/2 Technology System Optimization I		VGT312/4 Application System Development II	VGT322/5 Elective		
	VGT113/5 Flexible Manufacturing System I	VGT123/4 Technology System Programming II		VGT213/5 Embedded System Programming Tool	VGT223/2 Application System Development I		VGT313/4 Technology Quality Management	VGT323/4 Final Year Project I		
	VGT114/2 Technology System Programming I	VGT124/3 Professional Practices		VGT214/3 Network Security Implementation	VGT224/4 Technology Operation Management		VGT314/4 Capstone Technopreneur Project II			
					VGT225/4 Capstone Technopreneur Project I					
	14	13		15	16		16	14	6	12
UNIVERSITY CORE	UZWXXX/1 Curriculum 1	UZWXXX/1 Curriculum 2		UVW312/2 English for Technical Communication	UUW224/2 Engineering Entrepreneurship		UUW 131/2 Appreciation of Ethics and Civilizations			
	UVW410/2 University Malay Language	UUW322/2 Thinking Skill		**UVWXXX/2 Third Language						
	UUW 130/2 Phylosophy and Current Issues	UVW201/2 English for General Communication								
	*UVA 101/2 Preparatory English									
	5	5		4	2		2			
TOTAL CREDIT PER SEMESTER	19	18		19	18		18	14	6	12
TOTAL CREDIT FOR GRADUATION	124									

Note : *UVA 101/2 = Preparatory English (*Uncredited : Compulsory to students with MUET band 1 only) **UVWXXX/2 (Third Language)= Mandarin , Japanese and German
Elective : VGT 322/5 : Maintenance Management System

LIST OF COURSES:

EMT114	PENGENALAN KEPADA LITAR ELEKTRIK [INTRODUCTION TO ELECTRIC CIRCUIT]
EMT115	BAHASA PENGATURCARAAN [PROGRAMMING LANGUAGE]
EMT116	PERANTI ELEKTRONIK [ELECTRONIC DEVICES]
EMT124	ASAS KEJURUTERAAN ELEKTRIK [FUNDAMENTAL OF ELECTRICAL ENGINEERING]
EMT125	PRINSIP ELEKTRONIK DIGIT 1 [DIGITAL ELECTRONIC PRINCIPLES 1]
EMT181	FIZIK UNTUK ELEKTRONIK [PHYSICS FOR ELECTRONICS]
EMT182	ELEKTRONIK ANALOG 1 [ANALOG ELECTRONIC 1]
EMT235	PRINSIP-PRINSIP ELECTRONIC DIGITAL II [DIGITAL ELECTRONIC PRINCIPLES II]
EMT238	TEORI ELEKTROMAGNETIK [ELECTROMAGNETIC THEORY]
EMT243	PENGENALAN KEPADA REKABENTUK LITAR TERKAMIR [INTRODUCTION TO INTEGRATED CIRCUIT DESIGN]
EMT245	PENGENALAN KEPADA REKABENTUK MIKROPEMPROSES [NTRODUCTION TO MICROPROCESSOR DESIGN]
EMT272	ASAS-ASAS SEMIKONDUKTUR [SEMICONDUCTOR FUNDAMENTAL]
EMT282	PRINCIPLES OF ENGINEERING MATERIALS [PRINCIPLES OF ENGINEERING MATERIAL]
EMT283	ELEKTRONIK ANALOG 2 [ELECTRONIC ANALOG 2]
EMT293	ANALISIS ISYARAT [SIGNAL ANALYSIS]
EMT341	PENGURUSAN KEPADA JURUTERA [MANAGEMENT FOR ENGINEERS]
EMT342	JURUTERA PROFESIONAL [PROFESSIONAL ENGINEERS]
EMT352	PERANTI-PERANTI TERMAJU [ADVANCED DEVICES]
EMT353	REKABENTUK LITAR TERKAMIR DIGIT [DIGITAL INTEGRATED CIRCUIT DESIGN]
EMT355	MIKROPENGAWAL [MICROCONTROLLER]
EMT357	ASAS FABRIKASI MIKROELEKTRONIK [FUNDAMENTAL OF MICROELECTRONIC FABRICATION]
EMT358	KEJURUTERAAN PERHUBUNGAN [COMMUNICATION ENGINEERING]
EMT360	KEJURUTERAAN KAWALAN [CONTROL ENGINEERING]
EMT363	REKABENTUK VLSI [VLSI DESIGN]
EMT367	FABRIKASI MIKROELEKTRONIK [MICROELECTRONIC FABRICATION]
EMT368	KEBOLEHUJIAN DAN KEBOLEHARAPAN DALAM REKABENTUK LITAR TERKAMIR [RELIABILITY AND TESTABILITY IN INTEGRATED CIRCUIT DESIGN]
EMT369	ELEKTRONIK KUASA [POWER ELECTRONIC]
EMT381	PROJEK REKABENTUK MIKROELEKTRONIK [MICRO ELECTRONIC DESIGN PROJECT]
EMT382	PROJEK REKABENTUK ELEKTRONIK [ELECTRONIC DESIGN PROJECT]

EMT445	PROJEK AKHIR TAHUN I [FINAL YEAR PROJECT I]
EMT446	PROJEK TAHUN AKHIR II [FINAL YEAR PROJECT II]
EMT454	KEJURUTERAAN NANOELEKTRONIK [NANOELECTRONIC ENGINEERING]
EMT462	SISTEM OPTOELEKTRONIK [OPTOELECTRONIC SYSTEMS]
EMT463	REKABENTUK DAN FABRIKASI MEMS [MEMS DESIGN AND FABRICATION]
EMT470	PEMBUNGKUSAN SEMIKONDUKTUR [SEMICONDUCTOR PACKAGING]
EMT475	ORGANISASI DAN SENIBINA KOMPUTER [COMPUTER ORGANIZATION AND ARCHITECTURE]
EMT478	INSTRUMENTASI [INSTRUMENTATION]
EMT479	REKABENTUK LITAR TERKAMIR ANALOG [ANALOGUE INTEGRATED CIRCUIT DESIGN]
EMT480	KEBOLEHARAPAN & ANALISA KEGAGALAN [RELIABILITY AND FAILURE ANALYSIS]
EMT483	SISTEM ATAS CIP [SYSTEM ON CHIP]
EMT488	PEMPROSESAN ISYARAT DIGITAL [DIGITAL SIGNAL ANALYSIS]
EMT490	SISTEM MIKRO-ELEKTRO-MEKANIKAL [MICRO-ELECTRO-MECHANICAL SYSTEMS]
EMT494	KOMUNIKASI OPTIKAL [OPTICAL COMMUNICATION]
EKT101	TEORI LITAR ELEKTRIK [ELECTRIC CIRCUIT THEORY]
EKT102	ASAS KEJURUTERAAN ELEKTRONIK [BASIC ELECTRONIC ENGINEERING]
EKT103	KEJURUTERAAN ELEKTRIK [ELECTRICAL ENGINEERING]
EKT104	LITAR ELEKTRONIK ANALOG I [ANALOG ELECTRONIC CIRCUITS I]
EKT119	LITAR ELETRIK II [CIRCUIT THEORY II]
EKT120	PENGATURCARAAN KOMPUTER [COMPUTER PROGRAMMING]
EKT124	ELECTRONIK DIGIT I [DIGITAL ELECTRONICS I]
EKT214	LITAR ELEKTRONIK ANALOG II [ANALOG ELECTRONIC CIRCUIT II]
EKT221	ELEKTRONIK DIGIT II [DIGITAL ELECTRONICS II]
EKT222	SISTEM MIKROPEMPROSES [MICROPROCESSOR SYSTEM]
EKT224	ALGORITHMA DAN STRUKTUR-STRUKTUR DATA [ALGORITHM AND DATA STRUCTURES]
EKT232	ISYARAT DAN SISTEM [SIGNALS AND SYSTEMS]
EKT242	TEORI ELEKTROMAGNETIK [ELECTROMAGNETIC THEORY]
EKT243	OBJEK RANGKAIAN INTERNET [INTERNET OF THINGS]
EKT303	PRINSIP SENIBINA KOMPUTER [PRINCIPLES OF COMPUTER ARCHITECTURE]
EKT318	SISTEM KAWALAN MODEN [MODERN CONTROL SYSTEM]
EKT322	REKABENTUK SISTEM TERBENAM [EMBEDDED SYSTEM DESIGN]

EKT336	RANGKAIAN KOMPUTER [COMPUTER NETWORKS]
EKT342	JURUTERA PROFESIONAL [PROFESSIONAL ENGINEERS]
EKT346	PENGURUSAN UNTUK JURUTERA [MANAGEMENT FOR ENGINEERS]
EKT353	PRINSIP PEMPROSESAN ISYARAT DIGIT [PRINCIPLES OF DIGITAL SIGNAL PROCESSING]
EKT358	SISTEM PERHUBUNGAN [COMMUNICATION SYSTEMS]
EKT360	PROJEK REKABENTUK BERKUMPULAN [GROUP DESIGN PROJECT]
EKT421	KEJURUTERAAN PERISIAN [SOFTWARE ENGINEERING]
EKT424	SISTEM MASA NYATA [REAL TIME SYSTEM]
EKT434	PENGATURCARAAN RANGKAIAN [NETWORK PROGRAMMING]
EKT435	SISTEM PENGOPERASIAN MODEN [MODERN OPERATING SYSTEM]
EKT445	PROJEK TAHUN AKHIR I [FINAL YEAR PROJECT I]
EKT446	PROJEK TAHUN AKHIR II [FINAL YEAR PROJECT II]
EKT460	PEMPROSESAN IMEJ [IMAGE PROCESSING]
EKT466	KEPINTARAN BUATAN [ARTIFICIAL INTELLIGENCE]
EKT473	PENGENALAN KEPADA DATA ANALITIK [INTRODUCTION TO DATA ANALYTIC]
EKT474	OBJEK RANGKAIAN INTERNET [INTERNET OF THINGS]
ENT110	PENGATURCARAAN KOMPUTER [COMPUTER PROGRAMMING]
ENT114	TEORI LITAR [CIRCUIT THEORY]
ENT115	ANALOG ELEKTRONIK I [ANALOGUE ELECTRONICS I]
ENT116	PRINSIP ELEKTRONIK DIGIT [DIGITAL ELECTRONIC PRINCIPES]
ENT207	MEKANIK KEJURUTERAAN [ENGINEERING MECHANICS]
ENT216	ANALOG ELEKTRONIK II [ANALOGUE ELECTRONICS II]
ENT217	EPRINSIP ISYARAT DAN SISTEM [PRINCIPLES OF SIGNAL AND SYSTEM]
ENT218	BIOMEKANIK [BIOMECHANICS]
ENT219	BIOBAHAN [BIOMATERIALS]
ENT224	LUKISAN KEJURUTERAAN DAN REKABENTUK TERBANTU KOMPUTER [ENGINEERING DRAWING AND COMPUTER AIDED DESIGN]
ENT265	MIKROPENGAWAL DAN PENGANTARAMUKA [MICROCONTROLLER AND INTERFACES]
ENT310	SISTEM KAWALAN LELURUS [LINEAR CONTROL SYSTEMS]
ENT316	ASAS SISTEM KOMUNIKASI [PRINCIPLES OF COMMUNICATION SYSTEM]

ENT319	TERMOBENDALIR [THERMOFLUIDS]
ENT320	MEKANIK BAHAN [MECHANICS OF MATERIALS]
ENT321	KESELAMATAN , PIAWAIAN DAN ETIKA DALAM KEJURUTERAAN BIOPERUBATAN [SAFETY, STANDARDS AND ETHICS IN BIOMEDICAL ENGINEERING]
ENT323	MESIN ELEKTRIK DAN PEMACU [ELECTRICAL MACHINES AND DRIVES]
ENT324	PEMPROSESAN ISYARAT DIGIT DALAM APLIKASI-APLIKASI BIOPERUBATAN [DIGITAL SIGNAL PROCESSING IN BIOMEDICAL APPLICATIONS]
ENT325	PROJEK REKABENTUK I [DESIGN PROJECT I]
ENT390	BIOINSTRUMENTASI I [BIOINSTRUMENTATION I]
ENT402	PEMPROSESAN IMEJ PERUBATAN [MEDICAL IMAGE PROCESSING]

COURSE SYLLABUS:
ENGINEERING COURSES
EMT114 PENGENALAN KEPADA LITAR ELEKTRIK [INTRODUCTION TO ELECTRIC CIRCUIT]

No of Credits: 3

Course Synopsis:
Introduction to Electric Circuit course introduce students the method of analysis for linear electrical circuits based on the direct current (DC) and alternating current (AC) circuit theorems. The course can be categorized into 2 parts. First part is focusing on DC circuit. It covers the fundamental laws & theorem, circuit analytical technique, passive & active elements. Second part, it emphasize on ac circuit. It is introduces phasors, sinusoidal state analysis, using previous analytical techniques, under sinusoidal state excitation, RLC circuits, AC power calculations & power factor correction, RMS values & 3-phase balanced systems. At the end of the course, the student should be able to apply the theorems and concepts in order to analyze any linear electric circuits.

Course Outcomes:
CO1 - Ability to explain, analyze and solve circuit problems by using electrical circuit theory principle
CO2 - Ability to choose, and apply analysis techniques to solve complex circuit problems
CO3 - Ability to apply appropriate techniques, resources, and modern engineering to solve complex engineering problems in Circuit Theory

EMT115 BAHASA PENGATURCARAAN [PROGRAMMING LANGUAGE]

No of Credits: 3

Course Synopsis:
Integrating hardware and software is one aspect to be a good engineer, thus an electronic engineer should be competence in programming. This course will focus on the computer software program development using C programming language which is widely used programming language for creating computer programs. The syllabus will cover the theory of programming concepts and principles in order to solve the engineering problems. The students will be exposed to the coding, executing and debugging techniques during C program development.

Course Outcomes:
CO1 - Ability to analyze programming concepts and principles to solve engineering problems.
CO2 - Ability to design computer software programs to solve engineering problems.
CO3 - Ability to demonstrate coding, executing and debugging the computer software programs.

EMT116 PERANTI ELEKTRONIK [ELECTRONIC DEVICES]

No of Credits: 3

Course Synopsis:
This course will expose students to the basic electronic devices. The topic covered the fundamental concept of electronic devices. Students will expose to basic operation of diode and biasing circuits using data sheet. Students also will expose to diode application. The topics covered including Half wave rectifiers, Full wave rectifiers, Power Supply Filter and Regulators, Clipper and Clamper Diode circuits and Voltage Multipliers. Bipolar Junction Transistors (BJTs) and various types of Field Effect Transistors (FETs) are also covered in this course. The topics focus on the transistor structure, basic operation, characteristics and parameters, biasing and troubleshooting.

Course Outcomes:
CO1 - Ability to apply and understand the fundamental concept of semi conductor materials, diodes, bipolar junction transistors (BJTs) and field effect transistors (FETs)
CO2 - Ability to evaluate and analyse diodes, bipolar junction transistors

(BJTs) and field effect transistors (FETs) characteristics
CO3 - Ability to explain semiconductor materials, diodes, bipolar junction transistors (BJTs) and field effect transistors (FETs) through effective communication and presentation.

EMT124 ASAS KEJURUTERAAN ELEKTRIK [FUNDAMENTAL OF ELECTRICAL ENGINEERING]

No of Credits: 3

Course Synopsis:
This course focuses on the fundamental of electrical engineering and power electronics which consists of two parts; electrical machinery and instrumentation. This course will provide the basic knowledge in power transmission, machinery, power processing devices and metering. The topics covered in this course are transformers, AC and DC machines, AC and DC meters, AC and DC bridges, AC and DC converters, and sensors & transducers.

Course Outcomes:
CO1 - Ability to solve and analyze fundamental concept of transformers, DC& AC machines, DC & AC meters and DC & AC bridges
CO2 - Ability to evaluate the need of transformers / DC&AC machines DC & AC meters / DC & AC bridges for environmental and sustainable development
CO3 - Ability to evaluate different types of sensors and transducers and their applications as part of the group works.

EMT125 PRINSIP ELEKTRONIK DIGIT 1 [DIGITAL ELECTRONIC PRINCIPLES 1]

No of Credits: 3

Course Synopsis:
This course provides introductory of digital concept mainly numbering system, operation & codes, Boolean Algebra, and basic logic gates. Students are exposed to logic design, particularly combinational logic functions and sequential circuit design.

Course Outcomes:
CO1 - Ability to apply Boolean Algebra and, analyse and construct combinational logic circuits design
CO2 - Ability to identify, illustrate, analyze and deduce synchronous and asynchronous sequential circuits design
CO3 - Ability to apply techniques and skills using modern engineering tools for complex engineering practices to meet specifications

EMT181 FIZIK UNTUK ELEKTRONIK [PHYSICS FOR ELECTRONICS]

No of Credits: 3

Course Synopsis:
This course provides the principles of Physics, specifically as a foundation course for electronics, microelectronics and photonics. It is a calculus based course. The course is similar to undergraduate basic physics course consisting from classical physics of mechanics, thermodynamics, basic optics, electricity and magnetism, modern physics and the introductory to the electric conductivity for solid.

Course Outcomes:
CO1 - Ability to explain and apply fundamental knowledge of mathematics and physics in optics, modern physics, mechanic, waves and thermodynamics.
CO2 - Ability to explain and evaluate the principles of electricity and magnetism in basic electronics with involvement complex engineering problems.
CO3 - Ability to recommended and solve the problem related to the essential concept of physics for application in basic electronics

EMT182 ELEKTRONIK ANALOG 1 [ANALOG ELECTRONIC 1]

No of Credits: 3

Course Synopsis:
This course exposes the students to the basic knowledge in analogue circuits. The exposure encompasses amplifier design based on bipolar and field effect transistor, for single as well as multistage designs, power amplifiers, frequency response of amplifiers and also exposure to a few specialize device such as Shockley Diodes, SCS, Diac, Triac, SCR, Optotransistor, LASCR and Optocouplers. Emphasize is placed on basic designs aspects and applications. The course has been design to provide basic analogue electronics skills covering theories and practical.

Course Outcomes:
CO1 - Ability to apply and explain knowledge of mathematics, electronic devices and electric circuit theory to the solution of amplifier circuit problems.
CO2 - Ability to identify, formulate and analyse amplifier circuits.
CO3 - Ability to apply and explain appropriate techniques used in solving amplifier circuit problems.

EMT235 PRINSIP-PRINSIP ELECTRONIC DIGITAL II [DIGITAL ELECTRONIC PRINCIPLES II]

No of Credits: 3

Course Synopsis:
This course exposes the students to Digital Systems Design Concepts, focusing on Sequential Systems, Computer Design Basics as well as the Memory Unit.

Course Outcomes:
CO1 - This course exposes the students to Digital Systems Design Concepts, focusing on Sequential Systems, Computer Design Basics as well as the Memory Unit.
CO2 - Ability to design and recommend solutions for complex digital electronics system.
CO3 - Ability to create, select and apply appropriate techniques, resources and modern engineering tools to solve complex digital electronic problems.

EMT238 TEORI ELEKTROMAGNETIK [ELECTROMAGNETIC THEORY]

No of Credits: 3

Course Synopsis:
This purpose of this subject is to learn and understand the basic theory of electromagnetism. Students should be able to understand the core concepts of electrostatics and magnetism as well as the combined electromagnetism effect.

Course Outcomes:
CO1 - Ability to apply and deduce necessary knowledge in electrostatic and magnetostatic fields to the solution of engineering problems.
CO2 - Ability to analyse, formulate and evaluate engineering problems in electromagnetic time-varying fields.
CO3 - Ability to assess and consider the need for applications of electromagnetics in wave propagation and transmission lines

EMT243 PENGENALAN KEPADA REKABENTUK LITAR TERKAMIR [INTRODUCTION TO INTEGRATED CIRCUIT DESIGN]

No of Credits: 3

Course Synopsis:
The course provides the students an exposure on basic logic circuits design, layout design, layout simulation of integrated circuits, as well as basic integrated circuits design techniques.

Course Outcomes:

CO1 - Ability to apply Boolean Algebra and analyze logic circuits at transis tor level using schematic.
CO2 - Ability to design the layout of a circuit based on the design rules specified.
CO3 - Ability to evaluate the CMOS transistor characteristics
CO4 - Ability to function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

EMT245 PENGENALAN KEPADA REKABENTUK MIKROPEMPROSES [NTRODUCTION TO MICROPROCESSOR DESIGN]

No of Credits: 3

Course Synopsis:

The aim of this course is to study the microprocessor architecture and re-late that knowledge to the design of microprocessor based systems. This includes the design technique for memory, input and output for the systems. The study of microprocessor instruction set and various software develop-ment tools are also emphasized as the knowledge are needed in the design of the microprocessor-based systems

Course Outcomes:

CO1 - Ability to analyze the theory of microprocessor structure and design.
CO2 - Ability to write and classify the microprocessor programming, interfacing and operation using assembly language
CO3 - Ability to design and evaluate a microprocessor program to solve engineering related problem.

EMT272 ASAS-ASAS SEMIKONDUKTUR [SEMICONDUCTOR FUNDA-MENTAL]

No of Credits: 3

Course Synopsis:

Introduction to semiconductor devices and technology, energy bands and carrier concentration in thermal equilibrium, carrier transport phenomena, p-n junction, bipolar transistor, MOS diode and MOSFET.

Course Outcomes:

CO1 - Ability to apply and understand the theory and physics of semiconductor.
CO2 - Ability to identify and analyse the different semiconductor processes in terms of its problems and performances
CO3 - Ability to explain semiconductor process in terms of its problems and performances under individual and team work activity

EMT282 PRINCIPLES OF ENGINEERING MATERIALS [PRINCIPLES OF ENGINEERING MATERIAL]

No of Credits: 3

Course Synopsis:

The course is tailored to give students a broad introduction to material prop-erties and limitations. The subject will cover fundamental material structure, class of material properties, measurement of the properties, and knowledge to make material selection with better properties. The common micro-struc-tural features of different material classes will be outlined in order to relate material with its characteristics.

Course Outcomes:

CO1 - Ability to apply and understand the fundamental concept of materials structure and properties.
CO2 - Ability to evaluate, analyse and compare various material characteristic and properties
CO3 - Ability to act and function effectively as individual, and as a member or leader in diverse teams and in multidisciplinary settings to solve material reliability

EMT283 ELEKTRONIK ANALOG 2 [ELECTRONIC ANALOG 2]

No of Credits: 3

Course Synopsis:
This course offers the students an exposure to the Operational Amplifier: Operation, differential, common-mode, parameters, basic op-amp, practical op-amp circuits, op-amp datasheet; Applications of op-amp and frequency response: Summing amplifier, Voltage Follower, Comparator, Integrator, Differentiator, frequency response and compensation; Feedback Circuits: Concepts of feedback, types of feedback connection, practical feedback circuit, feedback amplifier; Oscillator: Basic operating, principles of an oscillator, phase shift, Wien Bridge, Crystal oscillator, uni-junction; Active filter: Basic filter, filter response characteristics, low-pass filter, high-pass filter, band-pass filter, band-stop filter, frequency response measurement. Design of filter, Butterworth, Chebychev and Elliptic; Voltage regulators: Basic series and basic shunt regulators, IC regulators and applications.

Course Outcomes:
CO1 - Ability to ANALYZE analogue circuits for op-amp characteristics and applications.
CO2 - Ability to DESIGN & EVALUATE oscillator, filter and voltage regulator circuits using op-amps.
CO3 - Ability to APPLY appropriate techniques, and engineering tools in solving experimental problems in Analogue Electronic.

EMT293 ANALISIS ISYARAT [SIGNAL ANALYSIS]

No of Credits: 3

Course Synopsis:
This course aims to introduce students to the basics of signals and its analysis. To learn how certain input to a system will produce the required output. To understand signal spectra and the methods to analyze signal and its relations.

Course Outcomes:
CO1 - Ability to reproduce, analyze and solve signal waveforms in analog form.
CO2 - Ability to identify, analyze and solve signals and systems via Continuous Time Fourier Series, Laplace Transform and Z Transformation.
CO3 - Ability to identify, analyze and evaluate signals and systems via available Transform methods for analog filter application

EMT341 PENGURUSAN KEPADA JURUTERA [MANAGEMENT FOR ENGINEERS]

No of Credits: 3

Course Synopsis:
This course aims to teach students on how to apply project management skills when undertaking projects and to provide basic tools of engineering economy to enable the students to carry out professional quality economic evaluations. At the end of the course, students will be able to identify and discuss issues and challenges faced by engineers relating to project management in the current economic scenarios.

Course Outcomes:
CO1 - Ability to analyze and evaluate project requirements and integrate the processes of project management like work plans, scheduling, cost estimation and perform project evaluation
CO2 - Ability to analyze and evaluate economic scenarios and integrate decision making process to engineering project and business ventures

EMT342 JURUTERA PROFESIONAL [PROFESSIONAL ENGINEERS]

No of Credits: 2

Course Synopsis:
This course aims to explain the main concepts in engineering ethics, risk management and occupational safety and health as well as to expose the students to basic of law in the engineering context. The materials will be of introductory nature to enable engineers to appreciate factors that have to be taken into account in decision-making. At the end of the course, students will be able to identify and discuss issues and challenges faced by engineers relating to engineering ethics, risk management and to understand the legal requirements related to engineering field.

Course Outcomes:
CO1 - Ability to understand, identify and evaluate the issues and challenges of engineering ethics.
CO2 - Ability to explain and identify hazards, evaluate and review the function of risk management and occupational safety and health (OSHA).
CO3 - Ability to identify, discuss and evaluate the aspects and procedures of legal on engineering issues.

EMT352 PERANTI-PERANTI TERMAJU [ADVANCED DEVICES]

No of Credits: 3

Course Synopsis:
This course provides extension knowledge on the operation of conventional MOSFETs and BJTs, including investigation of the physical mechanisms underlying the delays and speed limitations of the devices. Moreover, since advances in the electronic industry are rapid and fascinating, the aim of this course is to give sufficient background knowledge on the functioning of different semiconductor devices such as MESFETs, HEMTs, FinFETs, HBTs and BiCMOS.

Course Outcomes:
CO1 - Ability to appraise, analyze and apply the basic scientific knowledge on operations, characteristics and applications of advanced semiconductordevices
CO2 - Ability to explain, analyze and evaluate scientific investigation on the use of various semiconductor materials in advanced devices using research-based knowledge.
CO3 - Ability to engage and conclude in the broadest context of technological change pertaining to advanced technology.

EMT353 REKABENTUK LITAR TERKAMIR DIGIT [DIGITAL INTEGRATED CIRCUIT DESIGN]

No of Credits: 3

Course Synopsis:
This course provides the students an exposure to hardware modelling using Verilog Hardware Description Language, as a means of design entry, simulation and verification of digital circuits. The ModelSim software is used.

Course Outcomes:
CO1 - Ability to assess necessary knowledge of an engineering fundamentals and engineering specialization in digital electronic design using Verilog HDL.
CO2 - Ability to evaluate solutions for complex engineering problems and design a complete digital system using Verilog HDL.
CO3 - Ability to evaluate and conduct investigations on principles of Field Programmable Gate Array (FPGA) to provide valid conclusions.

EMT355 MIKROPENGAWAL [MICROCONTROLLER]

No of Credits: 3

Course Synopsis:
The aim or this course is to study the concept and requirement of embedded

system. This includes the characteristic of embedded system, hardware and software development, single chip microcontroller and programming technique in assembly language and C, basic multitasking concept, developing and embedded system application.

Course Outcomes:

CO1 - Ability to assess necessary knowledge of mathematics, engineering fundamentals and an engineering specialization of embedded system architecture.

CO2 - Ability to evaluate solutions for complex engineering problems and design systems, components or processes in C programming language for the embedded system application.

CO3 - Ability to construct and manipulate appropriate techniques, resources, and modern engineering tools in embedded system based on microcontroller.

EMT357 ASAS FABRIKASI MIKROELEKTRONIK [FUNDAMENTAL OF MICROELECTRONIC FABRICATION]

No of Credits: 3

Course Synopsis:

This introductory course on microelectronic fabrication focuses on the concept and the basics of semiconductor materials, process technology and the fabrication processes of Integrated Circuits (ICs). Topics covered in this course are as follow Introduction to Microelectronic Fabrication, Cleanroom Technology, Safety & Protocol, Basics of Semiconductor, Wafer Manufacturing, Semiconductor Materials, Wafer Cleaning, Thermal Processes I: Oxidation, Thermal Processes II: Diffusion, Thermal Processes III: Ion Implantation & Annealing, Photolithography I, Photolithography II, Metallization I : CVD, Metallization II : PVD and Etching.

Course Outcomes:

CO1 - Ability to apply and value necessary knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization respectively to the solution of complex engineering problems in microelectronic fabrication.

CO2 - Ability to create, select and apply appropriate techniques, resources, and modern engineering to solve complex engineering problems in microelectronic fabrication.

CO3 - Ability to recognize the need for, and have the preparation and engage in independent and life-long learning of microelectronic fabrication in the broadest context of technological change.

EMT358 KEJURUTERAAN PERHUBUNGAN [COMMUNICATION ENGINEERING]

No of Credits: 3

Course Synopsis:

This course will cover all the basic principles and concepts of analogue and digital communication including the basic elements of communications, signal analysis, amplitude modulation, angle modulations and digital modulations, as well as transmission channels and medium. In addition, introductions to signal propagations and calculations of signal to noise ratio are also introduced to relate the students with real world applications.

Course Outcomes:

CO1 - Ability to explain and apply the fundamental concept and principles of analog and digital communication engineering in real world.

CO2 - Ability to identify, analyse, and solve complex engineering problems related to analog and digital communication using fundamental principles of mathematics, natural sciences and engineering sciences.

CO3 - Ability to perform effectively as individual, and as a member or leader in diverse teams and in multidisciplinary settings to solve analog and digital comunication problems

EMT360 KEJURUTERAAN KAWALAN [CONTROL ENGINEERING]

No of Credits: 3

Course Synopsis:
This is an introduction course to control systems engineering. Students will be exposed to the mathematical modelling for mechanical, electrical as well as electro-mechanical systems using transfer functions, signal-flow graphs and Mason's rule. They will conduct system performance analysis in time and frequency domain. System stability will also be studied along with root locus analysis. Finally the students will be introduced to system compensation design using PID and lead-lag controllers. The laboratory sessions will be conducted to enable the students to test the theory.

Course Outcomes:
CO1 - Ability to evaluate and derive mathematical model for electrical/ electronic and mechanical systems.
CO2 - Ability to evaluate and perform system's time-domain and frequency domain analysis with response to test inputs.
CO3 - Ability to design and analyze different types of controllers and digital control systems.

EMT363 REKABENTUK VLSI [VLSI DESIGN]

No of Credits: 3

Course Synopsis:
This course will cover various important elements for VLSI design such as sequential circuit, clock tree, wire interconnect and power dissipation and low power design.

Course Outcomes:
CO1 - Ability to apply necessary knowledge to analyze the behavior of the sequential design.
CO2 - Ability to design and analyse circuit characterization and overall performance of VLSI design
CO3 - Ability to engage and conclude the technological change pertaining to VLSI design

EMT367 FABRIKASI MIKROELEKTRONIK [MICROELECTRONIC FABRICATION]

No of Credits: 3

Course Synopsis:
This course focuses on the fabrication process module of the CMOS technology. The students should be able to design, produce a mask, prepare the runcard (process flow of the MOSFET), fabricate the MOSFET, analyse and characterise the devices electrically. The students should also able to understand the important CMOS process modules such as well technology, isolation technology, multi level interconnect technology as well as related device issues mainly associated with the device miniaturisation.

Course Outcomes:
CO1 - Ability to explain and construct the essential aspects of the device technology
CO2 - Ability to apply the major CMOS process module for advanced CMOS process technology
CO3 - Ability to analyze and predict the major CMOS process and device issues in circuit level.

EMT368 KEBOLEHUJIAN DAN KEBOLEHARAPAN DALAM REKABENTUK LITAR TERKAMIR [RELIABILITY AND TESTABILITY IN INTEGRATED CIRCUIT DESIGN]

No of Credits: 3

Course Synopsis:
This course is basically divided into two areas: Reliability & testability. In

the first section of Reliability, students will learn the concept of Reliability, its terms & definitions, the different types of Reliability Distributions and also the different types of Reliability Prediction Techniques. In the second section, which is testability, students will be exposed to overview of testing; components of design for testability such as ad hoc techniques, scan-path design, boundary scan testing (BScan) and built in self test (BIST).

Course Outcomes:

CO1 - Ability to evaluate and apply the concept of Reliability and Testability to solve complex engineering problem in IC design

CO2 - Ability to function effectively as individual, and as a member or l eader in diverse teams and in multidisciplinary settings to solve Integrated Circuit Design Reliability and Testability problem.

CO3 - Ability to assess and conclude the broadest context of technological change pertaining to Reliability and Testability in Integrated Circuit Design field.

EMT369 ELEKTRONIK KUASA [POWER ELECTRONIC]

No of Credits: 3

Course Synopsis:

EMT 369 introduces Power Electronics as a Multidisciplinary & Interdisciplinary Applications Orientated Technology emphasising the main criterion of energy efficiency. AC-DC, AC-AC, DC-DC and DC-AC converter performance, including waveform analysis, is developed from theory. EMT 369 gives overview different types of power semiconductor devices and their switching characteristics and also covers the operation, characteristics and performance parameters of controlled rectifiers.

Course Outcomes:

CO1 - Ability to describe power electronic system operations, application areas and power semiconductor devices; power diode, SCR, BJT, IGBT, GTO and MOSFET.

CO2 - Ability to analyze and design AC-DC conversion, AC-AC conversion, DC-DC conversion and DC-AC conversion.

CO3 - Ability to learn and analyze the functioning of recently developed power electronic systems.

EMT381 PROJEK REKABENTUK MIKROELEKTRONIK [MICROELECTRONIC DESIGN PROJECT]

No of Credits: 4

Course Synopsis:

An exposure to the students in integrated design project. This project encompasses practical, innovation and invention elements in designing a solution to a specific engineering application. The students are expected to implements the knowledge and skills obtained in solving the specific engineering problem. The students are also need to practice their professional and social responsibilities in giving a sustainable solution via functioning in a multidisciplinary team.

Course Outcomes:

CO1 - Ability to identify, formulate, research literature and analyse complex engineering problems in Microelectronic/Electronic Design Project.

CO2 - Ability to design solutions for complex engineering problems and design systems, components or processes in Microelectronic/ Electronic Design Project.

CO3 - Ability to conduct investigations of complex problems using research-based knowledge and research methods in Microelectron ic/Electronic Design Project.

CO4 - Ability to apply reasoning informed by contextual knowledge in Microelectronic/Electronic Design Project to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.

CO5 - Ability to understand and evaluate the sustainability and impact of professional engineering work in Microelectronic/Electronic Design Project.
CO6 - Ability to function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings to solve Microelectronic/Electronic Design Project problem
CO7 - Ability to explain through effective communication on complex engineering activities related to Microelectronic/Electronic Design Project.
CO8 - Ability to demonstrate knowledge and understanding of engineering management principles and economic decision-making in Microelectronic/Electronic Design Project.

EMT382 PROJEK REKABENTUK ELEKTRONIK [ELECTRONIC DESIGN PROJECT]

No of Credits: 4

Course Synopsis:
An exposure to the students in integrated design project. This project encompasses practical, innovation and invention elements in designing a solution to a specific engineering application. The students are expected to implements the knowledge and skills obtained in solving the specific engineering problem. The students are also need to practice their professional and social responsibilities in giving a sustainable solution via functioning in a multidisciplinary team.

Course Outcomes:
CO1 - Ability to identify, formulate, research literature and analyse complex engineering problems in Microelectronic/Electronic Design Project.
CO2 - Ability to design solutions for complex engineering problems and design systems, components or processes in Microelectronic/ Electronic Design Project.
CO3 - Ability to conduct investigations of complex problems using research-based knowledge and research methods in Microelectronic/Electronic Design Project.
CO4 - Ability to apply reasoning informed by contextual knowledge in Microelectronic/Electronic Design Project to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.
CO5 - Ability to understand and evaluate the sustainability and impact of professional engineering work in Microelectronic/Electronic Design Project.
CO6 - Ability to function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings to solve Microelectronic/Electronic Design Project problem
CO7 - Ability to explain through effective communication on complex engineering activities related to Microelectronic/Electronic Design Project.
CO8 - Ability to demonstrate knowledge and understanding of engineering management principles and economic decision-making in Microelectronic/Electronic Design Project.

EMT445 PROJEK AKHIR TAHUN I [FINAL YEAR PROJECT I]

No of Credits: 2

Course Synopsis:
An exposure to the students in microelectronic/electronic/photonic based research project.

Course Outcomes:
CO1 - Ability to apply and summarize necessary knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems in final year project.
CO2 - Ability to design and recommend solutions for complex engineering problems and design systems, components or processes in final year project that meet specified needs with

appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
CO3 - Ability to design, recommend and conduct investigations of complex problems using research-based knowledge and research methods in final year project to provide valid conclusions.
CO4 - Ability to demonstrate and describe knowledge and understanding of engineering management principles and economic decision-making in multidisciplinary environments.

EMT446 PROJEK TAHUN AKHIR II [FINAL YEAR PROJECT II]

No of Credits: 4

Course Synopsis:
An exposure to the students in microelectronic/electronic/photonic based research project.

Course Outcomes:
CO1 - Ability to interpret necessary engineering knowledge of selected final year project topic.
CO2 - Ability to propose design of experiment using research-based knowledge to provide solutions of complex problems in final year project.
CO3 - Ability to explain the final year project through effective communication and presentation.
CO4 - Ability to demonstrate final year project management and decision making.

EMT454 KEJURUTERAAN NANOELEKTRONIK [NANOELECTRONIC ENGINEERING]

No of Credits: 3

Course Synopsis:
The aim of this course is to study the underlying physical principles, the fabrication technologies, and applications of a broad range of nanoelectronic devices. This includes device scaling of standard MOSFETs into nanoscale dimensions, electron transport and quantum effects in nanostructures and their applications, nanocharacterization, and nanofabrication methods (e.g., submicron optical lithography and electron-beam lithography).

C**ourse Outcomes**:
CO1 - Ability to appraise and analyze nano materials and structures from its fundamental point of view that involves quantum effects, that lead to the latest nano fabrication technology
CO2 - Ability to explain, analyze and apply scientific knowledge in nano fabrication that comprise of nano lithography, thin film technology and characterization.
CO3 - Ability to vindicate, present and conclude the characteristics and application of nanoelectronic devices

EMT462 SISTEM OPTOELEKTRONIK [OPTOELECTRONIC SYSTEMS]

No of Credits: 3

Course Synopsis:
The students studying this course will develop a basic understanding of the principles and practices of modern optoelectronic device includes fibre optic, semiconductor laser, photodiode and LED. The important functions for applications for these optoelectronic devices will acquire in optoelectronic system such as optical communication and display technology. Practical skills by using software in optical fibre systems and measurement will also be acquired.

Course Outcomes:
CO1 - Ability to apply necessary knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization respectively to the solution of complex engineering problems in optoelectronic system
CO2 - Ability to design solutions for complex engineering problems and

design systems, components or processes in optoelectronic system that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

CO3 - Ability to function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings to solve optoelectronic system problem.

EMT463 REKABENTUK DAN FABRIKASI MEMS [MEMS DESIGN AND FABRICATION]

No of Credits: 3

Course Synopsis:
The aim of this course is to provide the introduction and overview of MEMS market, scaling laws, MEMS devices and applications, MEMS materials and fabrication methods, and basic MEMS concepts including pressure and acceleration.

Course Outcomes:
CO1 - Ability to explain MEMS devices fabrication processes
CO2 - Ability to design and analyze MEMS devices
CO3 - Ability to simulate MEMS devices

EMT470 PEMBUNGKUSAN SEMIKONDUKTUR [SEMICONDUCTOR PACKAGING]

No of Credits: 3

Course Synopsis:
Students will be exposed to Microsystems packaging, the role of packaging in microelectronics, fundamental of IC assembly, general semiconductor process flow, design for reliability, thermal management, sealing and encapsulation, packaging material and processes, and latest packaging technology trend via latest scientific papers. The students will also be exposed to identifying critical packaging parameters and interpreting data of their own designed experiment. Mathematical modelling in packaging are also introduced.

Course Outcomes:
CO1 - Ability to analyze, differentiate and assess the semiconductor packaging process and its flow
CO2 - Ability to compare and evaluate the technology trend in semiconductor packaging
CO3 - Ability to design and conduct investigations, select critical parameters, interpret data and justify specific packaging process

EMT475 ORGANISASI DAN SENIBINA KOMPUTER [COMPUTER ORGANIZATION AND ARCHITECTURE]

No of Credits: 3

Course Synopsis:
This subject will focus on the computer system with various designs of interface techniques, organization and architecture. The syllabus will covered the theory of basic computer system, format of instruction set, memory organization and arithmetic logic unit as well as certain issues of designing such as bus structure, parallel processing, pipelining and memory management.

Course Outcomes:
CO1 - Ability to evaluate and deduce the theory of computer system component and the interactions between component.
CO2 - Ability to critique and evaluate the theory of operation in term of central processing and control unit
CO3 - Ability to design and evaluate a computer simulation program to solve engineering related problem.

EMT478 INSTRUMENTASI [INSTRUMENTATION]

No of Credits: 3

Course Synopsis:
This course covers the fundamental of electronic instrumentation. This includes the working principle and transduction properties of sensors and transducers. Importance and techniques of signal conditioning is emphasized. Element and principle of data acquisition and their applications are discussed. Modern stand-alone and computer-based measurement instruments are covered.

Course Outcomes:
CO1 - Ability to apply and interpret necessary knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization respectively to the solution of complex engineering 4 problems in electronic instrumentation.
CO2 - Ability to identify, formulate, research literature and evaluate complex engineering problems reaching substantiated conclusions in electronic instrumentation using mathematics, natural sciences and engineering sciences.
CO3 - Ability to assess the need for, and have the preparation of electronic instrumentation and engage in independent and lifelong learning in the broadest context of technological change.

EMT479 REKABENTUK LITAR TERKAMIR ANALOG [ANALOGUE INTEGRATED CIRCUIT DESIGN]

No of Credits: 3

Course Synopsis:
The course covers MOS characteristics, Second order effects, Basic Cells, Single stage Amplifier, Differential amplifier, MOS Op amp and Op-amp Application.

Course Outcomes:
CO1 - Ability to apply and explain the fundamental concept of transistor behaviour using basic laws and circuit theorem
CO2 - Ability to design and recommend the analog sub-circuit using basic laws and circuit theorem
CO3 - Ability to design and evaluate the analog system to meet the required specifications

EMT480 KEBOLEHARAPAN & ANALISA KEGAGALAN [RELIABILITY AND FAILURE ANALYSIS]

No of Credits: 3

Course Synopsis:
This course is basically divided into two areas: Reliability & Failure Analysis. In the first section of Reliability, students will learn the concept of Reliability, its terms & definitions, the different types of Reliability Distributions and also the different types of Reliability Prediction Techniques such as FMEA & FTA. In the second section of Failure Analysis, students will be exposed to the different types of FA techniques commonly conducted on a failed semiconductor device and the test instrumentation associated with each technique.

Course Outcomes:
CO1 - Ability to analyse and evaluate the reliability based problem
CO2 - Ability to explain types of semiconductor failures and select the most relevant techniques and tools to perform the Failure Analysis.
CO3 - Ability to recommend and apply appropriate techniques and tools available in Failure Analysis.

EMT483 SISTEM ATAS CIP [SYSTEM ON CHIP]

No of Credits: 3

Course Synopsis:
To expose the student with system on chip design methodology, IP design

and platform-based design. The student will be learned various important elements for succesfull system-on-chip design implementation such as design flow requirement, system performance evaluation and system integration issues.

Course Outcomes:
CO1 - Ability to ANALYSE System-On-Chip design methodology
CO2 - Ability to DESIGN the System-On-Chip architecture
CO3 - Ability to EVALUATE the System-On-Chip performance

EMT488 PEMPROSESAN ISYARAT DIGITAL [DIGITAL SIGNAL ANALYSIS]

No of Credits: 3

Course Synopsis:
This course is a continuation from introduction to signal analysis course that will more emphasize to digital signal analysis. This course will cover the topics related to Discrete Time Signal, Fourier Transform, Sampling process, IIR and FIR digital filter design.

Course Outcomes:
CO1 - Ability to apply knowledge of mathematics and engineering fundamentals necessary for the solution of complex discrete time systems.
CO2 - Ability to analyse complex discrete time systems to reach substantiated conclusions by using first principles of mathematics and engineering fundamentals.
CO3 - Ability to select and apply appropriate techniques, resources, and modern engineering tools necessary to solve complex discrete time systems.

EMT490 SISTEM MIKRO-ELEKTRO-MEKANIKAL [MICRO-ELECTRO-MECHANICAL SYSTEMS]

No of Credits: 3

Course Synopsis:
This course will focus on design and simulation of MEMS devices. The design will include various of analysis types such as structural, electrical and mechanical while the fabrication technology will focus on bulk and surface micromachining. This course will also discuss the application and technology of MEMS packaging in various fields.

Course Outcomes:
CO1 - Ability to develop and summarize the basic fabrication processes of MEMS technologies.
CO2 - Ability to design and compare the different concepts of MEMS sensors and actuators for different application areas.
CO3 - Ability to create, select and apply appropriate techniques and resources in designing MEMS cantilever.

EMT494 KOMUNIKASI OPTIKAL [OPTICAL COMMUNICATION]

No of Credits: 3

Course Synopsis:
This course is intended to present essential concepts involved in optical communications. Topics studied include communication, networks and signal processing which are main system elements in transmitting and receiving data. Various issues relating to signals propagation in optical fibers such as dispersion compensation, amplification, attenuation and nonlinear effects are presented. Students will have the opportunity for analysis and simulation of optical communication systems and be exposed to the latest trend in optical communication and signal processing engineering.

Course Outcomes:

CO1 - Ability to identify, formulate, research literature and analyse complex engineering problems reaching substantiated conclusions in Optical Communication using first principles of mathematics, natural sciences and engineering sciences.

CO2 - Ability to create, select and apply appropriate techniques, resources, and modern engineering to solve complex engineering problems in optical communication.

CO3 - Ability to describe knowledge and understanding of optical communication principles and economic decision-making in multidisciplinary environments.

EKT101 TEORI LITAR ELEKTRIK [ELECTRIC CIRCUIT THEORY]

No of Credits: 4

Course Synopsis:

Basically this introductory circuit course can be divided into two parts. Part I, consisting of chapter 1 through 4, is devoted to DC circuits. It covers fundamental laws and theorems, circuit analytical techniques, passive and active elements. Part 2, consisting of chapter 5 through 8, deals with AC circuits. It introduces phasors, sinusoidal steady state analysis, using previous analytical techniques under sinusoidal steady state excitation, RLC circuits, AC power calculations and power factor correction, RMS values and three-phase balanced systems.

Course Outcomes:

CO1 - Ability to apply knowledge of mathematics equations to solve problems in DC circuits

CO2 - Ability to analyze the first order circuits and second order circuits (containing passive elements, DC sources and switches) using differential equations.

CO3 - Ability to analyze special types of circuit such as two port networks.

EKT102 ASAS KEJURUTERAAN ELEKTRONIK [BASIC ELECTRONIC ENGINEERING]

No of Credits: 3

Course Synopsis:

This course will expose the students to the basic electronic devices. The topic covered including introduction to semiconductor: Atomic Structures, Semiconductors, Conductors, and Insulators, Covalent Bonds, Conduction in Semiconductor, N -Type and P-Type Semiconductor, the Diode, Biasing the Diode, Voltage-Current characteristic of a Diode, Diode Models, Testing a Diode.

Students will also expose to the diode application. The topic covered including Half-Wave Rectifiers, Full-Wave Rectifiers, Power Supply Filters and Regulations, Diode Limiting and Clamping Circuits, Voltage Multipliers, The Diode Data Sheet, Troubleshooting, Special Purpose Diodes: Zener Diodes, Zener Diode Applications, Varactor Diodes, Optical Diodes, Other Types of Diodes and Troubleshooting.

Bipolar Junction Transistors (BJT's) and various types of FET are also covered in this course. The topics including Transistor Structure, Basic Transistor Operation, Transistor Characteristic and parameters. The Transistor as an Amplifier, The Transistor as a Switch, Transistor Packages and Terminal Identification, Troubleshooting, Transistor Bias Circuits: The DC Operating Points, Voltage Divider Bias, Other Bias Methods. Field-Effect Transistor (FETs), The JFET, JFET Characteristic & parameters, JFET Biasing, The MOSFET, MOSFET Characteristic and Parameters, MOSFET Biasing, Troubleshooting.

Course Outcomes:

CO1 - Ability to apply the knowledge of natural science in electronic devices

CO2 - Ability to identify and solve the basic operation of electronic devices.

CO3 - Ability to analyze and solve the basic biasing techniques of electronic devices.

EKT103 KEJURUTERAAN ELEKTRIK [ELECTRICAL ENGINEERING]

No of Credits: 3

Course Synopsis:
This subject will expose the students to the basic electrical machines, electronic instrumentation and measurement and power quality. For the electrical machines and machine control, the topics covered include the Power Transformers, DC machines and AC machines. General concepts and basic principle of operation for each electrical machine are covered includes the characteristics and performance analysis. For the instrumentation part, the topics covered include general DC and AC meters, DC and AC bridges and sensors and transducers. Constructions and principles of operation for each part are covered in this part. In addition to that students are exposed to the principle of power quality.

Course Outcomes:
CO1 - Ability to apply the basic concept of single-phase and three-phase system.
CO2 - Ability to apply the concept of magnetism and electromagnetism
CO3 - Ability to identify and analyze the fundamental and operation and application of electrical transformer.
CO4 - Ability to identify, and analyze the fundatmentals, operation and application of ac machines and dc machines with respect to their efficiency,equivalent circuits and losses

EKT104 LITAR ELEKTRONIK ANALOG I [ANALOG ELECTRONIC CIRCUITS I]

No of Credits: 4

Course Synopsis:
This course exposes the student the basic knowledge in analog electronic. The exposure encompases amplifier design based on bipolar and field effect transistors, for single and multi stage, power amplifier, frequency response analysis of amplifiers and also exposure to a few specialized device such as Shockley diodes, SCS, Diac, Triac, SCR, Optotransistor, LASCR and Opto-couplers. Emphasis is placed on basic design aspects and applications. The course has been designed to provide basic analog electronic skilss covering theories and practicals.

Course Outcomes:
CO1 - Ability to analyze dc, small-signal analysis and frequency performance of basic configurations of amplifiers (BJT and FET).
CO2 - Ability to design basic configurations of BJT and FET amplifiers.
CO3 - Ability to investigate the performance of class A, B and AB of power amplifiers in term of their frequency response, equivalent circuit, thermal management and gain.

EKT119 LITAR ELETRIK II [CIRCUIT THEORY II]

No of Credits: 3

Course Synopsis:
This is a core subject. Students will expose to the circuit analysis using Laplace Transform, Fourier Series and Fourier Transform techniques. Students also should be able to explain the concept of frequency response of AC circuit and two port network.

Course Outcomes:
CO1 - Ability to analyse circuit's parameters containing sinusoidal steady-state sources using complex impedances and phasor r epresentations.
CO2 - Ability to apply knowledge of Laplace Transform, Fourier Series and Fourier Transform in solving electric circuits problem.
CO3 - Ability to construct Bode plot for various types of transfer function and analyze frequency response of AC circuits

EKT120 PENGATURCARAAN KOMPUTER [COMPUTER PROGRAMMING]

No of Credits: 4

Course Synopsis:
One of the aspects of a good engineer is to have the capability of integrating the hardware and the software, thus an electronic engineer should be competence in programming. This course introduces basic programming using high level language (C language). The main objective of this course is to prepare the students with the ability of problem solving with programming, to be able to do analysis with the programming tools such as organization chart, IPO chart, flowchart and pseudo code and then to implement them by developing C program.

Course Outcomes:
CO1 - Ability to apply knowledge of programming concepts and principles
CO2 - Ability to apply appropriate tools for coding compiling, executing and debugging computer program using GNU/Linux.
CO3 - Ability to identify, formulate and analyse complex engineering problems.
CO4 - Ability to design solutions for complex engineering related problems and design systems using computer programming techniques.

EKT124 ELECTRONIK DIGIT I [DIGITAL ELECTRONICS I]

No of Credits: 3

Course Synopsis:
This course covers the introduction and discussion of the fundamental of digital circuit design and analysis. The lecture and laboratory exercise covers the following topics: Boolean Algebra, Numbering System, Basic Logic Gates, Combinational Circuit Design, Timing Diagram, Bi-Stable Memory Device and Sequential Circuit Design.

Course Outcomes:
CO1 - Ability to apply the knowledge of different numbering systems and to understand basic theory of binary system.
CO2 - Ability to apply method of minimizing Boolean functions for digital logic circuit.
CO3 - Ability to solve and design combinational logic circuit in terms of Boolean Function.
CO4 - Ability to solve and design sequential logic circuit in terms of Boolean Function.

EKT214 LITAR ELEKTRONIK ANALOG II [ANALOG ELECTRONIC CIRCUIT II]

No of Credits: 4

Course Synopsis:
This course offers the students an exposure to the operational amplifier : Operation, differential amplifier, common-mode, parameters, basic op-amp, practical op-amp circuits, op-amp datasheet, applications of op-amp and frequency response and compensation; feedback circuits: Concepts and feedback, types of feedback connection, practical feedback circuit, feedback amplifier; Oscillator : basic operating principles of an oscillator, phase shift, Wien bridge, crystal oscillator, uni-juction; action filters : basic filter, filter response characteristics, low-pass filter, high-pass filter, band-pass filter, band-stop filter, frequency response measurement, design of filter, Butterworth, chebchev and Elliptic; Voltage regulators : Basic series and basic shunt regulators, basic switching regulator, IC regulators and applications

Course Outcomes:
CO1 - Ability to apply knowledge and application of OP-AMP feedback concept.
CO2 - Ability to design amplifier, oscillator or filter.
CO3 - Ability to apply knowledge of basic concept and principle of voltage regulators and explain their application in circuits.

EKT221 ELEKTRONIK DIGIT II [DIGITAL ELECTRONICS II]

No of Credits: 4

Course Synopsis:
This course exposes the students to the Combinational Logic System Design, Sequential System, Memory and Programmable Logic Devices, Register Transfer and Data path, Sequencing and Control as well as Computer Organization.

Course Outcomes:
CO1 - Ability to apply knowledge of a digital system in Register Transfer Language (RTL) form.
CO2 - Ability to analyse sequential systems on Finite State Machine (FSM) and Algorithmic State Machine.
CO3 - Ability to design a digital system with control unit using modern engineering/IT tool.

EKT222 SISTEM MIKROPEMPROSES [MICROPROCESSOR SYSTEM]

No of Credits: 4

Course Synopsis:
The aim of this course is to study the Intel 8085 microprocessor architecture and relate that knowledge to the design of microprocessor based systems. This includes the design technique for interfacing memory, input and output for the systems. The study of 8085 instruction set and various software development tools are also emphasized as the knowledge are needed in the design of the microprocessor-based systems.

Course Outcomes:
CO1 - Ability to apply knowledge of theory and basic architecture of microprocessor system.
CO2 - Ability to analyse engineering problems and able to build microprocessor programs.
CO3 - Ability to create and apply the appropriate techniques in designing the microprocessor based application system.

EKT224 ALGORITHMA DAN STRUKTUR-STRUKTUR DATA [ALGORITHM AND DATA STRUCTURES]

No of Credits: 3

Course Synopsis:
This course introduces data types, algorithm and data structures. The topics of array, pointers, structure and union in C are revisited. Then, the linear data structure i.e. stack, queue linked list and non linear data structure i.e. tree and graph are discussed in depth. In addition, sorting and searching algorithm are also included.
Course Outcomes:
CO1 - Ability to analyze the performance of computer programs in terms of space and time complexity.
CO2 - Ability to appropriately apply various abstract data types in computer programs.
CO3 - Ability to apply and formulate algorithms to solve computational problems.

EKT232 ISYARAT DAN SISTEM [SIGNALS AND SYSTEMS]

No of Credits: 3

Course Synopsis:
The course aims to introduce the concept of signals and systems analysis, the continuous signal and discrete signal functions and types of signal transformation. It begins with familiarization with different types of functions and relates them with convolution. To understand the Fourier series, Laplace-transform and Z-transform and familiarize with the properties involved the transform and the inverse method. In general how the signals and systems are analyzed in the time and frequency domain.

Course Outcomes:

CO1 - Ability to apply the concept of signal and system classifications, impulse response and convolution in both continuous and discrete time domain.
CO2 - Ability to apply the concept of Fourier representation of continuous and discrete signals and their properties.
CO3 - Ability to analyze linear and time-invariant systems using Laplace transform and its application.
CO4 - Ability to analyze and evaluate discrete systems using transform and their properties.

EKT242 TEORI ELEKTROMAGNETIK [ELECTROMAGNETIC THEORY]

No of Credits: 3

Course Synopsis:

The purpose of this course is to learn the basic theory and analysis of electromagnetic. Student should be able to understand the basic concept of electrostatics, magnetostatics and their effects. Student should also understand the theory and application of transmission line.

Course Outcomes:

CO1 - Ability to apply knowledge on coordinate system and their interrelation.
CO2 - Ability to apply concept of electric field intensity and force on charges under different field configurations.
CO3 - Ability to analyze concept of electric current density and boundary conditions, magnetic flux and magnetic flux density in a steady magnetic field and the basic laws of magnetic fields.
CO4 - Ability to design transmission lines and impedance matching using smith chart

EKT243 OBJEK RANGKAIAN INTERNET [INTERNET OF THINGS]

No of Credits: 3

Course Synopsis:

This course shall introduce the current technique in object oriented design, analysis, and programming by using Java Programming language. Topics such as encapsulation, abstraction, inheritance and polymorphism will be covered in the course. Apart from that, the course also will covers the basic UML diagrams used in object oriented design. Together with the design diagrams, students will be introduced to the relationship concept (i.e. association, aggregation and composition).

Course Outcomes:

CO1 - Ability to explain and apply the principles of object oriented programming in any computational problem.
CO2 - Ability to analyze computational problems and design appropriate UML diagrams.
CO3 - Ability to design object oriented solution for any UML diagram or any computational problem description.

EKT303 PRINSIP SENIBINA KOMPUTER [PRINCIPLES OF COMPUTER ARCHITECTURE]

No of Credits: 4

Course Synopsis:

This subject will focus on the computer system with various design of interface techniques, organization and architecture. The syllabus will covered the theory of basic computer system, format of instruction set, memory organization and arithmetic logic unit as well as certain issues of designing such as bus structure, parallel processing, pipelining and memory management. The student are required to design a simple CPU during a Lab session by using Quartus II software provided by Altera. The lab session will complement the theories given in lectures.

Course Outcomes:
CO1 - Ability to apply the knowledge of Computer architecture.
CO2 - Ability to analyze the performance of a computer system.
CO3 - Ability to design small scale computer system.
CO4 - Ability to apply appropriate CAD tool to design, verify, and test the computer system.

EKT318 SISTEM KAWALAN MODEN [MODERN CONTROL SYSTEM]

No of Credits: 3

Course Synopsis:
The objective of this course is to expose the students to the basic knowledge in the field of control systems. Students will be exposed to basic mathematical modeling of physical system using differential equation and state space representation, stability of linear systems, time response, root locus, frequency domain analysis, and design of control systems using lead and lag compensating networks.

Course Outcomes:
CO1 - Ability to formulate mathematical model for electrical and mechanical systems
CO2 - Ability to analyze and determine the stability of a system using time domain analysis.
CO3 - Ability to analyze and determine the stability of a system using frequency domain analysis.
CO4 - Ability to design lag, lead, lead-lag compensators for linear control systems

EKT322 REKABENTUK SISTEM TERBENAM [EMBEDDED SYSTEM DESIGN]

No of Credits: 4

Course Synopsis:
The aim of this course is to study the concept and requirement of embedded system. This includes the characteristic of embedded system, hardware and software development: single chip microcontroller and programming technique in assembly language and C, basic multitasking concept, developing an embedded system application.

Course Outcomes:
CO1 - Ability to apply the knowledge and identify formulate solution in development embedded system based on a single chip microcontroller.
CO2 - Ability to apply appropriate techniques to develop embedded system platform.
CO3 - Ability to design an complete embedded application system and able to communicate effectively in written and oral forms to defend and justify the engineering solutions.

EKT336 RANGKAIAN KOMPUTER [COMPUTER NETWORKS]

No of Credits: 3

Course Synopsis:
This course exposes students with the kind and knowledge of computer networks. Computer network technologies cover so many aspects and it is expanding rigorously. Therefore this course focuses on the fundamental concept and theories, applications and advantages of computer networks. Related technologies such as Local Area Network, Wide Area Network and techniques use in data transmission as well as latest technologies use are introduced. Practical exercises such as design, install and testing of a simple computer internetworking which improve understanding and develop

skills on networking are integrated in laboratories exercises.

Course Outcomes:
CO1 - Ability to explain, discuss and apply the concepts and principles of computer networking
CO2 - Ability to identify, analyze and solve network problems
CO3 - Ability to design and evaluate the performance of computer network

EKT342 JURUTERA PROFESIONAL [PROFESSIONAL ENGINEERS]

No of Credits: 2

Course Synopsis:
This course aims to explain the main concepts in engineering ethics, sustainable engineering, risk management, and occupational safety and health as well as to expose the students to basic law in the engineering context. The materials will be of introductory nature to enable engineers to appreciate factors that have to be taken into account in decision-making. At the end of the course, students will be able to identify and discuss issues and challenges faced by engineers relating to engineering ethics, sustainable engineering, risk management and to understand the legal requirements related to the engineering field.

Course Outcomes:
CO1 - Ability to understand,identify and evaluate the issues and challenges of engineering ethics
CO2 - Ability to understand the sustainable and impact in society and environmental context
CO3 - Ability to explain and identify hazards; evaluate and review the function of risk management, occupational safety, health (OSHA) and procedures of legal on engineering issues.

EKT346 PENGURUSAN UNTUK JURUTERA [MANAGEMENT FOR ENGINEERS]

No of Credits: 3

Course Synopsis:
This course aims to teach students on how to apply project management skills when undertaking projects and to provide basic tools of engineering economy to enable the students to carry out professional quality economic evaluations. At the end of the course, students will be able to identify and discuss issues and challenges faced by engineers relating to project management in the current economic scenarios.

Course Outcomes:
CO1 - Ability to analyze and evaluate project requirements and integrate the processes of Project management like work plans, scheduling, cost estimation and perform project evaluation.
CO2 - Ability to analyze and evaluate economic scenarios and integrate decision making process to engineering project and business ventures

EKT353 PRINSIP PEMPROSESAN ISYARAT DIGIT [PRINCIPLES OF DIGITAL SIGNAL PROCESSING]

No of Credits: 3

Course Synopsis:
Digital Signal Processing (DSP) has continued to have a major and increasing impact in many key areas of technology including telecommunication, computer vision, biomedicine, VLSI design etc. DSP is now at the core of many new emerging digital products and applications in the information society and is a core subject in most electronic/computer/communication engineering curricula. This course is three hour lecture per week and is designed to give students the necessary mathematical tools to analyze discrete time signals and systems. The course also includes various techniques for the

design and analyzing of digital filters and their application for multimedia signal processing e.g: speech and image.

Course Outcomes:
CO1 - Ability to apply the knowledge of mathematic tools for analyzing and evaluating the discrete time signal
CO2 - Ability to apply knowledge of discrete fourier transform and evaluate fast fourier transform structure.
CO3 - Ability to design and construct digital finite impulse response and infinite impulse response filters.
CO4 - Ability to analyze various signal processing techniques for a specific digital signal processing application.

EKT358 SISTEM PERHUBUNGAN [COMMUNICATION SYSTEMS]

No of Credits: 3

Course Synopsis:
This course is intended to cover the basic principles and concepts of communication engineering systems. It includes the theory of Amplitude modulation and Angle modulation. Basic digital modulation technique such as Pulse Amplitude Modulation (PAM), Pulse Position Modulation (PPM), Pulse Width Modulation (PWM) and Pulse Code Modulation (PCM) are also included in the course. Performance of communication system in the presence of noise is also considered.

Course Outcomes:
CO1 - Ability to identify the signal power and noise characteristics of the communication systems and analyze its overall performance in the presence of random signals.
CO2 - Ability to apply knowledge of analog and pulse modulation technique to produce a desired modulation signal in a system.
CO3 - Ability to assess and evaluate the performance of analog and pulse modulated signals.

EKT360 PROJEK REKABENTUK BERKUMPULAN [GROUP DESIGN PROJECT]

No of Credits: 3

Course Synopsis:
In this course, students will be divided into small groups working on design-based projects. Each group (consists of 3-4 students) will work on a discipline-related project which involves a complex engineering problem and design system, components or processes which integrates core areas and meeting the specified needs.

Upon completion of the course, students should be able to design one advanced electronic system component using related tools. Moreover, students are exposed to the method of problem solving, design process, and data analysis, with appropriate consideration for public health and safety, cultural, societal, and environmental.

Course Outcomes:
CO1 - Ability to apply theory and practical knowledge to solve engineering problems.
CO2 - Ability to design a solution with consideration of public health and safety, cultural, societal, and environmental.
CO3 - Ability to work in diverse teams and communicate effectively in a form of technical report, and presentation.
CO4 - Ability to demonstrate project management and finance principles of a project.

EKT421 KEJURUTERAAN PERISIAN [SOFTWARE ENGINEERING]

No of Credits: 3

Course Synopsis:
The course shall introduce principles and technique in software engineering, management integration concept, method or process and software metrics.

In addition, this course exposes presentation and discussion on specific software engineering method, documentation and tools. It also covers object based need analysis and modeling. This course explains about relevant method to verify and validate prototype developed.

Course Outcomes:
CO1 - Ability to apply knowledge of software engineering
CO2 - Ability to analyze engineering problems and develop related software engineering documentations
CO3 - Ability to write and present software engineering documentation in a team

EKT424 SISTEM MASA NYATA [REAL TIME SYSTEM]

No of Credits: 4

Course Synopsis:
The course shall discuss concepts relevant to real time system and concept which differentiates ordinary operating system and real time operating system. Focus and in depth coverage shall be on techniques on developing real time system application which incorporates concurrent and synchronize process on a target embedded board which runs POSIX compliant open source operating system.

Course Outcomes:
CO1 - Ability to apply knowledge of major concept relevant to real time system and RTOS.
CO2 - Ability to identify, formulate and solve problems utilizing algorithms of various RTOS concepts.
CO3 - Ability to design and develop software which adheres to basic principles of real time software requirements

EKT434 PENGATURCARAAN RANGKAIAN [NETWORK PROGRAMMING]

No of Credits: 3

Course Synopsis:
The aims of this course are to introduce the students of the programming in computer network and get familiar with the mechanism of protocols that consists in the network. The skills to programme the network protocols to works properly to transfer data from the sender to the receiver are exposed. The students are able to analyze, test, develop and design the protocols that are setting up a network.

Course Outcomes:
CO1 - Ability to identify and analyze the suitable protocol type (TCP and UDP) to make connection in network socket
CO2 - Ability to design and setting up elementary network programming
CO3 - Ability to design and implement the advanced socket into the network programming in a group project

EKT435 SISTEM PENGOPERASIAN MODEN [MODERN OPERATING SYSTEM]

No of Credits: 3

Course Synopsis:
This course introduces the fundamental of operating systems. It also covers theoretical and practical issues underlying operating system design and implementation. The topics include inter process communication, process scheduling, deadlock, memory management, virtual memory and file management system. Formal principles are illustrated with examples and case studies of modern operating system.

Course Outcomes:
CO1 - Ability apply knowledge of operating systems structures and basic

principles used in the design of modern operating systems.
CO2 - Ability to identify, formulate and solve problems related to process ,thread, resource access control mechanisms (concurrency etc.), physical and virtual memory, scheduling, I/O and files.
CO3 - Ability to design, implement and evaluate multiprocess / multithreaded synchronized programs using world Standard API.

EKT445 PROJEK TAHUN AKHIR I [FINAL YEAR PROJECT I]

No of Credits: 2

Course Synopsis:
This course aims to expose students the method of problem solving, data analysis, prototype design and research in computer and communication engineering fields. The student will be given an engineering problem (or encourage to identify on their own) and gain expertise by problem solving, investigation, research writing and effective presentation of the research outcome in the form of thesis and seminar.

Course Outcomes:
CO1 - Ability to apply, identify, research and formulate the theory and practical knowledge to solve engineering problems.
CO2 - Ability to apply knowledge and design the appropriate research methodology to solve engineering problems.
CO3 - Ability to communicate effectively in written and oral forms to defend and justify the proposed solutions.

EKT446 PROJEK TAHUN AKHIR II [FINAL YEAR PROJECT II]

No of Credits: 4

Course Synopsis:
This course aims to expose students the method of problem solving, data analysis, prototype design and research in computer and communication engineering fields. The student will be given an engineering problem (or encourage to identify on their own) and gain expertise by problem solving, investigation, research writing and effective presentation of the research outcome in the form of thesis and seminar.

Course Outcomes:
CO1 - Ability to apply, identify, research and formulate the theory and practical knowledge to solve engineering problems.
CO2 - Ability to investigate using research-based approach and design the appropriate solutions to solve the engineering problems.
CO3 - Ability to apply appropriate techniques, tools and resources to produce engineering solutions.
CO4 - Ability to communicate effectively in written and oral forms to defend and justify the engineering solutions.

EKT460 PEMPROSESAN IMEJ [IMAGE PROCESSING]

No of Credits: 3

Course Synopsis:
This subject is prepared for the growing needs of scientists and engineers in digital imaging and computer vision. The course will introduce a core knowledge of digital image processing in spatial and frequency domains by applying several mathematical tools. The syllabus covers the fundamental theory of image sampling, filtering, compression and multiresolution image analysis. Topics covered include image enhancement in spatial and frequency domain, image restoration model, image segmentation, linear and nonlinear image classification and statistical image analysis. The students will be exposed to various applications of image processing such as biometric recognition system and machine vision inspection system.

Course Outcomes:
CO1 - Ability to evaluate and analyze digital image in spatial and frequency domain.
CO2 - Ability to design a filter in frequency and spatial domain for image enhancement.

CO3 - Ability to analyze multiresolution image analysis, image processing application and compression in gray scale and color image using appropriate modern tools.

EKT466 KEPINTARAN BUATAN [ARTIFICIAL INTELLIGENCE]

No of Credits: 3

Course Synopsis:
In this course, the students will learn the fundamental concepts of Artificial Intelligence (AI) and apply them to the design and intelligent agents that solve real-world AI problems, including problems in search, problems involving uncertain and knowledge reasoning; and problems in machine learning.
Course Outcomes:

CO1 - Ability to design solutions for complex engineering problems by using artificial intelligence search techniques.
CO2 - Ability to design solutions for complex engineering problems by using probabilistic reasoning techniques.
CO3 - Ability to design solutions for complex engineering problems by using machine learning techniques.

EKT473 PENGENALAN KEPADA DATA ANALITIK [INTRODUCTION TO DATA ANALYTIC]

No of Credits: 3

Course Synopsis:
This course will introduce students to the analysis and management of big data using current techniques and open source software tools. Data and case studies will be drawn from diverse sources including health and informatics, life sciences, web traffic and etc. The general principles of analysis, investigation and reporting will be covered. Students will be encouraged to validate and critically assess the results of analysis.

Course Outcomes:
CO1 - Ability to formulate the characteristics of the datasets by using suitable exploratory data analysis with visualization.
CO2 - Ability to design analytical models by using machine learning techniques.
CO3 - Ability to validate and critically assess the result of the analysis.

EKT474 OBJEK RANGKAIAN INTERNET [INTERNET OF THINGS]

No of Credits: 3

Course Synopsis:
In this course, students will be introduced to IoT hardware design, IoT systems integration, sensors and actuator controls, IoT device integration to network communications and cloud computing.

Course Outcomes:
CO1 - Ability to identify and apply sensors and actuators to IoT devices.
CO2 - Ability to analyze and interface input-output signals using external interfaces on IoT devices.
CO3 - Ability to design and integrate a complete Internet of Things solution using appropriate method and tools.

ENT110 Pengaturcaraan Komputer [Computer Programming]

No of Credits: 3

Course Synopsis:
This course introduces students the concept of computer programming with emphasis on engineering problems using C language. The aims are to provide students with programming, and problem- solving skills. Coverage of the course includes the syntax, variables, data types, control flow, function, arrays, pointers, structures and file processing. Throughout the course, students are expected to analyze and to write a C program for various applications.

Course Outcomes:
CO1 - Ability to analyze source codes.
CO2 - Ability to develop a complete program for an application

ENT114 Teori Litar [Circuit Theory]

No of Credits: 3

Course Synopsis:
This course provide the fundamentals of electrical elements, basic laws such as Kirchorff's law, Nodal analysis, Thevenin's law and also circuit theorem i.e. mesh analysis, nodal analysis andsuperposition theorem. Calculate current, voltage and power in ac circuits using phasor approach. Study the mutual Inductance and transient response in RC, RL and RLC circuits.

Course Outcomes:
CO1 - Ability to apply analytical method to analyze DC & AC circuits.
CO2 - Ability to apply basic laws and circuit theorem to solve DC & AC problems.
CO3 - Ability to design and evaluate basic circuirs to meet specifications.

ENT115 Analog Elektronik I [Analogue Electronics I]

No of Credits: 3

Course Synopsis:
This course provides fundamental knowledge on analogue electronics. The student will be exposed to the basic structure of semiconductor materials, principle operation of selected electronic components and fundamental of electronic circuit design. Students will be introduced with several types of selected electronic components which are Diode, Bipolar Junction Transistor (BJT), Field Effect Transistor (FET) and Thyristors

Course Outcomes:
CO1 - Ability to explain the theory of semiconductor materials and selected electronic devices.
CO2 - Ability to illustrate the operation and application of selected electronic devices
CO3 - Ability to analyze and evaluate circuit or biasing of selected electronic devices.

ENT116 Prinsip Elektronik Digit [Digital Electronic Principes]

No of Credits: 3

Course Synopsis:
In this course, the students will be exposed to the basic principle digital systems, digital circuit design and analysis. Lecture and practical will cover Algebra Boolean, Numbering system, Basic Logic Gate, Combinational Logic Circuit Design, Bi-stable Memory Devices, Sequential Circuits Design, Programmable Logic Devices, Signal Interfacing and Processing.

Course Outcomes:
CO1 - Able to analyze the combinational and sequential logic circuits
CO2 - Be able to design and construct simple circuits and system of basic digital electronics

ENT207 Mekanik Kejuruteraan [Engineering Mechanics]

No of Credits: 3

Course Synopsis:
The course provides a foundation for the students to analyze mechanical problems using simple and logical methods. The syllabus is designed to enable non-mechanical engineering students to have strong fundamental to solve mechanical problems.

Course Outcomes:
CO1 - Ability to solve two dimensional (2D) problems in statics condition.
CO2 - Ability to solve three dimensional (3D) problems in statics condition.

CO3 - Ability to solve problems of a particle and rigid body in dynamics condition.

ENT216 Analog Elektronik II [Analogue Electronics II]

No of Credits: 3

Course Synopsis:
This course provides further knowledge on analogue electronics. The student will be exposed to the concept and operation of amplifiers including cascade amplifier, power amplifier and the operational amplifier. Students will also be introduced with the operating principles of active filters, feedback circuits, oscillators and voltage regulators.

Course Outcomes:
CO1 - Ability to explain principles and analyze analogue component, devices and electronic circuit application.
CO2 - Ability to design analogue electronic circuit for any application
CO3 - Ability to propose an analogue electronic circuit given any electronic components and specification.

ENT217 Prinsip Isyarat dan Sistem [Principles of Signal and System]

No of Credits: 3

Course Synopsis:
This course introduces the different types of signals and networks present in an engineering systems. Signal and system representations are discussed for both time (Fourier Series) and frequency domains (Fourier and Laplace transform). The concept of transfer function is introduced and other applications of the Laplace transform such as for the solution of differential equations, and circuit analyses are presented. The application of z-transform is introduced in the analysis of signals and systems. At the end of this course, the students are able to analyze different types of signals using numerous transformation techniques and evaluate its performance

Course Outcomes:

CO1 - Ability to comprehend the concept and identify specific type of signals and system.
CO2 - Ability to analyse the signal using time and frequency domain techniques.
CO3 - Ability to develop and formulate a system using both time-domain and frequency domain.

ENT218 Biomekanik [Biomechanics]

No of Credits: 3

Course Synopsis:
The course aims to introduce the fundamental of biomechanics which covers the engineering mechanics, anatomy and basic applications on the analysis of the human body as mechanical systems.

Course Outcomes:
CO1 - Ability to define, explain and compare the biomechanics and anatomy terminologies and their relationships
CO2 - Ability to differentiate and analyze the relationship of kinematics and kinetics of a particle and rigid body.
CO3 - Ability to solve engineering problems by choosing appropriate method that related to statics and dynamics.

ENT219 Biobahan [Biomaterials]

No of Credits: 3

Course Synopsis:
This course is designed to provide a fundamental knowledge of materials that are commonly utilized in engineering and biomedical field specifically. Various types of materials currently being utilized for biomedical applications and their biocompatibility with references to the biological environments will

be discussed.

Course Outcomes:

CO1 - Ability to describe the concept of biocompatibility and analyze basic properties of materials in medical applications.

CO2 - Ability to propose the suitable materials for specific biomedical applications and explain their effects with respect to biocompatibility.

CO3 - Ability to discuss biomaterials-tissue interactions,illustrate the main components of biomedical implants and justify the important characteristics of the implanted materials.

ENT224 Lukisan Kejuruteraan dan Rekabentuk Terbantu Komputer [Engineering Drawing and Computer Aided Design]

No of Credits: 2

Course Synopsis:

This course provides an introduction into Mechanical and Electronic Engineering drawing through the use of computer aided design software. The first part of the course covers Mechanical Drawing which involves sketching techniques, multi-view projections, pictorial, dimensioning, designing parts, assembling and structural analysis. The second part of the course concerns on Electronic Drawing which includes the processes of drawing schematic circuit,designing printed circuit board and testing the circuit in simulation. At the end of the course, the students are able to design both mechanical and electronics parts

Course Outcomes:

CO1 - Ability to draw 2D drawing using computer aided design software according to specific dimensions and constraints.

CO2 - Ability to design, assemble and project a 3D model using computer aided design software and simulate the motion of the model.

CO3 - Ability to construct electronic schematic diagram, simulate the circuit's response and design PCB layout using computer aided design software

ENT265 Mikropengawal dan Pengantaramuka [Microcontroller and Interfaces]

No of Credits: 4

Course Synopsis:

This course is designed to introduce the Microchip PIC 18 microcontroller architecture and help the students to explore the embedded system application. This includes the knowledge of PIC 18 hardware system, assembly language programming, 1/0 interfacing, arithmetic operations, data transfer, timers, serial port programming, interrupts, LCD and keyboard interfacing and data converters. The course also helps student to design and develop simple real-world applications based on PIC 18 microcontroller system.

Course Outcomes:

CO1 - Ability to describe and explain the theory and basic of computer architecture, microprocessor and/or microcontroller

CO2 - Ability to analyze and apply the concept and requirements of microcontroller-based system.

CO3 - Ability to develop a microcontroller based system based application on given specifications

ENT310 Sistem Kawalan Lelurus [Linear Control Systems]

No of Credits: 4

Course Synopsis:

This course will introduce students to linear control system techniques for analysis and design; includes mathematical modeling of electrical, mechanical and biomedical systems, stability analysis,time domain analysis and frequency domain analysis. PID and lead-lag controllers design using root locus will be discussed. The controller performance will be evaluated both in time and frequency domains. MATLAB software will be used for the analysis and design. At the end of the course, the students should be able to analyze,

design and evaluate controlled systems.

Course Outcomes:

CO1 - Ability to obtain the mathematical model for electrical, mechanical and biomedical systems.
CO2 - Ability to perform system response analysis and stability in time domain.
CO3 - Ability to perform system response analysis and stability in f requency domain
CO4 - Ability to design and evaluate PID and lead-lag controllers.

ENT316 Asas Sistem Komunikasi [Principles of Communication System]

No of Credits: 3

Course Synopsis:

This course is designed to introduce the principles of communication system and its applications in communication, broadcasting and other modern equipments. At the end of the course, the students are expected to provide clear understanding in fundamental communication system, relate the principles to various applications in engineering field and propose a conceptual model of a communication setup

Course Outcomes:

CO1 - Ability to analyze mathematical function of communication system model.
CO2 - Ability to evaluate performance of elements in communication device
CO3 - Ability to propose a conceptual setup of a communication system based on specific requirement

ENT319 Termobendalir [Thermofluids]

No of Credits: 3

Course Synopsis:

The objective of the course is to expose the students to the fundamental principles of fluid mechanic, thermodynamic, heat transfer, and also fundamental application of fluid mechanics in Biomedical Engineering. In Fluid Mechanics attention will be given to the fundamental principles of fluid mechanics and definition, fluid statics, fluid dynamics, and flow over bodies. In Thermodynamics focus is on the fundamental principles of thermodynamics and definition, the Zeroth law, the first law and the 2nd law. In Heat Transfer, different modes through conduction, convection and radiation to be covered.

Course Outcomes:

CO1 - Ability to explain and analyze the fundamental principles of fluid mechanics.
CO2 - Ability to explain and solve fundamental principles of thermodynamics related problems
CO3 - Ability to analyze the fundamental principles of heat transfer.

ENT320 Mekanik Bahan [Mechanics Of Materials]

No of Credits: 3

Course Synopsis:

This course provides the theories of mechanics of materials. The theories in statics and biomaterials will be extended and emphasized in this course the course covers the low of mechanics, concept of stress and strain, torsion and bending. Furthermore, it also covers the stress and strain transformation

Course Outcomes:

CO1 - Ability to apply the fundamental theory of solid mechanics in engineering problems

CO2 - Ability to evaluate problems related to various loadings
CO3 - Ability to solve the combination cases by using the stress and strain transformation

ENT321 Keselamatan, Piawaian dan Etika Dalam Kejuruteraan Biopeerubatan [Safety, Standards and Ethics In Biomedical Engineering]

No of Credits: 3

Course Synopsis:
The course provides an introduction to the acts and standards used in biomedical engineering. This includes ethical issues and the power system safety of electrical appliances especially medical equipments. The course also focuses on the safety issues in the healthcare institution which particularly emphasized on medical devices and their interrelation with the hospital's environment. At the end of this course, students will appreciate on how acts and standards are established with the requirements in compliance with the acts and standards. Safety aspects and measures will be emphasized so that students will be able to control and be prepared in any situation involving human life.

Course Outcomes:
CO1 - Ability to demonstrate safety awareness and ANALYSE hazards when dealing with active medical device
CO2 - Ability to EVALUATE applications of regulatory standards in ensuring safety and reliability of medical technology.
CO3 - Ability to regulatory standards and good ethical responsibilty when FORMULATE solution for problems related to healthcare technology.

ENT323 Mesin Elektrik dan Pemacu [Electrical Machines and Drives]

No of Credits: 3

Course Synopsis:
This course provides the students both theories and applications of electrical machines and drives which include different types of motor, generator and transformer. This course allows the students to identify and select a suitable electrical machines and drives for various applications.

Course Outcomes:
CO1 - Ability to perform analysis on the characteristics of different types of electrical machines
CO2 - Ability to perform analysis and evaluate the performance of different types of electrical machines.
CO3 - Ability to select suitable electrical drive and design related driver circuits for engineering applications

ENT324 Pemprosesan Isyarat Digit dalam Aplikasi-Aplikasi Biopeerubatan [Digital Signal Processing in Biomedical Applications]

No of Credits: 3

Course Synopsis:
This course provides an introduction to different types of signals and systems and; explains the application of different types of transform domains for analyzing the different types of signals and systems. The course covers the application of Discrete Fourier Transform (DFT) and Fast Fourier Transform (FFT) for analyzing the signals. This course also covers the design of Finite Impulse Response (FIR) and Infinite Impulse Response (IIR) filters. At the end of this course, the biomedical applications of digital signal processing and digital signal processors are discussed. Data processing software is used in the laboratory sessions. Data processing software usually programmed in the same languages as other science and engineering tasks

Course Outcomes:
CO1 - Ability to analyse and sketch biomedical signals using different types of transform domains.
CO2 - Ability to analyse and propose suitable types of transform domain algorithms to manipulate biomedical signal data in medical application
CO3 - Ability to select and design suitable digital filters to measure biomedical signals.

ENT325 Projek Rekabentuk I [Design Project I]

No of Credits: 3

Course Synopsis:
An advanced course to medical electronics & bioinstrumentation, the students will be exposed to the knowledge of designing bioelectrical amplifier and filters, application of microcontrollers in a data acquisition system, and platforms for telemedicine applications. Their theoretical knowledge will be tested in designing instrumentation for biomedical applications

Course Outcomes:
CO1 - Ability to design an instrumentation circuit to acquire biomedical signals
CO2 - Ability to develop a PC-based data acquisition device which is capable of acquiring biomedical signals
CO3 - Ability to demonstrate the project needs, design contsraints and requirement for the selected project in Biomedical Electronic Engineering field.

ENT390 Bioinstrumentasi I [Bioinstrumentation I]

No of Credits: 3

Course Synopsis:
This course provides an intensive coverage to medical electronics and bio-instrumentation. It will cover sensors and instrumentationfor medical applications, as well as measurement of biosignals such as electrocardiogram (ECG), electroencephalography (EEG),blood pressure and respiratory systems. At the end of the course, the students are expected to provide clear understanding in cariousmedical instrument principles and demonstrate the ability to apply, evaluate and integrate basic sensors and design basic electronics circuits for medical applications.

Course Outcomes:
CO1 - Ability to identify, apply and distinguish sensors and transducers for measurement of biological parameters in medical instrumentation system.
CO2 - Ability to discuss, explain and analyse design requirements and constraints for specific medical devices
CO3 - Ability to design, assemble, analyse, and evaluate basic circuits in medical instrumentation

ENT402 Pemprosesan Imej Perubatan [Medical Image Processing]

No of Credits: 3

Course Synopsis:
This course is designed to introduce a basic knowledge on medical image processing. It includes basic aspects related to image fundamental, spatial filtering, enhancement, segmentation, morphological image processing and image processing in biomedical applications. This subject will expose the student to process the medical images for different medical applications

Course Outcomes:
CO1 - Ability to explain, design and analyze the fundamental of image processing.
CO2 - Ability to select and evaluate image processing techniques for medical image applications

ENT403 Sistem Kecerdikan Buatan [Artificial Intelligence Systems]

No of Credits: 3

Course Synopsis:
This course is intended to explore the ideas and developments in Artificial Intelligence (AI). It starts with an introduction to AI, followed by specific topics include artificialneural networks, fuzzy systems, and evolutionary computation. Some case studies of AI for biomedical engineering will be presented and discussed. At the end of this course students should know a few major techniques in AI and has experience how to apply the techniques to solve biomedical engineering problems.

Course Outcomes:
CO1 - Ability to explain and perform analysis on various AI techniques.
CO2 - Ability to develop and evaluate AI system for various applications.

ENT405 Biopenderia dan BioMEMS [Biosensors and BioMEMS]

No of Credits: 3

Course Synopsis:
This course introduced the concept of biosensors, the main structure of biosensors, various sensing mechanism, and types of transducer used in biosensor technology. Students will be also exposed to bioelectronic based analytical devices that are typically used in clinical environment. The operation of biosensors in vivo and in vitro and issues in biocompatibility and biomaterial used in biosensor are discussed in details. The fundamental concept of Biomicroelectromechanical Systems (BioMEMS) is introduced in this course including the main principles and its medical applications

Course Outcomes:
CO1 - Ability to DISCUSS and EXPLAIN the concept and fundamental principles of biosensors.
CO2 - Ability to DISCUSS and EXPLAIN the concept and principles of MEMS fabrication and technology.
CO3 - Ability to DISCUSS the applications of biosensor and bioMEMS in biomedical engineering and their current/future trend.

ENT406 Robotik Perubatan [Medical Robotics]

No of Credits: 3

Course Synopsis:
The course is designed to introduce the basic principles of robotic technology which includes kinematics and kinetics of manipulator motion, safety and application of robotics in medical field. In addition, the course will provide some computational foundation of robotic technology. At the end of the course, students are expected to understand the main concept of robot manipulator and capable in analyzing and solving related problems

Course Outcomes:
CO1 - Ability to explain and analyze the fundamental principles of robotic technology.
CO2 - Ability to analyze and solve kinematics and kinetics aspect of manipulator.
CO3 - Ability to relate the fundamental aspects of robotic technology for medical application

ENT413 Pengimejan Perubatan [Medical Imaging]

No of Credits: 3

Course Synopsis:
In this course the students are introduced to the basic principle of medical imaging modalities. This will provide them the understanding of various types of diagnostic radiology such as general X-Ray, Mammography, Computed Tomography (CT) and Magnetic Resonance Imaging (MRI). Upon completion, students will be able to apply the fundamental principles and evaluate the efficiency of the medical imaging modalities that have been

used in healthcare industry

Course Outcomes:
CO1 - Ability to analyze and explain the concept of medical maging modalities used in clinical application.
CO2 - Ability to identify and propose the most suitable imaging modalities for specific needs.
CO3 - Ability to identify, and recognise safety issue and propose safety measure to prevent injuries or radiation.

ENT415 Bioinstrumentasi II [Bioinstrumentations II]

No of Credits: 3

Course Synopsis:
This course is a continuation from Bioinstrumentation I course. This course provides in-depth look at various types of medical equipment, such as measuring, recording and monitoring instruments and therapeutic equipment. At the end of the course, the students are expected to provide clear understanding in various medical instrumentation principles and demonstrate the ability to design basic electronic circuits for medical applications.

Course Outcomes:
CO1 - Ability to discuss, explain and analyse design requirements and constraints for measuring, recording and monitoring instruments
CO2 - Ability to discuss, explain and analyse design requirements and constraints for therapeutic equipment.

ENT417 Projek Rekabentuk II [Design Project II]

No of Credits: 3

Course Synopsis:
This course will focus on the design of a biomedical instrumentation for medical applications. Students will utilised their theoretical knowledge in various aspects of bioinstrumentation to solve a biomedical related problem by identifying problem needs, and developing potential designs as well as construct and testing prototypes. Students will be introduced to the principle of engineering design process at the beginning of the course, followed by selection of the project theme. This course provides the opportunity for the students to apply and develop their design, executing project management and polished their interpersonal and communication skill.

Course Outcomes:
CO1 - Apply technical knowledge and problem-solving skills to serve community, society and profession
CO2 - Ability to design and evaluate the specific sub-system in the design device and system.
CO3 - Ability to conduct economic evaluation of the selected project in Biomedical Engineering field

ENT418 Organ Buatan [Artificial Organs]

No of Credits: 3

Course Synopsis:
This course covers the artificial organ for the heart, kidney, lung, pancreas and ear. These topics focus on the implementation of artificial organs by understanding the anatomical, physiological and biological transport aspects as well as mathematical concepts of the respective organs. At the end of the course, students are expected to have the ability to apply the fundamental principles of the artificial organs, perform simple modeling and able to propose the suitable methods/devices for each problematic organ.

Course Outcomes:
CO1 - Ability to analyze mathematical concepts of human physiology, biotransport and artificial organs
CO2 - Ability to illustrate modeling and simulation of human physiological system and artificial organs.

CO3 - Ability to discuss concepts, fundamental principle and propose appropriate artificial organ devices for certain problems

ENT442 Jurutera Profesional [Professional Engineers]

No of Credits: 2

Course Synopsis:
This course aims to explain the main concepts in engineering ethics, risk management and occupational safety and health as well as to expose the students to basic of law in the engineering context. The materials will be of introductory nature to enable engineers to appreciate factors that have to be taken into account in decision-making. At the end of the course, students will be able to identify and discuss issues and challenges faced by engineers relating to engineering ethics, risk management and to understand the legal requirements related to engineering field

Course Outcomes:
CO1 - Ability to identify the issues and challenges and propose solutions based on engineering ethics.
CO2 - Ability to explain and evaluate the sustainable and impact in sociental and environmental context
CO3 - Ability to identify hazards; design the solutions for risk management, occupational safety, health (OSHA) and procedures of legal on engineering issues.

ENT443 Pengurusan Untuk Jurutera [Management For Engineers]

No of Credits: 3

Course Synopsis:
The course aims to teach students on how to apply project management skills when undertaking projects. This course is designed to provide basic tools of engineering economy to enable student to carry out professional quality economic evaluations. At the enf of the course, students will be able to identify and dicuss issues and challanges faced by engineers relating to project management in the current economic scenarios.

Course Outcomes:
CO1 - Ability to analyse and evaluate the process of project management, develops work plans, do cost estimation and perform project evaluation.
CO2 - Ability to analyse and evaluate economic scenarios and apply decision making process to engineering project and business venture.

ENT222 TEORI MEDAN ELEKTROMAGNETIK [ELECTROMAGNETIC FIELD THEORY]

No of Credits: 3

Course Synopsis:
The course provides a fundamental knowledge on electromagnetic. Student will be exposed to basic postulates of electrostatic and electromagnetic fields and able to solve related problems. On completion of this course, students should have a firm grasp of basic electromagnetic and identify their characteristic in different situations.

Course Outcomes:
CO1 - Ability to formulate and solve problems in electromagnetism using appropriate mathematical techniques.
CO2 - Ability to apply Maxwell's Equation to solve electromagnetism problems.
CO3 - Ability to solve electromagnetism problems associated with application in electrical and electronic.

ENT445 PROJEK TAHUN AKHIR I [FINAL YEAR PROJECT I]

No of Credits: 2

Course Synopsis:
In this course, students will be applying the knowledge they have learned throughout this programme by implementing them in a research project which is carried out for two semesters. In the first semester, focus is given on the preparation of work schedule, identifying the objectives, and writing the research methodology. Students are expected to begin project work according to the planned schedule.

Course Outcomes:
CO1 - Ability to identify research problems, develop techniques for information gathering and conduct literature review.
CO2 - Ability to conduct investigative research and select approriate methodology to solve research based engineeting issues(s)/ problem(s)

ENT446 PROJEK TAHUN AKHIR II [FINAL YEAR PROJECT II]

No of Credits: 4

Course Synopsis:
In this course, students will be applying the knowledge they have learned throughout this programme by implementing them in a research project which is carried out for two semesters. In the second semester, focus is given on the project work (experiments, simulation,etc), analysis of results and final report writing. Students are expected to complete project work according to the planned schedule.

Course Outcomes:
CO1 - Ability to identify research problems, develop techniques for information gathering and conduct literature review.
CO2 - Ability to conduct investigative research and select approriate methodology to solve research based engineeting issues(s)/ problem(s)
CO3 - Ability to delover individual abalysis and judgement in research findings and capable of being assessed independently.
CO4 - Ability yo utilize approriate modern technology/tools in conducting research.
CO5 - Ability to preppare and delover both written and oral presentation effectively by using computers and multimedia technology.

PCT111 KEMAHIRAN KEJURUTERAAN [ENGINEERING SKILLS]

No of Credits: 3

Course Synopsis:
This subjecf is 100% practical coursework and carried out 3 unils credit hours.This course contains six modules which are Basic Workshop, Machining, Wiring, PCB Design, PLC, AutoCAD and technical Drawlng that specificaly planned for electronic based programs.

Course Outcomes:
CO1 - Ability to APPLY and CONSTRUCT a basic skill and standard \ practiced of mechanical machines and equipment.
CO2 - Ability to APPLY and CONSTRUCT the basic skills and standard practiced of domestic wiring.
CO3 - Ability to APPLY and CONSTRUCT a logic system using common controller tool (PLC).
CO4 - Ability to APPLY CONSTRUCT a standard practiced of manual technical drawing and able to design a product using common software (AutoCAD)
CO5 - Ability to APPLY and CONSTRUCT the basic skills and standard practiced of PCB layout design and fabrication process.

PGT220 REKABENTUK VLSI [VLSI DESIGN]

No of Credits: 3

Course Synopsis:
This course will cover various important elements for VLSI design such as sequential circuit, clock design, DSM Interconnect and Power Dissipations and Low Power Design

Course Outcomes:
CO1 - Ability to construct and experiment (simulate) logic circuits at transistor level using schematic entry as well as netlists format.
CO2 - Ability to produce the layout design of a circuit based on the design rules specified and understand the principles of fabrication related
CO3 - Ability to analyze CMOS transistor characteristics and to express the performance estimation of a circuit

PGT320 ELEKTRONIK KUASA [POWER ELECTRONICS]

No of Credits: 3

Course Synopsis:
Fundamental Concepts of Power Electronics, Power Semiconductor Devices, Power Electronic Circuits, AC-DC Conversion, AC-AC Conversion, DC-DC Conversion and DC-AC Conversion.

Course Outcomes:
CO1 - Ability to EXPLAIN power electronic systems operation,applications area and need for efficiency design
CO2 - Ability to DESCRIBE different types of power semiconductor device; power diode, SCR, BJT, IGBT, GTO and MOSFET.
CO3 - Ability to CALCULATE, ANALYZE and DESIGN the AC-DC conversion, AC-AC conversion, DC-DC conversion and DC-AC conversion.

PGT321 REKABENTUK SISTEM VLSI [VLSI SYSTEM DESIGN]

No of Credits: 3

Course Synopsis:
This course will cover various important elements for VLSI design such as sequential circuit, clock design, DSM Interconnect and Power Dissipations and Low Power Design

Course Outcomes:
CO1 - Ability to analyze the behavior of the sequential design.
CO2 - Ability to design and analyze the circuit characterization and overall performance.
CO3 - Ability to design and analyze the circuit characterization and overall performance.

PGT322 MIKROPENGAWAL [MICROCONTROLLER]

No of Credits: 3

Course Synopsis:
The aim or this cource is to study the concept and requirement of embeded-ded system. This includes the characteristic of embededded system, hardware and software development, signle chip microecontroller and programming technique in assembly language and C, basic multitasking concept, developing and embedded system application.

Course Outcomes:
CO1 - Ability to analyze hardware architecture of microcontroller system and sketch the fundamental diagram describing its behavior
CO2 - Ability to design and write a structured programmed of microcontroller programing for the system application
CO3 - Ability to design differential amplifier and evaluate embedded systembasid in a single chip microcontroller

PGT323 VERIFIKASI ATAS CIP [VERIFICATION ON CHIP]

No of Credits: 3

Course Synopsis:
The aim of this course is to provide the introduction of system verilog language that will be used for verification to describe a basic coverage driven, constrained random layered testbench using Object Oriented Programming (OOP).

Course Outcomes:
CO1 - Ability to explain the concept of fault, fault dominance, fault equivalence and carry out testability measures.
CO2 - Ability to design and analyze test generation for stuck-at faults
CO3 - Ability to design and evaluate BIST structure for test generation and test compaction.

PGT420 INSTRUMENTASI [INSTRUMENTATION]

No of Credits: 3

Course Synopsis:
This course covers the fundamental of electronic instrumentation. This includes the working principle and transduction properties of sensors and transducers. Importance and techniques of signal conditioning is emphasized. Element and principle of data acquisition and their applications are discussed. Modern standalone and computer-based measurement instruments are covered.

Course Outcomes:
CO1 - Ability to explain the fundamental concept of electronic instrumentation
CO2 - Ability to analyze electronic instrumentation comprising of sensora, data acquisition, data storange and data display
CO3 - Ability to evaluate embedded computer-based and networked electronic instrumentation

PGT421 PENGUJIAN SEMIKONDUKTOR [SEMICONDUKTOR TESTING]

No of Credits: 3

Course Synopsis:
This course is designed to provide a strong foundation in conceptual understanding of semiconductor device testing. This conceptual knowledge of Automated Testing Equipment (ATE) instrumentation, basic semiconductor devices and test methods will provide the knowledge foundation. The case studies and labs will help build critical thinking abilities which is a very important skill for troubleshooting.

Course Outcomes:
CO1 - Ability to analyse and measure device datasheet's electrical parameter
CO2 - Ability to design ATE test solution for analogue devices
CO3 - Ability to deeisgn ATE test solution for logic devices

PGT422 REKABENTUK LITAR ANALOG BERSEPADU [ANALOG INTEGRATED CIRCUIT DESIGN]

No of Credits: 3

Course Synopsis:
The course covers MOS characteristics, Second order effects, Basic Cells, Single stage Amplifier, Differential amplifier, MOS Op amp and Op-amp Application.

Course Outcomes:
CO1 - Ability to Analyse the MOS transistor operation and basic building block for analog circuit
CO2 - Ability to design single stage amplifier

CO3 - Ability to design differential amplifier

PGT424 INTERNET BENDA [INTERNET OF THINGS]

No of Credits: 3

Course Synopsis:
This course is practical in nature. It introduces current enabling technologies, architectures and applications of IOT using real/actual devices. These devices are integrated within local area network and the internet wirelessly. Implementation of these seamless interconnections and interactions are made between people and machines. Examples of these interactions manifest in home, transport, health, office and factory automation and security. Emphasis is given in hands-on applications involving Bluetooth, RFID, WIFI and GSM technology.

Course Outcomes:
CO1 - Ability to select appopriate IOT technology
CO2 - Ability to integrate sensors actuators and embedded systems
CO3 - Ability to implement IOT based application

VGT111 KEMAHIRAN TEKNOLOGI DAN PEMBANGUNAN DALAM AUTOMASI ELEKTRONIK I [TECHNOLOGY SKILL AND DEVELOPMENT IN ELECTRONIC AUTOMATION I]

No of Credits: 2

Course Synopsis:
The aim of this course is to provide students with basic technical skills in electronic automation. This includes basic knowledge of technical drawing, software based drawing (CAD) and Print Ciruit Board (PCB) Design.
Course Outcomes:

CO1 - Ability to respond a standard practiced of manual technical drawing and able to construct a product using Computer-aided Design (CAD) tool
CO2 - Ability to apply the basic skills and standard practiced of print circuit board (PCB) layout design using software

VGT112 TEKNOLOGI PEMBANGUNAN PRODUK [PRODUCT DEVELOPMENT TECHNOLOGY]

No of Credits: 5

Course Synopsis:
This course covers the operational behaviour of circuit components, including resistor, capacitor, inductor, diode, transistors and up until integrated circuit (ICs). Important circuits, such as operational amplifier (op-amp) based circuits are also discussed and emphasized. An introduction to digital concept is also covered in this course.

Course Outcomes:
CO1 - Explain the operational behaviour of circuits components
CO2 - Ability to construct op-amp based circuits and perform the operation
CO3 - Verify the working principle of electronic circuits

VGT113 SISTEM PEMBUATAN FLEKSIBEL I [FLEXIBLE MANUFACTURING SYSTEM I]

No of Credits: 5

Course Synopsis:
This course will be further advancement related to the automation system and integration. The topics will cover on advanced PLC Programming (FBD, Structured Text, Graph, etc); basic electrical & electronic circuitry; electromechanical; pneumatic and electro-pneumatic systems and hydraulics and electro-hydraulics systems.

Course Outcomes:
CO1 - Ability to analyse the key concepts of automation technology principle, components and control sysem.
CO2 - Ability to construct and integrate automation control system application.
CO3 - Ability to justify the implementation of automation components such as sensor, actuator and drive/motion system

VGT114 PENGATURCARAAN SISTEM TEKNOLOGI I [TECHNOLOGY SYSTEM PROGRAMMING I]

No of Credits: 2

Course Synopsis:
This course delivers the competency to student in applying the fundamental programming concepts and able to analise problem and produce the solution using algorithm development tools. Solve the problem using fundamental programming (C or C#) The course will be delivered using the basic programming language that is trending at the current market.

Course Outcomes:
CO1 - Apply the fundamental programming concepts in solving problem using programming tools
CO2 - Construct the algorithm appropriate to given problem
CO3 - Demonstrate continual desire in developing algorithm for the given problem

VGT121 KEMAHIRAN TEKNOLOGI DAN PEMBANGUNAN DALAM AUTOMASI ELEKTRONIK II [TECHNOLOGY SKILL AND DEVELOPMENT IN ELECTRONIC AUTOMATION II]

No of Credits: 4

Course Synopsis:
This course aims to demystify the digital electronics through hands-on work in the lab creating simple machines with embodied behaviors. This course brings students over the beginner's threshold to a basic understanding of the use, terminology and potential of digital electronic. The skills and concepts taught in this course are presented from an interdisciplinary approach which merges practices in sciences and technology.

Course Outcomes:
CO1 - Ability to describe Boolean functions and logic circuit in digital applications.
CO2 - Ability to construct simple logical operations using combinational and sequential logic circuits.
CO3 - Ability to build the digital logic systems.

VGT122 RANGKAIAN, PENUKARAN DAN PENGHALAAN [NETWORK, SWITCHING AND ROUTING]

No of Credits: 2

Course Synopsis:
This course covers networking structure, and functions. The course introduces the principles and structure of IP addressing and the fundamentals of networks, switching and routing.

Course Outcomes:
CO1 - Ability to describe the fundamental concept of networking.
CO2 - Ability to setup the local area network and identify the network IP.
CO3 - Ability to develop a small network.

VGT123 PENGATURCARAAN SISTEM TEKNOLOGI II [TECHNOLOGY SYSTEM PROGRAMMING II]

No of Credits: 4

Course Synopsis:
This course delivers the competency to student in developing programs

taht can provide programmable solution using high level programming. The course will be delivered using the programming language that is trending at the current market. The student can also develope program to utilize the basic input sensors and respond according to the problems.

Course Outcomes:

CO1 - Ability to analyze the problem and solve using high level programming language
CO2 - Ability to apply the programming concept and produce the appropriate program solution
CO3 - Demonstrate the continual design in developing the program in solving the problem

VGT124 AMALAN PROFESIONAL [PROFESSIONAL PRACTICES]

No of Credits: 3

Course Synopsis:

Profesional Practices course aims to explain the main concepts in engineering and technology ethics, risk management and occupational safety and health as well as to expose the students to basic of law in the engineering and technology context.

Course Outcomes:

CO1 - Ability to EXPLAIN the issues and challenges of engineering and technology ethics.
CO2 - Ability to DISCUSS hazards, the function of risk management and occupational safety and health (OSHA).
CO3 - Ability to EXPLAIN the aspects and procedures of legal on engineering and technology issues.

VGT211 TEKNOLOGI PEROLEHAN DATA DAN ANALISIS I [TECHNOLOGY DATA ACQUISITION AND ANALYSIS I]

No of Credits: 2

Course Synopsis:

This course covers the basics of operation and analysis of electronic instruments, including the working principles and nature of transducers and sensors. The importance of application and signal conduction techniques is emphasized. Elements and principles of data exchange, acquisition and application are discussed.

Course Outcomes:

CO1 - Ability to apply the principle of transducer and sensor.
CO2 - Ability to demonstrate electronic apparatus interfacing to device consists of sensors and others.
CO3 - Ability to integrate the working principles of measurement and instrumentation.

VGT212 SISTEM PEMBUATAN FLEKSIBEL II [FLEXIBLE MANUFACTURING SYSTEM II]

No of Credits: 5

Course Synopsis:

This course will introduce student to Industry 4.0 and its core elements, Smart Manufacturing with Product Identification System and Applied PLC Programming skills for the development of Industry 4.0 Modular Production System.

Course Outcomes:

CO1 - Ability to classify the key concepts of industry 4.0 and its driving technologies and core elements
CO2 - Ability to justify the implementation of RFID system in Modular Production System

CO3 - Ability to construct Modular Production System using Advanced PLC Programming

VGT213 PERKAKASAN PENGATURCARAAN SISTEM TERBENAM [EMBEDDED SYSTEM PROGRAMMING TOOL]

No of Credits: 5

Course Synopsis:
This course emphasizes the role of microcontroller in an automation system. It covers input and output topics as well as memory usage. In addition, this course will also focus on how to program using language C. Meanwhile, the Resberry Pi or latest controller board will be used as a controller.

Course Outcomes:
CO1 - Ability to describe the theory and basic architecture of microcontroller system
CO2 - Ability to construct program into microcontroller
CO3 - Ability to design simple system of microcontroller interface with input and output device

VGT214 PELAKSANAAN RANGKAIAN KESELAMATAN [NETWORK SECURITY IMPLEMENTATION]

No of Credits: 3

Course Synopsis:
This course covers foundational understanding of cybersecurity and how it relates to information and network security. It provides core security skills needed for monitoring, detecting, investigating, analyzing and responding to security events, thus protecting systems and organizations from cybersecurity risks, threats and vulnerabilities.

Course Outcomes:
CO1 - Ability to apply network security principles as well as the tools and configurations available.
CO2 - Ability to manipulate to security incidents.
CO3 - Ability to identify data confidentiality, integrity, availability and security controls on networks, servers and applications.

DKT111 LITAR ELETRIK [ELECTRIC CIRCUITS PRINCIPLES]

No of Credits: 3

Course Synopsis:
This course covers introduction to the basic of electrical measurements, Ohm's Law, Series and Parallel Circuits, Circuit Theorems and Conversions and RLC circuits. This course will expose the students to the elements and principles of electrical circuit theory with appropriate to any RLC circuit applications.

Course Outcomes:
CO1 - Able to demonstrate theoretical concepts of electrical current, voltage, resistance, capacitance and inductance.
CO2 - Able to apply the concept of series and parallel circuits, circuit theorems and Delta to Wye/Wye to Delta conversions.
CO3 - Able to determine solution for RLC circuits calculation related to electric circuits applications.

DKT113 FIZIK KEJURUTERAA [ENGINEERING PHYSICS]

No of Credits: 3

Course Synopsis:
This course covers introduction to the physic and science which are force and motion, circular motion, work, power and energy, electrostatic, magnetism and electric current and resistance.This course will expose the students to the elements and principles of basic concepts of physics and its application

Course Outcomes:
CO1 - Able to apply the standard unit, force and motion and their applications
CO2 - Able to support circular motion principles in oscillation and wave.
CO3 - Able to apply the basics of electrostatic and electromagnetism
CO4 - Able to examine electric current and resistivity

DKT121 ASAS PENGATURCARAAN KOMPUTER [FUNDAMENTAL OF COMPUTER PROGRAMMING]

No of Credits: 3

Course Synopsis:
In this course, students learn computer system introduction, problem solving analysis and programming concept including variables, operator, control structure, function, array, file manipulation, structure and pointer

Course Outcomes:
CO1 - Ability to describe and explain programming concept and principle.
CO2 - Ability to Identify, demonstrate and design program using flowchart and pseudocode.
CO3 - Ability to use LINUX environment for coding, compiling, executing and debugging computer software program
CO4 - Ability to propose solution for engineering related problems using computer programming techniques

DKT122 SISTEM DIGIT 1 [DIGITAL SYSTEM 1]

No of Credits: 3

Course Synopsis:
The subject will focus on the concept of electronics devices and electronic circuits design. This includes fundamentals of digital electronic circuits design through exposure of basic logic IC's and parallels digital simulation software. The course then develops students to appreciate simple digital applications such as basic counter, multiplexer and de-multiplexer circuits and the design these circuits using a basic logic IC's. Flip-flops and its basic application are introduces in the later part of the course and together with all the other disciplines mentioned earlier, students are expected to design a digital system (using basic logic IC's, LEDs and switches) and demonstrate their understanding.

Course Outcomes:
CO1 - Able to describe and explain the basic concept of numbering system.
CO2 - Able to apply and analyze the basic logic for simple digital systems.
CO3 - Able to design and demonstrate the combinational logic circuit system.

DKT123 TEKNOLOGI ELEKTRIK [ELECTRICAL TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This subject will expose the student to AC circuit, electromagnetic, basic transformer and electrical machines. The topics cover AC analysis including series and parallel circuits, three phase system and magnetic coupled circuit. Student will also gain more knowledge on electromagnetism, transformers, DC machines and AC machines. General concept and basic principle of operation for each electrical machine are covered which include the characteristic and performance analysis.

Course Outcomes:
CO1 - Able to describe and explain the concept of magnetism and electromagnetism.
CO2 - Able to apply application of electrical transformer.
CO3 - Able to apply the concept of three-phase system and basic magnetic circuit.
CO4 - Able to construct the operation and apply the application of DC machine and AC machines.

DKT124 PERANTI ELEKTRONIK [ELECTRONIC DEVICES]

No of Credits: 3

Course Synopsis:
This course is designed to provide and exposes students with fundamentals and application of basics electronic device. The course also includes introduction to semiconductor, diode application, BJT, BJT Biasing and Field Effect Transistor (FET). Knowledge on theory acquired in lecture is also enhanced with a practical work conducted in laboratory.

Course Outcomes:
CO1 - Able to apply and solve theory of semiconductor materials and diode operation
CO2 - Able to analyze and calculate diode applications
CO3 - Able to justify Bipolar Junction Transistor (BJT) operation and biasing
CO4 - Able to apply Field Effect Transistor (FET) operation and biasing.

DKT125 PENGATURCARAAN BERORIENTASIKAN OBJEK [OBJECT-ORIENTED PROGRAMMING]

No of Credits: 2

Course Synopsis:
This course covers introduction to the object oriented programming concept. The course details on the applying and developing an object oriented program and able to analyse application development of Graphical User Interface (GUI) using object oriented concept.

Course Outcomes:
CO1 - Able to demonstrate object oriented programming concept.
CO2 - Able to create object oriented programming application in software development.
CO3 - Able to analyze application development using OOP based Graphical User Interface (GUI) library

DKT212 SISTEM DIGIT II [DIGITAL SYSTEM II]

No of Credits: 3

Course Synopsis:
This course expose the students to the applications of Combinational and Sequential Logic System, particularly in shift register and counter design. The course also includes Introduction to Sequencing and Control which will guide the students for subjects that will taken in later semesters.

Course Outcomes:
CO1 - Able to describe the theories of basic storage devices and fundamental operations of sequential circuit application.
CO2 - Able to construct counters using transition tables and counter application using finite state machine and register transfer language.
CO3 - Able to develop sequential circuit using CAD tools and program onto hardware.

DKT214 ELECTRONIC CIRCUIT [LITAR ELEKTRONIK]

No of Credits: 3

Course Synopsis:
This course covers introduction to Operational Amplifier, common Op-amp circuitry, active filtering, voltage regulating and voltage oscillating circuits using Op-amps. This course will expose the students to the elements and principles of electronic circuitry, advantages and analysis of Op-amp circuitry to determine responses for practical applications.

Course Outcomes:
CO1 - Able to describe the basic op-amp characteristics, parameters and configurations

CO2 - Able to apply the concept of negative feedback, its limitations and usage in practical circuitry.
CO3 - Able to construct op-amp circuitry related to electronic circuits applications

DKT215 PRINSIP SIGNAL DAN SISTEM [SIGNALS AND SYSTEMS PRINCIPLES]

No of Credits: 3

Course Synopsis:
This course is designed to expose students to types of signals, operations of signals and systems. Specifically, this subject covers analysis of signals in time domain and frequency domain representation, operation of signals and transformations of signals in s-domain and also the properties of a Linear Time Invariant system

Course Outcomes:
CO1 - Able to demonstrate types, characteristics and waveforms of the signals, perform operations of signals and the properties of a system.
CO2 - Able to analyze properties of LTI system, including time-domain signals and frequency domain representation of signals.
CO3 - Able to calculate transformation from time domain to s-domain and analyze system transfer function.
CO4 - Able to construct signal transformations and analyze system transfer functions using related software

DKT217 SISTEM KOMPUTER [COMPUTER SYSTEM]

No of Credits: 3

Course Synopsis:
This subject is focused on the computer system organization and architecture which includes the internal architecture, organization and interface techniques of a central processing unit (CPU). The syllabus covers the theory of a basic computer system, format of the instruction set and memory organization. The laboratory are procedures for students to develop and simulate a basic CPU using the Very High Speed Hardware Description Language (VHDL) using appropriate Computer Aided Design (CAD) tools

Course Outcomes:
CO1 - Able to explain the fundamental development of modern day computers and the central processing unit.
CO2 - Able to illustrate and derive the organization and architecture concepts for a central processing unit (CPU).
CO3 - Able to write VHDL codings and develop basic FPGA based systems

DKT218 MIKROPENGAWAL [MICROCONTROLLER]

No of Credits: 3

Course Synopsis:
The aim of this course is to study the Intel 8051 Microcontroller architecture and relate that knowledge to the design of microcontroller based systems. This includes the design technique using internal I/O interfacing, internal memory and introduction to interrupt configuration for the systems. The study of 8051 instruction set and various software development tools are also emphasized as the knowledge are needed in the designing of controller-based systems.

Course Outcomes:
CO1 - Able to explain the basic theories of microcontroller architecture and operations.
CO2 - Able to write the assembly language for basic microcontroller operations.
CO3 - Able to develop a simple microcontroller based application project.

DKT221 PRINSIP OPERASI SISTEM [OPERATING SYSTEM PRINCIPLE]

No of Credits: 3

Course Synopsis:
This course introduces the fundamentals of operating systems. Topics include interprocess communication, process scheduling, deadlock, memory management, virtual memory, and file system. Formal principles are illustrated with examples and case studies of one or more contemporary operating system.

Course Outcomes:
CO1 - Able to define and explain the major concepts which builds up an operating system
CO2 - Able to write a program in GNU/Linux operating system for coding, \ compile, execute and test C programming in simulating issues in Operating System.
CO3 - Able to describe the processes, file management, processor scheduler and memory management

DKT223 SISTEM PENGKALAN DATA [DATABASE SYSTEM]

No of Credits: 3

Course Synopsis:
The subject will focus on the concept of database system and architecture. This includes data models, schemas and instances and system environment. Students will be exposed with data modeling by using high level conceptual data models for database design. The course will also cover relational model database which contains concepts, constrains, normalization, languages design including SQL programming techniques, practical database, design methodology and use of UML diagrams.

Course Outcomes:
CO1 - Able to explain the concept of database system and the purpose and use of database management system.
CO2 - Able to write SQL program and recognize types of SQL statement.
CO3 - Able to normalize and administrate a relational database
CO4 - Able to design conceptual models of an application domain for database applications

DKT224 KOMUNIKASI DATA DAN RANGKAIAN [DATA COMMUNICATION AND NETWORK]

No of Credits: 3

Course Synopsis:
This course is to discuss the fundamental concepts of data communication and network, emphasized on application of concept architecture and layer, signal transmission technique, network topologies and connectivity devices. It also discuss on multiplexing as well as to give exposure of network.

Course Outcomes:
CO1 - Able to explain the theory and basic of data communication and network.
CO2 - Able to evaluate application of network connection concept and protocol used.
CO3 - Able to classify the data communication network equipments and instruments.
CO4 - Able to construct the network setup and perform troubleshooting in group.

DKT226 ASAS KEJURUTERAAN PERHUBUNGAN [BASIC COMMUNICATION ENGINEERING]

No of Credits: 3

Course Synopsis:
This course introduces the students with the basic communications systems including parameters, basic elements, modems and noise. The knowledge

gained will contribute in understanding the operation of the related circuit. The exposures in amplitude modulations and frequency modulations will help the most in understanding the real applications. The introduction of digital communications will enhance the students understanding about the revolution of communications and latest technology.

Course Outcomes:
CO1 - Able to define and explain the principles of basic communication systems.
CO2 - Able to describe the analog & digital modulation and the effect of SNR parameter.
CO3 - Able to construct the AM & FM outputs and solve the calculations of AM & FM circuits.
CO4 - Able to apply the concept of digital communications technology

DKT311 KEJURUTERAAN PERISIAN [SOFTWARE ENGINEERING]

No of Credits: 3

Course Synopsis:
The subject will focus on the concept of software engineering process and management. This includes on how to manage the project which concern on the critical system, economic and human consequences. The course will also cover the processes, techniques and deliverables that are associated with engineering requirement. This will include discussion of software requirement, system modelling, formal specification and techniques for specifying dependability. This course will also emphasize on the techniques for software verification and validation includes testing and critical system validation, process improvement and configuration management.

Course Outcomes:
CO1 - Able to describe the software engineering terms and concepts.
CO2 - Able to demonstrate the software processes management, validation and verification.
CO3 - Able to assess the problem based on software engineering process models and specification document
CO4 - Able to propose solution for engineering problem related to the software engineering techniques.

DKT313 SISTEM KAWALAN [CONTROL SYSTEM]

No of Credits: 3

Course Synopsis:
This course provides students with a background of control principles in various engineering applications. Throughout this course, students will learn the basic mathematical tools such as Laplace transform, transfer function, block diagram, signal flow graph, mathematical modeling of dynamic systems, time response analysis, stability of linear system, root locus and frequency domain analysis. The laboratory will be used to aid the students understanding of the concept introduced.

Course Outcomes:
CO1 - Able to demonstrate theoretical concepts of control systems.
CO2 - Able to produce mathematical models from multiple subsystems (block diagrams/signal flow graphs) and from mechanical/electrical systems.
CO3 - Able to evaluate stability for a given system using Routh-Hurwitz stability criterion.
CO4 - Able to analyse system's time and frequency-domain with response to test inputs.

DKT318 KESELAMATAN INDUSTRI, PENGURUSAN KUALITI DAN ETIKA [INDUSTRIAL SAFETY, QUALITY MANAGEMENT AND ETHICS]

No of Credits: 3

Course Synopsis:
This course gives an exposure to students to understand industrial safety standards and guidelines, quality management concept and various quality

tools that allow students to understand the general picture of both areas which are being practiced by industries towards Industry 4.0. At the end of this course, students are expected to engage in ethics while working and able to identify suitable quality techniques and tools to be implemented in production management and can apply industrial safety standards in real industrial environment.

Course Outcomes:

CO1 - Able to explain fundamentals of industrial safety and quality management towards Industry 4.0. CO2: Able to analyze the industrial hazards and electrical hazards.
CO2 - Able to select suitable techniques and tools in quality management
CO3 - Able to demonstrate ethics in industrial safety and quality management.

DKT319 INSTRUMENTASI ELEKTRONIK [ELECTRONICS INSTRUMENTATION]

No of Credits: 3

Course Synopsis:

In this course, students will be introduced to IoT hardware design, IoT systems integration, sensors and actuator controls, IoT device integration to network communications and cloud computing. The course would also cover security topics regarding IoT implementation and authentication protocols. Reliability perspective in IoT architecture will also be discussed together with privacy and ethics regarding IoT implementation in real life data gathering.

Course Outcomes:

CO1 - Able to explain the basic concepts of sensors and actuators.
CO2 - Able to interface and synthesize input-output signals using external interfaces on IoT devices.
CO3 - Able to design and integrate Internet of Things solution to the Internet

DKT351 PROJEK SEMESTRAL [SEMESTRAL PROJECT]

No of Credits: 3

Course Synopsis:

The Semestral Project is a small-scale design and applied projects for final year diploma students and expected to complete within one semester. The projects based in solving engineering problems by problems understanding, troubleshooting, identify, solving, and report writing. The projects cover electronics circuits, digital logics design, embedded and microprocessor system interfacing, PLC programming, computer system and software development.

Course Outcomes:

CO1 - Able to identify solution based on problem study.
CO2 - Able to design engineering solution utilizing an engineering practice.
CO3 - Able to perform an engineering project
CO4 - Able to write a technical report and communicate in oral presentation

DMT112 TEORI LITAR 1 [CIRCUIT THEORY I]

No of Credits: 3

Course Synopsis:

This course will introduces the students fundamentals of DC Circuits, laws and theorems. It will cover in series, parallel and series-parallel circuits includes Ohm's Law, Kirchhoff voltage and current Law, Voltage and Current Divider Rule. Network theorems includes delta to wye and wye to delta conversion, Nodal Analysis, Mesh Analysis, source transformations, superposition, maximum power transfer, Thevenin's and Norton's theorem. Students also will be exposed concepts for balance three phase system.

Course Outcomes:

CO1 - Able to explain the basic circuit elements, method of circuit analysis

,network theorem, and capacitance inductance initial and steady state condition

CO2 - Able to solve circuit's problems using series and parallel equivalents, using Ohm's Law, method of circuit analysis and network theorem in DC electric circuit.

CO3 - Able to rearrange and simplify circuits using application of series and parallel equivalents, method of circuit analysis and network theorem along with Ohm's Law.

DMT113 LUKISAN KEJURUTERAAN [ENGINEERING DRAWING]

No of Credits: 2

Course Synopsis:
The aim for this course is to give exposure and skills for the Diploma Engineering students the basic of engineering drawing knowledge and its application in engineering, mainly with the manual drawing skills and the skills of using Computer Aided Drafting (AutoCAD) software. This course comprises of basic engineering drawing concepts such as geometry drawings, dimensions and AutoCAD basic drawings.

Course Outcomes:
CO1 - Able to identify tools and drawing technique in engineering drawing
CO2 - Able to use traditional tools and CAD to draw lines, circles, arcs, and curves.
CO3 - Able to construct the geometry drawings using hand tools and CAD.
CO4 - Able to illustrate the multiview, axonometric and oblique drawings using hand tools and CAD.

DMT114 SAINS KEJURUTERAAN [ENGINEERING SCIENCE]

No of Credits: 2

Course Synopsis:
The purpose of this course is to give the knowledge for student about science and engineering that involve physicals and sciences phenomena, which is the basic for engineering. Theories, principles and standard units have been focused for every syllabus so that the student could understand fully about this course.

Course Outcomes:
CO1 - Able to apply principle concepts of science.
CO2 - Able to compare the principle concepts of sciences in engineering.
CO3 - Able to support principle concepts of science in engineering applications.

DMT121 PERANTI ELEKTRONIK [ELECTRONIC DEVICES]

No of Credits: 3

Course Synopsis:
This course introduces basic semiconductor devices such as diode, Bipolar Junction Transistor (BJT) and Field-Effect Transistor (FET) theory. The syllabus consists of:

I. Understanding the principles and operation of semiconductor devices
II. Investigates the applications of these devices.
III. Solving BJT and FET parameters using various type of biasing.

Course Outcomes:
CO1 - Able to explain theories of electronic devices.
CO2 - Able to demonstrate applications of electronic devices
CO3 - Able to develop operations of electronic devices.

DMT122 TEORI LITAR II [CIRCUIT THEORY II]

No of Credits: 3

Course Synopsis:
This course will introduce the students to the AC circuit, methods of circuit

analysis and network theorems. Students also will be exposed to the AC power analysis, the resonant circuit and parameters related to the frequency response and lastly to two port networks.

Course Outcomes:
CO1 - Able to explain the electrical component in AC circuit.
CO2 - Able to solve circuit's problem using series and parallel equivalents, Ohm's Law, method of circuit analysis and network theorem in AC electric circuit.
CO3 - Able to construct the resonance circuit, balance three phase system and two port networks.

DMT123 PENGENALAN KEPADA PENGATURCARAAN KOMPUTER [INTRODUCTION TO COMPUTER PROGRAMMING]

No of Credits: 3

Course Synopsis:
C is one the most popular programming languages used in engineering and science. This course is designed to teach students how to solve engineering and science problem using the C programming language.
Students will be exposed to the basic structures of computer, and the coding techniques used in C programming. Started with introduction to C programming, students then will learn about conditional statements, loops, functions, pointers, files operations, arrays and multi-dimensional

Course Outcomes:
CO1 - Able to sketch flowchart to solve engineering and science problems.
CO2 - Able to write C program for conditional statements, loops and functions.
CO3 - Able to construct dynamic data structures using arrays, pointers and file operations.

DMT124 ASAS DIGIT I [DIGITAL FUNDAMENTAL I]

No of Credits: 3

Course Synopsis:
This course provides students an exposure to logic design, particularly combinational logic functions. The students are expected to demonstrate their function design using fixed-function logic ICs.

Course Outcomes:
CO1 - Able to describe the concepts and principles of logic design.
CO2 - Able to construct combinational logic design using logic simplifications and circuit transformation.
CO3 - Able to design combinational logic functions.

DMT125 SAINS BAHAN [MATERIALS SCIENCE]

No of Credits: 2

Course Synopsis:
This course aims to give students a general introduction to materials properties. The subject will cover measurement of the properties, class of materials properties and fundamental knowledge to make material selection with better properties. The common micro-structural features of different materials classes will be outlined in order to relate with its process as well as performance.

Course Outcomes:
CO1 - Able to compare types of materials and describe their structure and properties.
CO2 - Able to analyse the nature and structure of an atom and distinguish between crystalline and non-crystalline materials.
CO3 - Able to investigate mechanical and electrical properties of various materials.

DMT126 KESELAMATAN, KUALITI DAN ETIKA DI INDUSTRI [SAFETY, QUALITY AND ETHICS IN INDUSTRY]

No of Credits: 2

Course Synopsis:
This course gives an exposure to students to understand industrial safety standards and guidelines, quality management concept and various quality tools that allow students to understand the general picture of both areas which are being practiced by industries. At the end of this course, students are expected to be able to identify suitable quality techniques and tools to be implemented in production management and can apply industrial safety standards in real industrial environment.

Course Outcomes:
CO1 - Able to explain and illustrate the fundamentals of Industrial Safety and Quality Management.
CO2 - Able to apply techniques and tools of Quality Management.
CO3 - Able to analyse safety issues using Safety standards and tools.
CO4 - Able to judge the issues and challenges of engineering ethics

DMT231 ELEKTRONIK ANALOG [ANALOGUE ELECTRONICS]

No of Credits: 3

Course Synopsis:
This course introduces the application and analysis of Bipolar Junction Transistor (BJT) and Field Effect Transistor (FET) and the usage in amplifier as well as power amplifier circuits.

Course Outcomes:
CO1 - Able to understand basic theory of analogue electronics.
CO2 - Able to analyze operation of Bipolar Junction Transistors (BJTs), Field Effect Transistors (FETs, BJTs multistage and Power amplifier circuits.
CO3 - Able to construct circuit of BJT, FET and Power amplifier circuits experiment.

DMT232 ASAS MESIN ELEKTRIK [BASIC ELECTRICAL MACHINE]

No of Credits: 3

Course Synopsis:
This course is to provide students with understanding of the basic concept of three phase system. Students also will gain knowledge on magnetic circuits, single-phase transformer. This course also covers electrical machine which related to single phase DC/AC machine and generator.

Course Outcomes:
CO1 - Able to apply the basic concept of three phase system
CO2 - Able to analyse the concept of magnetic circuit and machinery principles.
CO3 - Able to construct the standard equivalent circuit and fundamental equations of transformers and dc machines.

DMT233 ASAS DIGIT II [DIGITAL FUNDAMENTAL II]

No of Credits: 3

Course Synopsis:
The aim of this course is to expose students with the applications of combinational and sequential circuit. Emphasis will be given on the principles and applications of flip flop, counters, shift registers and introduction to the sequential circuit design.

Course Outcomes:
CO1 - Able demonstrate operation of flip flop, its applications and usage in synchronization circuits.
CO2 - Able to differentiate counter circuit and shift register application and design.

CO3 - Able to design operation of flip flop in basic sequential circuit design.

DMT234 PERANTI & SEMIKONDUKTOR FIZIK [SEMICONDUCTOR PHYSIC & DEVICES]

No of Credits: 3

Course Synopsis:
Introduction to semiconductor devices and technology, energy bands and carrier concentration in thermal equilibrium, carrier transport phenomena, p-n junction, bipolar transistor and related devices, MOSFET and related devices, MESFET and related devices.

Course Outcomes:
CO1 - Able to explain the theory of semiconductor physics and devices.
CO2 - Able to evaluate a problem and performance issues in semiconductor processes.
CO3 - Able to differentiate semiconductor devices behaviours.

DMT241 PENGANTAR BENTANGAN LITAR TERKAMIR [INTRODUCTION TO INTEGRATED CIRCUIT LAYOUT]

No of Credits: 3

Course Synopsis:
This course introduces the basic logic circuits design, Layout versus schematic design of Integrated Circuits as well as application in the design of ICs.

Course Outcomes:
CO1 - Able to apply the microelectronic technologies, IC design flow and VLSI design style in layout.
CO2 - Able to develop CMOS transistor concept and logic circuits design.
CO3 - Able to design an IC layout circuit.

DMT242 FABRIKASI WAFER [WAFER FABRICATION]

No of Credits: 3

Course Synopsis:
This course introduces the processes that involved in ICs fabrication. Both theories and practical are used to assure that students able to perform the wafer fabrication processes independently.

Course Outcomes:
CO1 - Able to explain, fundamental of semiconductor and process in wafer fabrication.
CO2 - Able to analyze theoretical background of each process involved in fabrication process.
CO3 - Able to illustrate and develop the structure and important parameter in fabrication process.

DMT243 PEMBUNGKUSAN ELEKTRONIK [ELECTRONIC PACKAGING]

No of Credits: 3

Course Synopsis:
This course exposes students to the electronics packaging process flow and the statistical analysis method to control the semiconductor packaging processes.

Course Outcomes:
CO1 - Able to explain the semiconductor packaging process flow.
CO2 - Able to evaluate the critical parameters in semiconductor packaging process.
CO3 - Able to develop technology trend in semiconductor packaging.

DMT244 ANALISA KEGAGALAN [FAILURE ANALYSIS]

No of Credits: 3

Course Synopsis:
This course focuses on the concepts and techniques of failure analysis in the semiconductor industry. Different types of failure analysis techniques and test instrumentation involves are covered in this course.

Course Outcomes:
CO1 - Able to define the terms commonly used in failure analysis and explain the failure analysis process flow
CO2 - Able to identify, compare, explain and illustrate (where applicable) the different tools and techniques available in FA, its importance and the details operation principle
CO3 - Able to make an interpretation of results of analysis and to choose the most suitable FA techniques to be conducted, given a particular failure.

DMT245 PENGENALAN KEPADA MIKROPENGAWAL [INTRODUCTION TO MICROCONTROLLER]

No of Credits: 3

Course Synopsis:
The aim of this course is to study the use of microcontroller system for a variety of applications. It covers hardware aspects such as interfacing techniques, software design, coding in assembly language, basic multitasking concept and developing and embedded system application.

Course Outcomes:
CO1 - Able to apply the basic concepts of a microcontroller system.
CO2 - Able to apply the skill to develop a program for microcontroller system using assembly language.
CO3 - Able to construct a program and interfacing between microcontroller systems to external peripheral devices to solve real-time problems

DMT351 PROJEK SEMESTRAL [SEMESTRAL PROJECT]

No of Credits: 3

Course Synopsis:
The Semestral Project is a small-scale design and applied projects for final year diploma students and expected to complete within one semester. The projects based in solving engineering problems by problems understanding, troubleshooting, identify, solving, and report writing. The projects cover electronics circuits, digital logics design, embedded and microprocessor system interfacing, PLC programming, computer system and software development.

Course Outcomes:
CO1 - Able to identify solution based on problem study.
CO2 - Able to design engineering solution utilizing an engineering practice.
CO3 - Able to perform an engineering project.
CO4 - Able to write a technical report and communicate in oral presentation

DMT352 INSTRUMENTASI ELEKTRONIK [ELECTRONIC INSTRUMENTATION]

No of Credits: 3

Course Synopsis:
This course introduces students to the electronic instruments such as oscilloscope, function generators, voltmeters, analog DC and AC meters. The students also will be introduced to the Dc and AC bridge circuits to measure resistance, capacitance and inductance. In addition, students will be exposed to the AC and DC converter, transducers, sensors, and basic amplifier and filter.

Course Outcomes:
CO1 - Able to identify the electronic measurement tools.
CO2 - Able to apply the electronic measurement tools for engineering application
CO3 - Able to construct the circuit of electronics instrumentation.

DMT353 PENGENALAN KEPADA PENGAWAL ATURCARA LOGIK [INTRODUCTION TO PLC]

No of Credits: 3

Course Synopsis:
Programmable Logic Controllers (PLCs) are the predominant tool for controlling industrial and specialty systems. These computer based controllers provide a variety of programming options and easily configurable inputs and outputs. This course deals with the basic operation, application and programming of the integrated industrial control system, concentrating on the industrial PLC. The course covers introduction to PLC, basic PLC operations and instructions, product ranges, benefits numbering systems and codes and logic concepts pertaining to PLCs. The student will develop an understanding of the PLC central processing unit, input-output systems, programming and peripheral devices, and programming languages and will develop skills in programming and documenting on a cross section of industrial PLCs.

Course Outcomes:
CO1 - Able to relate basic concept of PLC and hardware components.
CO2 - Able to construct a PLC system using ladder diagram and mnemonic code.
CO3 - Able to design PLC applications using timer and counter.

DMT354 PENGENALAN KEPADA SISTEM KAWALAN [INTRODUCTION TO CONTROL SYSTEM]

No of Credits: 3

Course Synopsis:
Throughout this course, students will learn the basic control system such as open-loop system, closed-loop system, block diagram and signal flow graph. Students also will be introducing to mathematical modeling of electrical and mechanical systems in frequency and time domains using Laplace transform. Student will be able to analyze time response and stability of linear system via root locus and Bode plot techniques. The experiments will be used to aid the students understanding of the concept introduced.

Course Outcomes:
CO1 - Able to explain basic structure of control system and use Laplace transform to solve mathematical model.
CO2 - Able to analyze time response analysis and control system problem into mathematical model.
CO3 - Able to propose system performance and system stability.

FAKULTI TEKNOLOGI KEJURUTERAAN MEKANIKAL

Programmes Offered:

1. Sarjana Muda Kejuruteraan Mekanikal dengan Kepujian
2. Sarjana Muda Kejuruteraan Pembuatan dengan Kepujian
3. Sarjana Muda Teknologi Kejuruteraan Mekanikal (Pemesinan) dengan Kepujian
4. Sarjana Muda Teknologi Kejuruteraan Mekanikal (Sistem Pertanian) dengan Kepujian
5. Sarjana Muda Teknologi Kejuruteraan Mekanikal (Reka Bentuk Produk) dengan Kepujian
6. Sarjana Muda Teknologi Kejuruteraan Mekanikal (Pemprosesan Bahan) dengan Kepujian
7. Sarjana Muda Teknologi Pemesinan Industri dengan Kepujian
8. Sarjana Muda Teknologi Automatif dengan Kepujian
9. Diploma Kejuruteraan Pembuatan

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UR4540001
Diploma in Manufacturing Engineering

Programme Educational Objective (PEO)

PEO 1
To raise graduates who are competent in their respective engineering fields as exhibited through career development.

PEO 2
To raise graduates who involved and contribute to the society.

PEO 3
To raise graduates who pursue education opportunity continually

PEO 4
To raise graduates who contribute through innovation and entrepreneurship.

Programme Outcomes (PO)

PO1
Knowledge: Apply knowledge of applied mathematics, applied science, engineering fundamentals and an engineering specialization to wide practical procedures and practices.

PO2
Problem analysis: Identify and analyse well-defined engineering problems reaching substantiated conclusions using codified methods of analysis specific to their field of activity.

PO3
Design/development of solutions: Design solutions for well-defined technical problems and assist with the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

PO4
Investigation: Conduct investigations of well-defined problems; locate and search relevant codes and catalogues, conduct standard tests and measurements.
PO5
Modern Tool Usage: Apply appropriate techniques, resources, and modern engineering and IT tools to well-defined engineering problems, with an awareness of the limitations.

PO6
The Engineer and Society: Demonstrate knowledge of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technician practice and solutions to well-defined engineering problems.

PO7
Environment and Sustainability: Understand and evaluate the sustainability and impact of engineering technician work in the solution of well-defined engineering problems in societal and environmental contexts.

PO8
Ethics: Understand and commit to professional ethics and responsibilities and norms of technician practice.
PO9
Individual and Team Work: Function effectively as an individual, and as a member in diverse technical teams.

PO10
Communications: Communicate effectively on well-defined engineering activities with the engineering community and with society at large, by being able to comprehend the work of others, document their own work, and give and receive clear instructions.

PO11
Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member or leader in a technical team and to manage projects in multidisciplinary environments.

PO12
Life-Long Learning: Recognise the need for, and have the ability to engage in independent updating in the context of specialised technical knowledge.

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DIPLOMA KEJURUTERAAN PEMBUATAN						
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SEMESTER	I	II	I	II	I	II
Kursus Teras Kejuruteraan	DKA 104/2 Matematik Awalan	DQT 101/3 Matematik I	DQT 102/3 Matematik II	DQT 203/3 Matematik III	DPT 351/3 Projek Semestral	DIT 361/6 Latihan Industri
	DPT 104/3 Bahan	DPT 102/3 Statik dan Dinamik	DPT 103/3 Mekanik Bahan	DPT 202/3 Themo-Bendalir	DPT 321/3 Rekabentuk Acuan Suntikan	
	DPT 114/3 Teknologi dan Amalan Kerja Tangan	DPT 115/3 Teknologi dan Amalan Pemesinan	-	-	-	
	DUT 123/2 Kemahiran IT dan Komunikasi	DPT 110/3 Proses Pembuatan 1	DPT 213/3 Proses Pembuatan 2	DPT 220/3 CAD/CAM	DPT 313/3 Kawalan Kualiti dan Metrologi	
	DPT 122/3 Lukisan Kejuruteraan dan Lukisan Berbantu Komputer	DPT 123/2 Permodelan 3D CAD	DPT 224/3 Rekabentuk 1	DPT 225/3 Rekabentuk 2	DPT 335/2 Perancangan dan Kawalan Pengeluaran	
	DKT 121/3 Asas Pengatucaraan Komputer	DPT 152/3 Asas Teknologi Elektrik	DPT 251/3 Asas Elektronik	DPT 214/3 Sistem Pneumatik dan Hidraulik	DPT 215/3 Automasi Pembuatan dan Robotik	
81	14	17	15	15	14	6
Kursus Wajib Universiti	DVW 410/2 Bahasa Melayu	-	DUW 129/2 Falsafah Dan Isu Semasa	-	DUW 224/2 Keusahawanan dan Kejuruteraan	-
	DVW 101/2 Bahasa Inggeris Komunikasi I	DVW 201/2 Bahasa Inggeris Komunikasi II	DVW 301/2 Bahasa Inggeris Komunikasi III	-	-	
	DZW XXX/1 Badan Beruniform 1	DZW XXX/1 Badan Beruniform 2	-	-	-	
14	5	3	4	-	2	-
95	19	20	19	15	16	6
TOTAL UNIT BERGRADUASI : 95 UNIT						
Nota : DKA 104/2 Matematik Awalan : Pra-Syarat Matematik 1 (DQT 101/3) yang mendapat gred D untuk Matematik Tambahan Peringkat SPM.						

UR6521001
Bachelor Of Mechanical Engineering With Honours

Programme Educational Objective (PEO)

PEO1
Graduates who have demonstrated career advancement in the field of Electrical Engineering or related engineering field.

PEO2
Graduates who are involved in a professional body or society.

PEO3
Graduates who pursue life-long learning

Programme Outcome (PO)

PO 01
Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

PO 02
Identify, formulate, conduct research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO 03
Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations, safety, cultural, societal, and environmental considerations.

PO 04
Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

PO 05
Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations.

PO 06
Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems.

PO 07
Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts including ability to have entrepreneurship skills.

PO 08
Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

PO 09
Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

PO 10
Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11
Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PO 12
Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multi-disciplinary environments.

CURRICULUM STRUCTURE
BACHELOR OF MECHANICAL ENGINEERING WITH HONOURS
ACADEMIC SESSION (2020/2021

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	I	II	III	IV	V	VI		VII	VIII
Engineering Core (101)	ENT141/3 Engineering Statics	ENT142/3 Engineering Dynamics	ENT242/3 Solid Mechanics I	ENT 246/3 Solid Mechanics II	ENT332/3 Mechanisms & Machines	ENT346/3 Vibration Mechanics	EIT 302/4 Industrial Training	ENT445/2 Final Year Project I	ENT446/4 Final Year Project II
	ENT143/3 Thermodynamics I	ENT146/3 Machining	ENT241/3 Fluid Mechanics I	ENT 248/4 Design Process	ENT334/4 Component Design	ENT335/4 System Design		ENT440/4 Design Project	ENT457/3 Management, Production & Operations
	ENT147/3 Engineering Materials	ENT150/3 Engineering Graphic & Computer Aided Drafting	ENT243/3 Thermodynamics II	ENT247/3 Fluid Mechanics II	ENT333/3 Heat Transfer	ENT336/3 Fluid Machinery		ENT385/3 Control Engineering	ENT4XX/3 Elective II
	ENT189/3 Computer Programming		ENT249/3 Electrical Circuit & Machine	ENT244/3 Manufacturing Processes	ENT286/3 Instrumentations & Measurements	ENT 337/3 Electronics & Microprocessors		ENT4XX/3 Elective I	ENT4XX/3 Elective III
Non Engineering Core (19)	EQT 101/3 Engineering Mathematics I	EQT102/3 Engineering Mathematics II	EQT203/3 Engineering Mathematics III	EQT271/3 Engineering Statistics		ENT443/3 Management for Engineers		ENT442/2 Professional Engineers	
						UUT122/2 Skills and Technology in Communication			
University Requirement (16)	UUW131/2 Appreciation of Ethics and Civilization	UUWXXX/2 Option or **UVW201/2 English for General Communication	UUW130/2 Philosophy and Current Issues	UVW312/2 English for Technical Communication	UVW410/2 University Malay Language ***UVW110/2 Basic Malay Language			UUW322/2 Thinking Skills	
	*UVA101/2 Preparatory English				UUW224/2 Engineering Entrepreneurship				
	UZWXXX/1 Co-curriculum	UZWXXX/1 Co-curriculum							
	18	15	17	18	17	18	4	16	13
Total Units for Graduation 136									

Elective:
Elective I : ENT464/3 Fracture Mechanics / ENT465/3 Rapid Engineering / ENT431/3 Refrigeration & Air Conditioning / ENT447/3 Finite Element Analysis
Elective II : ENT434/3 Mechanics of Composite Materials / ENT466/3 Design Optimization / ENT461/3 Renewable Energy / ENT441/3 Computational Fluid Dynamics Elective III : ENT435/3 Acoustic & Noise Control / ENT436/3 Internal Combustion Engine / ENT437/3 Additive Manufacturing
* Uncredited. Compulsory to students with MUET Band 1 and 2 only. This course is a prerequisite to UVW201 English for General Communication.
**Compulsory to students with MUET Band 3 or less. This course is a prerequisite to UVW312 English for Technical Communication.
***For international students only.

UR6540001
Bachelor of Manufacturing Engineering With Honours

Programme Educational Objective (PEO)

PEO1
Graduates who have demonstrated career advancement in the field of Electrical Engineering or related engineering field.

PEO2
Graduates who are involved in a professional body or society.

PEO3
Graduates who pursue life-long learning

Programme Outcomes (PO)

PO 01
Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

PO 02
Identify, formulate, conduct research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO 03
Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations, safety, cultural, societal, and environmental considerations.

PO 04
Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

PO 05
Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations.

PO 06
Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems.

PO 07
Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts including ability to have entrepreneurship skills.

PO 08
Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

PO 09
Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

PO 10
Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11
Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PO 12
Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

CURRICULUM STRUCTURE
BACHELOR OF MANUFACTURING ENGINEERING WITH HONOURS ACADEMIC SESSION (2020/2021)

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	I	II	III	IV	V	VI		VII	VIII
Engineering CORE (97 + 4)	EPT103/3 Materials	EPT161/3 Electrical Technology	EPT241/3 Solid Mechanics I	EPT228/3 Fluid Mechanics I	EPT335/3 Applied Thermodynamics	EPT312/3 Vibration and Mechanics of Machines	EIT302/4 Industrial Training	EPT445/2 Final Year Project I	EPT446/4 Final Year Project II
	EPT152/2 Engineering Drawing	EPT114/3 Statics	EPT212/3 Dynamics	EPT235/3 Thermodynamics	EPT341/3 Solid Mechanics II	EPT315/3 Machine Components Design		EPT412/3 Mechanical System Design	EPT481/3 Tools and Die Design
	EPT162/2 Computer Programming	EPT182/3 Manufacturing Process I	EPT261/3 Electronics	EPT281/3 Industrial Engineering	EPT383/3 Automation & Robotics	EPT386/3 Design for Manufacture		EPT447/3 Manufacturing Integrated Project	EPT495/2 Operational Research
		EPT183/2 Engineering Workshop	EPT282/3 Manufacturing Process II		EPT385/3 Metrology & Quality Control	EPT361/4 Instrumentation and Control		EPT484/2 Lean Manufacturing	EPT4XX/3 Elective**
		EPT181/2 CAD/CAM			EPT384/3 Advanced Manufacturing Technology	EPT324/2 Heat Transfer		EPT485/2 Production Planning and Control	
					EPT371/2 Finite Element Analysis				
Non Engineering CORE (19)	EQT101/3 Engineering Mathematics I	EQT102/3 Engineering Mathematics II	EQT203/3 Engineering Mathematics III	EQT271/3 Engineering Statistics		UUT122/2 Skills and Technology in Communication		EPT443/3 Management for Engineers	EPT442/2 Professional Engineers
University Required (18)	UUW130/2 Philosophy and Current Issues	UVA101/0 Preparatory English*	UVW201/2 English for General Communication*	UUW224/2 Engineering Entrepreneurship	UVW312/2 English for Technical Communication*				
	UVW410/2 University Malay Language ****UVW110/2 Basic Malaysia Language			YYYXXX/2 ***Option					
	UUW131/2 Appreciation of Ethics and Civilization	UUW322/2 Thinking Skills							
	UZWXXX/1 Co-Curriculum	UZWXXX/1 Co-Curriculum							
136 (or 138*)	17	19	17	14 (or 16*)	19	17	4	15	14
Total Units for Graduation: 136									

*Compulsory on option courses depending on MUET results.

	UVA101/0 Preparatory English	UVW201/2 English for General Communication	UVW312/2 English for Technical Communication	YYYXXX/2 ***Option
Band 1 & 2	Compulsory (no credit)	Compulsory (will be counted as Option)	compulsory	optional
Band 3	-	Compulsory (will be counted as Option)	compulsory	optional
Band 4, 5 & 6	-	-	compulsory	Compulsory

** Elective Courses (Subject to changes): EPT491/3 Micromachining or EPT492/3 Industrial Ergonomics or EPT 493 CFD for Engineering Applications
***Any courses (minimum 2 credit) offered by other faculty
****For international students only

UR6521002
Bachelor of Mechanical Engineering Technology (Machining) with Honour

Programme Educational Objectives (PEO)

PEO 01
Engineering technology graduates engaged in the field of mechanical engineering technology as demonstrated through career advancement.

PEO 02
Engineering technology graduates who are members and contribute to professional society.

PEO 03
Engineering technology graduates embracing in life-long learning or pursuing continuing education opportunities.

PEO 04
Engineering technology graduates who are technopreneurs.

Programme Outcomes (PO)

PO 01
Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialisation to defined and applied engineering procedures, processes, systems or methodologies.

PO 02
Identify, formulate, research literature and analyse broadly-defined engineering problems reaching substantiated conclusions using analytical tools appropriate to their discipline or area of specialisation

PO 03
Design solutions for broadly-defined engineering technology problems and contribute to the design of systems, components or processes to meet specified needs with appropriate consideration for public health and

PO 04
Conduct investigations of broadly-defined problems; locate, search and select relevant data from codes, data bases and literature, design and conduct experiments to provide valid conclusions.

PO 05
Select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to broadly- defined engineering problems, with an understanding of the limitations.

PO 06
Function effectively as an individual, and as a member or leader in diverse technical teams.

PO 07
Communicate effectively on broadly-defined engineering activities with the engineering community and with society at large, by being able to comprehend and write effective reports and design documentation,

PO 08
Demonstrate understanding of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technology practice and solutions to broadly-defined engineering

PO 09
Understand and commit to professional ethics and responsibilities and norms of engineering technology practice.

PO 10
Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member and leader in a team and to manage projects in multidisciplinary

PO 11 Understand the impact of engineering technology solutions of broadly- defined engineering problems in societal and environmental context and demonstrate knowledge of and need for sustainable development.

PO 12 Recognize the need for, and have the ability to engage in independent and life-long learning in specialist technologies.

CURRICULUM STRUCTURE
BACHELOR OF MECHANICAL ENGINEERING TECHNOLOGY (MACHINING) WITH HONOURS
ACADEMIC SESSION (2020/2021)

YEARS	2020	2021	2021	2022	2022	2023	2023	2024
MONTHS	OKTOBER - FEB	MAC - JULAI	SEP - JAN	FEB-JUN	SEP - JAN	FEB-JUN	SEP - JAN	FEB-JUN
YEAR	FIRST		SECOND		THIRD		FOURTH	
SEMESTER	I	II	I	II	I	II	I	II
DISCIPLINE CORE (106)	PDT 104/3 APPLIED STATICS & DYNAMICS	PDT122/3 MATERIAL SCIENCE	PDT204/3 APPLIED STRENGTH OF MATERIALS	PDT203/3 NOISE & VIBRATION	PDT309/3 MANUFACTURING ECONOMICS	PDT313/4 FINAL YEAR PROJECT I	PDT413/6 FINAL YEAR PROJECT II	PIT404/12 INDUSTRIAL TRAINING
	PDT106/3 ENGINEERING GRAPHICS	PDT102/3 THERMOFLUIDS	PDT209/3 INDUSTRIAL SAFETY	PDT206/3 JIGS & FIXTURES DESIGN	PDT318/4 ADVANCED MACHINING TECHNOLOGY	PDT314/4 MACHINING PROJECT	PDTXXX/3 ELECTIVE II	
	PDT 133/2 WORKSHOP TECHNOLOGY	PDT107/2 COMPUTER AIDED DESIGN	PDT210/4 CONVENTIONAL MACHINING	PDT213/4 CNC TECHNOLOGY	PDT312/3 COMPUTER AIDED MANUFACTURING	PDT319/3 MAINTENANCE MANAGEMENT	PDTXXX/3 ELECTIVE III	
	PDT111/3 MANUFACTURING PROCESS	PDT120/3 BASIC ELECTRICAL & ELECTRONIC	PDT202/3 HEAT TRANSFER	PDT222/3 METALLURGY	PDT310/3 QUALITY SYSTEM	PDT316/3 SUSTAINABLE MACHINING		
		PDT112/3 THEORY IN MACHINING		PDT212/3 GEOMETRIC, DIMENSIONING & TOLERANCE		PDTXXX/3 ELECTIVE I		
COMMON CORE (15)	PQT111/3 MATHEMATICS FOR ENGINEERING TECHNOLOGY I	PQT112/3 MATHEMATICS FOR ENGINEERING TECHNOLOGY II	PQT213/3 MATHEMATICS FOR ENGINEERING TECHNOLOGY III				PTT444/3 ENGINEERING TECHNOLOGIST IN SOCIETY	
							PTT333/3 ENGINEERING TECHNOLOGY MANAGEMENT	
UNIVERSITY REQUIRED (21)	UUW130/2 PHILOSOPHY & CURRENT ISSUES	UVA101/0 PREPARATORY ENGLISH	UVW201/2 ENGLISH FOR GENERAL COMMUNICATION		PUW122/2 SKILLS AND TECHNOLOGY IN COMMUNICATION			
	UVW410/2 UNIVERSITY MALAY LANGUAGE			UUW224/2 ENGINEERING ENTREPRENEURSHIP	UUW131/2 APPRECIATION OF ETHICS AND CIVILIZATION	UUW322/2 THINKING SKILLS		
	UZWXXX/1 **CO-CURRICULAR ACTIVITY**	UZWXXX/1 **CO-CURRICULAR ACTIVITY**		UVW312/2 ENGLISH FOR TECHNICAL COMMUNICATION	UVWXXX/2 OPTION SUBJECT (FOREIGN LANGUAGE)			
*MUET: 2-3	19	18	18	20	17	19	18	12
*MUET: 4-6	19	18	16	20	19	19	18	12

TOTAL UNITS FOR GRADUATION = 141

ELECTIVE 1	ELECTIVE 2	ELECTIVE 3
A1. PDT348/3 FINITE ELEMENT ANALYSIS	B1. PDT417/3 MODERN GRINDING TECHNOLOGY	C1. PDT418/3 CUTTING TOOL TECHNOLOGY
A2. PDT317/3 INJECTION MOULD DESIGN	B2. NIL	C2. NIL

UR6521003
Bachelor of Mechanical Engineering Technology (Agriculture System) with Honours

Programme Educational Objectives (PEO)

PEO 01
Engineering technology graduates engaged in the field of mechanical engineering technology as demonstrated through career advancement.
PEO 02
Engineering technology graduates who are members and contribute to professional society.
PEO 03
Engineering technology graduates embracing in life-long learning or pursuing continuing education opportunities.
PEO 04
Engineering technology graduates who are technopreneurs.

Programme Outcomes (PO)

PO 01
Apply knowledge of mathematics, science,engineering fundamentals and an engineering specialisation to defined and applied engineering procedures, processes, systems or methodologies.

PO 02
Identify, formulate, research literature and analyse broadly-defined engineering problems reaching substantiated conclusions using analytical tools appropriate to their discipline or area of specialisation

PO 03
Design solutions for broadly-defined engineering technology problems and contribute to the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

PO 04
Conduct investigations of broadly-defined problems; locate, search and select relevant data from codes, data bases and literature, design and conduct experiments to provide valid conclusions.

PO 05
Select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to broadly-defined engineering problems, with an understanding of the limitations.

PO 06
Function effectively as an individual, and as a member or leader in diverse technical teams.

PO 07
Communicate effectively on broadly-defined engineering activities with the engineering community and with society at large, by being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 08
Demonstrate understanding of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technology practice and solutions to broadly-defined engineering problems.

PO 09
Understand and commit to professional ethics and responsibilities and norms of engineering technology practice.

PO 10
Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member and leader in a team and to manage projects in multidisciplinary environments.

PO 11
Understand the impact of engineering technology solutions of broadly-defined engineering problems in societal and environmental context and demonstrate knowledge of and need for sustainable development.

PO 12
Recognize the need for, and have the ability to engage in independent and life-long learning in specialist technologies.

CURRICULUM STRUCTURE
BACHELOR OF MECHANICAL ENGINEERING TECHNOLOGY (AGRICULTURE SYSTEM) WITH HONOURS
ACADEMIC SESSION (2020/2021)

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEMESTER	I	II	III	IV	V	VI	VII	VIII
DISCIPLINE CORE (110)	PDT176/2 Computer Aided Drafting	PDT181/3 Engineering Mechanics	PDT204/3 Applied Strenght of Materials	PDT107/2 Computer Aided Design	PDT376/3 Farm Power and Machinery	PDT313/4 Final Year Project 1	PDT413/6 Final Year Project 2	
	PDT177/2 Applied Chemistry	PDT182/3 Electronic Appliction in Agriculture	PDT277/3 Applied Thermodynamics	PDT278/2 Geodetics Engineering	PDT377/3 Applied Heat and Mass Transfer	PDT382/3 Controlled Enviroment Agriculture	PDT 478/3 Post-Harvest Technology	
	PDT178/2 Applied Biology	PDT133/2 Workshop Technology	PDT279/4 Principle of Agronomy	PDT281/3 Instrumentatios and Control	PDT378/2 Precision Agriculture Technology	PDT383/3 Renewable Energy	PDT478/3 Agricultural waste Management and utilization Eng.	
	PDT179/3 Agricultural Economics	PDT184/4 Agricultural Production Systems	PDT280/2 Fundamentals of Agribusiness Accounting And Finance	PDT282/3 Applied Fluid Mechanics	PDT 379/3 Water Resource Management	PDT384/3 Food Technology	Elective II/3	
	PDT180/3 Engineering Science			PDT283/2 Agribusiness Management	PDT 380/3 Automations in Agricultural Systems	Elective I/3	Elective III/3	
				PDT284/2 Agro-ecosystem and Sustainability				PIT 404/12 Industrial Training
COMMON CORE (15)	PQT 111/3 Mathematics for Engineering Technology I	PQT 112/3 Mathematics for Engineering Technology II	PQT 213/3 Mathematics for Engineering Technology III		PTT 333/3 Engineering Technology Management	PTT 444/3 Engineering Technologist in Society		
UNIVERSITY REQUIRED (18)	UVW 410/2 University Malay Language	UVW 201/2 English for General Comunication or UVW XXX/2 Option Subject	UUW130/2 Philosophy and Currents Issues	UUT122/2 Skill and Technology in Comunication	UUW 131/2 Appreciation of Ethics and Civilization			
	UZW XXX/1 Co-Curriculum	UUW322/2 Thinking Skills	UVW 312/2 English for Technical Communication	UUW 224/2 Engineering Entrepreneurship				
		UZW XXX/1 Co-Curriculum						
TOTAL CREDIT	18	20	19	18	19	19	18	12
Total units for Graduation = 143								

Elective I : PDT385/3 Biomaterial Engineering or PDT386/3 Integrated Agrosystems
Elective II : PDT479/3 Bio-Renewable Systems or PDT480/3 Food Processing Engineering
Elective III : PDT481/3 Advances In Agrotechnology or PDT482/3 Food And Herbal Crop Production Technology

MUET Band 2: UVA101/2 Foundation English (1st semester, 1st year)> UVW201/2 English for General Communication> UVW312 English for Technical Communication
MUET Band 3: UVW201/2 English for General Communication >UVW312 English for Technical Communication,
MUET Band 4 and above: UVW312 English for Technical Communication, *Option Subject is compulsory (UVW XXX/2)

UR6521004
Bachelor of Mechanical Engineering Technology (Product Design) with Honours

Programme Educational Objectives (PEO)

PEO 1
Engineering technology graduates engaged in the field of Mechanical Engineering Technology as demonstrated through career advancement.

PEO 2
Engineering technology graduates who are members and contribute to professional society.

PEO 3
Engineering technology graduates embracing in life-long learning or pursuing continuing education opportunities

PEO 4
Engineering technology graduates who are technopreneurs

Programme Outcomes (PO)

PO 1
Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialisation to defined and applied engineering procedures, processes, systems or methodologies.

PO 2
Identify, formulate, research literature and analyse broadly-defined engineering problems reaching substantiated conclusions using analytical tools appropriate to their discipline or area of specialisation

PO 3
Design solutions for broadly-defined engineering technology problems and contribute to the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

PO 4
Conduct investigations of broadly-defined problems; locate, search and select relevant data from codes, data bases and literature, design and conduct experiments to provide valid conclusions.

PO 5
Select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to broadly-defined engineering problems, with an understanding of the limitations.

PO 6
Function effectively as an individual, and as a member or leader in diverse technical teams.

PO 7
Communicate effectively on broadly-defined engineering activities with the engineering community and with society at large, by being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 8
Demonstrate understanding of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technology practice and solutions to broadly-defined engineering problems.

PO 9
Understand and commit to professional ethics and responsibilities and norms of engineering technology practice.

PO 10
Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member and leader in a team and to manage projects in multidisciplinary

PO 11
Understand the impact of engineering technology solutions of broadly-defined engineering problems in societal and environmental context and demonstrate knowledge of and need for sustainable development.

PO 12
Recognize the need for, and have the ability to engage in independent and life-long learning in specialist technologies.

CURRICULUM STRUCTURE
BACHELOR OF MECHANICAL ENGINEERING TECHNOLOGY (PRODUCT DESIGN) WITH HONOURS
ACADEMIC SESSION (2020/2021)

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEM	I	II	III	IV	V	VI	VII	VIII
Discipline Core	PDT 104/3 Applied Statics & Dynamics	PDT 122/3 Material Science	PDT 204/3 Applied Strength of Material	PDT 240/3 Applied Ergonomics & Safety	PDT 341/3 Industrial Dialogue	PDT 313/4 Final Year Project I	PDT 413/6 Final Year Project II	PIT 404 INDUSTRIAL TRAINING
	PDT 126/3 Design Fundamental	PDT 128/2 Design Visualization	PDT 229/3 Design Integration	PDT230/3 Design Studio I	PDT 330/3 Design Studio II	PDT 348/3 Finite Element Analysis	Elective II/2	
	PDT 127/2 Design Appreciation	PDT 111/3 Manufacturing Process	PDT 251/3 Thermofluids	PDT202/3 Heat Transfer	PDT 310/3 Quality System	Elective I/2	PDT 443/3 Design for Manufacturing & Assembly	
	PDT 106/3 Engineering Graphics	PDT 131/3 Computer Aided Industrial Design I (CAID I)	PDT 231/3 Computer Aided Industrial Design II (CAID II)	PDT 232/3 Product Data Management (PDM)	PDT 344/3 Innovation Management & Product Development			
	PDT 133/2 Workshop Technology	PDT 134/3 Design Practice	PDT 234/3 Rapid Prototyping I (RP I)	PDT 235/3 Rapid Prototyping II (RP II)	PDT 236/2 Computer Programming			
		PDT 120/3 Basic Electrical & Electronic						
Common Core	PQT 111/3 Mathematics for Engineering Technology I	PQT 112/3 Mathematics for Engineering Technology II	PQT 213/3 Mathematics for Engineering Technology III				PTT 444/3 Engineering Technologist in Society	
	UUW 322/2 Thinking Skills	*UVA101/0 Preparatory English	**UVW201/2 English for General Communication	UUW 224/2 Engineering Entrepreneurship	UUW XXX/2 Option Subject (Foreign Language)	UUW130/2 Philosophy and Currents Issues	PTT 333/3 Engineering Technology Management	
University Required				UUT 122/2 Skills & Technology in Communication	UVW 312/2 English for Technical Communication	UUW 131/2 Appreciation of Ethics and Civilization		
	UZW XXX/1 Co-Curricular Activity	UZW XXX/1 Co-Curricular Activity		UVW 410/2 University Malay Language				
MUET: 2-3	19	21	20	21	16	14	18	12
MUET: 4-6	19	21	18	21	18	14	18	12
Total Units for Graduation = 141								
Elective 1			Elective 2					
A1. PDT 346/3 Production Management for Designers			B1. PDT 347/3 Product Study & Professional Practice					
A2. PDT 345/3 Customer Behavior			B2. PDT 442/3 Commercialization Culture					

Notes:
MUET Band 2: UVA 111/0 Preparatory English > UVW 201 English for General Communication > UVW 312 English for Technical Communication, *Option Subject is NOT COMPULSORY
MUET Band 3: UVW 201/2 English for General Communication > UVW 312/2 English for Technical Communication, *Option Subject is NOT COMPULSORY
MUET Band 4 and above: UVW 312 English for Technical Communication, *Option Subject is COMPULSOR

UR6543001
Bachelor of Mechanical Engineering Technology (Material Processing) with Honours

Programme Educational Objective (PEO)

PEO 1
Engineering technology graduates engaged in the field of mechanical engineering technology as demonstrated through career advancement.

PEO 2
Engineering technology graduates who are members and contribute to professional society.

PEO 3
Engineering technology graduates embracing in life-long learning or pursuing continuing education opportunities.

PEO 4
Engineering technology graduates who are technopreneurs.

Programme Outcomes (PO)

PO 1
Apply knowledge of mathematics, science,engineering fundamentals and an engineering specialisation to defined and applied engineering procedures, processes, systems or methodologies.

PO 2
Identify, formulate, research literature and analyse broadly-defined engineering problems reaching substantiated conclusions using analytical tools appropriate to their discipline or area of specialisation

PO 3

Design solutions for broadly-defined engineering technology problems and contribute to the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations

PO 4
Conduct investigations of broadly-defined problems; locate, search and select relevant data from codes, data bases and literature, design and conduct experiments to provide valid conclusions.

PO 5
Select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to broadly-defined engineering problems, with an understanding of the limitations.

PO 6
Function effectively as an individual, and as a member or leader in diverse technical teams.

PO 7
Communicate effectively on broadly-defined engineering activities with the engineering community and with society at large, by being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 8
Demonstrate understanding of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technology practice and solutions to broadly-defined engineering problems.

PO 9
Understand and commit to professional ethics and responsibilities and norms of engineering technology practice.

PO 10
Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member and leader in a team and to manage projects in multidisciplinary environments.

PO 11
Understand the impact of engineering technology solutions of broadly-defined engineering problems in societal and environmental context and demonstrate knowledge of and need for sustainable development.

PO 12
Recognize the need for, and have the ability to engage in independent and life-long learning in specialist technologies.

CURRICULUM STRUCTURE
BACHELOR OF MECHANICAL ENGINEERING TECHNOLOGY (MATERIAL PROCESSING) WITH HONOURS
ACADEMIC SESSION (2020/2021)

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEM	I	II	III	IV	V	VI	VII	VIII
Discipline Core	PDT 151/2 Introduction to Materials Processing Technology	PDT 155/3 Quality Control	PDT 251/3 Thermo-fluids	PDT 255/3 Process Control	PDT 282/3 Applied Fluids Mechanics	PDT 451/3 Materials Selection & Design	PDT 413/6 Final Year Project II	PIT 404 INDUSTRIAL TRAINING
	PDT 104/3 Applied Statics & Dynamics	PDT 152/3 Materials Chemistry	PDT 204/3 Applied Strength of Materials	PDT 256/3 Materials Characterization	PDT 362/4 Metal Fabrication Technology	PDT 463/3 Material for Energy & Environmental Sustainability	Elective II/4	
	PDT 180/3 Engineering Science	PDT 153/3 Materials Structure & Properties	PDT 253/2 Materials Processing Lab	PDT 261/3 Whiteware Ceramic Processing	PDT 352/2 Design of Die & Moulds	PDT 313/4 Final Year Project I		
	PDT 106/3 Engineering Graphics	PDT 154/3 Materials Testing	PDT 264/3 Electronic Materials	PDT 262/3 Metal Extraction Technology	PDT 364/3 Composite Materials Processing	Elective I/4		
	PDT 133/2 Workshop Technology	PDT 120/3 Basic Electrical & Electronic	PDT 236/2 Computer Programming	PDT 263/4 Plastic Processing	PDT 351/3 Materials Failure Analysis			
Common Core	PQT 111/3 Mathematics for Engineering Technology I	PQT 112/3 Mathematics for Engineering Technology II	PQT 213/3 Mathematics for Engineering Technology III				PTT 444/3 Engineering Technologist in Society	
University	UUW 130/2 Philosophy and Current Issues	*UVA 101/0 Preparatory English	**UVW201/2 English for General Communication	UUW 224/2 Engineering Entrepreneurship			PTT 333/3 Engineering Technology Management	
			UUW XXX/2 Option Subject (Foreign Language)	UUW 131/2 Appreciation of Ethics and Civilization	UVW 410/2 University Malay Language	UUT 122/2 Skills & Technology in Communication		
	UZW XXX/1 Co-Curricular Activity	UZW XXX/1 Co-Curricular Activity			UUW 322/2 Thinking Skill	UVW 312/2 English for Technical Communication		
M: 2-3	19	19	18	20	19	18	16	12
M: 4-6	19	19	18	20	19	18	16	12
Total Units for Graduation = 141								

Elective 1	Elective 2	Elective 3
A1. PDT353/4 Polymer Adhesive and Coatings A2. PDT354/4 Glass Technology A3. PDT355/4 Advanced Metallurgy	B1. PDT473/4 Rubber and Latex Technology B2. PDT474/4 Technical Ceramic Technology B3. PDT475/4 Geopolymer Materials Technology	C1. C2.

Notes
MUET Band 2: UVA111/0 Preparatory English > UVW211 English for General Purpose> UVW312 English for Technical Communication, *Option Subject is NOT COMPULSORY
MUET Band 3: UVW211 English for General Purpose > UVW312 English for Technical Communication, *Option Subject is NOT COMPULSORY
MUET Band 4 and above: UVW312 English for Technical Communication, *Option Subject is COMPULSORY

UR6521006
Bachelor of Technology in Industrial Machining with Honours

Programme Educational Objective (PEO)

PEO 1
To produce machining technologist that perform related work including machinist, design, manufacturer, maintencance, facility manager and production manager.

PEO 2
To produce technopreneurs in machining related technology.

PEO 3
To produce relevant, respected and referred professionals in machining technology.

Programme Outcomes (PO)

PO 1
Apply knowledge of technology fundamentals to broadly-defined procedures processes, systems and methodologies in machining technology.

PO 2
Able to suggest and apply latest tools and techniques to solve broadly-defined problems.

PO 3
Demonstrate strong analytical and critical thinking skills to solve broadly-defined problems in machining technology.

PO 4
Able to communicate and articulate effectively in both verbal and written among technologist communities and society at large.

PO 5
Demonstrate understanding of the societal related issues and the consequent responsibilities relevant to broadly-defined technology practices.

PO 6
Recognize the needs for professional development and to engage independent lifelong learning in specialist technologists.

PO 7
Demonstrate an awareness of management and technopreneurship practices in real perspective.

PO 8
Demonstrate professionalism and social and ethical consideration.

PO 9
Demonstrate leadership quality, mentoring and work effectively in diverse teams.

CURRICULUM STRUCTURE
BACHELOR OF TECHNOLOGY IN INDUSTRIAL MACHINING WITH HONOURS
ACADEMIC SESSION (2020/2021)

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEMESTER	I	II	II	IV	V	VI	VII	VIII
DICISPLINE CORE (104)	VDT150/3 Product Drafting and Specification	VDT154/4 Tool Setup and Refurbishment	VDT250/4 Precision and Finishing in CNC Technology	VDT254/4 Multi Axis Machining	VDT350/4 Assembly Method	VDT315/4 Final Year Project 1	VDT415/6 Final Year Project 2	VDT416/12 Industrial Training
	VDT151/3 Standard Product Precision	VDT155/3 Sustainable Machining	VDT251/3 Precision and Finishing in EDM and Grinding Technology	VDT255/3 Complex CADCAM Product	Elective	VDT353/4 Project Management and Supervision		
	VDT152/3 Workpiece and Cutting Tool Properties	VDT156/3 Assessment of Machinability	VDT252/4 Prismatic CAD/CAM Product	VDT256/3 Heat Treatment of Machined Component	VDT351/4 Rework and Rehabilitation of Machined Component	VDT354/4 Acts and Risks Assessment in Machining Production		
	VDT153/3 Jig and Fixture	VDT157/3 Condition Monitoring in Machining	VDT258/4 Capstone Technopreneurship 1	VDT259/4 Capstone Technopreneurship 1	VDT352/4 Surface Aesthetics of Machined Component	VDT355/4 Machine Maintenance		
UNIVERSITY CORE	UZWXXX/1 Co-Curiculum I	UZWXXX/1 Co-Curiculum II	UVW312/2 English Technical for Communication	UUW235/2 Engineering Entrepreneurship	UUW131/2 Appreciation of Ethics and Civilization			
	UVW410/2 University Malay Language	UUW130/2 Philosophy and Current Issues	UVWXXX/2 Third Language					
	PUW122/2 Skill and Technology in Communication	UVW201/2 English for General Communication						
	UVA101/2 *Preparatory English							
	17	18	19	16	18	16	6	12

Electives:
VDT356/4 Tool and Die Making,
VDT357/4 Aerospace Machining VDT358/4 RapidMachining,
VDT359/3 Human Factor Technology,
VDT360/4 Production Planning in Machining

UR6525001
Bachelor of Technology in Automotive with Honours

Programme Educational Objectives (PEO)

PEO 1
To produce automotive technologist that perform automotive related work including diagnostic specialist and retrofit specialist

PEO 2
To produce technopreneurs in automotive related technology

PEO 3
To produce relevant respected referred professionals in automotive technology

Programme Outcomes (PO)

PO1
Apply knowledge of technology fundamentals to broadly-defined procedures, processes, systems and methodologies in the field of automotive study.

PO2
Able to suggest and apply latest tools and techniques to solve broadly- defined problems.

PO3
Demonstrate strong analytical and critical thinking skills to solve broadly-defined problems in the field of automotive study.

PO4
Able to communicate and articulate effectively in both verbal and written among technologist communities and society at large .

PO5
Demonstrate understanding of the societal related issues and the consequent responsibilities relevant to broadly-defined technology practices.

PO6
Recognize the needs for professional development and to engage independent lifelong learning in specialist technologists.

PO7
Demonstrate an awareness of management and technopreneurship practices in real perspective.

PO8
Demonstrate professionalism and social and ethical consideration
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PO9
Demonstrate leadership quality, mentoring and work effectively in diverse teams.

CURRICULUM STRUCTURE
BACHELOR OF TECHNOLOGY IN AUTOMOTIVE WITH HONOURS
ACADEMIC SESSION (2020/2021)

YEAR	FIRST		SECOND		THIRD			FOURTH
SEMESTER	I	II	III	IV	V	VI	short sem	VII
COMMON CORE	VDT110/4 Automotive Industry & Technology	VDT113/3 Shop floor Supervision	VDT210/3 Project Management	VDT212/4 Powertrain System Service	VDT310/3 Automotive Legislation		VDT415/6 FYP 2	VITXXX/12 Industrial Training
	VDT111/3 Automotive Drafting	VDT114/4 Automotive Component Design & Assembly	VDT211/4 Autotronic System Service	VDTXXX/4 Elective III	VDTXXX/4 Elective V	VDT313/6 Quality Management		
	VDT112/4 Automotive Workshop Practice	VDT115/4 Automotive Component Fabrication	VDTXXX/4 Elective I	VDTXXX/4 Elective IV	VDTXXX/4 Elective VI	VDT314/3 Risk Assessment		
			VDTXXX/4 Elective II	VDT213/4 Capstone Technopreneur 1	VDT311/4 Capstone Technopreneur 2	VDT315/4 FYP 1		
					VDT316/2 Vehicle Marketing	VDT316/3 Asset & Inventory Management		
	11	11	15	16	17	16	6	12
UNIVERSITY CORE	UZWXXX/1 Co-Curiculum 1	UZWXXX/1 Co-Curiculum II	UV312/2 English Technical for Communication	UUW235/2 Engineering Entrepeneurship	UUW131/2 Appreciation of Ethics and Civilization			
	UVW410/2 University Malay Language	UUW130/2 Philosophy and Current Issues	UVWXXX/2 Third Language					
	PUW122/2 Skill and Technology in Communication	UVW201/2 English for General Communication						
	UVA101/2 *Preparatory English							
	5	5	4	2	2			
TOTAL CREDIT PER SEMESTER	16	16	19	18	19	16	6	12
TOTAL CREDIT FOR GRADUATION	122							

Elective I : VDT214/4 Commercial Vehicle Servicing / VDT215/4Surface Design
Elective II : VDT216/4 Drivetrain Maintenance / VDT217/4 Automotive Modelling
Elective III : VDT218/4 Vehicle Performance Analysis / VDT219/4 Exterior Design
Electice IV : VDT220/4 Vehicle Fault Diagnosis / VDT221/4 Component Remanufacturing
Elective V : VDT317/4 Hybrid Servicing / VDT318/4 Interior Design
Elective VI: VDT319/4 Electric Vehicle Service / VDT318/4 Painting

LIST OF COURSES:
ENGINEERING COURSES

EPT103	BAHAN [MATERIALS]
EPT114	STATIK [STATICS]
EPT152	LUKISAN KEJURUTERAAN [ENGINEERING DRAWING]
EPT161	TEKNOLOGI ELEKTRIK [ELECTRICAL TECHNOLOGY]
EPT162	PENGATURCARAAN KOMPUTER [COMPUTER PROGRAMMING]
EPT181	CAD/CAM [CAD/CAM]
EPT182	PROSES PEMBUATAN 1 [MANUFACTURING PROCESS 1]
EPT183	BENGKEL KEJURUTERAAN [ENGINEERING WORKSHOP]
EPT212	DINAMIK [DYNAMICS]
EPT228	MEKANIK BENDALIR 1 [FLUID MECHANICS 1]
EPT235	TERMODINAMIK [THERMODYNAMICS]
EPT241	MEKANIK PEPEJAL 1 [SOLID MECHANICS I]
EPT261	ELEKTRONIK [ELECTRONICS]
EPT281	KEJURUTERAAN INDUSTRI [INDUSTRIAL ENGINEERING]
EPT282	PROSES PEMBUATAN 2 [MANUFACTURING PROCESS II]
EPT312	GETARAN DAN MEKANIK MESIN [VIBRATION AND MECHANICS OF MACHINES]
EPT315	REKABENTUK KOMPONEN MESIN [MACHINE COMPONENTS DESIGN]
EPT324	PEMINDAHAN HABA [HEAT TRANSFER]
EPT335	TERMODINAMIK GUNAAN [APPLIED THERMODYNAMICS]
EPT341	MEKANIK PEPEJAL 2 [SOLID MECHANICS LL]
EPT361	INSTRUMENTASI DAN KAWALAN [INSTRUMENTATION AND CONTROL]
EPT371	ANALISA UNSUR TERHINGGA [FINITE ELEMENT ANALYSIS]
EPT383	AUTOMASI DAN ROBOTIK [AUTOMATION AND ROBOTICS]
EPT384	TEKNOLOGI PEMBUATAN TERMAJU [ADVANCED MANUFACTURING TECHNOLOGY]
EPT385	METROLOGI DAN KAWALAN KUALITI [METROLOGY AND QUALITY CONTROL]
EPT386	REKABENTUK UNTUK PEMBUATAN [DESIGN FOR MANUFACTURE]

EPT442	JURUTERA PROFESSIONAL [PROFESSIONAL ENGINEER]
EPT445	PROJEK TAHUN AKHIR 1 [FINAL YEAR PROJECT 1]
EPT446	PROJEK TAHUN AKHIR 2 [FINAL YEAR PROJECT 2]
EPT447	PROJEK BERSEPADU PEMBUATAN [MANUFACTURING INTEGRATED PROJECT]
EPT481	REKABENTUK PERKAKAS DAN ACUAN [TOOLS AND DIE DESIGN]
EPT484	PEMBUATAN LEAN [LEAN MANUFACTURING]
EPT485	PERANCANGAN PENGELUARAN DAN KAWALAN [PRODUCTION PLANNING AND CONTROL]
EPT491	PEMESINAN MIKRO [MICROMACHINING]
EPT492	ERGONOMIK INDUSTRI [INDUSTRIAL ERGONOMICS]
EPT493	PENGKOMPUTERAN DINAMIK BENDALIR UNTUK APLIKASI KEJURUTERAAN [CFD FOR ENGINEERING APPLICATIONS]
EPT495	PENYELIDIKAN OPERASI [OPERATIONAL RESEARCH]
ENT442	JURUTERA PROFESIONAL [PROFESSIONAL ENGINEERS]
ENT443	PENGURUSAN UNTUK JURUTERA [MANAGEMENT FOR ENGINEERS]
ENT141	STATIK KEJURUTERAAN [ENGINEERING STATICS]
ENT142	DINAMIK KEJURUTERAAN [ENGINEERING DYNAMICS]
ENT143	TERMODINAMIK I [THERMODYNAMICS I]
ENT146	PEMESINAN [MACHINING]
ENT147	BAHAN KEJURUTERAAN [ENGINEERING MATERIALS]
ENT150	GRAFIK KEJURUTERAAN & LUKISAN TERBANTU KOMPUTER [ENGINEERING GRAPHICS & COMPUTER AIDED DRAFTING]
ENT241	MEKANIK BENDALIR I [FLUID MECHANICS I]
ENT242	MEKANIK PEPEJAL I [SOLID MECHANICS I]
ENT243	TERMODINAMIK II [THERMODYNAMICS II]
ENT244	PROSES-PROSES PEMBUATAN KEJURUTERAAN [MANUFACTURING ENGINEERING PROCESSES]
ENT246	MEKANIK PEPEJAL II [SOLID MECHANICS II]
ENT247	MEKANIK BENDALIR II [FLUID MECHANICS II]
ENT248	PROSES REKABENTUK [DESIGN PROCESS]
ENT249	LITAR DAN MESIN ELEKTRIK [ELECTRICAL CIRCUIT AND MACHINE]
ENT332	MEKANISME DAN MESIN [MECHANISMS & MACHINES]

ENT333	PEMINDAHAN HABA [HEAT TRANSFER]
ENT334	REKABENTUK KOMPONEN [COMPONENT DESIGN]
ENT335	REKABENTUK SISTEM [SYSTEM DESIGN]
ENT336	JENTERA BENDALIR [FLUID MACHINERY]
ENT337	ELEKTRONIK & MIKROPEMPROSES [ELECTRONICS & MICROPROCESSORS]
ENT346	MEKANIK GETARAN [VIBRATION MECHANICS]
ENT385	KEJURUTERAAN KAWALAN [CONTROL ENGINEERING]
ENT440	PROJEK REKABENTUK [DESIGN PROJECT]
ENT457	PENGURUSAN, PENGELUARAN DAN OPERASI [MANAGEMENT, PRODUCTION & OPERATIONS]
ENT431	PENYEJUKAN DAN PENYAMAN UDARA [REFRIGERATION AND AIR CONDITIONING]
ENT434	MEKANIK BAHAN KOMPOSIT [MECHANICS OF COMPOSITE MATERIALS]
ENT435	AKUSTIK & KAWALAN KEBISINGAN [ACOUSTIC & NOISE CONTROL]
ENT436	ENJIN PEMBAKARAN DALAMAN [INTERNAL COMBUSTION ENGINE]
ENT437	PEMBUATAN PENAMBAHAN [ADDITIVE MANUFACTURING]
ENT441	PENGIRAAN MEKANIK BENDALIR [COMPUTATIONAL FLUID DYNAMICS]
ENT447	ANALISIS UNSUR TERHINGGA [FINITE ELEMENT METHODS]
ENT461	TENAGA DIPERBAHARUI [RENEWABLE ENERGY]
ENT464	MEKANIK PATAH [FRACTURE MECHANICS]
ENT465	KEJURUTERAAN PANTAS [RAPID ENGINEERING]
ENT466	PENGOPTIMUMAN REKABENTUK [DESIGN OPTIMIZATION]
ENT189	PENGATURCARAAN KOMPUTER [COMPUTER PROGRAMMING]
ENT189	PENGATURCARAAN KOMPUTER [COMPUTER PROGRAMMING]
ENT286	INSTRUMENTASI DAN PENGUKURAN [INSTRUMENTATION & MEASUREMENTS]
ENT445	PROJEK TAHUN AKHIR I [FINAL YEAR PROJECT I]
ENT446	PROJEK TAHUN AKHIR II [FINAL YEAR PROJECT II]
PDT102	THERMOFLUIDS [TERMOBENDALIR]
PDT104	STATIK DAN DINAMIK GUNAAN [APPLIED STATICS AND DYNAMICS]

PDT104	STATIK DAN DINAMIK GUNAAN [APPLIED STATICS AND DYNAMICS]
PDT106	ENGINEERING GRAPHICS [GRAFIK KEJURUTERAAN]
PDT106	GRAFIK KEJURUTERAAN [ENGINEERING GRAPHICS]
PDT107	COMPUTER AIDED DESIGN [REKABENTUK BERBANTU KOMPUTER]
PDT111	MANUFACTURING PROCESS [PROSES PEMBUATAN]
PDT111	PROSES PEMBUATAN [MANUFACTRUING PROCESS]
PDT112	THEORY IN MACHINING [TEORI DALAM PEMESINAN]
PDT120	BASIC ELECTRICAL AND ELECTRONIC [ASAS ELEKTRIK DAN ELEKTRONIK]
PDT120	BASIC ELECTRICAL AND ELECTRONIC [ASAS ELEKTRIK DAN ELEKTRONIK]
PDT120	ASAS ELEKTRIK DAN ELEKTRONIK [BASIC ELECTRIC ELECTRONIK]
PDT122	MATERIAL SCIENCE [SAINS BAHAN]
PDT122	SAINS BAHAN [MATERIAL SCIENCE]
PDT126	ASAS REKA BENTUK [DESIGN FUNDAMENTAL]
PDT127	PENGHAYATAN REKA BENTUK [DESIGN APPRECIATION]
PDT128	VISUALISASI REKA BENTUK [DESIGN VISUALIZATION]
PDT131	REKA BENTUK INDUSTRI TERBANTU KOMPUTER 1 [COMPUTER AIDED INDUSTRIAL DESIGN I (CAID 1)]
PDT133	WORKSHOP TECHNOLOGY [TEKNOLOGI BENGKEL]
PDT133	TEKNOLOGI BENGKEL [WORKSHOP TECHNOLOGY]
PDT134	AMALAN REKA BENTUK [DESIGN PRACTICE]
PDT151	INTRODUCTION TO MATERIALS PROCESSING TECHNOLOGY [PENGENALAN TEKNOLOGI PEMPROSESAN BAHAN]
PDT152	MATERIALS CHEMISTRY [KIMIA BAHAN]
PDT153	MATERIALS STRUCTURE AND PROPERTIES [STRUKTUR DAN SIFAT BAHAN]
PDT154	MATERIALS TESTING [PENGUJIAN BAHAN]
PDT155	QUALITY CONTROL [KAWALAN KUALITI]
PDT176	LUKISAN TERBANTU KOMPUTER [COMPUTER AIDED DRAFTING]
PDT177	KIMIA GUNAAN [APPLIED CHEMISTRY]
PDT178	BIOLOGI GUNAAN [APPLIED BIOLOGY]
PDT179	EKONOMI PERTANIAN [AGRICULTURAL ECONOMICS]
PDT180	ENGINEERING SCIENCE [SAINS KEJURUTERAAN]

PDT182	APLIKASI ELETRONIK DALAM PERTANIAN [ELECTRONICS APPLICATION IN AGRICULTURE]
PDT184	SISTEM PENGELUARAN PERTANIAN [AGRICULTURAL PRODUCTION SYSTEMS]
PDT202	HEAT TRANSFER [PEMINDAHAN HABA]
PDT203	NOISE & VIBRATION [HINGAR & GETARAN]
PDT204	APPLIED STRENGTH OF MATERIALS [KEKUATAN BAHAN GUNAAN]
PDT206	JIG AND FIXTURE DESIGN [REKABENTUK JIG DAN LEKAPAN]
PDT209	INDUSTRIAL SAFETY [KESELAMATAN DALAM INDUSTRI]
PDT210	CONVENTIONAL MACHINING [PEMESINAN KONVENSIONAL]
PDT212	GEOMETRIC, DIMENSIONING AND TOLERANCING [GEOMETRI, PENDIMENSIAN DAN TOLERANSI]
PDT213	CNC TECHNOLOGY [TEKNOLOGI CNC]
PDT222	METALLURGY [METALURGI]
PDT229	REKA BENTUK INTEGRASI [DESIGN INTEGRATION]
PDT230	STUDIO REKA BENTUK I [DESIGN STUDIO I]
PDT231	REKA BENTUK INDUSTRI TERBANTU KOMPUTER II [COMPUTER AIDED INDUSTRIAL DESIGN II (CAID II)]
PDT232	PENGURUSAN DATA PRODUK [PRODUCT DATA MANAGEMENT (PDM)]
PDT232	PROTOTAIP PANTAS II [RAPID PROTOTYPING II]
PDT234	PROTOTAIP PANTAS I [RAPID PROTOTYPING I]
PDT236	COMPUTER PROGRAMMING [PENGATURCARAAN KOMPUTER]
PDT236	COMPUTER PROGRAMMING [PENGATURCARAAN KOMPUTER]
PDT240	ERGONOMIK GUNAAN DAN KESELAMATAN [APPLIED ERGONOMIC AND SAFETY]
PDT251	THERMO-FLUIDS [TERMO-BENDALIR]
PDT253	MATERIALS PROCESSING LAB [MAKMAL PEMPROSESAN BAHAN]
PDT255	PROCESS CONTROL [KAWALAN PROSES]
PDT256	MATERIALS CHARACTERIZATION [PENCIRIAN BAHAN]
PDT261	WHITEWARE CERAMIC PROCESSING [PEMPROSESAN SERAMIK TEMBIKAR PUTIH]
PDT262	METAL EXTRACTION TECHNOLOGY [TEKNOLOGI PENGEKSTRAKAN LOGAM]

PDT263	PLASTIC PROCESSING [PEMPROSESAN PLASTIK]
PDT264	ELECTRONIC MATERIALS [ELEKTRONIKBAHAN]
PDT277	TERMODINAMIK GUNAAN [APPLIED THERMODYNAMICS]
PDT278	KEJURUTERAAN GEODETIK [GEODETICS ENGINEERING]
PDT279	PRINSIP AGRONOMI [PRINCIPLES OF AGRONOMY]
PDT280	ASAS PERAKAUNAN AGRI-PERNIAGAAN DAN KEWANGAN [FUNDAMENTALS OF AGRIBUSINESS ACCOUNTING AND FINANCE]
PDT281	INSTRUMENTASI DAN KAWALAN [INSTRUMENTATIONS AND CONTROL]
PDT282	APPLIED FLUID MECHANICS [MEKANIK BENDALIR GUNAAN]
PDT283	PENGURUSAN AGRI-PERNIAGAAN [AGRIBUSINESS MANAGEMENT]
PDT284	AGRO-EKOSISTEM DAN KELESTARIAN [AGRO-ECOSYSTEMS AND SUSTAINABILITY]
PDT309	MANUFACTURING ECONOMICS [EKONOMI DALAM PEMBUATAN]
PDT310	QUALITY SYSTEM [SISTEM KUALITI]
PDT310	KAWALAN KUALITI [QUALITY CONTROL]
PDT312	COMPUTER AIDED MANUFACTURING [PEMBUATAN BERBANTU KOMPUTER]
PDT313	FINAL YEAR PROJECT I [PROJEK TAHUN AKHIR I]
PDT314	MACHINING PROJECT [PROJEK PEMESINAN]
PDT316	SUSTAINABLE MACHINING [PEMESINAN MAPAN]
PDT317	INJECTION MOULD DESIGN [REKABENTUK ACUAN SUNTIKAN]
PDT318	ADVANCED MACHINING TECHNOLOGY [TEKNOLOGI PEMESINAN TERMAJU]
PDT319	MAINTENANCE MANAGEMENT [PENGURUSAN PENYELENGGARAAN]
PDT330	STUDIO REKABENTUK II [DESIGN STUDIO II]
PDT341	DIALOG PERINDUSTRIAN [INDUSTRIAL DIALOGUE]
PDT344	PENGURUSAN INOVASI DAN PEMBANGUNAN PRODUCT [INNOVATION MANAGEMENT AND PRODUCT DEVELOPMENT]
PDT344	GELAGAT PENGGUNA [CONSUMER BEHAVIOUR]
PDT346	PENGURUSAN PRODUK UNTUK PEREKABENTUK [PRODUCT MANAGEMENT FOR DESIGNERS]
PDT347	KAJIAN PRODUK DAN AMALAN PROFESIONAL [PRODUCT STUDY AND PROFESSIONAL PRACTICE]

PDT348	FINITE ELEMENT ANALYSIS [ANALISIS UNSUR TERHINGGA]
PDT348	ANALISIS ELEMEN TERHINGGA [FINITE ELEMENT ANALYSIS]
PDT351	MATERIALS FAILURE ANALYSIS [ANALISIS KEGAGALAN BAHAN]
PDT352	DESIGN OF DIE & MOULDS [REKA BENTUK DIE & ACUAN]
PDT353	POLYMER ADHESIVE AND COATINGS [PELEKAT DAN SALUTAN POLIMER]
PDT354	GLASS TECHNOLOGY [TEKNOLOGI KACA]
PDT355	ADVANCED METALLURGY [METALURGI TERMAJU]
PDT362	METAL FABRICATIONTECHNOLOGY [TEKNOLOGI FABRIKASI LOGAM]
PDT364	COMPOSITE MATERIALS PROCESSING [PEMPROSESAN BAHAN KOMPOSIT]
PDT376	JENTERA DAN KUASA LADANG [FARM POWER AND MACHINERY]
PDT377	PEMINDAHAN HABA DAN JISIM GUNAAN [APPLIED HEAT AND MASS TRANSFER]
PDT378	TEKNOLOGI PERTANIAN TEPAT [PRECISION AGRICULTURE TECHNOLOGY]
PDT379	PENGURUSAN SUMBER AIR [WATER RESOURCES MANAGEMENT]
PDT380	SISTEM AUTOMASI DALAM PERTANIAN [AUTOMATIONS IN AGRICULTURAL SYSTEMS]
PDT383	TENAGA DIPERBAHARUI [RENEWABLE ENERGY]
PDT384	TEKNOLOGI MAKANAN [FOOD TECHNOLOGY]
PDT385	KEJURUTERAAN BIO-BAHAN [BIOMATERIAL ENGINEERING]
PDT386	SISTEM AGRO-BERSEPADU [INTEGRATED AGROSYSTEMS]
PDT413	FINAL YEAR PROJECT II [PROJEK TAHUN AKHIR II]
PDT417	MODERN GRINDING TECHNOLOGY [TEKNOLOGI PENGISARAN MODEN]
PDT418	CUTTING TOOL TECHNOLOGY [TEKNOLOGI PEMOTONGAN MATALAT]
PDT442	BUDAYA PENGKOMERSILANA [COMMERCIALIZATION CULTURE]
PDT443	REKA BENTUK UNTUK PEMBUATAN DAN PEMASANGAN [DESIGN FOR MANUFACTURING AND ASSEMBLY]
PDT451	MATERIALS SELECTION & DESIGN [PEMILIHAN & REKA BENTUK BAHAN]
PDT463	MATERIALS FOR ENERGY AND ENVIRONMENT SUSTAINABILITY [BAHAN UNTUK KELESTARIAN TENAGA DAN ALAM SEKITAR]

PDT473	RUBBER AND LATEX TECHNOLOGY [TEKNOLOGI GETAH DAN LATEKS]
PDT474	TECHNICAL CERAMIC TECHNOLOGY [TEKNOLOGI SERAMIK TEKNIKAL]
PDT475	GEOPOLYMER MATERIALS TECHNOLOGY [TEKNOLOGI BAHAN GEOPOLIMER]
PDT477	TEKNOLOGI LEPAS TUAI [POST-HARVEST TECHNOLOGY]
PDT478	PENGURUSAN SISA PERTANIAN DAN KEJURUTERAAN PENGUNAAN [AGRICULTURAL WASTE MANAGEMENT AND UTILIZATION ENGINEERING]
PDT479	SISTEM BIO-DIPERBAHARUI [BIO-RENEWABLE SYSTEMS]
PDT480	KEJURUTERAAN PEMPROSESAN MAKANAN [FOOD PROCESSING ENGINEERING]
PDT481	KEMAJUAN DALAM TEKNOLOGI AGRO [ADVANCES IN AGROTECHNOLOGY]

CO1 - ABILITY TO APPLY MODERN TECHNOLOGIES IN THE PRODUCTION, HANDLING AND PROCESSING OF AGRICULTURAL PRODUCTS.

DPT102	STATIK DAN DINAMIK [STATICS AND DYNAMICS]
DPT103	MEKANIK BAHAN [MECHANICS OF MATERIAL]
DPT104	BAHAN [MATERIALS]
DPT110	PROSES PEMBUATAN 1 [MANUFACTURING PROCESS 1]
DPT114	TEKNOLOGI DAN AMALAN KERJA TANGAN [TECHNOLOGY AND HANDWORK PRACTICE]
DPT115	TEKNOLOGI DAN AMALAN PEMESINAN [TECHNOLOGY AND MACHINING PRACTICE]
DPT122	LUKISAN KEJURUTERAAN DAN LUKISAN BERBANTU KOMPUTER [ENGINEERING DRAWING AND COMPUTER AIDED DRAFTING]
DPT123	PERMODELAN 3D CAD [3D CAD MODELLING]
DPT152	ASAS TEKNOLOGI ELEKTRIK [BASIC ELECTRICAL TECHNOLOGY]
DPT202	THERMO-BENDALIR [THERMO-FLUID]
DPT213	PROSES PEMBUATAN 2 [MANUFACTURING PROCESS 2]
DPT214	SISTEM PNEUMATIK DAN HIDRAULIK [PNEUMATIC AND HYDRAULIC SYSTEM]
DPT215	AUTOMASI PEMBUATAN DAN ROBOTIK [MANUFACTURING AUTOMATION AND ROBOTICS]
DPT220	REKABENTUK DAN PEMBUATAN BERBANTU KOMPUTER [COMPUTER AIDED DESIGN AND MANUFACTURING]
DPT224	REKABENTUK 1 [DESIGN 1]

DPT225	REKABENTUK 2 [DESIGN 2]
DPT251	ASAS ELEKTRONIK [BASIC ELETRONICS]
DPT313	METROLOGI DAN KAWALAN KUALITI [METROLOGY AND QUALITY CONTROL]
DPT321	REKABENTUK ACUAN SUNTIKAN [INJECTION MOULD DESIGN]
DPT335	KAWALAN DAN PERANCANGAN PENGELUARAN [PRODUCTION PLANNING AND CONTROL]
DPT351	PROJEK SEMESTRAL [SEMESTRAL PROJECT]

COURSE SYLLABUS:

ENGINEERING COURSES
EPT103 BAHAN [MATERIALS]

No of Credits: 3

Course Synopsis:
This course introduces students to the engineering materials fundamentals including the engineering materials application, atomic bonding, crystal structure, mechanical and physical properties, corrosion mechanism, microstructural analysis, phase diagram, ferrous and non-ferrous alloys, polymer and advance materials.

Course Outcomes:
CO1 - Ability to ANALYSE transformation, microstructure and behaviors of engineering materials - ferrous, non ferrous and polymer.
CO2 - Ability to ANALYSE mechanical and corrosion properties of engineering materials.
CO3 - Ability to ANALYSE advanced materials and sustainable materials.

EPT114 STATIK [STATICS]
No of Credits: 3

Course Synopsis:
This course deals with the rigid-body mechanics in the area of statics. Statics deals with the equilibrium of bodies that are at rest. Each principle is applied first to a particle, then to a rigid body subjected to a coplanar system of forces, and finally to a general case of three-dimensional force systems acting on a rigid body. The topics involved in this course is force vector, equilibrium of a particle, force system resultants, equilibrium of a rigid body, structural analysis, mechanical friction and moment of inertia.

Course Outcomes:
CO1 - Ability to ANALYSE transformation, microstructure and behaviors of engineering materials - ferrous, non ferrous and polymer.
CO2 - Ablity to EVALUATE the principles of equilibrium for rigid bodies.
CO3 - Abilty to EVALUATE the geometrical properties for a body.

EPT152 LUKISAN KEJURUTERAAN [ENGINEERING DRAWING]
No of Credits: 2

Course Synopsis:
This course introduces fundamental of engineering drawing, engineering graphic as language, basic drafting skill, applied geometry, shape description, basic dimensioning, tolerance, detail and assembly drawing based on BS308 part 1 and part 2.

Course Outcomes:
CO1 - Able to PRODUCE technical drawing and drafting using manual technique.
CO2 - Able to PRODUCE technical drawing and drafting using AutoCAD software
CO3 - Able to PRACTICE Geometric Dimensioning and Tolerancing (GDT) on technical drawing.

EPT161 TEKNOLOGI ELEKTRIK [ELECTRICAL TECHNOLOGY]
No of Credits: 3

Course Synopsis:
This course is intended to provide students with clear understanding the concepts and principles of the DC and AC circuits, basic principles of three phase ac circuits, and electromagnetism. The students will also gain an understanding of the basic operating principles of a transformer; calculate induced e.m.f, equivalent resistance, reactance and impedance, losses and transformer efficiency. At the end of the subject, the students will understand the principles of DC and AC Electrical Machines.

Course Outcomes:
CO1 - Ability to apply the electrical laws and theorem to solve DC circuits to determine the voltage, current, resistance and power.
CO2 - Ability to analyse and solve single phase and three phase AC

circuits for its impedance, voltage, current, power and power factors.
CO3 - Ability to analyse the concept of magnetic fields and principle operation of transformer.
CO4 - Ability to apply the concept and principles used in electrical machines and their applications.

EPT162 PENGATURCARAAN KOMPUTER [COMPUTER PROGRAMMING]
No of Credits: 2

Course Synopsis:
This course introduces to Computers and Computing Fundamentals, Program Structure, Printing, Comments, Variables, Arithmetic Operations, Math Functions, Input/ Output, Control Structure, Looping, Functions, Numeric Arrays, User Friendly Interface and their application on solving engineering problems. C programming language is utilized in this course.

Course Outcomes:
CO1 - Construct C programs with the most suitable variables: perform correct arithmetic operations and math functions.
CO2 - Construct C programs with the desired input/ output.
CO3 - Construct C programs with control structure and looping.
CO4 - Construct C programs with functions and numeric arrays.

EPT181 CAD/CAM [CAD/CAM]
No of Credits: 2

Course Synopsis:
This course introduces the principles and application of CAD/CAM systems. It enables students to understand the theory, concept, and application of CAD/CAM as used in the industry. Students will use CAD software to illustrate parts, and CAM software to convert CAD files into numerical control (NC) codes.

Course Outcomes:
CO1 - Ability to identifies, explains and constructs manual Numerical Codes (NC) programs from 2D drawing.
CO2 - Ability to develop 3D solid and surface modelling using CAD software.
CO3 - Ability to constructs 2D drafting from 3D modeling parts and assembly using CAD software.
CO4 - Ability to builds, simulate 3D milling and turning process and generate Computer Numerical Control (CNC) programs using CAM software.

EPT182 PROSES PEMBUATAN 1 [MANUFACTURING PROCESS 1]
No of Credits: 3

Course Synopsis:
This course explores the manufacturing process which used in industry to convert raw material into finished product. This course will devided into five groups; first introduction to manufacturing technology, followed by fundamentals of materials in manufacturing. Secondly solidification process will be introduced including metal casting, casting processes, glass product, shaping plastics, producing rubber goods and polymer matrix composite. Thirtly this course focus on metal forming and sheet metal working. Fourthly students will be expose to powder processing. Lastly, this course will be introduce various joining and assembly process such as welding, brazing, soldering, adhesive bonding, and mechanical fastening processes.

Course Outcomes:
CO1 - Ability to analyze solidification processes.
CO2 - Ability to analyze forming, shaping and processes.
CO3 - Ability to analyze joining processes.
CO4 - Ability to assess and determine suitable manufacturing processes on a product using research base knowledge (research literature)

EPT183 BENGKEL KEJURUTERAAN [ENGINEERING WORKSHOP]
No of Credits: 2

Course Synopsis:
This course explores the manufacturing processes with practical methods

that used in industry to convert raw material into finished product. This course will devided into five workshops; first workshop: solidification process will be introduced including sand casting and plastic injection molding process. Second workshop: particulate processing of metal, forming and sheet metalworking. Thirt workshop: various joining and assembly process such as welding and mechanical fastening processes. Fourth workshop: students will be expose to rapid prototyping process and last workshop: students need do the presentation of mini project that given by lecturer or vocasional trainning officer (PLV).

Course Outcomes:
CO1 - Ability to describe, discuss, explain and report on metal processing and polymer processing.
CO2 - Ability to operate equipment/machine used for metal processing and polymer processing.
CO3 - Ability to reproduce with suitable manufacturing process (open ended lab).

EPT212 DINAMIK [DYNAMICS]
No of Credits: 3

Course Synopsis:
In this course, students use the concepts of mechanics in dynamic conditions. The course will be presented in two parts: kinematics, which treats only the geometric aspects of motion, and kinetics, which is the analysis of the forces causing the motion. To develop these principles, student learns the dynamics of a particle first, followed by topics in rigid-body dynamics in two and then three dimensions. Emphasis will be given on the kinematics and kinetics of a particle, planar kinematics and kinetics of a rigid body.

Course Outcomes:
CO1 - Ability to evaluate the KINEMATICS problems for a PARTICLE.
CO2 - Ability to propose solutions for the KINETICS problems for a PARTICLE.
CO3 - Ability to evaluate the KINEMATICS problems for a RIGID BODY.
CO4 - Ability to evaluate the KINETICS problems for a RIGID BODY.

EPT228 MEKANIK BENDALIR 1 [FLUID MECHANICS 1]
No of Credits: 3

Course Synopsis:
In Fluid Mechanics I, students will be exposed to the knowledge of basic properties of fluid, static fluid problems, integral relation of control volume problems, and principle of fluid friction in pipe. This course will enable the students to integrate the theory in fluid mechanics to the real world problems. Besides, there are also several expected experiments in this course which should be conducted by the students during the course period.

Course Outcomes:
CO1 - Ability to apply and analyze basic properties of fluid.
CO2 - Ability to analyze and assess fluid statics and pressure problems.
CO3 - Ability to analyze and assess fluid kinematics problems, laminar and turbulent flow in pipes.

EPT235 TERMODINAMIK [THERMODYNAMICS]
No of Credits: 3

Course Synopsis:
This course covers the basic concepts in thermodynamic laws such as the properties of substances, energy principles, first and second law of thermodynamics which applicable in engineering applications. The course emphasizes the study of energy sources and conservation through its concept and principles.

Course Outcomes:
CO1 - Ability to analyze the properties of pure substances.
CO2 - Ability to analyze the first law of thermodynamics.
CO3 - Ability to analyze the second law of thermodynamics.
CO4 - Ability to analyze the entropy changes of substances.

EPT241 MEKANIK PEPEJAL 1 [SOLID MECHANICS I]
No of Credits: 3

Course Synopsis:
This course covers deformation and internal forces that exist in a solid body when subjected to external loads. The concepts of stress, strain, and constitutive behaviors are discussed. Students are taught to solve problems of loading on solid bodies under axial, torsion and bending loading conditions. The concepts of principal stresses and strains are used to solve problems involving multi-directional loadings. Students use Mohr's Circle to solve the problems.

Course Outcomes:
CO1 - Ability to evaluate the stresses and strains problems in structural members subjected to axial load and transformation of stress and strain under rotation of axes
CO2 - Ability to analyze the circular shafts problems which are subjected to torsional loadings
CO3 - Ability to evaluate the stresses and strains problems in structural prismatic members subjected to pure bending and transverse loading and the shear flow in built up beams and thin walled members
CO4 - Ability to develop open-ended experiment on solid body.

EPT261 ELEKTRONIK [ELECTRONICS]
No of Credits: 3

Course Synopsis:
The purpose of this course is to give introduction and exposure to student about the electronic devices which includes analog and digital devices. The analog devices topic includes the introduction to semiconductor, PN junction, diodes, zener diodes, bipolar junction transistor (BJT) and operational amplifier. The digital device topic includes the introduction to binary number system, Boolean Algebra, logic gates and logic circuits, Boolean function, combinational logic circuits, sequential logic circuit and counters. Students will be exposed to the electronic basic, operation concept, analysis method including the usage of electronic device used in industry and introduction to microprocessor. Lab test will also be done to clarify the topics learned in the class.

Course Outcomes:
CO1 - Ability to demonstrate knowledge and comprehension of concepts and principles of semiconductor, diodes, and zener diodes and apply the principles of electrical laws to solve the application circuits.
CO2 - Ability to demonstrate knowledge and comprehension of concepts and principles of Bipolar Junction Transistor and apply principles of electrical laws to solve the application circuits.
CO3 - Ability to demonstrate knowledge and comprehension of concepts and principles of Operational Amplifier and active filters apply principles of electrical laws to solve the application circuits.
CO4 - Ability to demonstrate knowledge and comprehension of concepts and principles of Logic Gates and Boolean Algebra in digital system, and apply the theorem and method to simplify the digital circuits.

EPT281 KEJURUTERAAN INDUSTRI [INDUSTRIAL ENGINEERING]
No of Credits: 3

Course Synopsis:
This course introduces the fundamentals of Industrial Engineering. It covers elements of industrial engineering, improvement and the installation of people, materials, equipment, information, energy and economics. The main objectives of this course is to develop students into competent analysts who are capable of designing facilities and layouts that optimize material flow and minimize waste, understanding ergonomics and Occupational Safety and Health (OSH) requirements in working condition, performing neccessary evaluation in motion study for manufacturing operations, and understanding Six Sigma concept and methodology in industrial operation.

Course Outcomes:
CO1 - Ability to explain Product, Process and Schedule Design, principles of Material Handling, types of Material Handling

devices and PROPOSE layout design.
CO2 - Ability to explain Ergonomics and OSH. PROPOSE working condition using suitable ergonomics and OSH methods.
CO3 - Ability to ANALYZE standard time for manufacturing operations.
CO4 - Ability to EVALUATE manufacturing process using six sigma.

EPT282 PROSES PEMBUATAN 2 [MANUFACTURING PROCESS II]
No of Credits: 3

Course Synopsis:
This course enables students to understand the use of conventional and modern machining processes. The course begins with an introduction to machining processes, followed by analyses of machine tools. Then, students are taught about CNC programming, CNC processes, tools and control systems. Students will perform machining processes and learn how to develop programming and solve problems related with it.

Course Outcomes:
CO1 - Ability to demonstrate knowledge and comprehension of conventional and CNC machining processes.
CO2 - Ability to investigate and analyze the conventional machining processes for various material removing applications.
CO3 - Ability to develop machining program for CNC turning and milling processes according to complex cutting path requirement and tool parameters.

EPT312 GETARAN DAN MEKANIK MESIN [VIBRATION AND MECHANICS OF MACHINES]
No of Credits: 3

Course Synopsis:
This course is designed so that students learn the application of concepts in mechanics (statics and dynamics) to solve real world mechanical engineering problems pertaining to various machines that include belt and pulley systems, gears, flywheels and gyroscopes. Student will also learn the methods of balancing rotating masses and parts of a combustion engine. The concepts of vibration with respect to one-degree-of-freedom are also studied. At the end of this course, students should be able to solve problems related to various mechanical systems. In addition, they should be able to evaluate analytically the parameters of components of various machines under study.

Course Outcomes:
CO1 - Ability to demonstrate knowledge and comprehension with calculation of transmission system (with related forces) concepts & principles from one position to another.
CO2 - Ability to examine the velocity control in a cycle and the mean velocity control and analyze the balancing concept of a rotating body and balancing in engine system.
CO3 - Ability to analyze and evaluation the gyroscopic movements and its effect on a rotational body.
CO4 - Ability to analyze the theory of free vibration and its application in solving problems and calculate the system vibrating due to some externally impressed force and its application in solving problems.

EPT315 REKABENTUK KOMPONEN MESIN [MACHINE COMPONENTS DESIGN]
No of Credits: 3

Course Synopsis:
This course prepares students to determine structural integrity of common machine components such as Fasteners, Shafts, Gears, Springs and Riveted Joints. It introduces the methodology in engineering design and its relationship to top-level mechanical systems. It illustrates the isolation of the critical factors from a practical engineering problem, the application of known knowledge to quantitatively formulate the critical process, the assembly of the information needed for a solution, and the proper application of the solution in practical designs. This course will show how to identify the critical design parameters for any engineering component design and to manipulate them as part of the design process.

Course Outcomes:
CO1 - Ability to define, describe and explain the fundamental of the design process, materials in mechanical design and basic

concepts of tolerances. Then, be capable to solve tolerances, fits, belt drive and chain drive problems.

CO2 - Ability to discuss, analyze and design gear mechanism, keys, couplings and seals using appropriate engineering data.

CO3 - Ability to describe, analyze and design machine components including shafts, rolling contact bearings and plain surface bearings by using standard engineering data.

CO4 - Ability to explain, illustrate, analyze and design machine components including springs, screw and fasteners and riveted joint.

CO5 - Ability to make discriminating decisions concerning material selection as related to mechanical engineering design and clearly explain and apply basic fatigue and fracture analyses and apply safety margins.

EPT324 PEMINDAHAN HABA [HEAT TRANSFER]
No of Credits: 2

Course Synopsis:
The main objective of this course is to enable student to understand the concepts of conduction, convection and radiation which form the basics of heat transfer. Student will also perform theoretical calculations such as thermal conductivity, heat loss, and other important theories.

Course Outcomes:

CO1 - Ability to distinguish fundamental knowledge of heat transfer mechanism.

CO2 - Ability to apply knowledge, analyze and solve thermal engineering problems in conduction, convection and radiation.

CO3 - Ability to apply knowledge, analyze and solve thermal engineering problems in heat exchanger system.

EPT335 TERMODINAMIK GUNAAN [APPLIED THERMODYNAMICS]
No of Credits: 3

Course Synopsis:
Applied Thermodynamics is designed to enhance and extend students' ability to apply thermodynamic principles, especially the first and second laws of thermodynamics, and the laws of conservation of mass, momentum and energy, to industrial systems. It covers the broad application of the theory to many engineering applications, and emphasizes the analysis of energy transfers during power generation, heating, air-conditioning and refrigeration processes. At the end of the course, students should be able to apply relevant thermodynamic and conservation principles and perform calculations to evaluate the performance of gas and vapor power cycles, various compressors, and the performance of air-conditioning, refrigeration and heat pump cycles. Students should also be able to perform thermodynamic analyses of gas mixtures and gas-vapor mixtures.

Course Outcomes:

CO1 - Ability to analyze and evaluate mixtures of gases and vapours, combustion processes and internal combustion engines.

CO2 - Ability to analyze and evaluate steam and gas power cycles.

CO3 - Ability to analyze and evaluate refrigeration cycles including air-conditioning systems.

CO4 - Ability to analyze and evaluate rotary and reciprocating expanders and compressors.

EPT341 MEKANIK PEPEJAL 2 [SOLID MECHANICS LL]
No of Credits: 3

Course Synopsis:
The objective of the course is to enhance the understanding of the Solid Mechanics I course. The course is extended to deformation under static loading, beam deflection, column buckling, and fracture mechanics. The deflection of beam problems is taught using various methods including application of energy methods. This energy method covers the principle of conservation of energy, virtual work and Castigliano's theorem. Fracture mechanics cover fracture mechanism and fatigue loading to solve fracture mechanics and creep problems.

Course Outcomes:

CO1 - Ability to assess the state of stress under combine loading.

CO2 - Ability to evaluate beam and shaft deflection problems and

energy method under various types of loading.
CO3 - Ability to evaluate buckling, fracture mechanics, fatigue and creep problems.
CO4 - Ability to conduct investigation of buckling problems using research-based knowledge

EPT361 INSTRUMENTASI DAN KAWALAN [INSTRUMENTATION AND CONTROL]
No of Credits: 4

Course Synopsis:
This course prepares students with the basic knowledge of and skill in instrumentation and control for instrumentation systems and control engineering. Students are exposed to the basic concepts of instrumentation systems, elements, transducers, instrumentation system analysis, design criteria for measuring instrument and the suitable materials. This course will enhance the students' knowledge toward the principles and usage of instrumentation in manufacturing industries. The students will also learn control systems concepts and methods commonly used in industries. They will have the opportunity to strengthen their knowledge and understanding of instrumentation and control in manufacturing engineering. As such, students will be able to apply instrumentation and control techniques in manufacturing environment. In addition, they will also learn how to analyze and design simple controllers.

Course Outcomes:
CO1 - Ability to UNDERSTAND and ANALYSE the terminology used in instrumentation system
CO2 - Ability to ANALYSE the characteristic performances for a particular measurement devices such as displacement, strain, vibration and pressure measurement.
CO3 - Ability to DETERMINE a mathematical model and ANALYSE the transient response for a simple dynamic system.
CO4 - Ability to DETERMINE the best controller setting and ANALYSE its performances using root locus technique and perform controller tuning.
CO5 - Ability to ANALYSE appropriate manufacturing processes parameters for sheet metal process.

EPT371 ANALISA UNSUR TERHINGGA [FINITE ELEMENT ANALYSIS]
No of Credits: 2

Course Synopsis:
The finite element analysis (FEA) or finite element method (FEM) is a computational technique used to obtain approximate solutions of boundary value problems in engineering. A boundary value problem is a mathematical problem in which one or more dependent variables must satisfy a differential equation everywhere within a known domain of independent variables and satisfy specific conditions on the boundary of the domain. By taking this course, the students will learn the theoretical basis of the finite element analysis, its implementation principles, and the commercial software for solving finite element problems.

Course Outcomes:
CO1 - Ability to formulate concepts and principles of finite element analysis equations for one and two dimensional element models.
CO2 - Ability to perform engineering analysis using CAE software.
CO3 - Ability to evaluate physical problems using CAE software.

EPT383 AUTOMASI DAN ROBOTIK [AUTOMATION AND ROBOTICS]
No of Credits: 3

Course Synopsis:
The objective of this course is to enhance the knowledge and the understanding of industrial automation and robotic which have been used in the industries today. Its covers topics regarding automation systems such as Flexible Manufacturing System (FMS), material handling, Automated Storage/Retrieval System (ASRS), Automated Guided Vehicles (AGV). Students will be learning programmable logic control (PLC)and how to design pneumatic and hydraulic circuits manually and translate to simulation using related software. The course covers an explanation of the classification of robots, robot systems, end-of-arm tooling, sensors, robot safety and robot utilisation in the industries. In addition, Combination of Modular Production System (MPS) with Automation and Robotic Systems are also discussed.

Course Outcomes:

CO1 - Ability to analyze and assess concepts and methodologies of manufacturing automation and industrial control technology.
CO2 - Ability to decide, design develop and evaluate, the automation, Flexible Manufacturing System for simple application.
CO3 - Ability to analyze and assess application to evaluate control using PLC for automation and process control.
CO4 - Ability to analyze, decide, design and develop the concepts of robotic which include type of robots and its application in industries.

EPT384 TEKNOLOGI PEMBUATAN TERMAJU [ADVANCED MANUFACTURING TECHNOLOGY]
No of Credits: 3
Course Synopsis:

This course is an introduction to Advanced Manufacturing Technology (AMT). In general, AMT uses innovative technologies to improve products and/or processes, and also the use of new business/management methodologies. In this course, three main elements in manufacturing including product design and development, manufacturing process technologies, and manufacturing support systems will be discussed with respect to the advanced technologies. Following are some of the technologies involved in the realization of AMT:

- Computer technologies (e.g., CAD, CAE, CAM, CIM)
- High Performance Computing for modeling, simulation and analysis
- High Performance Cutting
- High Precision Technologies
- Information Technologies
- Sustainable and green technologies
- New industrial platform technologies (e.g., composite materials)

Course Outcomes:

CO1 - Ability to INTERPRET advanced technologies in manufacturing in general.
CO2 - Ability to SELECT and PROPOSE suitable advanced manufacturing processes regardless any condition.
CO3 - Ability to DESIGN, APPLY and JUSTIFY innovative tools to enhance the manufacturing efficiency, capability, productivity and sustainability.

EPT385 METROLOGI DAN KAWALAN KUALITI [METROLOGY AND QUALITY CONTROL]
No of Credits: 3

Course Synopsis: 0

Course Outcomes:

CO1 - Ability to ANALYZE using metrology techniques and geometric dimensioning & tolerancing in solving engineering problems.
CO2 - Ability to ANALYZE problems using seven Quality Control (QC) tools in troubleshooting issues related to quality.
CO3 - Ability to DEVELOP the sampling technique, process capability, reliability and FMEA in engineering application.

EPT386 REKABENTUK UNTUK PEMBUATAN [DESIGN FOR MANUFACTURE]
No of Credits: 3

Course Synopsis:

• Computer technologies (e.g., CAD, CAE, CAM, CIM)

Course Outcomes:

CO1 - Ability to apply the concept and principle of Boothroyd Dewhurst DFA methodology for classification the product components of existing design then to RECOMMEND new improved design.
CO2 - Ability to RECOMMEND a specific material and manufacturing process for manufacture product components.
CO3 - Ability to ANALYSE appropriate manufacturing processes parameters for plastic injection molding.
CO4 - Ability to ANALYSE appropriate manufacturing processes parameters for die casting.

EPT412 REKABENTUK SISTEM MEKANIKAL [MECHANICAL SYSTEM DESIGN]
No of Credits: 3

Course Synopsis: 0

Course Outcomes:
CO1 - Ability to design engineering systems by applying design theory
CO2 - Ability to analyse risk and reliability in designing an engineering system.
CO3 - Ability to analyse sustainability measures in designing an engineering system.
CO4 - Ability to analyse pressure vessel system.

EPT442 JURUTERA PROFESSIONAL [PROFESSIONAL ENGINEER]
No of Credits: 2

Course Synopsis:
• High Performance Computing for modeling, simulation and analysis

Course Outcomes:
CO1 - Ability to engender the issues and challenges of engineering ethics.
CO2 - Ability to synthesize issues related to sustainability and its impact in societal and environmental context.
CO3 - Ability to hypothesize hazards, risk management, occupational safety & health (OSHA) and legal procedures on engineering issues.

EPT443 PENGURUSAN UNTUK JURUTERA [MANAGEMENT FOR ENGINEERS]
No of Credits: 3

Course Synopsis: 0

Course Outcomes:
CO1 - Ability to devise project requirements and integrate the processes of project management like work plans, scheduling, cost estimation and perform project evaluation
CO2 - Ability to engender economic scenarios and integrate decision making process for engineering project and business ventures.

EPT445 PROJEK TAHUN AKHIR 1 [FINAL YEAR PROJECT 1]
No of Credits: 2

Course Synopsis:
• High Performance Cutting

Course Outcomes:
CO1 - Ability to apply, integrate, correlate and hypothesize knowledge of mathematics, natural science, engineering fundamentals or an engineering specialization to solve engineering or management problem.
CO2 - Ability to identify, formulate, compare and conduct research literature and analyze complex engineering problems.
CO3 - Ability to select and develop design solutions or methodology for complex engineering problems that meet specified needs with appropriate consideration including the design of experiments, modeling or simulation.
CO4 - Ability to create, comprehend and write effective technical reports and perform effective presentation on complex engineering activities undertaken.
CO5 - Ability to demonstrate and apply knowledge and understanding of engineering management principles to manage projects in multidisciplinary environments.

EPT446 PROJEK TAHUN AKHIR 2 [FINAL YEAR PROJECT 2]
No of Credits: 4

Course Synopsis: 0

Course Outcomes:
CO1 - Ability to apply, integrate, correlate and hypothesize knowledge of mathematics, natural science, engineering fundamentals or an

engineering specialization to solve engineering or management problem.

CO2 - Ability to identify, formulate, compare and conduct research literature and analyze complex engineering problems.

CO3 - Ability to select and develop design solutions or methodology for complex engineering problems that meet specified needs with appropriate consideration including the design of experiments, modeling or simulation.

CO4 - Ability to conduct and develop investigation of complex engineering problems using research-based knowledge in order to analyze, evaluate and interpret data to provide valid results and conclusions with suitable recommendations.

CO5 - Ability to create, comprehend and write effective technical reports and perform an effective presentation on complex engineering activities undertaken.

CO6 - Ability to demonstrate and apply knowledge and understanding of engineering management principles to manage projects in multidisciplinary environments.

EPT447 PROJEK BERSEPADU PEMBUATAN [MANUFACTURING INTEGRATED PROJECT]
No of Credits: 3

Course Synopsis:
• High Precision Technologies

Course Outcomes:

CO1 - Ability to apply knowledge to understand design problems or an improvement in existing or new product design/development and manufacturing process/material selection.

CO2 - Ability to identify, analyse and evaluate information and perform analysis base on the principles of mathematics, sciences and engineering.

CO3 - Ability to develop and propose appropriate design solution on engineering components, materials and manufacturing processes that meet customer requirements.

CO4 - Ability to conduct investigation and use appropirate methodology to obtain data and information to provide valid conclusion for solving existing design problems.

CO5 - Ability to select and apply appropriate engineering technique/ method/ tool and practice such as CATIA, DOE, CFD, DFMA, FMEA, Finite Element etc. to solve engineering design problem. To visualize the solution by developing working model or simulation or computer modelling.

CO6 - Ability to understand and carry-out assesment/ evaluation on design sustainability and environmental impact.

CO7 - Ability to work with team members effectively (team work) during carry-out project assignment and shows commitment/support to complete tasks assigned to achieve overall team objectives.

CO8 - Ability to communicate effectively within team members, public and society as well as relevant industry community in order to solve problems, preparing technical documentation/report. To make effective presentation to express and to convince the final solutions/results.

CO9 - Ability to demonstrate understanding the enginering project management principle and engineering economics decision making and apply to own project work.

EPT481 REKABENTUK PERKAKAS DAN ACUAN [TOOLS AND DIE DESIGN]
No of Credits: 3

Course Synopsis: 0

Course Outcomes:

CO1 - Ability to apply the work holding and clamping principles to select proper holding and clamping mechanism.

CO2 - Ability to develop expertise in applying data and making comparisons on the basic for design of cutting tools.

CO3 - Ability to employ the appropriate knowledge to design a good jig, fixture or die that can work properly and require infrequent repairs.

EPT484 PEMBUATAN LEAN [LEAN MANUFACTURING]
No of Credits: 2

Course Synopsis:
• Information Technologies

Course Outcomes:
CO1 - Ability to explain, demonstrate and apply suitable lean tools and techniques in manufacturing problems solving and continuous improvement.
CO2 - Ability to identify the value stream of a process; evaluate, develop and propose significant improvement.
CO3 - Ability to identify and select steps necessary to implement a lean system and facilitate teams in improving and sustaining the lean culture.

EPT485 PERANCANGAN PENGELUARAN DAN KAWALAN [PRODUCTION PLANNING AND CONTROL]
No of Credits: 2

Course Synopsis: 0

Course Outcomes:
CO1 - Ability to apply and compare multiple analytical techniques in developing business forecasts.
CO2 - Ability to identify and apply the key variables in constructing the capacity and aggregate planning.
CO3 - Ability to analyze and solve inventory and scheduling problems.
CO4 - Ability to apply analytical techniques to evaluate and solve materials requirements and supply chain related problems.

EPT491 PEMESINAN MIKRO [MICROMACHINING]
No of Credits: 3

Course Synopsis:
• Sustainable and green technologies

Course Outcomes:
CO1 - Ability to interpret micromachining in general.
CO2 - Ability to propose analysis and design improvement with respect to the micromachining.
CO3 - Ability to evaluate principles and mechanism of material removal processes related to the micromachining.
CO4 - Ability to interpret applications and critical issues of the micromachining.

EPT492 ERGONOMIK INDUSTRI [INDUSTRIAL ERGONOMICS]
No of Credits: 3

Course Synopsis: 0

Course Outcomes:
CO1 - Ability to APPLY knowledge of basic concepts and principles of ergonomics and body mechanics.
CO2 - Ability to ANALYZE and PERFORM suitable anthropometric study in workspace design, equipment and facilities in ergonomics issues.
CO3 - Ability to USE suitable assessment tools in the design and EVALUATION of the work tasks.
CO4 - Ability to SOLVE and DESIGN an effective and comfortable workplace to ensure workers' productivity, health and safety.

EPT493 PENGKOMPUTERAN DINAMIK BENDALIR UNTUK APLIKASI KEJURUTERAAN [CFD FOR ENGINEERING APPLICATIONS]
No of Credits: 3

Course Synopsis:
• New industrial platform technologies (e.g., composite materials)

Course Outcomes:

CO1 - Ability to analyze and evaluate the governing equations of CFD, discretizations of equations and assumptions with regards to Finite Volume Method.
CO2 - Ability to mechanize fluid mechanics problems using commercial CFD software and/or other CAD tools.
CO3 - Ability to evaluate the results obtained of the fluid mechanics problems in terms of performance and/or validity.
CO4 - Ability to analyze and evaluate the results obtained and document the results in a report.

EPT495 PENYELIDIKAN OPERASI [OPERATIONAL RESEARCH]
No of Credits: 2

Course Synopsis:

Operations research (OR) has many applications in science, engineering, economics and industry. OR helps in solving problems in different environments that needs decisions. This course will focus on mathematical modeling, where the students will be teach to formulate, analyze and solve mathematical models that represent real-world problems. In particular, this course will cover mathematical programming techniques such as linear programming (graphical solution, simplex method, duality theory and sensitivity analysis), network optimization (transportation and assignment problems, shortest path, minimum spanning tree problem), and integer programming. At the end of this course, students will have the skills to expand existing or build their own formulations to critically evaluate the impact of model assumptions and choose an appropriate solution technique for a given formulation.

Course Outcomes:

CO1 - Ability to FORMULATE, IMPLEMENT and SOLVE linear programming model for real-world applications.
CO2 - Ability to PERFORM duality and sensitivity analysis to determine the direction and magnitude of change of a model.
CO3 - Ability to BUILD and SOLVE the transportation and network optimization models.
CO4 - Ability to do MODELING and SOLVE problems using integer programming.

ENT442 Jurutera Profesional [Professional Engineers]
No of Credits: 2

Course Synopsis:

This course aims to explain the main concepts in engineering ethics, risk management and occupational safety and health as well as to expose the students to basic of law in the engineering context. The materials will be of introductory nature to enable engineers to appreciate factors that have to be taken into account in decision-making. At the end of the course, students will be able to identify and discuss issues and challenges faced by engineers relating to engineering ethics, risk management and to understand the legal requirements related to engineering field.

Course Outcomes:

CO1 - Ability to identify the issues and challenges and propose solutions based on engineering ethics.
CO2 - Ability to explain and evaluate the sustainable and impact in sociental and environmental context
CO3 - Ability to identify hazards; design the solutions for risk management, occupational safety, health (OSHA) and procedures of legal on engineering issues.

ENT443 Pengurusan Untuk Jurutera [Management For Engineers]
No of Credits: 3

Course Synopsis:

The course aims to teach students on how to apply project management skills when undertaking projects. This course is designed to provide basic tools of engineering economy to enable student to carry out professional quality economic evaluations. At the enf of the course, students will be able to identify and dicuss issues and challanges faced by engineers relating to project management in the current economic scenarios.

Course Outcomes:

CO1 - Ability to analyse and evaluate the process of project management, develops work plans, do cost estimation and perform project evaluation.

CO2 - Ability to analyse and evaluate economic scenarios and apply decision making process to engineering project and business venture.

ENT141 STATIK KEJURUTERAAN [ENGINEERING STATICS]
No of Credits: 3

Course Synopsis:
The objective of the course is to look into problems related to mechanics concepts in static conditions. This course deals with balanced force systems applied to rigid-bodies that are at rest. Methods to determine support reactions and relationships between internal and external forces, as well as internal force distribution will be introduced in this course. This course is important as it serves as pre-requisite and fundamental in later engineering courses.

Course Outcomes:
CO1 - Ability to draw and use the Free Body Diagram (FBD) to solve static problems.
CO2 - Ability to solve Two Dimensional (2-D) static problems.
CO3 - Ability to solve Three Dimensional (3-D) static problems.

ENT142 DINAMIK KEJURUTERAAN [ENGINEERING DYNAMICS]
No of Credits: 3

Course Synopsis:
The objective of the course is to enable students to evaluate problems related to mechanics concepts in dynamic condition. The course covers topics of force and acceleration, work and energy, and also impulse and momentum for both kinematics of a particle and planar kinetics of a rigid body problems.

Course Outcomes:
CO1 - Ability to analyze problems related to rectilinear kinematics, law of motions, and also concepts mechanics and vector mechanics.
CO2 - Ability to evaluate problems related to kinematics of particle, involving force and acceleration, work and energy, and also impulse and momentum.
CO3 - Ability to evaluate problems related to planar kinetics or a rigid body, involving force and acceleration, work and energy, and also impulse and momentum.

ENT143 TERMODINAMIK I [THERMODYNAMICS I]
No of Credits: 3

Course Synopsis:
To introduce concepts and basic knowledge of thermodynamics to the mechanical engineering students. Emphasis will be given to the first and second laws of thermodynamics, physical properties, pure substances, enthalpy, entropy, ideal and real gas, and exergy.

Course Outcomes:
CO1 - Ability to apply the first law of thermodynamics to a system having energy/mass transfer to and from it.
CO2 - Ability to apply the second law of thermodynamics to the closed/ open systems.

ENT146 PEMESINAN [MACHINING]
No of Credits: 3

Course Synopsis:
The objective of this course is to introduce and provide the students with theoretical and practical skills that are required in fabricating and manufacturing mechanical parts or components. At the end of this course the students will be able to appreciate various skills and technology in manufacturing processes including manufacturing metrology, welding, conventional machining and advanced machining.

Course Outcomes:
CO1 - Ability to describe and choose the proper measurement tools and their safety procedures to complete a particular machining.
CO2 - Ability to understand and operate different conventional machining, welding and advanced machining.

CO3 - Ability to select the proper machining process to complete a finish product.

ENT147 BAHAN KEJURUTERAAN [ENGINEERING MATERIALS]
No of Credits: 3
Course Synopsis:
This course provides concept that relates to process selection and metal structure in materials engineering. The course topics involve investigating the relationships that exist between the structures and properties of materials. Upon completion of this course, the student will be able to analyze characteristic properties of engineering materials, select appropriate materials and alter their properties for various engineering applications.

Course Outcomes:
CO1 - Ability to analyze problems related to atomic and crystalline material structure, phase diagram, diffusion and heat treatment.
CO2 - Ability to analyze problems related to mechanical properties and behavior of metals.
CO3 - Ability to identify and analyze problems related to material failure, degradation and materials selection.

ENT150 GRAFIK KEJURUTERAAN & LUKISAN TERBANTU KOMPUTER [ENGINEERING GRAPHICS & COMPUTER AIDED DRAFTING]
No of Credits: 3

Course Synopsis:
This course provides the foundation for mechanical engineering students to acquire and apply the language of engineering graphics to visibly communicate engineering intent that follow good engineering conventions and practices. In this course, manual drafting technique and CAD software will be introduced to model 2-D and 3-D engineering drawings which including sketching techniques, multi-view projections, pictorial, sectional and auxiliary view representation and dimensioning techniques. The use of solid modeling software to capture design intent and generate engineering drawings gives the opportunity to apply this knowledge for engineering design projects.

Course Outcomes:
CO1 - Ability to understand concepts of drafting and interpreting technical drawings as a communication tool in mechanical engineering discipline.
CO2 - Ability to design and construct engineering drawings using computer aided design software.

ENT241 MEKANIK BENDALIR I [FLUID MECHANICS I]
No of Credits: 3

Course Synopsis:
This course aims to develop the basic knowledge on the principles of fluid mechanics and the application of these principles to practical applied problems. Emphasis is on fluid properties, fluid statics, fluid kinematics, conservation of mass, and Bernoulli equation. Momentum analysis, dimensional analysis, modeling, and concepts of internal flow. At the end, this course will be able to solve, analyze and evaluate the problems dealing with fluid mechanics.

Course Outcomes:
CO1 - Ability to identify the various properties of fluids and analyze problems related to fluids statics.
CO2 - Ability to analyze fluid flow problems including boundary layer approximations.
CO3 - Ability to apply dimensional analysis and modeling in fluid mechanics and evaluate the related problems of internal flow.

ENT242 MEKANIK PEPEJAL I [SOLID MECHANICS I]
No of Credits: 3

Course Synopsis:
This course provides the fundamental theories of solid mechanics. The theories in statics will be extended and emphasized in this course. The course covers the law of mechanics, concept of stress and strain, torsion and bending.

Course Outcomes:
CO1 - Ability to apply the fundamental theory of solid mechanics in engineering problems
CO2 - Ability to evaluate problems related to various loadings

ENT243 TERMODINAMIK II [THERMODYNAMICS II]
No of Credits: 3

Course Synopsis:
This course provides the thermodynamics cycles for engineering application. Emphasis will be given to the gas power cycles, vapour power cycles, refrigeration cycles, air-conditioning, chemical reactions and phase equilibrium. Problem solving will be focused for industry and every day life applications.

Course Outcomes:
CO1 - Ability to evaluate the problems of gas, vapor and combined power cycles, each in their applications.
CO2 - Ability to evaluate the problems of refrigeration and air conditioning cycles.
CO3 - Ability to apply analytical techniques for solving the problem of chemical reactions, adiabatic flame temperature and phase equilibrium.

ENT244 PROSES-PROSES PEMBUATAN KEJURUTERAAN [MANUFACTURING ENGINEERING PROCESSES]
No of Credits: 3

Course Synopsis:
This course provides a basic knowledge of the manufacturing processes as to serve diverse demands and to get a feel for cutting-edge technologies and manufacturing. It starts with a general view of the importance of manufacturing to humankind, followed by the interaction of design and manufacturing up to process choice. It is expected that students will be able to decide suitable manufacturing processes in fabrication of products.

Course Outcomes:
CO1 - Ability to gathering and processing information of the right raw materials for a manufacturing process
CO2 - Ability to describe and analyze an appropriate process or process sequence to the products to be produced
CO3 - Ability to design and optimize the design through the use of a desirable manufacturing process

ENT246 MEKANIK PEPEJAL II [SOLID MECHANICS II]
No of Credits: 3

Course Synopsis:
The objective of the course is to enhance the understanding of the topics that have been learned in Solid Mechanics I. The topics is extended and emphasized on stress transformation occur in beam, shaft and member. It is also covered an introduction on buckling and energy method theory. At the end of this course, students will be able to evaluate related engineering problems applied by various loadings.

Course Outcomes:
CO1 - Ability to analyse shaft, beam and member subjected to various loadings and develop a stress strain transformation analysis
CO2 - Ability to recognize, calculate and solve deflection in structural analysis.
CO3 - Ability to calculate buckling and strain energy applied by various loadings.

ENT247 MEKANIK BENDALIR II [FLUID MECHANICS II]
No of Credits: 3

Course Synopsis:
The analysis of real/ideal fluid with and without compressibility effect in a flow system is important in fluid mechanics study. This course begins with the differential form of the conservation laws, and discusses the well known Navier-Stokes equation of motion along with some of its exact and approximate solutions, flow over bodies, Superposition in irrotational regions of two-dimensional flow, Compressible fluid flow, and flow through

turbomachines. Numerous and diverse real-world engineering examples will give students a feel for how fluid mechanics is applied in engineering practice.

Course Outcomes:
CO1 - Ability to analyze the differential analysis of fluid flow and boundary layer problems on flows past a flat plate
CO2 - Ability to recognize, calculate and solve deflection in structural analysis.
CO3 - Ability to evaluate the potential flow problems, real flow problems, and flow over bodies

ENT248 PROSES REKABENTUK [DESIGN PROCESS]
No of Credits: 4
Course Synopsis:
This course will provide the foundation in formulating and devising appropriate solutions and plans to open engineering design problems using systematic design methods that promote innovation. This course aims to develop an understanding to strategically and systematically observe, develope, analyze, and compare existing products during the design process. Student will use appropriate engineering approaches and methods to formulate and compare alternative solutions systematically at different stages of the design process to refine and evaluate alternative solutions. This course covers a set of product development methods that bringing together the marketing, design, and manufacturing functions. This course introduce analysis of user needs and customer's needs and product marketability through the chapter of "Customers/User Centered Design".

Course Outcomes:
CO1 - Ability to determine design requirements from general problem descriptions.
CO2 - Ability to produce clear design information and ideas.
CO3 - Ability to evaluate critically the designs using engineering criteria and design selection tools.
CO4 - Ability to develop systematically a design from concept to prototype.

ENT249 LITAR DAN MESIN ELEKTRIK [ELECTRICAL CIRCUIT AND MACHINE]
No of Credits: 3

Course Synopsis:
This course covers the fundamental concept of electrical circuits, electric supply system and installation, magnetic and electromagnetic, inductance, capacitance and AC circuit, three-phase system, basic principles of electrical machines, DC and AC electrical machines, transformer and electrical safety. The concept is emphasized by laboratory works.

Course Outcomes:
CO1 - Ability to analyze the DC, AC and Three Phase circuits to solve engineering problems.
CO2 - Ability to analyze the electromagnetic circuit and characteristics of electrical machine and it application;
CO3 - Ability to design and evaluate the electrical circuit and electrical machine.

ENT332 MEKANISME DAN MESIN [MECHANISMS & MACHINES]
No of Credits: 3

Course Synopsis:
This course is intended as an advanced knowledge of mechanism and machine for undergraduate level. Bringing together analytical and graphical techniques from previous courses to accomplish the analysis of complete mechanism, machine or mechanical system. The course will emphasize on the analytical design techniques used to evaluate machine elements and machinery in mechanical engineering applications. This course will utilise Computer Aided Engineering (CAE) software as a tool in analyzing and solving mechanism and machine problems.

Course Outcomes:
CO1 - Ability to perform kinematics analysis in certain mechanical system
CO2 - Ability to evaluate machinery dynamics of a mechanical system.
CO3 - Ability to analyze balancing of machinery.

ENT333 PEMINDAHAN HABA [HEAT TRANSFER]
No of Credits: 3

Course Synopsis:
This course covers the concepts and applications of heat transfer modes to the mechanical engineering students. Emphasis will be given in solving and evaluating the problems through comprehensive study of the modes of heat transfer, such as conduction, convection, radiation etc. At the end of this course, students will be able to formulate necessary equations and solve problems related to heat transfer.

Course Outcomes:
CO1 - Ability to formulate the necessary equations related to the problems of heat transfer.
CO2 - Ability to analyze the problems for different modes of heat transfer in various applications.
CO3 - Ability to analyze experimental results by designing and conducting heat transfer experiments.

ENT334 REKABENTUK KOMPONEN [COMPONENT DESIGN]
No of Credits: 4

Course Synopsis:
The objective of this course is to introduce the concepts and principles of mechanical components design to the students. Student should have ability to design mechanical components for certain applications of mechanical system. The course begins with understanding of design fundamental and followed with the components selection, stress analysis, failure theories, and designing the mechanical components. It consists of screws and fasteners, mechanical springs, bearings, gears, clutches, brakes and flexible mechanical elements. The knowledge of mechanical design will be implemented in a mini project by utilizing the suitable 3D softwares.

Course Outcomes:
CO1 - Ability to design mechanical components for certain applications.
CO2 - Ability to analyze design failure of mechanical components under static and variable loadings.
CO3 - Ability to evaluate performance of mechanical components for selected mechanical systems.

ENT335 REKABENTUK SISTEM [SYSTEM DESIGN]
No of Credits: 4

Course Synopsis:
This course is intended as an advanced knowledge in mechanical system design for undergraduate level. Bringing together the fundermantals theories and techniques from previous courses to accomplish the design of a complete machine or mechanical system.

The course begins with underlaying the fundamentals in system engineering and the definition of system design. The course will also emphasizes on the analytical design techniques used to evaluate machine elements and machinery in mechanical systems. It is a creative, iterative, and often open-ended process subject to constraints which may be governed by standards, or legislation to varying degrees within mechanical engineering discipline. This course will utilize Computer Aided Engineering (CAE) software as tool in analyzing and solving mechanical system design problems as part of a corner-stone project. This course will require students to work in a group environment and collaborate with other members to arrive at good design decisions and to provide proper reports on these decisions upon completion of project.

Course Outcomes:
CO1 - Ability to determine and analyse design requirements in defining and solving structured and unstructured design problems.
CO2 - Ability to apply and integrate fundamentals mechanical engineering design theory in the selection, creation and design of components and mechanism for a complete design of mechanical systems.
CO3 - Ability to evaluate critically the design of mechanical system using engineering criteria, design tools and computer based techniques.

ENT336 JENTERA BENDALIR [FLUID MACHINERY]
No of Credits: 3

Course Synopsis:
This course introduces the operating principles of different types of pumps, compressors and conventional prime movers used in power generation. Their analyses and design characteristic considerations are also considered. Upon completion of this course, students will be able to select proper fluid machines for specific applications and solve related fluid machinery problems.

Course Outcomes:
CO1 - Ability to analyse and evaluate the performance of different pumps, fans, and compressors for certain applications.
CO2 - Ability to assess and evaluate the performance of various hydraulic turbines for certain applications.
CO3 - Ability to assess the operating principles of thermal turbines (steam/gas turbines) and evaluate their performance.

ENT337 ELEKTRONIK & MIKROPEMPROSES [ELECTRONICS & MICROPROCESSORS]
No of Credits: 3

Course Synopsis:
This course introduces the basic concepts of electronics and microprocessors for application in Mechanical Engineering. The first part of the course focusses on the analog and digital electronics, chich covers the fundamental of semiconductor, electronic components, electronic circuit, digital electronics and signal conversion. The second part of the course introduces students to architecture, hardware and software of microprocessor. Upon completion of the course, the students will be able to develop application through the combination of electronic circuit and microprocessor.

Course Outcomes:
CO1 - Ability to analyze and apply electronic components and circuit
CO2 - Ability to understand and apply microprocessor functions
CO3 - Ability to develop simple microprocessor based application with electronic circuit

ENT346 MEKANIK GETARAN [VIBRATION MECHANICS]
No of Credits: 3

Course Synopsis:
This course provides the skills and knowledge in vibrations disciplines. The syllabus covers the fundamental of vibration and oscillation motion, free vibration, force vibration, transient vibration, two degree of freedom systems and multiple degree of freedom systems. The students will be exposed towards industrial application elements such as vibration control, vibration measurement and signal analysis methods.

Course Outcomes:
CO1 - Ability to analyze the response of various systems to various inputs.
CO2 - Ability to control vibration in a system.
CO3 - Ability to measure and analyze the vibration signals.

ENT385 KEJURUTERAAN KAWALAN [CONTROL ENGINEERING]
No of Credits: 3

Course Synopsis:
This is an introduction course to control systems engineering. Students will be exposed to the mathematical modeling for mechanical, electrical as well as electro-mechanical systems using transfer functions, signal-flow graphs and Mason's rule. They will conduct system performance analysis in time and frequency domain. System stability will also be studied along with the root locus analysis. Finally the students will be introduced to system compensation design using PID and lead-lag controllers. The laboratory sessions will be conducted to enable the students to test the theory.

Course Outcomes:
CO1 - The ability to obtain the mathematical model for systems.
CO2 - The ability to perform system's time-domain analysis with response totest inputs. Analysis includes the determination of the

system stability.

CO3 - The ability to perform system's frequency-domain analysis with response to test inputs. Analysis includes the determination of the system stability.

CO4 - The ability to design and evaluate P,PI, PD, PID, lead, lag controllers based on the analysis of the system's response in time and frequency domain.

ENT440 PROJEK REKABENTUK [DESIGN PROJECT]
No of Credits: 4
Course Synopsis:
The course covers the principle of engineering design process continouing from conceptual design process in the prerequisite course. This course focuses from embodiment design to developing functional prototype. Students are expected to work in a group on selected theme to design a project with current issues related to safety, cultural, societal, environmental as well as the economic considerations. At the end of the course, students are required to present and demonstrate the working prototype.

Course Outcomes:

CO1 - Ability to acquire information from a variety of sources, apply design process and develop solutions to solve complex mechanical engineering problem.

CO2 - Ability to evaluate solution that meets customer and financial needs with consideration to standard regulations for environmental and societal impact.

CO3 - Ability to communicate effectively and demonstration of the design solution.

CO4 - Ability to function in a team for the successful delivery of design project.

ENT457 PENGURUSAN, PENGELUARAN DAN OPERASI [MANAGEMENT, PRODUCTION & OPERATIONS]
No of Credits: 3

Course Synopsis:
This course offers comprehensive contents about production and operation management in manufacturing and services. Production and operation management is the process of managing people and resources in order to create a product or a service. This course also introduces students to decision making tools, linear programming, project management, location and layout strategies, aggregate planning theory, inventory management theory, Material Requirements Planning (MRP), short-term scheduling theory, and managing quality.

Course Outcomes:

CO1 - Ability to manage production based on management concepts.

CO2 - Ability to evaluate production processes.

CO3 - Ability to analyze management, productions and operations based on operation research.

ENT431 PENYEJUKAN DAN PENYAMAN UDARA [REFRIGERATION AND AIR CONDITIONING]
No of Credits: 3

Course Synopsis:
In this course, students will acquire advanced knowledge of refrigeration and air conditioning system. The course content includes air psychrometry, air conditioning processes and refrigeration cycles, indoor and outdoor design conditions, load calculations and refrigeration system components.

Course Outcomes:

CO1 - Ability to analyze total energy required for one confined space to achieve comfort zone.

CO2 - Ability to demonstrate and propose methods to control temperature, humidity, air circulation and air purity in one confined space.

CO3 - Ability to design and improve the COP of an air conditioning system while reducing its sound and vibration.

ENT434 MEKANIK BAHAN KOMPOSIT
[MECHANICS OF COMPOSITE MATERIALS]
No of Credits: 3

Course Synopsis:
The basic concepts of composite materials are introduced. The elastic behaviour of unidirectional lamina and multidirectional laminates are presented and simulated by different models. Several failure criteria of laminates are introduced. Experimental methods used to characterise composite materials are presented.

Course Outcomes:
CO1 - Develop knowledge of the role of constituents in overall response of composite lamina (micromechanics) and its effect on the laminate properties (macromechanics)
CO2 - Ability to analyze elastic and strength properties, and elastic response, of orthotropic and anisotropic materials having both continuous and discontinuous reinforcements.
CO3 - Ability to describe and explain the basic experimental methods to characterise composite materials

ENT435 AKUSTIK & KAWALAN KEBISINGAN
[ACOUSTIC & NOISE CONTROL]
No of Credits: 3

Course Synopsis:
The aim of this course is to enable students to understand fundamental principles of engineering acoustics. Several acoustics criterias, meaurements and noise control guidances that are required for design and construction of those features related to noise, are also to be introduced in the course. After completing this course, students should be able to use the basic concepts of acoustic measurements and application of acoustic signal analysis for particular applications in noise control.

Course Outcomes:
CO1 - Ability to describe the conceptual and fundamental of engineering acoustics.
CO2 - Ability to explain the principles and techniques of noise and their applications in controlling noise.
CO3 - Ability to evaluate the various methods for controlling exposure to noise.

ENT436 ENJIN PEMBAKARAN DALAMAN
[INTERNAL COMBUSTION ENGINE]
No of Credits: 3

Course Synopsis:
The objective of the course is to look into the fundamentals of operation on internal combustion engines in term of their performance, operation, fuel requirements, and environmental impact. The topics include fluid flow, thermodynamics, combustion, heat transfer and fuel properties, with reference to engine power, efficiency, and emissions. Students will learn about the features and operating characteristics of different types of internal combustion engines, spark-ignition, diesel, stratified-charge, and mixed-cycle engines. At the end of this course, students should be able to understand real world engine issues and able to optimize future engine designs for the specific sets of constraints (fuel economy, performance, emissions).

Course Outcomes:
CO1 - Ability to evaluate the concept of operating characteristics of modern internal combustion engines.
CO2 - Ability to evaluate the relationship of the internal combustion process in term of the thermodynamics, combustion, and other factors affecting engine power, efficiency and emissions.
CO3 - Ability to apply analytical techniques to the engineering problems and performance analysis of internal combustion engines.

ENT437 PEMBUATAN PENAMBAHAN [ADDITIVE MANUFACTURING]
No of Credits: 3

Course Synopsis:
This course covers the principles and applications of reverse engineering and additive manufacturing as related to design and manufacturing. It will

detail the synchronized approach consideration of functional design, analysis and manufacturing that support the integration of reverse engineering and additive manufacturing. It will discuss the importance of additive manufacturing in manufacturing and other industries. The course will address additive manufacturing principles, variety and their concept; and scope of additive manufacturing with application areas. Upon completion, students will have the ability to select the proper additive manufacturing techniques for product design and manufacturing which include using commercial software for digitizing free-form geometry, capturing digital data from a difficult to design object and make a manufactured model, create the design of an object suitable for additive manufacturing processes, compare traditional versus next generation manufacturing, defining and applying criterion for selecting appropriate additive manufacturing process for any given application, investigating application domain of additive manufacturing and learning the important process parameters and determining suitable additive technique for selected industries such as aerospace, medical devices, remote sensing, UAS/UAV, automotive in case study relevant to mass customized manufacturing, and some of the important research challenges associated with AM and its data processing tools.

Course Outcomes:

CO1 - Ability to describe and analyze possibilities and needs of application of direct digital manufacturing in modern development, design and production.

CO2 - Ability to describe and evaluate reverse engineering and additive manufacturing processes in the design and manufacturing of finished product.

CO3 - Ability to evaluate and design product based on suitable additive manufacturing techniques in terms of hardware and software technologies.

ENT441 PENGIRAAN MEKANIK BENDALIR
[COMPUTATIONAL FLUID DYNAMICS]
No of Credits: 3

Course Synopsis:

The course offers an in-depth introductory foundational and technical knowledge in computational fluid dynamics. Starting from the basic fluid dynamics physics, the course will discuss the basic partial differential equation models up to how to implement finite difference and finite volume method for the model equations. Implementation of algorithm for incompressible Navier-Stokes equations will be discussed. Basic grid generation method will also be introduced. The final part of the course will introduce turbulence modeling.

Course Outcomes:

CO1 - Ability to analyze and apply basic fluid dynamics related partial differential equations.

CO2 - Ability to formulate and apply basic finite difference/finite volume method for fluid dynamics related partial differential equations.

CO3 - Ability to solve fluid dynamics related problems by using commercial CFD software and writing codes.

ENT447 ANALISIS UNSUR TERHINGGA
[FINITE ELEMENT METHODS]
No of Credits: 3

Course Synopsis:

The objective of this course is to introduce the students with theoretical knowledge that are required in solving engineering problems using finite element methods (FEM). The students are also will be exposed to the commercial software for Finite Element Analysis (FEA) in solving engineering problems. At the end of this course, the students will be able to apply various approaches in solving engineering problems especially for structural problems and utilize the FEA software for solving complex engineering problems.

Course Outcomes:

CO1 - Ability to assemble the stiffness matrices and identify boundary conditions for various engineering problems.

CO2 - Ability to analyze and solve engineering problems using various approaches in finite element methods.

CO3 - Ability to model and evaluate structural problem using computational tools

ENT461 TENAGA DIPERBAHARUI [RENEWABLE ENERGY]
No of Credits: 3

Course Synopsis:
The objective of the course is to look into concepts and application of Renewable Energy as we are approaching the practical limits of some of the sources of energy we have come to depend the most. This course will encourage students to investigate the facts about our energy needs, desires, and supplies and the environmental and human effects of obtaining and using energy.

Course Outcomes:
CO1 - Ability to evaluate the basic concepts and principles of renewable energy technologies and energy resources available today for sustainable development.
CO2 - Ability to perform conversion of alternative energies to thermal/ mechanical/electrical energy
CO3 - Ability to evaluate the relationships of renewable energies in the field, and their environmental impact.

ENT464 MEKANIK PATAH [FRACTURE MECHANICS]
No of Credits: 3

Course Synopsis:
This course contains the theory of principles and application of fracture mechanics. The fracture mechanics have a wide range of engineering design applications, including the analysis of brittle fracture of low-toughness structural materials and many non-metallic, and quantitative prediction of fatigue crack growth in a wide range of engineering materials. It will emphasize on the mathematical principles of linear elastic fracture mechanics, computational fracture mechanics and their application to engineering design.

Course Outcomes:
CO1 - Ability to analyze the concepts of fracture mechanics in engineering materials and structures
CO2 - Ability to compute stress intensity factor and evaluate the results of fracture mechanics analysis for a particular crack configuration.
CO3 - Ability to create computational fracture mechanics program for a specific fracture mechanic problem solving

ENT465 KEJURUTERAAN PANTAS [RAPID ENGINEERING]
No of Credits: 3

Course Synopsis:
This course covers the principles and applications of reverse engineering and additive manufacturing as relate to design and manufacturing. It will emphasized on the detail descriptions of reverse engineering and additive manufacturing processes and specifications. It will discuss the importance of additive manufacturing in manufacturing and other industries. Upon completion, students will have the ability to select the proper additive manufacturing techniques for product design and manufacturing.

Course Outcomes:
CO1 - Ability to select and describe the processes for rapid prototyping, design and manufacturing of finished product.
CO2 - Ability to select and evaluate the proper additive manufacturing techniques in terms of hardware and software technologies for product design and manufacturing in various industries a finished product .

ENT466 PENGOPTIMUMAN REKABENTUK [DESIGN OPTIMIZATION]
No of Credits: 3

Course Synopsis:
This course introduces the traditional non-linear optimization methods that can be used to solve a wide range of problems across all engineering disciplines. By the end of the semester the student will have gained a basic knowledge of numerical optimization algorithms and will have sufficient understanding of the strengths and weakness of these algorithms to apply them appropriately in engineering design. Students will write simple code as well as use off-the-shelf routines to gain experience and appreciation.

Course Outcomes:
CO1 - Ability to apply basic theoretical of optimization in practical engineering design situations.
CO2 - Ability to apply mathematical constructs and theoretical tools to solve linear and non-linear design problems
CO3 - Ability to formulate the optimization problem from the constraint associated with design.

ENT189 PENGATURCARAAN KOMPUTER
[COMPUTER PROGRAMMING]
No of Credits: 3

Course Synopsis:
This course is designed to introduce the fundamentals of Computer Programming. It provides an introduction to the principles of procedural programming, data types, control structures, data structures and functions, data representation on the machine level. This course also introduces the basic concepts of object oriented programming. At the end of this course students should be able to write, debug and document well-structured C applications applied to Mechatronic Engineering.

Course Outcomes:
CO1 - Ability to define the basic programming techniques.
CO2 - Ability to apply suitable programming technique to solve a given problem.
CO3 - Ability to develop and analyze computer program in C and C++ for Mechatronic Applications

ENT189 PENGATURCARAAN KOMPUTER
[COMPUTER PROGRAMMING]
No of Credits: 3

Course Synopsis:
This course is designed to introduce the fundamentals of Computer Programming. It provides an introduction to the principles of procedural programming, data types, control structures, data structures and functions, data representation on the machine level. This course also introduces the basic concepts of object oriented programming. At the end of this course students should be able to write, debug and document well-structured C applications applied to Mechatronic Engineering.

Course Outcomes:
CO1 - Ability to design the basic programming techniques
CO2 - Ability to apply suitable programming technique to solve a given problem.
CO3 - Ability to develop and analyze computer programs in C and C++ for Mechatronic Applications.

ENT286 INSTRUMENTASI DAN PENGUKURAN
[INSTRUMENTATION & MEASUREMENTS]
No of Credits: 3

Course Synopsis:
This course provides the knowledge of measurement and instrumentation with various transducers and techniques involving physical phenomena. This includes an overview of general measurement system, errors and signal characteristics, followed by diverse type of sensors and their application in measuring electronics signal, temperatures, humidity, displacement as well as velocity and acceleration, force, torques strain and stress and also the flow rate measurement. The use of computer for interfacing application is also covered in this course.

Course Outcomes:
CO1 - Ability to explain basic concepts of transducers, sensors and measurement techniques and errors in measurement
CO2 - Ability to apply interfacing concept between transducers, computer and signals obtained from measurement techniques.
CO3 - Ability to design measurement system using suitable sensors and transducers

ENT445 PROJEK TAHUN AKHIR I [FINAL YEAR PROJECT I]
No of Credits: 2

Course Synopsis:
In this course, students will be applying the knowledge they have learned throughout this programme by implementing them in a research project which is carried out for two semesters. In the first semester, focus is given on the preparation of work schedule, identifying the objectives, and writing the research methodology. Students are expected to begin project work according to the planned schedule.

Course Outcomes:
CO1 - Ability to identify research problems, develop techniques for information gathering and conduct literature review.
CO2 - Ability to conduct investigative research and select approriate methodology to solve research based engineeting issues(s)/ problem(s)

ENT446 PROJEK TAHUN AKHIR II [FINAL YEAR PROJECT II]
No of Credits: 4

Course Synopsis:
In this course, students will be applying the knowledge they have learned throughout this programme by implementing them in a research project which is carried out for two semesters. In the second semester, focus is given on the project work (experiments, simulation,
etc), analysis of results and final report writing. Students are expected to complete project work according to the planned schedule.

Course Outcomes:
CO1 - Ability to identify research problems, develop techniques for information gathering and conduct literature review.
CO2 - Ability to conduct investigative research and select approriate methodology to solve research based engineeting issues(s)/ problem(s)
CO3 - Ability to delover individual abalysis and judgement in research findings and capable of being assessed independently.
CO4 - Ability yo utilize approriate modern technology/tools in conducting research.
CO5 - Ability to preppare and delover both written and oral presentation effectively by using computers and multimedia technology.

PDT102 THERMOFLUIDS [TERMOBENDALIR]
No of Credits: 3

Course Synopsis:
This course will cover the basic knowledge, comprehension and application of law of thermodynamic to understand the relationship between the properties that matter exhibits as it changes its condition. The first part includes review of thermodynamic concept, heat and energy. The second part covers the hydrostatic pressure, various manometers, and hydrostatic force on a plane surface and curved surface, Newton's Second Law of fluid motion, static, stagnation, dynamic, total pressure and the Bernoulli equation.

Course Outcomes:
CO1 - Ability to analyze the basic concepts and processes that relate to the first law of thermodynamics and properties of pure substances.
CO2 - Ability to analyze the concept and knowledge of fluid dynamics on Newton's Second Law of fluid motion, static, stagnation, dynamic and total pressure, centre of pressure for immersed surfaces and the Bernoulli equation.
CO3 - Ability to operate the apparatus and equipment in the laboratory.

PDT104 STATIK DAN DINAMIK GUNAAN [APPLIED STATICS AND DYNAMICS]
No of Credits: 3

Course Synopsis:
This course comprises two parts of applied courses, namely: statics and dynamics. In applied statics, the bacis principles of engineering mechanics such as forces, moments and friction are introduced. Students are required to apply this bacis knowledge in analysing the equilibrium of rigid

bodies, as well as the stability of a structure. In applied dynamics it cover the concept of kinematics and kinetics. It provides an in-depth study of the physical concepts related to motion. The student will be exposed to a number of concepts and equations related to planar and rotational motion; able to identify and quantify forces affecting motion; able to describe and quantify forces and units of measure, related to work, energy and power. Analyses in relation to kinetic problems are solved using accelerationmethod, principle of work and energy, and principle of impulse and momentum.

Course Outcomes:

CO1 - Ability to apply and analyse the basic principles of physics related to static such as force, moment, Newton's First, Second and Third Law, trusses, frame and machine.

CO2 - Ability to apply and analyse the structures and frameworks problems by constructing, sketching and/or drawing free body diagram in ensuring static equilibrium.

CO3 - Ability to apply and analyse the kinematics and kinetics for particles and systems of particles.

CO4 - Ability to apply and analyse the planar kinematics and kinetics of a rigid body.

PDT104 STATIK DAN DINAMIK GUNAAN
[APPLIED STATICS AND DYNAMICS]
No of Credits: 3

Course Synopsis:

This course comprises two parts of applied courses, namely: statics and dynamics. In applied statics, the bacis principles of engineering mechanics such as forces, moments and friction are introduced. Students are required to apply this bacis knowledge in analysing the equilibrium of rigid bodies, as well as the stability of a structure. In applied dynamics it cover the concept of kinematics and kinetics. It provides an in-depth study of the physical concepts related to motion. The student will be exposed to a number of concepts and equations related to planar and rotational motion; able to identify and quantify forces affecting motion; able to describe and quantify forces and units of measure, related to work, energy and power. Analyses in relation to kinetic problems are solved using accelerationmethod, principle of work and energy, and principle of impulse and momentum.

Course Outcomes:

CO1 - Ability to apply and analyse the basic principles of physics related to static such as force, moment, Newton's First, Second and Third Law, trusses, frame and machine.

CO2 - Ability to apply and analyse the structures and frameworks problems by constructing, sketching and/or drawing free body diagram in ensuring static equilibrium.

CO3 - Ability to apply and analyse the kinematics and kinetics for particles and systems of particles.

CO4 - Ability to apply and analyse the planar kinematics and kinetics of a rigid body.

PDT106 ENGINEERING GRAPHICS [GRAFIK KEJURUTERAAN]
No of Credits: 3

Course Synopsis:

This course provides the skills to students the basics of Engineering Drawing, Computer Aided Drafting (CAD) and their engineering applications. The course covers the detail of Engineering Drawing for beginners followed with projection systems, oblique and isometric sketches. The course also introduced the Computer Aided Drafting using dedicated software, AUTOCAD, which focuses on product design in 2D and 3D environment. Fundamental knowledge in dimensioning and geometrical tolerance (GDT) enhances student's ability in interpreting and assessing information from basic raw data of an engineering drawing.

Course Outcomes:

CO1 - Ability to apply and analyse the basic principles of physics related to static such as force, moment, Newton's First, Second and Third Law, trusses, frame and machine. Ability to apply the basic drafting, sketching, engineering components, and common term used in engineering drawing.

CO2 - Ability to apply orthographic, auxiliary view, cross section and

isometric in engineering drawing.
CO3 - Ability to apply and analyse geometric, dimensioning, and tolerancing (GDT) in engineering drawing.
CO4 - Ability to apply detail and assembly drawing in engineering drawing.

PDT106 GRAFIK KEJURUTERAAN [ENGINEERING GRAPHICS]
No of Credits: 3

Course Synopsis:
This course provides the skills to students the basics of Engineering Drawing, Computer Aided Drafting (CAD) and their engineering applications. The course covers the detail of Engineering Drawing for beginners followed with projection systems, oblique and isometric sketches. The course also introduced the Computer Aided Drafting using dedicated software, AUTOCAD, which focuses on product design in 2D and 3D environment. Fundamental knowledge in dimensioning and geometrical tolerance (GDT) enhances student's ability in interpreting and assessing information from basic raw data of an engineering drawing.

Course Outcomes:
CO1 - To apply the basic drafting, sketching engineering components, and common term used in engineering drawing.
CO2 - To apply orthographic, auxiliary view, cross section and isometric in engineering drawing.
CO3 - To apply geometric, dimensioning, and tolerancing (GDT) in engineering drawing.
CO4 - To apply detail and assembly drawing in engineering drawing.

PDT107 COMPUTER AIDED DESIGN
[REKABENTUK BERBANTU KOMPUTER]
No of Credits: 2

Course Synopsis:
This course focuses on giving exposure and skill to students about the basics of 3D modeling and its application in engineering field by using 3D Modeling software. This course includes details on 3D modeling followed by producing 2D drawing, assembly drawing, exploded drawing, surface modeling, rendering and animation. All this skill will help student to produce technical drawing and virtual prototype or model. This skill is very demanding in industry.

Course Outcomes:
CO1 - Apply technical/2D drawing components using drawing software.
CO2 - Apply assembly drawing, exploded drawing, 3D animation and rendering using drawing software.

PDT111 MANUFACTURING PROCESS [PROSES PEMBUATAN]
No of Credits: 3

Course Synopsis:
This course explores the manufacturing process which used in industry to convert raw material into finished product. This course is devided into five sections. First, the introduction to manufacturing technology will be given, followed by material selection in manufacturing and heat treatment process. Secondly, the casting technology and various metal casting processes will be introduced including sand casting, investment casting, vacuum casting and other casting processes. Thirdly, overview of forming and shaping process will be given on rolling, forging, extrusion, drawing, sheet-metal forming, powder metallurgy, processing of ceramics, injection molding, and rapid prototyping process. Fourthly is about various joining process such as brazing, soldering, adhesive bonding, and mechanical fastening processes
.

Course Outcomes:
CO1 - Ability to describe the concept & methodologies of manufacturing technology and fundamental of materials in manufacturing.
CO2 - Ability to describe and analyze the concept & methodologies of solidification processes.
CO3 - Ability to analyze and evaluate the concept of forming and shaping processes.
CO4 - Ability to analyze and evaluate the concept & methodologies of joining and assembly technology.

PDT111 PROSES PEMBUATAN [MANUFACTRUING PROCESS]
No of Credits: 3

Course Synopsis:
This course explores the manufacturing process which used in industry to convert raw material into finished product. This course is divided into five sections. First, the introduction to manufacturing technology will be given, followed by material selection in manufacturing and heat treatment process. Secondly, the casting technology and various metal casting processes will be introduced including sand casting, investment casting, vacuum casting and other casting processes. Thirdly, overview of forming and shaping process will be given on rolling, forging, extrusion, drawing, sheet-metal forming, powder metallurgy, processing of ceramics, injection molding, and rapid prototyping process. Fourthly is about various joining process such as brazing, soldering, adhesive bonding, and mechanical fastening processes.

Course Outcomes:
CO1 - Ability to describe the concept & methodologies of manufacturing technology and fundamental of materials in manufacturing.
CO2 - Ability to describe and analyze the concept & methodologies of solidification processes.
CO3 - Ability to analyze and evaluate the concept of forming and shaping processes.
CO4 - Ability to analyze and evaluate the concept & methodologies of joining and assembly technology

PDT112 THEORY IN MACHINING [TEORI DALAM PEMESINAN]
No of Credits: 3

Course Synopsis:
In this course, the students learn the fundamentals and principles of metal cutting/machining processes common to current industrial practises. This includes single point orthogonal and turning operations, multi-point cutting operations, i.e. milling, drilling; and abrasive processes/grinding operations. Key technological principles and mechanisms of chip formations are initially explained. This is followed by discussions and evaluations of various conventional machining operations for different part shape requirements. Basic toolings for machining operations are introduced along with the machine tool structures to perform the cutting operations. Material removal rate, machining time and machining economics are analyzed as part of machinability analyses.

Course Outcomes:
CO1 - Ability to discuss the principles of metal cutting and chip formation processes. Ability to analyse Merchant force equation for machining force relationships.
CO2 - Ability to evaluate the concepts machine tools and machining operations for various engineering shapes.
CO3 - Ability to formulate the machinability of various metallic materials based on technical and economical factors.

PDT120 BASIC ELECTRICAL AND ELECTRONIC
[ASAS ELEKTRIK DAN ELEKTRONIK]
No of Credits: 3

Course Synopsis:
This course provides basic knowledge of solving DC and AC electrical circuits. It also covers the fundamentals of electrical machines. The electronics section includes basic semi conductor diodes and transistors as well as the fundamentals of digital systems. At the end of the semester students will be able to understand, analyze and apply basic electrical and electronics concept and principles.

Course Outcomes:
CO1 - Ability to implement and analyze basic electrical circuits.
CO2 - Ability to analyze single phase and three phase a.c circuits.
CO3 - Ability to analyze the three phase induction motors.
CO4 - Ability to implement and analyze basic electronics circuits.

PDT120 BASIC ELECTRICAL AND ELECTRONIC [ASAS ELEKTRIK DAN ELEKTRONIK]
No of Credits: 3
Course Synopsis:
This course provides basic knowledge of solving DC and AC electrical circuits. It also covers the fundamentals of electrical machines. The electronics section includes basic semi conductor diodes and transistors as well as the fundamentals of digital systems. At the end of the semester students will be able to understand, analyze and apply basic electrical and electronics concept and principles.
Course Outcomes:
CO1 - Ability to implement and analyze basic electrical circuits.
CO2 - Ability to analyze single phase and three phase a.c circuits.
CO3 - Ability to analyze the three phase induction motors.
CO4 - Ability to implement and analyze basic electronics circuits.

PDT120 ASAS ELEKTRIK DAN ELEKTRONIK [BASIC ELECTRIC ELECTRONIK]
No of Credits: 3

Course Synopsis:
This course provides basic knowledge of solving DC and AC electrical circuits. It also covers the fundamentals of electrical machines. The electronics section includes basic semiconductor diodes and transistors as well as the fundamentals of digital systems. At the end of the semester students will be able to understand, analyze and apply basic electrical and electronics concept and principles.

Course Outcomes:
CO1 - Ability to implement and analyze basic electrical circuits.
CO2 - Ability to analyze single phase and three phase a.c circuits
CO3 - Ability to analyze the three phase induction motors.
CO4 - Ability to implement and analyze basic electronics circuits.

PDT122 MATERIAL SCIENCE [SAINS BAHAN]
No of Credits: 3

Course Synopsis:
This course introduces students to historical perspective of materials science and engineering fundamentals characteristics begin from understanding the atomic structures, atomic bonding in solids, crystal structures, mechanical and physical properties of materials. Students will then apply the understanding on properties of materials through phase diagram, transformations and heat treatment processing on ferrous and non-ferrous alloys, polymer and advanced materials.

Course Outcomes:
CO1 - Ability to describe and explain the materials' atomic structures, bonding, crystal structure and imperfections.
CO2 - Ability to explain and analyse the mechanical, physical properties of materials.
CO3 - Ability to explain and analyze the metal alloys microstructure, phase diagram and heat treatment processes.
CO4 - Ability to describe and explain machinability of ferrous and non-ferrous metal alloys, polymer materials, and advanced materials.

PDT122 SAINS BAHAN [MATERIAL SCIENCE]
No of Credits: 3

Course Synopsis:
This course introduces students to historical perspective of materials science and engineering fundamentals characteristics begin from understanding the atomic structures, atomic bonding in solids, crystal structures, mechanical and physical properties of materials. Students will then apply the understanding on properties of materials through phase diagram, transformations and heat treatment processing on ferrous and non-ferrous alloys, polymer and advanced materials.

Course Outcomes:

CO1 - Ability to describe and explain the materials' atomic structures, bonding, crystal structure and imperfections
CO2 - Ability to explain and analyse the mechanical, physical properties of materials
CO3 - Ability to explain and analyse the metal alloys microstructure, phase diagram and heat treatment processes.
CO4 - Ability to describe and explain machinability of ferrous and non-ferrous metal alloys, polymer materials and advanced materials.

PDT126 ASAS REKA BENTUK [DESIGN FUNDAMENTAL]
No of Credits: 3

Course Synopsis:

The subject introduces students to the theory and practice of art. In this course, the elements of art (line, color, shape/form, space, value, and texture) and the principles of art (balance, harmony, unity, emphasis, repetition, rhythm, contrast, and composition) are discussed and practiced through student individual or group projects. Students will be exposed to the topics about Nature of Design; Design Process and Communication; Design Techniques and Critiques. The most important topic in this course is visual language, which comprises of exploration towards visual elements and design principles. In addition, students will be exposed and experienced the aesthetics value of an art work, through creating graphical images or 3 dimensional objects including presentations and critique sessions.

Course Outcomes:

CO1 - Ability to describe and apply design elements and principles in design projects and assignments.
CO2 - Ability to analyze aesthetic value of 2 dimensional artwork and 3 dimensional objects of the design output.
CO3 - Ability to recognize/realize the important of leadership and teamwork in producing projects or assignments for better output.

PDT127 PENGHAYATAN REKA BENTUK [DESIGN APPRECIATION]
No of Credits: 3

Course Synopsis:

This course is designed to incorporate an understanding of the vast range of works of art. It is a chronological survey of major artwork, movements and monuments since the earliest cave drawings. The first part of this course introduces students to the history and appreciation of art, including exploration of the elements and principles of the visual arts. Students will be introduced to the study and history of the visual arts with focus on the unique characteristics, representative artists and works; and common art forms and genres of various art historical periods. The second part of this course is the historical study to the progression of industrial design/ product design professions and the important aspects of their involvement and contributions in product design. Finally, students will be introduced to the art of product styling and the important of product semantics in the process of creating a product.

Course Outcomes:

CO1 - Ability to understand, identify and evaluate the issues and challenges of industrial technologies ethics.
CO2 - Ability to translate and explain the factor of design history and revolution and the effects to the industrialization sector.
CO3 - Ability to discuss in group and evaluate the aspects of industrial revolution technology and the effects to the social and cultural.

PDT128 VISUALISASI REKA BENTUK [DESIGN VISUALIZATION]
No of Credits: 2

Course Synopsis:

This course aims at addressing important issues in the visual design. The course will cover fundamental design concepts in a logical sequence which will provide students with good visual design. The most important topic in this course is visual language, which comprises of exploration towards visual elements and design principles. In addition, the student will learn about aesthetics value of an art work, such as graphical images and 3 dimensional objects. The student will undergo lecture series on related

topics and experience some design projects included presentations and critique sessions.

Course Outcomes:

CO1 - Ability to describe and apply design elements and principles in design projects and assignments.
CO2 - Ability to analyze aesthetic value of 2 dimensional artwork and 3 dimensional objects of the design output.
CO3 - Ability to recognize/realize the important of leadership and teamwork in producing projects or assignments for better output.
CO4 - Ability to construct and produce 2 dimensional and 3 dimensional objects using various drawing and modeling techniques with appropriate tools and instruments.

PDT131 REKA BENTUK INDUSTRI TERBANTU KOMPUTER 1 [COMPUTER AIDED INDUSTRIAL DESIGN I (CAID 1)]
No of Credits: 3

Course Synopsis:

This course focuses on giving exposure and skill to students about the basics of 3D modeling and its application in engineering field by using 3D Modeling software. This course includes details on 3D modeling followed by producing 2D drawing, assembly drawing, exploded drawing, surface modeling, rendering and animation. All this skill will help student to produce technical drawing and virtual prototype or model. This skill is very demanding in industry

Course Outcomes:

CO1 - Design 3d model of components by using CAD software.
CO2 - Apply and construct technical/2d drawing using CAD software
CO3 - Apply and construct assembly drawing and exploded drawing using CAD software.
CO4 - Apply and construct 3d animation and rendering for the components using CAD software.

PDT133 WORKSHOP TECHNOLOGY [TEKNOLOGI BENGKEL]
No of Credits: 2
Course Synopsis:
In this course, the explanation about the safety aspects in the workshop will be covered, followed by the fundamental model marking processes for product development purpose. Students will also use the techniques in tooling, machinery and material selection. The processes that involved are cutting technique, joining technique and finishing technique. Practical work will help the students to gain effective understanding in the workshop technology course.

Course Outcomes:

CO1 - Ability to work in a group, communicate effectively, apply basic industrial procedure and safety precaution when handling tools and equipments.
CO2 - Ability to understand and employ various types of measurement equipment and techniques related.
CO3 - Ability to analyze, develop and fabricate model/prototype in various types of materials by using related equipment.
CO4 - Ability to understand, describe and to operate lathe machine, milling machine and various hand tools without neglecting the safety precaution while working.

PDT133 TEKNOLOGI BENGKEL [WORKSHOP TECHNOLOGY]
No of Credits: 2

Course Synopsis:

In this course, explanation about safety aspects in workshop will be covered,followed by fundamental measurement techniques , and use of measurement equipment such as Vernier Caliper , Chiseling , Sawing , etc. Students will be introduced to fabrication, sheet metal forming, and welding processes which consists of introduction to basic knowledge of various cutting methods and hand tools, such as file, hacksaw, chisel, and etc.The second part of the course introduces the fundamentals of measurement techniques' followed by milling, lathe and grinding operations which consist of introduction to basic knowledge of various cutting tools, parts of machines and their functions, machine operations, and numerous

calculations involving the operations. Students will practice conventional machining process that it used in the industry to transform raw material to finished products. Practical work will help students gain effective understanding.

Course Outcomes:
CO1 - Work in a group, communicate effectively; apply basic industrial safety regulation as well as emergency first aid techniques.
CO2 - Ability to apply and understand engineering drawing and able to transfer for model/prototype fabrication.
CO3 - Define and operate the conventional machining.

PDT134 AMALAN REKA BENTUK [DESIGN PRACTICE]
No of Credits: 3

Course Synopsis:
This course will expose the student in practicality and developing skills regarding design processes and model/prototype fabrication. Hence, topics will be focusing to product sketching techniques and model/prototype fabrication. Through the assignment given, the knowledge and skills that need by a product designer will be developing. Furthermore, this course will expose the student by studio/workshop sessions through product design assignments which emphasis on creative thinking and the production of visual in the context of design. The student will be expose trough design assignment about the concepts and methods in designing; elements of good quality product; included concepts sketching and presentation drawing; model making; understanding of engineering drawing and design documentation

Course Outcomes:
CO1 - Ability to define and apply design philosophy and process flow in product development
CO2 - Ability to construct and produce 2 Dimensional or 3 Dimensional objects using various medium and modelling techniques with appropriate tools and instruments.
CO3 - Ability to identify and define different techniques in concept generation and design method in model making process.

PDT151 INTRODUCTION TO MATERIALS PROCESSINGTECHNOLOGY [PENGENALAN TEKNOLOGI PEMPROSESAN BAHAN]
No of Credits: 2

Course Synopsis:
This is a course for undergraduate students majored in materials engineering technology. It is designed to teach the basic knowledge to processing methods used to manufacture materials such as metal, ceramic, polymeric and composites components. The topics covered will include casting, joining, deformation processing, machining, powder processing of metals and ceramics, polymer processing, coating processes, microelectronics manufacturing, materials selection, and manufacturing process selection.

Course Outcomes:
CO1 - Able to learn about understand on materials and available manufacturing processes for metals, ceramics, polymers, composites and coatings.
CO2 - Able to relate material processing to structure and performance pertaining to several different types of material.
CO3 - Able to develop an understanding of how material processes affect the material microstructure, properties, cost, energy, and power requirements, shape limitations and dimensional tolerances and time to manufacture components.
CO4 - Able to use fundamentals of materials science and engineering to perform basic materials selection and determine processing conditions needed to achieve desired shapes and properties.

PDT152 MATERIALS CHEMISTRY [KIMIA BAHAN]
No of Credits: 3

Course Synopsis:
This course is designed to introduce the students aspect of thermodynamics including first law and second law of thermodynamics, Reaction kinetics such as effect of reactants and products concentration, effect of temperature, determination of order and velocity constant of reaction,

electrochemistry and interface phenomenon.

Course Outcomes:

CO1 - Able to identify the basic solid state chemistry and how structure properties relationships are important in materials chemistry.
CO2 - Able to classify the inorganic materials, nano-material, synthetic strategies, physical bonding and properties (optical, electronic, conduction) in solid and environmental application.
CO3 - Able to demonstrate the effect reactant and products concentration, effect of temperature, and diffusion in solid state.
CO4 - Able to analyse electrochemistry, surface energy, interfacial energy expect gas/liquid interfacial, absorption, and colloid.

PDT153 MATERIALS STRUCTURE AND PROPERTIES [STRUKTUR DAN SIFAT BAHAN]
No of Credits: 3

Course Synopsis:

This course is designed to introduce some fundamentals of materials engineering; materials structure, solid defects and basic theory of diffusion. Introduction to mechanical and physical properties for various types of engineering materials, how these properties are measured and what these properties represent.

Course Outcomes:

CO1 - Able to identify and differentiate the type of atomic bonding and materials structure.
CO2 - Able to identify various types of defect and basic concept of diffusion in materials.
CO3 - Able to comprehend and measure physical and mechanical properties of various types of engineering materials.
CO4 - Able to relate in between physical and mechanical properties for various type of engineering materials and identify the factor that affect physical and mechanical properties of materials.

PDT154 MATERIALS TESTING [PENGUJIAN BAHAN]
No of Credits: 3

Course Synopsis:

This course is designed to expose students the theory and practical aspects of materials testing using destructive and non-destructive tests such as compression test, charpy impact testing, hardness test, magnetic particle test and liquid penetration test.

Course Outcomes:

CO1 - Able to identify the importance of materials testing, the types of materials testing, the basic of materials imperfection and impurities in solids.
CO2 - Able to demonstrate the destructive and non-destructive materials tests using testing machines.
CO3 - Able to analyze the result and defects that exist on inspection materials through destructive and non-destructive testings.
CO4 - Able to analyze physical and mechanical properties of materials through various testing techniques such as compression test, charpy impact testing, hardness test, magnetic particletest and liquid penetration test.

PDT155 QUALITY CONTROL [KAWALAN KUALITI]
No of Credits: 3

Course Synopsis:

This course is an overview of quality studies that take into account the philosophical, managerial and technical issues of Quality. The managerial aspects include TQM, ISO 9000. The technical aspects include statistical tools and techniques used in many industrial applications.Topics covered include: Introduction to Quality, TQM, ISO standard, Design of experiment, six sigma, basic statistics, fundamentals of probability, control charts for variable and attribute, process capability, acceptance sampling plan, acceptance sampling system and reliability.

Course Outcomes:

CO1 - Ability to differentiate the essentials of the quality management philosophy and theories of experts including Deming and Juran.
CO2 - Ability to develop and implement TQM in work place as well as can contribute in developing ISO 9000 System
CO3 - Ability to apply statistical process control techniques to monitor i ndustrial process variation as well as interpret the chart to identify potential corrective actions.

PDT176 LUKISAN TERBANTU KOMPUTER [COMPUTER AIDED DRAFTING]
No of Credits: 2

Course Synopsis:
Students are hoped to be able to understanding various engineering design environments and produce the technical report to support conceptual.
Course Outcomes:

CO1 - Ability to apply basic drafting skills using computer aided drafting software.
CO2 - Ability to construct and interpret drawings in orthographic projection.
CO3 - Ability to construct a working drawing for an engineering product or device using a CAD system.
CO4 - Ability to accurately interpret and construct standard engineering drawings and schematic diagram.

PDT177 KIMIA GUNAAN [APPLIED CHEMISTRY]
No of Credits: 2

Course Synopsis:
The course covers pure chemistry (chemical elements, atoms and molecules), water and the fitness of environment, carbon and functional groups, structure and function of macromolecules and analytical chemistry (stoichiometric calculations and chemical equilibrium which comprises of acid base equilibrium, acid base titrations and reactions, and precipitation titrations).

Course Outcomes:

CO1 - Ability to apply the concepts and principles of general chemistry and analytical chemistry.
CO2 - Ability to solve the problems in chemical reactions and calculations.
CO3 - Ability to recognise and analyze the data from various types of chemistry of life and problem solving in analytical chemistry

PDT178 BIOLOGI GUNAAN [APPLIED BIOLOGY]
No of Credits: 2

Course Synopsis:
This course introduces the general concepts of biology as related to agricultural technology, the molecular and cellular aspects of living things, structure and function of plants and animals, plant and animal diversity, principles of classification and ecological relationships in organisms, and the role of genetics in organism variation and adaptation.

Course Outcomes:

CO1 - Ability to illustrate important traits in living organisms with reference to: evolution, classification and ecology
CO2 - Ability to interpret growth in living organisms with reference to: physiology and genetics

PDT179 EKONOMI PERTANIAN [AGRICULTURAL ECONOMICS]
No of Credits: 3

Course Synopsis:
The course introduces to the study of economic principles with respect to supply-demand, finance and marketing of agricultural products related to food and fiber production with special references to Malaysian conditions and policies.

Course Outcomes:

CO1 - Ability to apply economic development and agriculture, with specific context of Malaysia's economy and the agriculture sector.
CO2 - Ability to analyze consumer behavior, market supply-demand

equilibrium, and elasticity.

CO3 - Ability to analyze business behavior and market supply-demand equilibrium.

CO4 - Ability to apply macroeconomics of agriculture with respect to international agricultural trades and exchange rates and policies.

PDT180 ENGINEERING SCIENCE [SAINS KEJURUTERAAN]
No of Credits: 3

Course Synopsis:
The course covers foundations of quantity and units of measurement, vectors, particle dynamics, work, power and momentum. Additional coverage includes forces on objects and introduction to electrical circuit.

Course Outcomes:

CO1 - Ability to analyze problems related to units of measurements, and scalar and vector quantities.

CO2 - Ability to analyze particles in motion, energy, work, power, and momentum.

CO3 - Ability to analyze forces acting on objects.

CO4 - Ability to analyze basic electrical circuitry.

PDT182 APLIKASI ELETRONIK DALAM PERTANIAN [ELECTRONICS APPLICATION IN AGRICULTURE]
No of Credits: 3

Course Synopsis:
This course introduces basic electrical circuit theory and analogue electronics, basic DC and AC circuits and fundamental of electronic components such as operational amplifiers and semiconductor diodes.
Course Outcomes:

CO1 - Ability to demonstrate application of the key principles of DC circuit theory including Kirchhoff's laws of current and voltage, and rules for current and voltage division

CO2 - Ability to apply ideal and non-ideal operational amplifier circuits

CO3 - Ability to analyze simple AC series and parallel circuits using phasors and complex numbers

PDT184 SISTEM PENGELUARAN PERTANIAN [AGRICULTURAL PRODUCTION SYSTEMS]
No of Credits: 4

Course Synopsis:
The course covers the various facets of agricultural production systems and practices, dynamism within the soil-plant-atmosphere continuum involving living organisms related to crops and fauna, components in agricultural production systems and good agricultural practices and sustainability approaches

Course Outcomes:

CO1 - Ability to define and interpret the basic principles and processes involved in agricultural production systems

CO2 - Ability to solve systems/problems related to aspects in agricultural production systems

CO3 - Ability to choose systems related to good agricultural practices and sustainable farming

PDT202 HEAT TRANSFER [PEMINDAHAN HABA]
No of Credits: 3

Course Synopsis:
This course is designed to enhance and extend student's ability to apply the principles of heat transfer especially its three major modes: conduction, convection, and radiation. In addition to the three modes of heat transfer, students will learn about heat transfer during phase changes (boiling and condensation heat transfer). Besides, It also covers the application of the principles of heat transfer and discusses the design of equipment to accomplish a certain requirement (heat exchangers).

Course Outcomes:

CO1 - Ability to analyse the basic principles of heat transfer

CO2 - Ability to analyse the condensation and boiling heat transfer, and heat exchangers

CO3 - Ability to operate the apparatus and equipment in the laboratory.

PDT202 HEAT TRANSFER [PEMINDAHAN HABA]
No of Credits: 3

Course Synopsis:
This course is designed to enhance and extend student's ability to apply the principles of heat transfer especially its three major modes: conduction, convection, and radiation. In addition to the three modes of heat transfer, students will learn about heat transfer during phase changes (boiling and condensation heat transfer). Besides, It also covers the application of the principles of heat transfer and discusses the design of equipment to accomplish a certain requirement (heat exchangers).

Course Outcomes:
CO1 - Ability to analyse the basic principles of heat transfer
CO2 - Ability to analyse the condensation and boiling heat transfer, and heat exchangers
CO3 - Ability to operate the apparatus and equipment in the laboratory.

PDT203 NOISE & VIBRATION [HINGAR & GETARAN]
No of Credits: 3

Course Synopsis:
The objective of the course is to introduce the students with the skills and knowledge in vibrations disciplines. The syllabus covers the fundamental of vibration and oscillation motion, free vibration, force vibration, transient vibration, two degree of freedom systems and multiple degree of freedom systems. The students will be well prepared towards industrial application elements such as vibration control, vibration measurement, signal analysis methods and noise control.

Course Outcomes:
CO1 - Ability to analyse free and force vibration for single and two degree of freedom.
CO2 - Ability to evaluate the response of various systems (multi degrees of freedom) and noise measurement.
CO3 - Ability to operate the apparatus and equipment in the laboratory.

PDT204 APPLIED STRENGTH OF MATERIALS [KEKUATAN BAHAN GUNAAN]
No of Credits: 3

Course Synopsis:
This course is intended to provide the students with a clear, easy, and thorough understanding of theory and application of the principles of mechanics of materials in real industrial situations. The important concepts of statics, deformation, stresses, and strain are discussed for axial-loaded and directly-sheared members. The solid bodies which subjected to torsion and bending loadings are also analysed. Besides, the concepts for transforming multiaxial states of stress and strain are presented. Discussion on the stability, support types, and design of column are also covered.

Course Outcomes:
CO1 - Ability to analyse the basic principles of deformation, stress, and strain in load-bearing structure.
CO2 - Ability to analyse the structure which are subjected to axial, twisting couples or torques, and transverse loading.
CO3 - Ability to evaluate the case of bending in beams or shafts, and to construct the shear and bending diagrams.
CO4 - Ability to analyse the stress and strain transformations, and to evaluate buckling structure supporting axial compressive load.

PDT204 APPLIED STRENGTH OF MATERIALS [KEKUATAN BAHAN GUNAAN]
No of Credits: 3

Course Synopsis:
This course is intended to provide the students with a clear, easy, and thorough understanding of theory and application of the principles of mechanics of materials in real industrial situations. The important concepts of statics, deformation, stresses, and strain are discussed for axial-loaded and directly-sheared members. The solid bodies which subjected to torsion and bending loadings are also analysed. Besides, the concepts

for transforming multiaxial states of stress and strain are presented. Discussion on the stability, support types, and design of column are also covered.

Course Outcomes:

CO1 - Ability to analyse the basic principles of deformation, stress, and strain in load-bearing structure.
CO2 - Ability to analyse the structure which are subjected to axial, twisting couples or torques, and transverse loading.
CO3 - Ability to evaluate the case of bending in beams or shafts, and to construct the shear and bending diagrams.
CO4 - Ability to analyse the stress and strain transformations, and to evaluate buckling structure supporting axial compressive load.

PDT206 JIG AND FIXTURE DESIGN [REKABENTUK JIG DAN LEKAPAN]
No of Credits: 3

Course Synopsis:

This course provides concept and understanding to allow students to find suitable designs for components in designing machine system, jig and fixtures. It focuses on basics of power transmission system, motors, fasteners and fundamental principles of jig and fixtures. Students will be exposed with simple design problems before being assigned to compute design parameters. At the end of this course, students will be analyzed simple designs of machine components by using CAD Aided Engineering (CAE) software.

Course Outcomes:

CO1 - Ability to apply knowledge and comprehension of fundamental Jig and Fixture Design in machining application.
CO2 - Ability to apply the knowledge in order to select and use the tool material in jig and fixture design.
CO3 - Ability to evaluate the principles of design economy in jig and fixture design.

PDT209 INDUSTRIAL SAFETY [KESELAMATAN DALAM INDUSTRI]
No of Credits: 3

Course Synopsis:

This course gives an exposure to students to understand industrial safety standards and guidelines, quality management concept and various quality tools that allow students to understand the general picture of both areas which are being practiced by industries. At the end of this course, students are expected to be able to identify suitable quality techniques and tools to be implemented in production management and can apply Industrial Safety standards in real industrial environment.

Course Outcomes:

CO1 - Ability to explain the fundamental of OSH MS and establish OSH management system at the work place
CO2 - Ability to analyse safety issues and apply suitable OSH related legal provisions/regulations to resolve the cases
CO3 - Ability to assess the hazards and risk and recommend mitigation/ remedial plan

PDT210 CONVENTIONAL MACHINING [PEMESINAN KONVENSIONAL]
No of Credits: 4

Course Synopsis:

This course introduce about safety aspects in workshop and fundamental of measurement technique followed by milling, lathe and grinding operation which consists of introduction to basic knowledge of various cutting tools, parts of machine and its functions, machine operations, and numerous calculations involving the operations. Students will practices the conventional machining process that is used in the industry to transform from raw material to finished products. Practical work will help students to gain effective understanding.

Course Outcomes:

CO1 - Ability to analyze and select machining operations,cutting tools and machining conditions to perform turning process.

CO2 - Ability to analyze and select machining operations, cutting tools and machining conditions to perform milling process.
CO3 - Ability to analyze and select machining operations, cutting tools and machining conditions to perform others machining process.
CO4 - Ability to perform in group/team to design, evaluate and construct product with suitable machining process.

PDT212 GEOMETRIC, DIMENSIONING AND TOLERANCING [GEOMETRI, PENDIMENSIAN DAN TOLERANSI]
No of Credits: 3

Course Synopsis:
This course focuses on the theory and concept to Geometric Dimensioning and Tolerencing (GD&T). Geometric Dimensioning and Tolerencing (GD&T) is a graphic language, that the learner can understand and use it in practical applications in industry. This course develops students' knowledge and skills on the basis of Geometric Dimensioning and Tolerencing (GD&T) and its application in engineering. All this knowledge and skills will help student to apply its in engineering field to fulfill industry demand.

Course Outcomes:
CO1 - Ability to apply theory and concepts of Geometric Dimensioning and Tolerancing, dimensioning fundamentals.
CO2 - Ability to analyze theory and concepts of Geometric Dimensioning and Tolerancing, dimensioning fundamentals.
CO3 - Ability to evaluate the concept of tolerance and fits and strategize.

PDT213 CNC TECHNOLOGY [TEKNOLOGI CNC]
No of Credits: 4

Course Synopsis:
This course enables students to understand the use of conventional and modern machining processes. The course begins with an introduction to machining processes, followed by analyses of machine tools. Then, students are taught about CNC programming, CNC processes, tools and control systems. Students will perform machining processes and learn how to develop programming and solve problems related with it.

Course Outcomes:
CO1 - Ability to apply the concept of NC machining operation such as workpiece zero setting, tool setting, etc.
CO2 - Ability to generate G and M code programs and documentation for machining operation on CNC machine tools.
CO3 - Ability to explain concept of automated system availabe in a CNC machine.

PDT222 METALLURGY [METALURGI]
No of Credits: 3

Course Synopsis:
This course is designed to provide an understanding about basic principles of metallurgy. it will covered basic theory of thermodynamics, extraction of the metals from the raw, properties of the metal and current technolgy involved in metal fabrication.

Course Outcomes:
CO1 - Ability to define and apply thermodynamics concept and rate processes.
CO2 - Ability to analyze the microstructure and properties of alloy and the industrial application.
CO3 - Ability to discuss and justify the concept of corrosion of metals.
CO4 - Ability to evaluate the basic principle in metal extraction from its ore by hydrometallurgy, electrometallurgy and pyrometallurgy.

PDT229 REKA BENTUK INTEGRASI [DESIGN INTEGRATION]
No of Credits: 3

Course Synopsis:
This subject introduce the role of industrial designer profession consist of explanation on the job scope and knowledge and required skills. Furthermore, the subject exposes the students to the development of visual and creative thinking within the context of industrial design field, with special emphasis on the development of product form. Through lecture sessions and design assignments, students will be focused and exposed to the aesthetic, styling and classification of products; concepts and design devel-

opment method; producing product visualization/presentation techniques including concept sketching and rendering techniques; model making and basic documentation skills inclusive of design presentation skills. The student will exposed and familiarized with the workshop environment and regulation and utilize and use those facilities for model making.

Course Outcomes:

CO1 - Ability to plan, perform and reflect on different phase in a design process.
CO2 - Ability to plan and embark on design research to support the design process
CO3 - Ability to produce a product model and adapt with the workshop facilities and modeling materials.
CO4 - Ability to communicate an opinion, design idea, concept, and other information clearly and convinced the audience using language, gestures, and presentation materials.
CO5 - Ability to demonstrate and apply relevant basic engineering principles and material properties and manufacturing processes.

PDT230 STUDIO REKA BENTUK I [DESIGN STUDIO I]
No of Credits: 3

Course Synopsis:

This course aims to develop an understanding of customers and product marketability trough the subject theme of “Customers/User Centered Design”. Student will use appropriate engineering approaches and methods to analyze user needs and formulate solution to the design problems. Students are required to use and manipulate 3D CAD based software to construct product detailing and specifications and analyzing basic product reliability and performance. Additionally, student must use the software output to produce product illustrations and digital rendering techniques for product presentation.

Course Outcomes:

CO1 - Ability to ANALYZE user’s needs and formulate solution to the design problem based on product design and development process
CO2 - Ability to CONSTRUCT 2 Dimensional visual and 3 Dimensional object using various visualization and modelling techniques with appropriate tools, equipments and technologies.
CO3 - Ability to COMMUNICATE the proposal and results of the project effectively using visual,oral or written format.
CO4 - Understand and appreciate virtual engineering technologies and how they can be applied to product life-cycle design.

PDT231 REKA BENTUK INDUSTRI TERBANTU KOMPUTER II [COMPUTER AIDED INDUSTRIAL DESIGN II (CAID II)]
No of Credits: 3

Course Synopsis:

Once an Industrial Designer has completed the conceptual design stage of a project the details required for manufacture need to be resolved and prototypes made. It is at this stage that Computer Aided Design (CAD) is used. 3D CAD allows the details of the design to be resolved. Rapid prototypes can be made directly from the CAD data for design testing and verification. Modifications to the CAD data can be made quickly. Once the design is satisfactory, the 3D CAD models can then be used to generate photo-realistic images and engineering drawings so that the new product can be manufactured.

Course Outcomes:

CO1 - Apply three-dimensional transformations and viewing operations in computer-aided product design
CO2 - Apply curve, surface, and solid modelling in computer-aided product design.
CO3 - Understand product data management (PDM) technologies and the acquisition of PDM systems.
CO4 - Understand and appreciate virtual engineering technologies and how they can be applied to product life-cycle design.

PDT232 PENGURUSAN DATA PRODUK [PRODUCT DATA MANAGEMENT (PDM)]
No of Credits: 3

Course Synopsis:
This lesson provides an engaging context to introduce students to the advance processes of computer aided design and manufacture (CAD/CAM). Students analyze the reasons behind using CAD/CAM to develop selected products concept before identifying the advantages and disadvantages of its use. Students are given an opportunity to practice their advance CAD skills by responding to a design concept. The lesson is supported by instructional worksheets, and demonstrates the importance of the use of advance CAD/CAM tools and equipment in the process of realizations of a design or product concepts.

Course Outcomes:
CO1 - APPLY filing system related to CAD data.
CO2 - APPLY bill of material in the project.
CO3 - understand and EXAMINE product data management (PDM) technologies and the acquisition of PDM systems.
CO4 - RECOGNIZE and REALIZE the importance of virtual engineering technologies and how they can be applied to Product Data Management.

PDT232 PROTOTAIP PANTAS II [RAPID PROTOTYPING II]
No of Credits: 3

Course Synopsis:
Once an Industrial Designer has completed the conceptual design stage of a project the details required for manufacture need to be resolved and prototypes made. It is at this stage that Computer Aided Design (CAD) is used. 3D CAD allows the details of the design to be resolved. Rapid prototypes can be made directly from the CAD data for design testing and verification. Modifications to the CAD data can be made quickly. Once the design is satisfactory, the 3D CAD models can then be used to generate photo-realistic images and engineering drawings so that the new product can be manufactured.

Course Outcomes:
CO1 - Ability to EVALUATE suitable prototyping techniques and technologies in prototype construction process
CO2 - Ability to CONSTRUCTS physical prototype based on technical specifications and requirements
CO3 - Ability to ORGANIZE the project based on timeline,rules and regulations with understanding of professional ethics.
CO4 - RECOGNIZE and REALIZE the importance of virtual engineering technologies and how they can be applied to Product Data Management.

PDT234 PROTOTAIP PANTAS I [RAPID PROTOTYPING I]
No of Credits: 3

Course Synopsis:
Once an Industrial Designer has completed the conceptual design stage of a project the details required for manufacture need to be resolved and prototypes made. It is at this stage that Rapid Prototyping process is used. 3D geometry CAD data allows the details of the design to be resolved before actual manufacturing. Rapid prototypes can be made directly from the CAD data for design testing and verification. Modification to the CAD data can be made quickly. Once the design is satisfactory, the 3D CAD models can then be used to generate physical model made of plastic by using layer type rapid prototyping and engineering drawings so that the new product can be manufactured.

Course Outcomes:
CO1 - Ability to APPLY various Rapid Prototyping technology
CO2 - Ability to ADAPT Rapid Prototyping technology into physical prototype construction based on technical specification given.
CO3 - Ability to ORGANIZE the project based on timeline,rules and regulations with understanding of professional ethics.

PDT236 COMPUTER PROGRAMMING [PENGATURCARAAN KOMPUTER]
No of Credits: 2

Course Synopsis:
This course introduces basic programming using high level language (C language). The main objective of this course is to prepare the students with the ability of problem solving with programming tools such as organization chart, IPO chart, flowchart and pseudo code and then to implement them by developing C program.

Course Outcomes:
CO1 - Ability to analyse and construct simple and straightforward manner in C Programs.
CO2 - Ability to analyse and construct C programs with variables, to perform mathematics functions and to configure with desired input/output.
CO3 - Ability to analyse and design C programs with control structure, looping, functions and numeric arrays.

PDT236 COMPUTER PROGRAMMING [PENGATURCARAAN KOMPUTER]
No of Credits: 2

Course Synopsis:
This course introduces basic programming using high level language (C language). The main objective of this course is to prepare the students with the ability of problem solving with programming tools such as organization chart, IPO chart, flowchart and pseudo code and then to implement them by developing C program.

Course Outcomes:
CO1 - Ability to analyse and construct simple and straightforward manner in C Programs.
CO2 - Ability to analyse and construct C programs with variables, to perform mathematics functions and to configure with desired input/output.
CO3 - Ability to analyse and design C programs with control structure, looping, functions and numeric arrays.

PDT240 ERGONOMIK GUNAAN DAN KESELAMATAN [APPLIED ERGONOMIC AND SAFETY]
No of Credits: 3

Course Synopsis:
This course addresses ergonomics knowledge in product design. It explains the application of anthropometrics data in the design of products, equipment and tools. Students will learn about fundamental knowledge of ergonomics, its applications in design and basic assessment tools to analyze design problems. The course also exposes students to specific considerations, needs or requirement for special populations such as the elderly and the disabled in the design. It also looks into ergonomic hazards, safety analysis & prevention, and the product safety.

Course Outcomes:
CO1 - Ability to define and explain the application and importance of ergonomics in design, and human capability and limitations.
CO2 - Ability to apply anthropometric data in product or workplace design, and perform analysis and evaluation.
CO3 - Ability to explain interaction design and usability issues, and apply usability principles and framework in product design
CO4 - Ability to address human needs through the use of ergonomics principles in product or workplace design
CO5 - Ability to identify, analyze and evaluate design problems by using suitable ergonomics methods.
CO6 - Ability to apply ergonomics knowledge in equipment and tools design.

PDT251 THERMO-FLUIDS [TERMO-BENDALIR]
No of Credits: 3

Course Synopsis:
This course will cover the basic knowledge, comprehension and application of law of thermodynamic to understand the relationship between the

properties that matter exhibits as it changes its condition. The first part includes review of thermodynamic concept, statistic thermodynamic and solution. The second part covers the phase equilibrium, thermodynamic of phase diagram, crystal defect, phase transformation unary and heterogeneous system, solution, phase equilibrium, surface and interface, defects in crystal, phase transformation and energy of interfaces.

Course Outcomes:

CO1 - Ability to apply basic concepts of mass, heat, work, energy and entropy in thermo-fluids mechanics and demonstrate the application of the basic principles of Thermodynamics on systems.

CO2 - Ability to employ the second law of thermodynamics on system and control volumes.

CO3 - Ability to evaluate the basic principles of fluid statics, conservation of linear momentum law into fluid flow problems and conservation of energy laws on control volumes.

PDT251 THERMO-FLUIDS [CECAIR-HABA]
No of Credits: 3

Course Synopsis:

This course will cover the basic knowledge, comprehension and application of law of thermodynamic to understand the relationship between the properties that matter exhibits as it changes its condition. The first part includes review of thermodynamic concept, statistic thermodynamic and solution. The second part covers the phase equilibrium, thermodynamic of phase diagram, crystal defect, phase transformation unary and heterogeneous system, solution, phase equilibrium, surface and interface, defects in crystal, phase transformation and energy of interfaces.

Course Outcomes:

CO1 - Ability to apply basic concept and process that relate to the material thermodynamics.

CO2 - Ability to employ a basic concept and process of thermodynamic for further understanding in phase transformation, solid state reaction and thermodynamic application to materials.

CO3 - Ability to relate and apply the knowledge on thermodynamics of interfaces, the thermodynamics of electrolysis and defect in crystals to the materials process.

PDT253 MATERIALS PROCESSING LAB [MAKMAL PEMPROSESAN BAHAN]
No of Credits: 3

Course Synopsis:

The purpose of this laboratory is to familiarize students with experimental set-up and use of metallurgical apparatus. In addition, the students will learn hands on experience in examination of different materials through metallographic examination, tensile property characterization, different hardness testing methods, and effect of different thermal processing on the mechanical properties and microstructure. Safety aspects and regulations on conducting scientific experiments are also briefed and taught.

Course Outcomes:

CO1 - Identify and categorize different types of materials processing.

CO2 - Determine and measure the parameters involve in each of the processing technique.

CO3 - Propose and contruct a suitable processing technique of the materials.

PDT255 PROCESS CONTROL [KAWALAN PROSES]
No of Credits: 3

Course Synopsis:

Basic concept for process control system, continuous and batch control. Implemention control algorithm for selected processes. Instrumentation selection for process control. Project management and implementation. Process control design and implementation.

Course Outcomes:

CO1 - Able to discuss the objective for control, process and able to distinguish the essential feature of process control.

CO2 - Able to elaborate dynamic process by constructing balance

equation; solve differentiation equation, and design the transfer function for open and closed-loop.
CO3 - Able to describe the stability of the system, apply and validate the control system in physical equipment.

PDT256 MATERIALS CHARACTERIZATION [PENCIRIAN BAHAN]
No of Credits: 3

Course Synopsis:
This course is designed to expose students the basic principles of materials characterization using LM, SEM, TEM as well as the principles of crystallography , metal texture, x- ray diffraction method and followed by spectroscopic technique and analytical.

Course Outcomes:
CO1 - Able to identify suitable characterization technique such as XRD , XRF, SEM, DTA, TGA and others to characterize ceramic, metal, polymer and composite materials.
CO2 - Able to apply a materials characterization concept and method.
CO3 - Able to determine a material via various characterization techniques (modern engineering tools) such as XRD, XRF, SEM, DTA, TGA and others.
CO4 - Able to analyze physical and chemical properties of materials throughvarious characterization technique such as XRD, XRF, SEM, DTA, TGAand others for selection materials purpose.

PDT261 WHITEWARE CERAMIC PROCESSING [PEMPROSESAN SERAMIK TEMBIKAR PUTIH]
No of Credits: 3

Course Synopsis:
Introduction to the traditional whiteware ceramics materials including types, properties and applications. Student will be exposed to the traditional ceramics processing including different shaping techniques, drying, firing and glazing

Course Outcomes:
CO1 - Able to discuss traditional ceramic raw materials including properties and production technique.
CO2 - Able to compare different types of shaping technique in traditional ceramic processing.
CO3 - Able to explain mechanism in drying stages.
CO4 - Able to develop firing and glazing process.

PDT262 METAL EXTRACTION TECHNOLOGY [TEKNOLOGI PENGEKSTRAKAN LOGAM]
No of Credits: 3

Course Synopsis:
This course will introduce student to mineral processing and general principle in extracting metal from ore: hydrometallurgy, elecrometallurgy and pyrometallurgy. This course will exposed student to the advantages mineral processing, crushing, grinding, sizing, classification, gravity concentration, magnetic and electrostatic separation and flotation. Hydrometallurgy: Leaching: process and mode of leaching. Leaching technique: in-situ leaching, dump leaching, heap leaching, vat leaching, bacterial leaching, electrochemical leaching, Counter current leaching system. Electrometallurgy: Electrorecovery and electropurification: principles, electrochemical, electrod potential, overpotential, limited potential, electrochemical/elecrolysis cell. Pyrometallurgy: Ore treatment by roasting, calcination, and sintering. Melting and smelting, matte smelting. Reduction of iron ore from blast furnace. Direct smelting/melting.

Course Outcomes:
CO1 - Ability to discuss and practice the principle and process involved in mineral processing.
CO2 - Ability to discuss and differentiate the theory in hydrometallurgy, electrometallurgy and pyrometallurgy.
CO3 - Ability to DEMONSTRATE and PRACTICE mineral or metal extraction process from its ore using hydrometallurgy, electrometallurgy and pyrometallurgy.
CO4 - Able to explain extraction process of some metals that have been established worldwide.

PDT263 PLASTIC PROCESSING [PEMPROSESAN PLASTIK]
No of Credits: 4

Course Synopsis:
This course will provide students with a broad knowledge on the aspect of thermoplastic and thermoset processing methods, parameters, and also knowledge on the thermoplastic and thermoset compounding and additives. This course also will expose student to environmental of plastic product.

Course Outcomes:
CO1 - Able to discuss the concept of plastics materials and ILLUSTRATE the physical basis of plastics processing.
CO2 - Able to prepare plastics produt and COMPARE different techniques parameter for thermoplastic and thermoset processing.
CO3 - Able to propose the finishing and assembly of plastic processing end products.
CO4 - Able to practice the environmental aspect of plastic product.

PDT264 ELECTRONIC MATERIALS [ELEKTRONIKBAHAN]
No of Credits: 3

Course Synopsis:
Materials and the interfaces between them are the key elements in determining the functioning of electronic devices and systems. This course develops the fundamental parameters of the basic solid material types and their relationships to electrical, thermal, mechanical, and optical properties. The application of these materials to the design and fabrication of electronic components is described, including integrated circuits, passive components, and electronic boards, modules, and systems.

Course Outcomes:
CO1 - Able to-identify fundamental knowledge of material properties importan t to electronic systems including electrical conductivity, coefficient of thermal expansion, thermal conductivity, and strength.
CO2 - Ability to identify material related problems in semiconductor and other electronic devices.
CO3 - Ability to elaborate ideal semiconductor devices.
CO4 - Able to identify and state reasons for the selection of the common electronic materials used in integrated circuits, printed wiring board assemblies, etc.

PDT277 TERMODINAMIK GUNAAN [APPLIED THERMODYNAMICS]
No of Credits: 3

Course Synopsis:
Thermodynamics is the study of heat related to matter in motion. The First Law of Thermodynamics involves the conversion of energy from one form to another while the Second Law determines the direction of heat flow, and the availability of energy to do work. This course, covers the terminology, principles, theory, and practical application of the First and Second Law of engineering thermodynamics.

Course Outcomes:
CO1 - Ability to discuss basic concept of thermodynamic and energy transformation in the system
CO2 - Ability to apply the concepts of thermodynamics systems such as processes, cycles and working fluid in engineering field
CO3 - Ability to solve thermodynamics system performance problem analytically.
CO4 - Ability to analyze thermodynamics system such as steam power cycles and refrigeration cycles.

PDT278 KEJURUTERAAN GEODETIK [GEODETICS ENGINEERING]
No of Credits: 3

Course Synopsis:
This course emphasizes on knowledge and skills using surveying equipments such as leveling, theodolite and GPS. Topics discussed include are traversing, tacheometry, mapping, setting out, triangulation, geometric design, vertical and horizontal alignment, and volume of earthwork

Course Outcomes:
CO1 - Ability to apply concepts and principles of geodetic surveying
CO2 - Ability to perform surveying tasks and procedures.
CO3 - Ability to analyze data from various types of geodetics surveying.

PDT279 PRINSIP AGRONOMI [PRINCIPLES OF AGRONOMY]
No of Credits: 4

Course Synopsis:
A foundation course in agronomy applying crop, soil, and environmental sciences in understanding agricultural systems. Topics include crop morphology and classification, soils and soil water management, mineral nutrition of crops, pest management, plant breeding, seed and grain quality and sustainable aspects of crop production.

Course Outcomes:
CO1 - Ability to relate the science and principles of agricultural crop production systems and the importance of crops to our society
CO2 - Ability to apply crop production principles to crop production practices.
CO3 - Ability to demonstrate sustainable practices for agricultural crops

PDT280 ASAS PERAKAUNAN AGRI-PERNIAGAAN DAN KEWANGAN [FUNDAMENTALS OF AGRIBUSINESS ACCOUNTING AND FINANCE]
No of Credits: 2

Course Synopsis:
This course covers fundamentals of the double-entry accounting cycle as it relates to partnerships and sole proprietorships operating in the agricultural sector including the use of automated accounting software the application of an agribusiness firm.

Course Outcomes:
CO1 - Ability to apply transactions into debit and credit parts
CO2 - . Ability to apply accounts as assets, liabilities, or owner's equity
CO3 - Ability to prepare and analyze a balance sheet, an income statement, and statement of owner's equity

PDT281 INSTRUMENTASI DAN KAWALAN [INSTRUMENTATIONS AND CONTROL]
No of Credits: 3

Course Synopsis:
The course covers the general concept of instrumentation, various measuring devices, manipulation, transmission, and recording of data, measurement standards, data analysis, calibration methods and software simulation to design and solve problems in measurement and automation systems.

Course Outcomes:
CO1 - Ability to differentiate main components in instrumentation, measurement, their integration and working principle of various measurement devices.
CO2 - Ability to differentiate roles and features of appropriate instruments for various agricultural technology and applications
CO3 - Ability to solve connectivity and interfacing of different instrumentation.

PDT282 APPLIED FLUID MECHANICS [MEKANIK BENDALIR GUNAAN]
No of Credits: 3

Course Synopsis:
This course emphasizes fundamental concepts and problem-solving techniques in fluid properties, static and kinematics, control volume analysis, momentum analysis of flow system, dimensional analysis, internal flows (pipe flows), differential analysis, and external flows (lift and drag).

Course Outcomes:
CO1 - Ability to analyze the essential parameters describing a fluid system and common devices used in measuring pressure and

flow rates and turbo machineries.
CO2 - Ability to analyze pressures, forces, and energy in fluid systems.
CO3 - Ability to calculate pressure, forces and flow rates in dynamic fluid system.

PDT283 PENGURUSAN AGRI-PERNIAGAAN [AGRIBUSINESS MANAGEMENT]
No of Credits: 2

Course Synopsis:
As farming becomes more complex and global, and that the economic pressure on farming increases, future farm managers need to be equipped with knowledge in management and business strategies. This course covers strategy, marketing, financial, operations quality, risks, human resources, and organizational management

Course Outcomes:
CO1 - Ability to apply various management functions to agribusiness entity
CO2 - Ability to analyze business process improvement using quality tools.
CO3 - Ability to analyze time-value of money

PDT284 AGRO-EKOSISTEM DAN KELESTARIAN [AGRO-ECOSYSTEMS AND SUSTAINABILITY]
No of Credits: 2

Course Synopsis:
This course discusses important components of sustainability for agrosystems which can be optimized through suitable application of engineering principles to reinforce the conventional wisdom of agrosystems production. Important engineering approaches invoking current practices and design are covered

Course Outcomes:
CO1 - Ability to distinguish agrosystems practices and sustainability indicators which include soil, water, biomass and waste
CO2 - Ability to apply and formulate mathematical model for sustainable agrosystems.
CO3 - Ability to design components and processes of sustainable agrosystems

PDT309 MANUFACTURING ECONOMICS [EKONOMI DALAM PEMBUATAN]
No of Credits: 3

Course Synopsis:
This course addresses a systematic evaluation of proposed solution to engineering problems. It evaluates the monetory consequences of products, projects and processes that engineers design. The course introduces students to fundamental economics consideration and costs involve in decision making for a production or a project which will be economically acceptable and demonstrate a positive balance of long term benefits over long term costs. The students learn about fundamental cost concepts and costs involve in a production process. Then, money-time relationship (also called time value of money) and concept of equivalence expose students to the value of investment by estimating future costs or revenues. The application of money-time relationship in comparing different alternatives help to choose best solution before investing.

Course Outcomes:
CO1 - Ability to explain the general concept of engineering economy as well as able to analyze financial statement ratios.
CO2 - Ability to analyze the concept of cost accounting methods for the purpose of decision making.
CO3 - Ability to decide suitable solution for discrete cash flow problems and evaluate the time value of money concept.
CO4 - Ability to conduct the capital budgeting process for particular project and evaluate breakeven and sensitivity analysis.

PDT310 QUALITY SYSTEM [SISTEM KUALITI]
No of Credits: 3

Course Synopsis:
This course covers quality improvement techniques and analyses for process and product quality; namely statistical process control, capability studies; acceptance sampling concepts; and reliability models for prediction and testing. The course also differentiates the essential philosophy of total quality management in workplace.

Course Outcomes:
CO1 - Apply the principles of quality systems and analyses for i mprovement of process and product qualities.
CO2 - Analyze and evaluate quality improvement techniques (quality tools) such as Statistical Process Control (SPC), control charts, Design of Experiment (DOE) and etc. which are typically used in manufacturing/ production operation.
CO3 - Organize the essential philosophy of total quality management in workplace.

PDT310 KAWALAN KUALITI [QUALITY CONTROL]
No of Credits: 3

Course Synopsis:
This course is offered to introduce quality assurance which refers to all systematic and planned activities in quality systems that are proved to be sufficient enough to build up proper confidence in meeting quality requirements whether for products or services which meet or exceed customer expectations. In this course student will learn the quality management as the key for quality assurance achievement. This course comprise of the quality management's philosophy and concepts and application of quality tools and techniques in order to achieve quality assurance. By understanding the entire contents of this course, students will be able to interpret the standard for quality assurance and quality management systems, and able to develop, formulate, and organize their works or organization effectively.

Course Outcomes:
CO1 - Apply the principles of quality systems and analyses for improvement of process and product qualities
CO2 - Analyze and evaluate quality improvement techniques (quality tools) such as Statistical Process Control (SPC), control charts, Design of Experiment (DOE) and etc. which are typically used in manufacturing/ production operation.
CO3 - Organize the essential philosophy of total quality management in workplace.

PDT312 COMPUTER AIDED MANUFACTURING [PEMBUATAN BERBANTU KOMPUTER]
No of Credits: 3

Course Synopsis:
This course enhances the students with skills of using Computer Aided Manufacturing (CAM) software for generating NC part programming in machining processes. It also enables students to understand the theory, concept, and application of CAM in machining that applied in industries. It covers five sections in CAM application which are 2-Axis Machining in Milling operation, 3-Axis Machining in Milling operation, 4 or 5-Axis Machining in Milling operation, CAM on Turning operation and CAM on Turn and Mill operation.

Course Outcomes:
CO1 - Ability to apply and construct the NC part programming for 2-Axis machining of milling process using CAM software.
CO2 - Ability to apply and construct the NC part programming for 3-Axis machining of milling process using CAM software.
CO3 - Ability to apply and construct the NC part programming for 4 and 5-Axis machining of milling process using CAM software.
CO4 - Ability to apply and construct the NC part programming for turning operation & turn and mill operation using CAM software.

PDT313 FINAL YEAR PROJECT I [PROJEK TAHUN AKHIR I]
No of Credits: 4

Course Synopsis:
This course consists of lecture and independent study on the technique of conducting literature review, identification of problem statements, project objectives and research methodology. The students are guided on the proper techniques and format of thesis writing, submit the project proposal and present the final year project to the internal examiners

Course Outcomes:
CO1 - Ability to synthesize information including journals, field data, standards and others that relevant to the specific research to be undertaken in order to solve technical or management problem.
CO2 - Ability to analyse scenario and compose the problem statements and the research objectives of the project.
CO3 - Ability to formulate research methodology incorporating clear fundamentals, theories and benchmarked against standard practices governing the research project.
CO4 - Ability to write, present and defend the technical report (dissertation) for the project undertaken.

PDT314 MACHINING PROJECT [PROJEK PEMESINAN]
No of Credits: 4

Course Synopsis:
Machining project is a multi-disciplinary integrated subject in which small groups of three or four students work together to complete a major project. Each project will require students to solve problems related to the machining practices in term of design, process, or industry. The project can be titled either based on product design, product fabrication, experimental analysis, case study or investigation of problems in industry.

Course Outcomes:
CO1 - Ability to adapt the knowledge and comprehension of concept, methodologies & planning in machining field.
CO2 - Ability to fabricate by using techniques, skills and modern engineering tools to solve and evaluate the machining practices.
CO3 - Ability to organise in group and communicates effectively using the project management principles.

PDT316 SUSTAINABLE MACHINING [PEMESINAN MAPAN]
No of Credits: 3

Course Synopsis:
This course covers the recent techniques and requirements in green and sustainable machining practices. It includes about the definition of green manufacturing, machining with minimum metalworking fluid, dry machining, gas-cooled machining, recent literature studies on sustainable machining, offline and online optimization of machining processes, economics of environmentally friendly machining, and epilogue: looking at the future.

Course Outcomes:
CO1 - Able to elaborate the concept of green manufacturing and sustainability in machining practices and relates with the economical and future issues in sustainable machining.
CO2 - Able to evaluate the principles and sustainability of using minimum cutting fluid, dry machining and gas-cooled in various machining operations.
CO3 - Able to evaluate the practices of optimization in machining operations and the advanced material used in machining operations.

PDT317 INJECTION MOULD DESIGN [REKABENTUK ACUAN SUNTIKAN]
No of Credits: 3

Course Synopsis:
This course introduces students to basic knowledge of plastic injection mould. This module focuses on the actual step in designing mould starts with procedure in designing plastic products, procedure in designing plastic injection mould, analyses of material flow in plastic injection mould and continuing producing the assembly drawing of plastic injection mould to produce a plastic product.

Course Outcomes:

CO1 - Ability to discuss basic terminology process in plastic injection molding and mould design.
CO2 - Ability to design the plastic parts for injection moulding process.
CO3 - Ability to evaluate the plastic flow into injection mould by using commercial software.
CO4 - Ability to design the mould for plastic injection moulding by using 3D CAD software.

PDT318 ADVANCED MACHINING TECHNOLOGY [TEKNOLOGI P EMESINAN TERMAJU]
No of Credits: 4

Course Synopsis:

This course is the introduction for EDM technology (Electrical Discharge Machining) which is used in industries nowadays. It includes topics about introduction to EDM technology, wire-cut and Ram (die-sinker) machining. Students are involved with system and process for both type of machining. Besides that, students are also exposed to other types of EDM process.

Course Outcomes:

CO1 - Ability to evaluate the concept and methodology of Electrical and Wire Electrical Discharge Machining (EDM and WEDM) processes.
CO2 - Ability to evaluate the concept and methodology of Chemical and Electrochemical Machining (CHM dan ECM) processes.
CO3 - Ability to evaluate the concept and methodology of Ultrasonic and Water Jet Machining (USM and WJM) processes.
CO4 - Ability to evaluate the concept and methodology of Laser Beam and Electron Beam Machining (LBM and EBM) processes.
CO5 - Ability to apply the basic concept and methodology MEMS, NEMS and coating technology.

PDT319 MAINTENANCE MANAGEMENT [PENGURUSAN PENYE-LENGGARAAN]
No of Credits: 3

Course Synopsis:

The objective of this course is to expose the knowledge and the understanding in the area of maintenance management & engineering. The examples of real industrial cases will be used in teaching and learning processes, so that exposed the students to practical perspective. This course is designed to equip students with comprehensive understanding on the rule and function of maintenance management & engineering in real industries application. The course will expose students regarding the evolution of traditional to modern maintenance methods/techniques towards managing and solving the maintenance problems.

Course Outcomes:

CO1 - Ability to analyse the different rules and functions of maintenance systems/ approaches/ techniques in the context of management & engineering for industrial applications.
CO2 - Ability to propose suitable solutions structure of maintenance problem based on management perspective.
CO3 - Ability to manage the maintenance decision based on analytical models towards engineering perspective.

PDT330 STUDIO REKABENTUK II [DESIGN STUDIO II]
No of Credits: 3

Course Synopsis:

The student will expose and gain knowledge on the subject of design affordance and semantic throughout the course. Study and analysis about user interaction in relation to the design concept is the most important subject to appreciate by the student. Furthermore, sustainable design and manufacturing is the second topic to be discussed in this course. The course will enhance student designing skill by focusing the engineering study on materials and manufacturing aspects which implements into design projects. The design should be electrical or electronic products which involve the use of instrumentation and control. Student will develop an

understanding of Failure Mode and Effects Analysis (FMEA), a risk assessment technique for systematically identifying potential failures in a system or a process throughout the product life cycle

Course Outcomes:
CO1 - EXPLAIN the concept of design method and ability to APPLY the method in design activities.
CO2 - Ability to ANALYZE the product design language and DIFFERENTIATES the product DNA.
CO3 - Ability to DESIGN and CONSTRUCT 2 Dimensional and 3 Dimensional Product using various methods and techniques.

PDT341 DIALOG PERINDUSTRIAN [INDUSTRIAL DIALOGUE]
No of Credits: 3

Course Synopsis:
Once an Industrial Designer has completed the conceptual design stage of a project the details required for manufacture need to be resolved and prototypes made. It is at this stage that Computer Aided Design (CAD) is used. 3D CAD allows the details of the design to be resolved. Rapid prototypes can be made directly from the CAD data for design testing and verification. Modifications to the CAD data can be made quickly. Once the design is satisfactory, the 3D CAD models can then be used to generate photo-realistic images and engineering drawings so that the new product can be manufactured.

Course Outcomes:
CO1 - Ability to EVALUATE suitable prototyping techniques and technologies in prototype construction process
CO2 - Ability to CONSTRUCTS physical prototype based on technical specifications and requirements
CO3 - Ability to ORGANIZE the project based on timeline,rules and regulations with understanding of professional ethics.
CO4 - RECOGNIZE and REALIZE the importance of virtual engineering technologies and how they can be applied to Product Data Management.

PDT344 PENGURUSAN INOVASI DAN PEMBANGUNAN PRODUCT [INNOVATION MANAGEMENT AND PRODUCT DEVELOPMENT]
No of Credits: 3

Course Synopsis:
In this course addresses to the integration problems in innovative product design, comprehensive management development and industrial finance structure. Students will learn the appropriate engineering approaches and methods to analyze with engineering science principle. This course focuses on manipulation of 3D CAID based software to construct the product conceptual solutions.

Course Outcomes:
CO1 - Ability to UNDERSTAND, DESCRIBE and DIFFERENTIATE the basic concepts and principles of innovation management and product development
CO2 - Ability to COMPARE and EVALUATE the fundamental principles of technology and product cycle used in innovation.
CO3 - Ability to ARRANGE and WRITE the followings in terms of aesthetic intentions in product invention

PDT345 GELAGAT PENGGUNA [CONSUMER BEHAVIOUR]
No of Credits: 3

Course Synopsis:
This course addresses major concepts, research and applications based on natural science study of human behaviour, perception and price tag study and also a personality theory.The course also exposes students to understand about the application of advertisement, consciousness and memory, consumer involvement and decision making, behavioural methods and consumer analysis based on product satisfaction.

Course Outcomes:
CO1 - EXPLAIN the basic concept of human behaviour and consumer behaviour and ANALYZE the related behaviour
CO2 - Ability to EVALUATE the consumer behavior interpretation processes as directed towards product benefits.

CO3 - Ability to ARRANGE consistency as input to attitude and satisfaction base on price and psychological strategies.

PDT346 PENGURUSAN PRODUK UNTUK PEREKABENTUK [PRODUCT MANAGEMENT FOR DESIGNERS]
No of Credits: 3

Course Synopsis:
This course addresses the Product management is an organizational life-cycle function dealing with the planning, forecasting, and production, or marketing of a product or products at all stages of the product lifecycle. Similarly, Product Lifecycle Management (PLM) integrates people, data, processes and business systems. It provides product information for companies and their extended supply chain enterprise. Product management also involves elimination decisions. Product management often serves an inter-disciplinary role, bridging gaps within the company between teams of different expertise, most notably between engineering-oriented teams and commercially oriented teams.

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Course Outcomes:
CO1 - Ability to Discuss and Analyze the relation between management and stakeholders in Product Lifecycle Management area.
CO2 - Ability to Discuss and Analyze user experience concept and market strategy in product management.
CO3 - Apply and Analyze product roadmap concept – strategy and Business Model with Financial

PDT347 KAJIAN PRODUK DAN AMALAN PROFESIONAL [PRODUCT STUDY AND PROFESSIONAL PRACTICE]
No of Credits: 3

Course Synopsis:
Students will learn this course through some case studies where the product and its system development are analyzed in the aspect of design, function and usability based on design guidelines. Students also will be exposed to professional approaches practiced in industry and consulting including project organization and management. Student will learn the professional and ethical responsibilities, corporate identity, branding, and design portfolio concept.

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Course Outcomes:
CO1 - To DEMONSTRATE the corporate identity in the product design.
CO2 - Ability to ANALYZE in the aspect of design, usability and function.
CO3 - Ability to EVALUATE the product based on design guidelines.

PDT348 FINITE ELEMENT ANALYSIS [ANALISIS UNSUR TERHINGGA]
No of Credits: 3

Course Synopsis:
This course gives students an exposure to the theoretical basis of the finite element method and its implementation principles, and to introduce the use of available finite element applications for solving real-life engineering problems.

Course Outcomes:
CO1 - Formulate the basic equations of finite element method for simple one- and two-dimensional element
CO2 - Apply the finite element method to model and analyse simple real engineering problems, by hand calculation, and then interpret the results
CO3 - Apply the use of available finite element software to solve real-life engineering problems, especially those of the structural mechanics type, and correctly evaluate the results

PDT348 ANALISIS ELEMEN TERHINGGA [FINITE ELEMENT ANALYSIS]
No of Credits: 3

Course Synopsis:
This course gives students an exposure to the theoretical basis of the finite element method and its implementation principles, and to introduce the use of available finite element applications for solving real-life engineering problems.

Course Outcomes:

CO1 - FORMULATE the basic equations of finite element method for simple one- and two-dimensional element
CO2 - APPLY the finite element method to model and ANALYSE simple real engineering problems, by hand calculation, and then INTERPRET the results
CO3 - APPLY the use of available finite element software to solve real-life engineering problems, especially those of the structural mechanics type, and correctly EVALUATE the results

PDT351 MATERIALS FAILURE ANALYSIS [ANALISIS KEGAGALAN BAHAN]
No of Credits: 3

Course Synopsis:

A comprehensive overview of the field, this course covers three principal areas of interest such as procedures for failure analysis, root-caused of failure, failure mechanisms andrecommendation to prevent future failure. The forensic analysis of product/component failures is also studied from beginning to end for certain case studies that normally happen in industries. The module also provides hands-on experience on material failure analysis during laboratory work and on site visit. Student also exposed with technical report writing technique through mini project.

Course Outcomes:

CO1 - Ability to explain general procedures, techniques and precautions of in failure analysis.
CO2 - Ability to analyse the data collection by failed product/component.
CO3 - Ability to relate the types of material failure analysis in terms of profitability and liability.
CO4 - Ability to recommend corrective and preventive actions based on failure analysis findings.

PDT352 DESIGN OF DIE & MOULDS [REKA BENTUK DIE & ACUAN]
No of Credits: 2

Course Synopsis:

This course is designed to provide students with a broad knowledge about the mold, process and products made from injection molding. In this course, students are guided in designing plastic products, analyse the mold component, process flow, and defects using the CAD and injection moulding analysis software.

Course Outcomes:

CO1 - Able to identify the design requirement for plastics injection moulding products and mould.
CO2 - Able to design plastic injection moulding products.
CO3 - Able to analyse and simulate the injection molding process.

PDT353 POLYMER ADHESIVE AND COATINGS [PELEKAT DAN SALUTAN POLIMER]
No of Credits: 4

Course Synopsis:

This course provides an introduction to basic concepts, types of adhesives, typical formulation, coating properties, and application of polymer adhesive and coatings in the polymer technology. The course covers basics principles, methods, properties and resin, surface preparation, and coating system in the polymeric material. The course gives knowledge on the formulation, resin, and applications of adhesive and coatings in the polymer industry such as advanced paint technology and automotive industries.

Course Outcomes:

CO1 - Able to compare the basic knowledge of adhesive and coatings.
CO2 - Able to analyze the adhesives and coating process for certain applications.
CO3 - Able to estimate the formulation and compounding on the surface coating and analyze classification of coatings in the industry.
CO4 - Able to apply and create the adhesives and coating in various fields.

PDT354 GLASS TECHNOLOGY [TEKNOLOGI KACA]
No of Credits: 4

Course Synopsis:
This course is introduced to enhance the knowledge on ceramic materials. It consists the principles of glass formation, understanding on phase diagram and structure of glass. it will aslo include the understanding of glass properties and its performance on the final applications.

Course Outcomes:
CO1 - Able to explain the principles of glass formation.
CO2 - Able to explain an understanding on phase diagram and structure of glass.
CO3 - Able to evaluate and justify the properties of glass.
CO4 - Able to propose the characterization method for the glass properties and performance.

PDT355 ADVANCED METALLURGY [METALURGI TERMAJU]
No of Credits: 4

Course Synopsis:
This course is to get student familiarize on three classical metal alloy classes (i.e. iron and steel, aluminium, copper and their alloys) and deepen their understanding on general characteristic of metals and alloys. Then, enlarge the field of knowledge of students in other technological important classes of Ni-based, Ti-based and Mg-based alloys along with precious metal metallurgy and intermetallic and their modern developments. Characteristics and formation mechanisms of metals and alloys produced during fabrication processes such as cast/solidification, plastic deformation and heat treatments are comprehensively introduced.

Course Outcomes:
CO1 - Able to understand the fundamental of thermodynamics for metallurgy.
CO2 - Able to develop an understanding on phase diagram, microstructures and phase transformation of metal (ferrous and non-ferrous) and its alloy.
CO3 - Able to relate an understanding between physical, chemical and mechanical properties of metallic materials with heat treatment and steel making.

PDT362 METAL FABRICATIONTECHNOLOGY [TEKNOLOGI FABRIKASI LOGAM]
No of Credits: 3

Course Synopsis:
Metal fabrication technology program focused towards sheet metal, plates and structure fabrication in the engineering and construction field. Metal fabrication technology will exposed student to the heavy metal plating used in building structure and wall panels, oil and gas, power station, pipeline building in the transportation of liquid and gas, large storage boilers and vessels, platform for oil and rigs and heavy industrial plant. Student will be provided with strengthening of theoretical knowledge with high degree of design and practical work usage of modern CNC metal fabrication machinery, equipment and state-of-the-art CAD/CAM solutions. The main objective of the course is to prepare students to the needs and demands of the current and future industry with regards to fabrication, welding, inspection and testing.

Course Outcomes:
CO1 - Ability to identify and follow the concepts, tool and techniques in linear and angular measurement
CO2 - Ability to explain and display the basic process, tools and defects of fitting and metal forming.
CO3 - Ability to elaborate and display on the joining process; its types, process, mechanism and its application.
CO4 - Ability to evaluate and measure on different types of cutting process.

PDT364 COMPOSITE MATERIALS PROCESSING [PEMPROSESAN BAHAN KOMPOSIT]
No of Credits: 3

Course Synopsis:
This course is focusing on three major types of composite materials which are Ceramic Matrix Composite (CMC), Polymer Matrix Composite (PMC), and Metal Matrix Composite (MMC). Lectures cover on several important aspects of composite materials. This includes the introductions, classifications, properties, applications and characterizations of composite materials, matrix and reinforcement phase, manufacturing and processing methods, types and influence of different reinforcement, inter-phase properties, current and future potential applications of composite products. At the end of this course, students will have a comprehensive knowledge and well understanding regarding composite materials processing.

Course Outcomes:
CO1 - Able to classify, evaluate and compare on properties and characteristics of each type of the composites.
CO2 - Able to distinguish different phases in composite system.
CO3 - Able to describe the failure behaviour and strengthening mechanism of composite materials.
CO4 - Able to analyse problems and explain a suitable fabrication technique of composite materials to develop better composite system.

PDT376 JENTERA DAN KUASA LADANG [FARM POWER AND MACHINERY]
No of Credits: 3

Course Synopsis:
The course covers the basic of machines and the importance of mechanization for various farm operations, selection of appropriate machines and its maintenance and the management of farm machineries.

Course Outcomes:
CO1 - Ability to apply the basic principles, construction and working of farm machinery for different crops and livestocks
CO2 - Ability to select and assemble appropriate machinery, use, repair and maintenance
CO3 - Ability to manage agro machinery service centre

PDT377 PEMINDAHAN HABA DAN JISIM GUNAAN [APPLIED HEAT AND MASS TRANSFER]
No of Credits: 3

Course Synopsis:
The course covers the application of various energy resources to generate power useful for processing biological materials and focuses on the technology, production process and engineering of renewable sources of energy which includes solar, wind, wave, and energy from biomass

Course Outcomes:
CO1 - Ability to discuss mechanisms and characteristics of heat and mass transfer
CO2 - Ability to apply mathematical models of various heat transfer mechanisms
CO3 - Ability to analyze different types of heat exchangers, heat transfer coefficient for heat exchanger and energy analysis on heat exchanger
CO4 - Ability to analyze and calculate physical mechanism of mass transfer, the rate of massdiffusion, and simultaneous heat and mass transfer

PDT378 TEKNOLOGI PERTANIAN TEPAT [PRECISION AGRICULTURE TECHNOLOGY]
No of Credits: 3

Course Synopsis:
This course covers the essential aspects of Precision Agriculture (PA) concepts including soil/landscape and crop spatial variability, GIS, DEM, GPS, sensors, variable rate machinery, PA software, remote sensing; geostatistics, sampling, experimental designs, precision integrated crop management, data acquisition, processing, and management and socio-economical and e-marketing aspects.

Course Outcomes:
CO1 - Ability to illustrate the concept, component and application of precision farming in agriculture
CO2 - Ability to apply spatial information and precision agriculture technologies to improve soil and crop management, environmental and socio-economical aspects.
CO3 - Ability to analyze geo-referenced data using spatial information technologies

PDT379 PENGURUSAN SUMBER AIR [WATER RESOURCES MANAGEMENT]
No of Credits: 3

Course Synopsis:
This course introduces principles of surface and ground water hydrology and their applications in water resources engineering, descriptive and quantitative applications of the hydrologic cycle, weather system, precipitation, evaporation, transpiration, surface and subsurface waters, stream flow hydrographs and flood routing. The course also covers water resources management principles, regulatory issues, management of water resources for sustainable development, tools for water resources management; economic analysis, water supply, water demand, climate change and water resources management, extremes (floods and droughts), water management in the Malaysia practices and use of computer-based tools in solving water resources management problems

Course Outcomes:
CO1 - Ability to analyze principle of water resources, planning and management.
CO2 - Ability to infer the components of hydrologic cycle and the affect to human daily lives.
CO3 - Ability to analyze hydrologic data for engineering design and management.

PDT380 SISTEM AUTOMASI DALAM PERTANIAN [AUTOMATIONS IN AGRICULTURAL SYSTEMS]
No of Credits: 3

Course Synopsis:
This course covers advanced study on instrumentation with emphasis on selection of measurement techniques and transducers to sense physical properties of biological materials with application to agricultural, food processing industries and biological system. Application of biosensors in agriculture, design of automation system and machine/gentry for agricultural systems

Course Outcomes:
CO1 - Ability to identify and apply the concepts of automated machines and equipment and to agricultural related problems
CO2 - Ability to operate with existing biosensor systems and transducers, as well as to design new sensors
CO3 - Ability to identify and assemble industrial sensors in farming system

PDT383 TENAGA DIPERBAHARUI [RENEWABLE ENERGY]
No of Credits: 3

Course Synopsis:
The course covers the application of various energy resources to generate power useful for processing biological materials and focuses on the technology, production process and engineering of renewable sources of energy which includes solar, wind, wave, and energy from biomass

Course Outcomes:
CO1 - Ability to explain technologies used in generating mechanical and electrical power for biosystems
CO2 - Ability to demonstrate the concepts of renewable energy conversion suitable for production and processing of biological material
CO3 - Ability to evaluate the efficiency and performance of different renewable energy generating systems

PDT384 TEKNOLOGI MAKANAN [FOOD TECHNOLOGY]
No of Credits: 3

Course Synopsis:
This course covers multidisciplinary field of food technology and related industries. Topics covered include food science, food ingredients, nutrition, nutritional information, food spoilage, food production systems, preservation processes, freezing, drying, direct-heating, radiation, extrusion and packaging, freezing, texturization, mechanical separation and food biotechnology

Course Outcomes:
CO1 - Ability to differentiate the principles of food technology
CO2 - Ability to interpret ingredients and nutrition in food
CO3 - Ability to solve problems involved in food production

PDT385 KEJURUTERAAN BIO-BAHAN [BIOMATERIAL ENGINEERING]
No of Credits: 3

Course Synopsis:
This course covers structure and properties of biomaterial and related solids, physical and chemical bases for properties exhibited by materials, polymeric biomaterials, metallic biomaterials, ceramic biomaterials and composite materials. Material properties including mechanical, electrical, magnetic and thermal behaviour, applications of biomaterials in agricultural systems, relationship between physical and chemical structure of materials and biological system response, selection, fabrication and modification of materials for specific applications, biomaterials processing and degradation, implant requirements, host-implants reactions including wound healing response and inflammatory response, physiological and biomechanical basis for soft-tissue implants, design of modified biomaterials, bulk and surface characterization of materials and regulatory and ethical concerns dealing with the implementation and commercialisation of biomaterials

Course Outcomes:
CO1 - Ability to analyze the biomaterial physical, chemical and biological properties
CO2 - Ability to design the processing system for a biomaterial
CO3 - Ability to recommend the commercialization potential of biomaterial

PDT386 SISTEM AGRO-BERSEPADU [INTEGRATED AGROSYSTEMS]
No of Credits: 3

Course Synopsis:
An advanced course integrating principles of crop production, animal husbandry, aquaculture, soils and environmental sciences in agricultural systems. Topics include concept and principles of biologically integrated farms, components, interactions, techniques and energy flows of integrated farms.

Course Outcomes:
CO1 - Ability to compare and contrast between integrated farming and conventional farming.
CO2 - Ability to categorize the components, interactions and energy flows in an integrated farming system.
CO3 - Ability to demonstrate sustainable practices of integrated farming systems

PDT413 FINAL YEAR PROJECT II [PROJEK TAHUN AKHIR II]
No of Credits: 6

Course Synopsis:
This course consists of lectures and independent study on the techniques of conducting laboratory and/or field experiments. The students are guided on the techniques and implementation of research and monitored based on the research plan, data analysis, interpretation and conclusion. The students are required to write, submit and defend their thesis to the internal examiners.

Course Outcomes:

CO1 - Ability to conduct research experiments, evaluate data and deduce good conclusion.
CO2 - Ability to use techniques and modern tools to solve research problems.
CO3 - Ability to plan activities pertaining to research project and execute the plan to meet the required research objectives and datelines.
CO4 - Ability to write research report that conforms to standard thesis format and defends the thesis in verbal presentation.

PDT417 MODERN GRINDING TECHNOLOGY [TEKNOLOGI PENGISARAN MODEN]
No of Credits: 3

Course Synopsis:

In this course, students will be exposed to the basic concepts of modern grinding technology and its role in manufacturing. This is followed by explantion on related theories such as the grinding system elements, material removal and grinding wheel specifications (which includes grinding wheel contacts, dressing, tools and wear) and grinding process control. The trends and technologies in centerless grinding and high speed grinding will be discussed as well. At the end of the course, students will be exposed to problem solving on grinding process.

Course Outcomes:

CO1 - Ability to discuss and evaluate the concept of grinding process and the material removal.
CO2 - Ability to discuss the specification of grinding wheel, concept of dressing, and analyze the wheel contact and wear effects.
CO3 - Ability to discuss the concept of centreless, high speed grinding and grinding process control.
CO4 - Ability to evaluate the vibration problem-solving in grinding operation.

PDT418 CUTTING TOOL TECHNOLOGY [TEKNOLOGI PEMOTONGAN MATALAT]
No of Credits: 3

Course Synopsis:

This course covers the fundamental and recent technologies related to cutting tools for machining processes. It includes topics such as trends and development of cutting tool materials, heat, forces and stresses on cutting tools, single-point turning tools and chip breaking techniques, multi-point tools. In addition to that, this course reviews the fundamental issues on tool wear and tool life, tool condition monitoring and special topics on machining advanced materials.

Course Outcomes:

CO1 - Able to differentiate cutting tools types and materials for different application of metal, polymer, and composite material.
CO2 - Able to evaluate the technologies of cutting tool for different method of machining processes.
CO3 - Able to analyze the cutting tool monitoring system for wear and life.
CO4 - Able to categorize the types of cutting tools for composites machining.

PDT442 BUDAYA PENGKOMERSILANA [COMMERCIALIZATION CULTURE]
No of Credits: 3

Course Synopsis:

This course aims at developing student capability, professionalism and working culture in planning, preparation and managing of product design promotion and exhibition event. The student will be exposed by visiting local trade exhibitions and practices negotiation techniques. The students have to complete the product package with their own branding and corporate identity included promotion of their Final Year project. At the end of the course the student will prepare and launch an exhibition event which manages by them.

Course Outcomes:

CO1 - Ability to perform and work in a group, communicate effectively and able to work independently.
CO2 - Ability to analyze the concept of the commercialization relations to its culture.
CO3 - Ability to analyze the product lifecycle and it relationship with commercialization aspects.

PDT443 REKA BENTUK UNTUK PEMBUATAN DAN PEMASANGAN [DESIGN FOR MANUFACTURING AND ASSEMBLY]
No of Credits: 3

Course Synopsis:

This course introduces method that is used to determine the suitable manufacturing process according to design and development of a product. It also introduces the assembly methodology that helps producing correctly and efficiently in term of costing and manufacturing process requirement. It applies for manual assembly and automatic assembly processes. Design guidelines and rules in DFMA will be used to develop suitable component design according to the manufacturing process required. Student will have a group project to analyze existing product then propose better design in manufacturing and assembly aspect

Course Outcomes:

CO1 - Ability to demonstrate knowledge and comprehension of concepts & methodologies of suitable materials and manufacturing process selection.
CO2 - Ability to analyze and evaluate parts reduction and process selection using reduction methodology.
CO3 - Ability to develop suitable component design according to the manufacturing process

PDT451 MATERIALS SELECTION & DESIGN [PEMILIHAN & REKA BENTUK BAHAN]
No of Credits: 3

Course Synopsis:

This course builds an understanding of the inter-relationship between selection, materials processing, product design (material, design and processing) and product performance to develop a holistic approach to optimum selection of materials for engineering and industrial applications. The focuses of this course are fundamentals of the design process, specifications, decision-making, materials selection, materials process, experimental design, statistic process control and preliminary design. The course integrates vertically and horizontally concepts from all areas of engineering technology and material processing and into a practical design project designed to train the students in the design practice.

Course Outcomes:

CO1 - Able to define and describe fundamental materials design and selection.
CO2 - Able to relate materials knowledge, processing, microstructure and performance and their implication with materials design.
CO3 - Able to design and make a selection material using a method: performance index and efficiency of materials, weibull modulus, base on mechanical factors, semi quantitative and others.

PDT463 MATERIALS FOR ENERGY AND ENVIRONMENT SUSTAINABILITY [BAHAN UNTUK KELESTARIAN TENAGA DAN ALAM SEKITAR]
No of Credits: 3

Course Synopsis:

This course builds an understanding of critical relationship between the environment, energy and sustainability. It will exposed the student to the development and application of materials in sustainable energy production. In this subject, while chemistry is the underlying scientific basis, materials are vital in enabling technologies that can offer promising solutions for sustainable energy future. Materials with new properties and improved

functionalities are needed for boosting the performance and efficiency of the different types of processing thus the end product at lower cost.

Course Outcomes:
CO1 - Able to define and describe the relationship between energy, environment and sustainability.
CO2 - Able to demonstrate materials knowledge and processing on non-renewable and renewable energy.
CO3 - Able to analyze the industrial case study in energy efficiency.
CO4 - Able to evaluate the green processing and recycling process.

PDT473 RUBBER AND LATEX TECHNOLOGY [TEKNOLOGI GETAH DAN LATEKS]
No of Credits: 4

Course Synopsis:
This course expose student to basic knowledge, principle, and concept of rubber and latex technology. This course also focus on compounding, formulation, production, characterization and testing of latex and rubber processing.

Course Outcomes:
CO1 - Able to analyse basic of polymer lattice and rubber.
CO2 - Able to differentiate types of polymer and propose knowledge in rubber formulation and mixing.
CO3 - Able to prepare and display different latex compounds and testing on rubber.
CO4 - Able to propose and demonstrate main latex processing technique, handling and controlling rubber processing machines.

PDT474 TECHNICAL CERAMIC TECHNOLOGY [TEKNOLOGI SERAMIK TEKNIKAL]
No of Credits: 4

Course Synopsis:
Introduction to the technical ceramics including properties and applications. Student will be exposed to the modern technical ceramic, glass and glass ceramics processing technology including raw materials preparation, different shaping techniques, sintering and finishing.

Course Outcomes:
CO1 - Able to discuss technical ceramic raw materials preparation technique.
CO2 - Able to compare different shaping technique of technical ceramic products.
CO3 - Able to select appropriate process and applications for sustainable environmental development of various technical ceramic materials.
CO4 - Able to predict mechanism of solid state technique and sintering process.

PDT475 GEOPOLYMER MATERIALS TECHNOLOGY [TEKNOLOGI BAHAN GEOPOLIMER]
No of Credits: 4

Course Synopsis:
Introduction to the geopolymer materials including theory, processing, characterization and application. Student will be exposed to the basic introduction of geopolymer technology, basic materials of geopolymer including raw materials preparation, raw materials characterization, sintering and application. This course covers a basic but through review in this subject provides knowledge on theory and practical. Student will be exposed to the important aspect in geopolymer materials technology including concept, principles, properties and applications by considering the environmental and sustainable development.

Course Outcomes:
CO1 - Able to apply the concepts of Geopolymer Basic Materials.
CO2 - Able to analyze and explain the materials, processing, and mechanism of geopolymer.
CO3 - Able to elaborate and display the basic of geopolymer materials, testing and analysis.
CO4 - Able to do the design and construct the geopolymer properties and application for sustainable development.

PDT477 TEKNOLOGI LEPAS TUAI [POST-HARVEST TECHNOLOGY]
No of Credits: 3

Course Synopsis:
This course introduces the overview of post-harvest handling technology of selected commodities that emphasizes on the basic of pre-harvest, harvest factors and post harvest handling technology fresh production, post-harvest treatment and processing, packaging operation and appropriate equipment, post harvest pest management, quality assurance and preparation of fresh cuts, and socio-economics of post harvest.

Course Outcomes:
CO1 - Ability to analyze the physical properties of agricultural products in order to apply the appropriate post-harvest handling technology
CO2 - Ability to distinguish the packaging operation and propose the appropriate equipment for handling this operation
CO3 - Ability to differentiate the preharvest and harvest factors that affects on postharvest quality

PDT478 PENGURUSAN SISA PERTANIAN DAN KEJURUTERAAN PENGUNAAN [AGRICULTURAL WASTE MANAGEMENT AND UTILIZATION ENGINEERING]
No of Credits: 3

Course Synopsis:
This course covers the agricultural sources of pollution (pesticides, commercial fertilizer, on-farm food processing wastes and animal manure) and their effect on the environment. Physical, chemical and biological properties of agricultural waste materials, treatment processes of agricultural wastes, methods of land application of agricultural wastes, and technologies for utilization of agricultural wastes for biogas production and animal feed

Course Outcomes:
CO1 - Ability to recommend suitable physical, chemical and/or biological treatment of industrial and agricultural organic wastes.
CO2 - Ability to design systems for the collection, handling, treatment and utilization of wastes.
CO3 - Ability to propose suitable utilization technique for agricultural waste and wastewater to sustain an environmental

PDT479 SISTEM BIO-DIPERBAHARUI [BIO-RENEWABLE SYSTEMS]
No of Credits: 3

Course Synopsis:
An in-depth introduction to bio-renewable concepts in relation to converting bio-renewable resources into bio-energy, bio-based products, feedstock production, economics, logistics and marketing of products and co-products.

Course Outcomes:
CO1 - Ability to differentiate biorenewable resources
CO2 - Ability to compare and contrast the products, co-products, production processes, economics and marketing of bio-renew able resources
CO3 - Ability to analyze conversion of bio-renewable resources into bio-energy and bio-based products

PDT480 KEJURUTERAAN PEMPROSESAN MAKANAN [FOOD PROCESSING ENGINEERING]
No of Credits: 3

Course Synopsis:
This course covers multidisciplinary field of applied physical sciences that combines science and engineering education for food and related industries. Topics covered include introduction to food engineering, fluid flow theory, heating and cooling processes for foods, thermal processes, food freezing and freeze concentration, evaporation and freeze concentration, food dehydration, filtration, sedimentation and centrifugation, membrane process, extrusion and cleaning and sanitation.

Course Outcomes:
CO1 - Ability to categorize the appropriate physical characteristic according to food processing.
CO2 - Ability to differentiate the principles of food engineering operations
CO3 - Ability to analyze the problem that involved in food engineering operations and propose the solutions.

PDT481 KEMAJUAN DALAM TEKNOLOGI AGRO [ADVANCES IN AGROTECHNOLOGY]
No of Credits: 3

Course Synopsis:
This course covers inventions, achievements, acceptance and challenges in the use of modern agricultural technologies to increase yield and quality of agricultural produce with emphasis on the application, transfer and management of technologies that regulate crop and soil quality in relation to social, technical and environmental conditions.

Course Outcomes:
CO1 - Ability to apply modern technologies in the production, handling and processing of agricultural products.
CO2 - Ability to distinguish modern agricultural technologies that would improve quantity and quality of agricultural products.
CO3 - Ability to experiment with new technologies and alternative solutions in agricultural production

PDT482 TEKNOLOGI PENGELUARAN TANAMAN MAKANAN DAN HERBA [FOOD AND HERBAL CROP PRODUCTION TECHNOLOGY]
No of Credits: 3

Course Synopsis:
This course covers crop production practices of important food crops (paddy, maize/corn, sweet potato and cassava) in meeting the energy requirements and ensuring food security and food safety as well as selected herbal crops with pharmaceutical/nutraceutical/medicinal properties

Course Outcomes:
CO1 - Ability to distinguish appropriate crop production technology
CO2 - Ability to apply good agricultural practices in food and herbal crop production
CO3 - Ability to select new technology to increase yield.

DPT102 STATIK DAN DINAMIK [STATICS AND DYNAMICS]
No of Credits: 3

Course Synopsis:
This course is mainly divided into two parts; statics and dynamics. In statics, student will be exposed to the basic concepts of engineering mechanics such as forces, moments and friction. They will apply this basic knowledge to analyze the equilibrium of rigid bodies, as well as the stability of a structure. The subject of dynamics will be dealt in two parts: kinematics, which treats only the geometric aspects of the motion, and kinetics, which is the analysis of the forces causing the motion. Analysis regarding kinetic problems will be solved by using acceleration method, principle of work and energy, and principle of impulse and momentum.

Course Outcomes:
CO1 - Able to describe principles of physics for static: force, moment, Newton's First Law, Newton Third Law, trusses, frame and machine.
CO2 - Able to apply principles in describing, sketching and/or drawing free body diagram and solving static problems.
CO3 - Able to describe principles of physics for dynamics: kinematics, kinetics, Newton Second Law, position, velocity, acceleration, work, energy, impulse and momentum.
CO4 - Able to apply principles in creating, sketching and/or drawing free body diagram and solving dynamic problems.

DPT103 MEKANIK BAHAN [MECHANICS OF MATERIAL]
No of Credits: 3

Course Synopsis:
This course is designed to provide students with a clear presentation of

both; the theory and application of the fundamental principle of mechanics of materials. Students are expected to acquire the knowledge of physical behaviour of materials under load and material behaviour requirement.

Course Outcomes:
CO1 - Able to apply concepts and principles of mechanics of materials.
CO2 - Able to analyze and evaluate mechanical properties of specific materials of specific material; stress, shear, strain, axial loading, torsion and bending.

DPT104 BAHAN [MATERIALS]
No of Credits: 3

Course Synopsis:
This course introduces students to the engineering materials fundamentals including the engineering materials application, atomic bonding, crystal structure, mechanical and physical properties, corrosion mechanism, microstructural analysis, phase diagram, ferrous and non-ferrous alloys, polymer and advance materials.

Course Outcomes:
CO1 - Able to analyse and evaluate transformation micro-structure and behaviors of ferrous, non-ferrous and polymer.
CO2 - Able to analyse mechanical and corrosion properties of engineering materials.
CO3 - Able to analyse advance and sustainable materials.

DPT110 PROSES PEMBUATAN 1 [MANUFACTURING PROCESS 1]
No of Credits: 3

Course Synopsis:
This course explore the manufacturing process which used in industry to convert raw material into finished product. In the beginning, introduction to manufacturing technology will be given, followed by material selection in manufacturing and heat treatment process. Various metal casting processes will be introduced including sand casting, investment casting, vacuum casting and other casting processes. Overview of forming and shaping process will be given on rolling, forging, extrusion, drawing, sheet metal, powder metallurgy, injection moulding and rapid prototyping process. Besides that, this course also include various joining process such as brazing, soldering, adhesive bonding, and mechanical fastening processes.

Course Outcomes:
CO1 - Able to illustrate the manufacturing process: Plastic Shaping, Metal Casting, Metal forming and Joining.
CO2 - Able to develop different types of manufacturing processes to produce various product.
CO3 - Able to develop different types of manufacturing processes to produce various product.
CO4 - Able to operate the machine: Injection moulding machine, Sand casting process, Rapid prototyping machine, Vacuum casting machine, Powder metallurgy process and Vacuum Casting.

DPT114 TEKNOLOGI DAN AMALAN KERJA TANGAN [TECHNOLOGY AND HANDWORK PRACTICE]
No of Credits: 3

Course Synopsis:
In this course, explanation about safety aspects in workshop will be given to the students. Then, they will be exposed to fundamental measurement technique, measurement equipment such as vernier caliper, micrometer, etc., followed by explanation on various basic cutting processes, e.g. filing, chiseling, sawing, etc. Students will be introduced to fabrication, sheet metal forming, and welding process which consists of introduction to basic knowledge of various cutting methods and hand tools, such as file, hacksaw, chisel, etc. The practices or lab sessions consist of briefly explanation on safety precautions in workshop, metrology lab, fitting work, sheet metal forming, and welding process.

Course Outcomes:
CO1 - Able to illustrate different type of manual production process (craftsmanship, e.g.: filing, chiseling, manual sawing, sheet met al, etc.).

CO2 - Able to choose various types of hand tools and equipment/ instrument according to specifications and safety regulations.
CO3 - Able to construct a product.

DPT115 TEKNOLOGI DAN AMALAN PEMESINAN [TECHNOLOGY AND MACHINING PRACTICE]
No of Credits: 3

Course Synopsis:
This course introduce about safety aspects in workshop and fundamental of measurement technique followed by milling, lathe and grinding operation which consists of introduction to basic knowledge of various cutting tools, parts of machine and its functions, machine operations, and numerous calculations involving the operations.

Course Outcomes:
CO1 - Able to illustrate different type of conventional machining operation such as milling, turning and grinding.
CO2 - Able to operate lathe machine, milling machine and grinding machine and apply the safety precaution while working.
CO3 - Able to construct a product.

DPT122 LUKISAN KEJURUTERAAN DAN LUKISAN BERBANTU KOMPUTER [ENGINEERING DRAWING AND COMPUTER AIDED DRAFTING]
No of Credits: 3

Course Synopsis:
Objective of this course is to provide exposure and skills to Engineering Diploma student in basic Engineering Drawing, Computer Aided Drafting (CAD) and its engineering applications. The course will cover the detail of Engineering Drawing for beginners followed by projection systems and isometrics, before going on Computer Aided Drafting using AutoCAD software, which focus on product design in 2D and isometric. Knowledge in dimensioning and geometrical tolerance (GDT) will enhance student's ability in interpreting and assessing information from basic raw data of an engineering drawing.

Course Outcomes:
CO1 - Able to illustrate technical drawing and drafting using manual technique.
CO2 - Able to apply principle in technical drawing and drafting using AutoCAD software.
CO3 - Able to practice basic Geometric Dimensioning and Tolerancing (GDT) on technical drawing.

DPT123 PERMODELAN 3D CAD [3D CAD MODELLING]
No of Credits: 2

Course Synopsis:
This course focus on giving exposure and skill to students about basis of 3D modeling and its application in engineering field by using 3D Modeling software. This course include details on 3D modeling followed by producing 2D drawing, assembly drawing, exploded drawing, surface modeling, rendering and animation. All this skills will help student to apply its in engineering field to fulfill industry demand.

Course Outcomes:
CO1 - Able to design 3D model of components by using 3D modelling software.
CO2 - Able to apply and produce technical/2D drawing using 3D modelling software.
CO3 - Able to apply and produce assembly drawing and exploded drawing using 3D modelling software.
CO4 - Able to apply and produce 3D animation and rendering for the components using 3D modelling software.

DPT152 ASAS TEKNOLOGI ELEKTRIK [BASIC ELECTRICAL TECHNOLOGY]
No of Credits: 3

Course Synopsis:
This course is offered to non-electrical engineering background students. This course is intended to provide students with clear understanding the concepts and principles of the DC and AC circuits, basic principles of three phase ac circuits, and electromagnetism. The students will also gain an understanding of the basic operating principles of a transformer, calculate induced e.m.f, equivalent resistance, reactance and impedance, losses and transformer efficiency. At the end of the chapter, the students will understand the principles of DC Machines and three phase induction motors and do some basic calculation of losses and efficiency of DC Machines.

Course Outcomes:
CO1 - Able to apply the terms, units, laws and theorems of basic electrical system.
CO2 - Able to describe the concept and principle of single phase and three phase AC circuits parameters.
CO3 - Able to describe the concept and principle of magnetic fields and the operation of transformer.
CO4 - Able to develop the concept and principles used in DC machines and three phase induction motor.

DPT202 THERMO-BENDALIR [THERMO-FLUID]
No of Credits: 3

Course Synopsis:
This course designed to provide a background on the fundamental principles and engineering applications of thermodynamics, heat transfer and fluid mechanics. These three areas collectively make up the field of thermal sciences but are traditionally taught as separate courses. However, in this course sequence, the three areas are presented in a more integrated manner, emphasizing the connectivity between these areas through the use of 'realworld' examples of thermal systems. The course begins with discussion on Basic concepts of thermodynamics, first law of thermodynamics. Then students will be discussing on topic Thermodynamics properties of liquids and solids. Course sequence of Heat Transfer and Fluid mechanics, topic is covered on mod of heat transfer (Conduction, Convection and Radiation) and then cover-up for fluid properties and fluid at rest. The fundamental laws, governing the motion of fluids are discussed next.

Course Outcomes:
CO1 - Able to evaluate the principle of thermodynamic in selected area of study.
CO2 - Able to analyse the principle of heat transfer in selected area of study.
CO3 - Able to analyse the principle of fluid mechanic in selected area of study.

DPT213 PROSES PEMBUATAN 2 [MANUFACTURING PROCESS 2]
No of Credits: 3

Course Synopsis:
This course exposes student the utilization of advanced machining processes. The course begins with overview to advanced machining processes, followed by CNC 5-axis, EDM wire cut, super drill, die sinker, abrasive water jet, electrochemical and laser cut machines operation. The Programming Operation which include G and M codes will be taught and students will also be exposed with the principles of operation and applications of other advanced manufacturing processes. Students also attend industrial visit to exposed what the advanced machining are using by industrial based on currently technology.

Course Outcomes:
CO1 - Able to explain advanced machining processes, tools related and control systems.
CO2 - Able to distinguish the advance machining processes and

applications.
CO3 - Able to operate the machine: CNC, EDM Wire Cut Machine, EDM Die Sinker Machine

DPT214 SISTEM PNEUMATIK DAN HIDRAULIK [PNEUMATIC AND HYDRAULIC SYSTEM]
No of Credits: 3

Course Synopsis:
This course will be exposing students about the fundamental of basic Pneumatic & Hydraulic Systems that are being practiced in Industry today. This course will be focusing on basic introduction which covers symbols, components, and circuits used in Pneumatic & Hydraulic Systems as well as its application in industry. To increase knowledge of students in this course, a practical approach will be done using the Pneumatic & Hydraulic equipments aided by computer software to construct the related circuits in Manufacturing Automation Lab. At the end of this course, the Pneumatic System application will be combined with Electro-Pneumatic System which uses electric power, relay, sensor and limit switch to move the components and actuator in Pneumatic System.

Course Outcomes:
CO1 - Able to describe concepts of Pneumatic & Hydraulic Systems.
CO2 - Able to illustrate components and symbols of Pneumatic & Hydraulic Systems.
CO3 - Able to design circuits of Pneumatic Systems that related to industrial applications.
CO4 - Able to interpret the Electro-Pneumatic Systems applications.

DPT215 AUTOMASI PEMBUATAN DAN ROBOTIK [MANUFACTURING AUTOMATION AND ROBOTICS]
No of Credits: 3

Course Synopsis:
This course introduces the Manufacturing Automation and Robotic which been used in the industries today. Its covers topics regarding automation systems such as the pneumatic, hydraulic, programmable logic control (PLC), material handling, Automated Storage/Retrieval System (ASRS), Automated Guided Vehicles (AGV) and Automation Safety. Students are trained to design and programmed the programmable logic control (PLC) using PLC software. Robotic Course is an explanation of the classification, robot system, end-of-arm tooling, sensors, robot safety and robot utilization in the industries. There also an exposure regarding Combination of Modular Production System (MPS) with Automation and Robotic Systems.

Course Outcomes:
CO1 - Able to explain the concept of Automation and Robotics in manufacturing Technologies applications.
CO2 - Able to apply the concept of Automation, Material Handling and Robotics System in Manufacturing Systems application.
CO3 - Able to evaluate concept of Programmable Logic Controller (PLC), endof-arm tooling for industrial robotics and sensor devices for industrial applications.
CO4 - Able to construct the automated system applications using PLC including timers, counter and sensor devices.

DPT220 REKABENTUK DAN PEMBUATAN BERBANTU KOMPUTER [COMPUTER AIDED DESIGN AND MANUFACTURING]
No of Credits: 3

Course Synopsis:
This course introduces principles and application of CAD/CAM system which integrates with the application of CNC machine. This course enables student to understand the theory, concept, and application of CAD/CAM and CNC machine in an industry. Student will be exposed to CAD software to illustrate parts and then using CAM software to convert CAD file into numerical control (NC) codes. Then transfer the NC code to the CNC machine and perform the actual machining process. This course also enable students to understand the NC code to to review the program.

Course Outcomes:

CO1 - Able to explain CAD/CAM system as part of product development process.
CO2 - Able to generate part programming for machining process based on CAD file.
CO3 - Able to explain Computer Numerical Control (CNC) processes, tools related and control systems.
CO4 - Able to creat Numerical Control (NC) codes manually or using CAD/CAM software and transfer the NC program to operate CNC machine.

DPT224 REKABENTUK 1 [DESIGN 1]
No of Credits: 3

Course Synopsis:

Design is an activity which needs to be well organized and take into account all influences that are likely to be responsible for the success of the product under development. Design is a creative process, requires knowledge, skill and imagination. When done well, it captivates us and inspires us. The content of this course covers basic concept of design, process and design technique, influence factors and product design phase. Other than that, sketching and design concept, design process, understand and conscious in consumer requirement. Furthermore, as a value added on student's understanding, the concepts of DFX, GDT, product economics, prototyping, report presentation, etc will be given.

Course Outcomes:

CO1 - Able to describe principle concept and procedures of engineering design process.
CO2 - Able to design engineering product by following methodology of engineering design process.
CO3 - Able to construct prototype using handwork and machining skills.

DPT225 REKABENTUK 2 [DESIGN 2]
No of Credits: 3

Course Synopsis:

This course provides concept and understanding to allow students to find suitable designs for components in designing machine system, jig and fixtures. It focuses on basics of power transmission system, motors, fasteners and fundamental principles of jig and fixtures. Students will be exposed with simple design problems before being assigned to compute design parameters. At the end of this course, students will be analyzed simple designs of machine components by using CAD Aided Engineering (CAE) software.

Course Outcomes:

CO1 - Able to apply fundamental components in designing machine elements: gears, belts, motors, jigs and fixtures.
CO2 - Able to analyse simple design problems by using basic mechanical analysis.
CO3 - Able to analyse simple design problems using CAE software.

DPT251 ASAS ELEKTRONIK [BASIC ELETRONICS]
No of Credits: 3

Course Synopsis:

The purpose of this course is to give introduction and exposure to student about the electronic devices which includes analog and digital device. The analog device topic includes the introduction to basic electronic components, semiconductor, PN junction, diodes, zener diodes, bipolar junction transistor (BJT) and operational amplifier. The digital device topic includes the introduction to digital electronic binary number system, Boolean algebra, logic gates, logic circuits, Boolean function and combinational logic circuits. Students will be exposed to the electronic basic, operation concept, analysis method including the usage of electronic device used in industry. Lab test will also be done to clarify the topics learned in the class.

Course Outcomes:
CO1 - Able to explain electronic component.
CO2 - Able to develop electronic circuits.
CO3 - Able to explain the application of electronic devices.

DPT313 METROLOGI DAN KAWALAN KUALITI [METROLOGY AND QUALITY CONTROL]
No of Credits: 3

Course Synopsis:
This course divided into two sections first Metrology and second Quality Control. In Metrology section, students will expose with introduction the basic knowledge of metrology, measurement standards and tolerance in measurement. The students will be exposed to metrology equipment as vernier calliper, micrometer, profile projector, gage block, coordinate measuring machine (CMM) and surface roughness tester. It covers measurement techniques for reference plane, angle measurement and surface measurement. Practical work will help students to gain effective understanding. In Quality Control section, gives an exposure to students to understand the quality control tools. The students will be exposed the quality control tools as 7 tools quality control (old and new), total quality management (TQM), sampling and reliability. Beside that, the student will be exposed relationship between metrology and quality control in industry.

Course Outcomes:
CO1 - Able to apply the concepts, tools and techniques in linear measurement, angular measurement, surface measurement and coordinate measuring machine.
CO2 - Able to differentiate different tools and techniques in quality control.
CO3 - Able to develop quality tool base on the problem given in quality tool.

DPT321 REKABENTUK ACUAN SUNTIKAN [INJECTION MOULD DESIGN]
No of Credits: 3

Course Synopsis:
This course introduces students to basic knowledge of plastic injection mould. This module focuses on the actual step in designing mold starts with procedure in designing plastic products, procedure in designing plastic injection mould, analyses of material flow in plastic injection mould and translation of 3D data to CAM and continuing producing the assembly drawing of plastic injection mould to produce a plastic product.

Course Outcomes:
CO1 - Able to solve plastic injection moulding problem during process and designing part, and solve the part defect.
CO2 - Able to analyse material flow behaviour and mould cost estimation.
CO3 - Able to design gate, runner, air vent and cooling system in plastic injection mould.

DPT335 KAWALAN DAN PERANCANGAN PENGELUARAN [PRODUCTION PLANNING AND CONTROL]
No of Credits: 2
Course Synopsis:
This course addresses the production planning and control in manufacturing and service firm. The course introduces students to the fundamental concepts of modern production management and discusses its importance to the overall strategy and competitiveness of a firm. The students learn about the main approaches supporting the decision process in designing and operating the production and logistics system of an enterprise. Longterm, medium-term and short-term planning which includes forecasting, aggregate planning, materials requirement planning (MRP), lot sizing scheduling, project scheduling, supply chain management, inventory management, production planning, materials handling, JIT, Lean production system and human resources and job design are covered.

Course Outcomes:

CO1 - Able to Analyze cases or problems on Production Planning Systems by applying principle of Forecasting, Capacity Planning, Aggregate Planning and Process and Facility Layout.

CO2 - Able to develop strategies based on cases or problems given on Production Management Systems by applying principle of inventory management, material requirement planning (MRP) and scheduling methods.

DPT351 PROJEK SEMESTRAL [SEMESTRAL PROJECT]
No of Credits: 3
Course Synopsis:

This course is implemented in individual or groups (maximum of 3 students per group) and should be completed in one semester period. The group should finished their project based on the human's life problem statement in engineering field which consists of design, mechanical, manufacturing, automation, electric and electronic. Besides that, each group will discuss with their project supervisor based on project's title and proposal paper, final report, log book, presentation and finished work (product).

Course Outcomes:

CO1 - Able to identify solution based on problem study.

CO2 - Able to design engineering solution utilizing an engineering practice.

CO3 - Able to construct a product.

CO4 - Able to write a technical report and communicate in oral presentation.

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4. Sarjana Muda Kejuruteraan Pertanian dengan Kepujian
5. Sarjana Muda Teknologi Kejuruteraan Kimia (Teknologi Makanan) dengan Kepujian
6. Sarjana Muda Teknologi Kejuruteraan Kimia (Proses Kimia Industri) dengan Kepujian
7. Sarjana Muda Teknologi Kejuruteraan Kimia (Bioteknologi Industri) dengan Kepujian
8. Sarjana Muda Teknologi Kimpalan dengan Kepujian
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UR4521001
Diploma in Metallurgical Engineering

Programme Educational Objective (PEO)

PEO 1
To raise graduates who are competent in their respective engineering fields as exhibited through career development.

PEO 2
To raise graduates who involved and contribute to the society.
PEO 3
To raise graduates who pursue education opportunity continually

PEO 4
To raise graduates who contribute through innovation and entrepreneurship.

Programme Outcomes (PO)

PO1
Knowledge: Apply knowledge of applied mathematics, applied science, engineering fundamentals and an engineering specialization to wide practical procedures and practices.

PO2
Problem analysis: Identify and analyse well-defined engineering problems reaching substantiated conclusions using codified methods of analysis specific to their field of activity.

PO3
Design/development of solutions: Design solutions for well-defined technical problems and assist with the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

PO4
Investigation: Conduct investigations of well-defined problems; locate and search relevant codes and catalogues, conduct standard tests and measurements.

PO5
Modern Tool Usage: Apply appropriate techniques, resources, and modern engineering and IT tools to well-defined engineering problems, with an awareness of the limitations.

PO6
The Engineer and Society: Demonstrate knowledge of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technician practice and solutions to well-defined engineering problems.

PO7
Environment and Sustainability: Understand and evaluate the sustainability and impact of engineering technician work in the solution of well-defined engineering problems in societal and environmental contexts.

PO8
Ethics: Understand and commit to professional ethics and responsibilities and norms of technician practice.

PO9
Individual and Team Work: Function effectively as an individual, and as a member in diverse technical teams.

PO10
Communications: Communicate effectively on well-defined engineering activities with the engineering community and with society at large, by being able to comprehend the work of others, document their own work, and give and receive clear instructions.

PO11
Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member or leader in a technical team and to manage projects in multidisciplinary environments.

PO12
Life-Long Learning: Recognise the need for, and have the ability to engage in independent updating in the context of specialised technical knowledge.

CURRICULUM STRUCTURE
DIPLOMA IN METALLURGICAL ENGINEERING ACADEMIC SESSION (2020/2021)

YEAR	FIRST		SECOND		THIRD	
SEMESTER	I	II	III	IV	V	VI
Engineering Core Courses (81)	DKA104/2 Preliminary Mathematics	DQT101/3 Mathematic I	DQT102/3 Mathematic II	DQT203/3 Mathematic III	DBT351/3 Semestral Project	DIT361/6 Industrial Training
	DBT110/3 Engineering Science	DBT102/3 Ferrous Metal	DET211/3 Basic Electrical Technology	DBT206/3 Foundry Technology	DBT301/3 Powder Metallurgy	
	DBT101/3 Introduction to Engineering Materials	DBT107/3 Basic Static and Dynamic	DBT202/3 Non Ferrous Metal	DBT208/3 Technology of Metal Welding 2	DBT302/3 Heat Treatment	
	DKT121/3 Basic Computer Programming	DBT109/3 Chemical Thermodynamics	DBT203/3 Metal Extractive Technology	DBT209/3 Metal Testing	DBT303/3 Metals Protection	
	DBT108/2 Basic Metal Workshop	DUT123/2 IT & Communication Skills	DBT204/3 Technology of Metal Welding 1	DBT210/3 Strength of Materials	DBT304/3 Occupational Safety and Quality Management	
	DBT111/2 Engineering Drawing and Computer Aided Drafting			DBT211/3 Basic Machining of Metals		
81	13	14	15	18	15	6
University Requirement Courses (14)	DVW101/2 English I	DVW201/2 English II	DVW301/2 English III	DVW410/2 Malay Language	DUW224/2 Engineering Entrepreneurship	
	DZWXXX/1 Badan Beruniform 1	DZWXXX/1 Badan Beruniform 2	DUW129/2 Falsafah dan Isu Semasa			
14	3	3	4	2	2	
95	16	17	19	20	17	6

Note: DKA104/2 Preliminary Mathematics: Pre-requisite for SPM-level Additional Mathematics with grade D

UR6524001
Bachelor of Chemical Engineering With Honours

Programme Educational Objective (PEO)

PEO 1
Graduates who have demonstrate career advancement in the field of Chemical Engineering or related engineering field.

PEO 2
Graduates who are involved in a professional body or society.

PEO 3
Graduates who pursue life-long learning.

Programme Outcomes (PO)

PO 1
Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

PO 2
Identify, formulate, conduct research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO 3
Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

PO 4
Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

PO 5
Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations.

PO 6
Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems.

PO 7
Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts including ability to have entrepreneurship skills.

PO 8
Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

PO 9
Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO 10
Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11
Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PO 12
Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary.

CURRICULUM STRUCTURE
BACHELOR OF CHEMICAL ENGINEERING WITH HONOURS
ACADEMIC SESSION (2020/2021)

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	I	II	III	IV	V	VI		VII	VIII
Engineering Core (92)	ERT 105/3 Electrical Technology	ECT 112/3 Engineering Skills	ERT 201/3 Chemical Eng. Thermodynamics	ERT 217/3 Mass Transfer	ERT 316/3 Reaction Engineering	ERT 325/3 Engineering Economics	EIT 302/4 Industrial Training	ERT 401/3 Chemical Plant Design I	ERT 402/4 Chemical Plant Design II
	ERT114/2 Engineering Mechanics	EKT150/3 Introduction to Computer Programming	ERT 215/3 Fluid Mechanics	ERT221/3 Bioreactor System	ERT 321/4 Process Control & Dynamics	ERT326/3 Biochemical Engineering		ERT 445/2 Final Year Project 1	ERT 446/4 Final Year Project 2
	ERT 113/3 Introduction to Sustainability	ERT115/2 Thermodynamics	ERT 214/4 Material and Energy Balance	ERT218/3 Heat Transfer	ERT 324/3 Separation process	ERT 322/3 Safety & Loss Prevention		ERT 432/3 Good Manufacturing Practice	# ERT4XX/3 Elective 3
		ERT 117/2 Process Instrumentations		ERT219/1 Transport Phenomena Application	ERT305/1 Skills in Separation Process	ERT 327/2 Simulation for Chemical Engineering		ERT 319/3 Industrial Waste Treatment	
						# ERT3XX/3 Elective 1		# ERT4XX/3 Elective 2	
Non Engineering (33)	EQT 101/3 Engineering Mathematics I	EQT 102/3 Engineering Mathematics II	EQT 203/3 - Engineering Mathematics III	EQT271/3 Engineering Statistics	ERT 443/3 Management for Engineers	ERT 442/2 Professional Engineers			
	ERT 110/2 Organic Chemistry I	ERT 116/2 Organic Chemistry II	ERT204/3 Analytical Chemistry						
	ERT111/3 Introduction to Biological and Chemical Science Principles	ERT112/1 Biochemical Science							
University Required (16)	UVW 410/2 University Malay Language	UVW201/2* English For General Communication		UVW 312/2 English For Technical Communication	UUW 130/2** Philosophy and Current Issues				
	UVA101/0* Preparatory English		UVW or UUW XXX/2 Option Subjects	UUW 129/2 Introduction of Philosophy	UUW 131/2*** Appreciation of Ethics and Civilization				
	UZW XXX/1 Co-Curricular Activity	UZW XXX/1 Co-Curricular Activity			UUW 224/2 Engineering Entrepreneurship				
136	19	17	18	17	20	16	4	14	11

Total Units for Graduation 136

* Please refer to additional NOTE.	PROCESS ENGINEERING	BIOCHEMICAL ENGINEERING	SUSTAINABILITY
Elective I:	ERT328/3 Colloidal and Biomaterials Processing ERT434/3	ERT329/3 Bioreactor Engineering Design	ERT330/3 Biomass Utilization
Elective II:	Energy and Process Utility Engineering	ERT433/3 Halal Processing	ERT435/3 Sustainable Energy
Elective III:	ERT436/3 Petrochemical Process	ERT437/3 Pharma and Nutraceutical Engineering	ERT439/3 Fuel Cells
For International students: ** UUW 237/2 Malaysian Cultures; *** UUW 239/2 Malaysian Studies			

UR6524002
Bachelor of Polymer Engineering With Honours

Programme Educational Objective (PEO)

PEO 1
Graduates who have demonstrated career advancement in the field of Polymer Engineering or related engineering field.

PEO 2
Graduates who are involved in a professional body or society.

PEO 3
Graduates who pursue lifelong learning.

Programme Outcomes (PO)

PO 1
Apply knowledge of mathematics, natural science. engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

PO 2
Identify, formulate, conduct research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences

PO 3
Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal. and environmental considerations

PO 4
Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions

PO 5
Create, select, and apply appropriate techniques, resources, and modem engineering and IT tools, including prediction and modeling to complex engineering problems, with an understanding of the limitations

PO 6
Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems

PO 7
Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts including ability to have entrepreneurship skills.

PO 8
Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

PO 9
Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

PO 10
Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11
Recognize the need for, and have the preparation and ability to engage in independent and life-long leaning in the broadest context of technological change.

PO 12
Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

CURRICULUM STRUCTURE
BACHELOR OF POLYMER ENGINEERING WITH HONOURS
ACADEMIC SESSION (2020/2021)

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	I	II	III	IV	V	VI		VII	VIII
Engineering Core (101)	EBT105/4 Organic Chemistry	ECT112/3 Engineering Skills	EBT 238/3 Physical Chemistry	EBT109/3 Engineering Quality Control	EBT317/3 Fluid Mechanics	EBT303/3 Process Control	EIT3024 Industrial Training & Engineering Innovation	EBT 442/3 Polymer Engineering Integrated Design Project	#*EBT448/3 Polymer Adhesive & Coating* OR #*EBT449/3 Environmental Friendly Polymer*
	EBT114/3 Electrical Technology	EBT 131/3 Engineering Mechanics	EBT 240/3 Plastic Materials	EBT232/4 Polymer Synthesis	EBT334/3 Polymer Testing & Characterization	EBT441/3 Polymer Engineering Design		EBT437/3 Polymer Composites	
	EKT150/3 Computer Programming	EBT 110/3 Introduction to Polymer	EBT242/3 Elastomeric Materials	EBT 235/4 Structure & Polymer Properties	EBT 333/4 Rubber Processing	EBT337/4 Mass & Heat Transfer in Polymer		EBT 335/4 Polymer Blends	EBT435/3 Polymer in Electronic Application
		EBT151/3 Engineering Drawing		EBT245/3 Thermodynamic in Polymer	EBT336/4 Plastic Processing	EBT338/4 Latex Processing		EBT445/2 Final Year Project 1	EBT446/4 Final Year Project 2
						#*EBT344/2 Polymers in Biomedical Applications* OR #*EBT345/2 Photoluminescent Polymers and their Appplications*			
Non Engineering Core (19)	EQT101/3 Engineering Mathematics I	EQT102/3 Engineering Mathematics II	EQT203/3 Engineering Mathematics III	EQT271/3 Engineering Statistics		EBT450/3 Management For Engineers			EBT451/2 Professional Engineer
	UUT122/2 Skills & Technology in Communication								
120	15	15	12	17	14	19		12	12
University Required (16)		*UVA101/0 Preparatory English	**UVW201/2 English For General Communication		UVW312/2 English for Technical Communication			UUW130/2 Philosophy & Current Issues	
	UUWXXX/2 or UVWXXX/2 Option Subject	UVW410/2 University Malay Language or ***UVW110/2 Basic Malay Language	UUW131/2 Appreciation of ethics and civilization		UUW322/2 Thinking Skill			UUW224/2 Engineering Entrepreneurship	
	UZWXXX/1 Co-Curriculum	UZWXXX/1 Co-Curriculum							
16	3	3	4	-	4	-	-	4	
136	18	18	16	17	18	19	4	16	12

Total Units for Graduation 136

Elective Subject. *Uncredited. Compulsory to students with MUET Band 2 only. This course is a prerequisite to UVW211 English for General Purposes.
Compulsory to students with MUET Band 3 or less. This course is a prerequisite to UVW312 English for Technical Communication. * For international student only.

UR6524003
Bachelor of Agricultural Engineering With Honours

Programme Educational Objective (PEO)

PEO 1
Graduates who have demonstrated career advancement in the field of Agricultural Engineering or related engineering field.

PEO 2
Graduates who are involved in a professional body or society

PEO 3
Graduates who pursue lifelong learning

Programme Outcomes (PO)

PO 1
Ability to acquire and apply knowledge of mathematics, science, engineering and an in-depth technical competence in agricultural engineering discipline to the solution of complex engineering problem.

PO 2
Ability to identify, formulate and solve complex agricultural engineering problems.

PO 3
Ability to design solutions for complex engineering problems and systems, component or process to meet desired needs.

PO 4
Ability to conduct investigation into complex problems, as well as to analyze and interpret data.

PO 5
Ability to use techniques, skills and modern engineering tools necessary for complex engineering practices so as to be easily adaptable to industrial needs.

PO 6
Understanding of the social, cultural, global and environmental responsibilities of a professional engineer.

PO 7
In-depth understanding of entrepreneurship, the process of innovation and the need for sustainable development.

PO 8
Understanding of professional and ethical responsibilities and commitment to the community.

PO 9
Ability to function on multi-disciplinary teams.

PO 10
Ability to communicate effectively on complex engineering activities with the engineering community and with society at large.

PO 11
Recognition of the need for, and an ability to engage in life-long learning.

PO12
Demonstrate understanding of project management and finance principles.

CURRICULUM STRUCTURE
BACHELOR OF AGRICULTURAL ENGINEERING WITH HONOURS
ACADEMIC SESSION (2020/2021)

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEM	I	II	I	II	I	II		I	II
Engineering Core (94)	ERT167/3 Fundamental of Agricultural Engineering	ERT154/3 Dynamics	ERT205/4 Fluid Mechanics Engineering	ERT257/3 Hydrology & Water Resources Engineering	ERT357/3 Farm Structural Design	ERT358/2 Farm Machinery	EIT302/4 Industrial Training	ERT445/2 Final Year Project 1	ERT446/4 Final Year Project 2
	ERT148/2 Computer Aided Engineering Design	ERT155/3 Strength of Materials	ERT253/3 Electrical and Electronic Technology	ERT268/3 Heat and Mass Transfer	ERT354/3 Soil Engineering	ERT356/3 Unit Operation		ERT481/3 Agricultural Engineering Design 1	ERT482/3 Agricultural Engineering Design 2
	ERT152/3 Statics		ERT264/3 Thermodynamics	ERT255/3 Engineering Properties of Biological Materials	ERT363/3 Energy and Power	ERT457/3 Design of Automation Systems		ERT471/3 Design of Machines	ERT473/3 Bioproduct Manufacturing
	ERT252/3 Geomatics Engineering				ERT360/3 Instrumentation, Measurement and Control	ERT365/2 Modeling and Simulation		ERT472/3 Postharvest Engineering	ERT4XX/3 Elective 2
					ERT443/3 Management for Engineers	ERT442/2 Professional Engineers		ERT4XX/3 Elective 1	
Non-Engineering Core (26)	EQT101/3 Engineering Mathematics I	EQT102/3 Engineering Mathematics II	EQT203/3 Engineering Mathematics III	EQT271/3 Engineering Statistics					
	ERT163/3 Plant and Animal Sciences	ERT161/3 Crop and Livestock Production Systems	ECT112/3 Engineering Skills	EKT150/3 Introduction to Computer Programming					
		UUT122/2 Skills & Technology in Communication							
University Required (16)	UZWXXX/1 Co-Curricular Activity	UZWXXX/1 Co-Curricular Activity	UUW130/2 Philosophy & Current Issues	UVW312/2 English For Technical Communication	UUW224/2 Engineering Entrepreneurship	UUW322/2 Thinking Skills			UVWXXX/2 Option
		UVW410/2 University Malay Language				UUW131/2 Appreciation of Ethics & Civilization			
	UVA101/0 Preparatory English	UVW201/2* English for General Purposes							
136	18	17	18	17	17	16	4	14	15

UR6527001
Bachelor of Materials Engineering With Honours

Programme Educational Objective (PEO)

PEO 1
Graduates who have demonstrated career advancement in the field of Materials Engineering or related engineering field

PEO 2
Graduates who are involved in a professional body or society

PEO 3
Graduates who pursue lifelong learning

Programme Outcomes (PO)

PO 1
Apply knowledge of mathematics, natural science, engineering fundamentals and Material Engineering specialization to the solution of complex engineering problems.

PO 2
Identify, formulate, conduct research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO 3
Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

PO 4
Conduct investigation of complex engineering problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

PO 5
Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations.

PO 6
Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems.

PO 7
Understand and evaluate the sustainability and impact of professional engineering work in the solutions of complex engineering problems in societal and environmental contexts including ability to have entrepreneurship skills

PO 8
Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

PO 9
Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

PO 10
Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11
Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PO 12
Demonstrate knowledge and understanding of engineering management principles and economic decision making and apply these to one's own work, as a member and leader in a team, to manage projects in multidisciplinary environments.

CURRICULUM STRUCTURE
BACHELOR OF MATERIALS ENGINEERING WITH HONOURS
ACADEMIC SESSION (2020/2021)

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	I	II	III	IV	V	VI		VII	VIII
Engineering Core (101)	EBT151/3 Engineering Drawing	EBT109/3 Engineering Quality Control	EBT207/4 Materials Structure & Properties	EBT254/3 Transport Phenomenon in Materials Engineering	EBT317/3 Fluid Mechanics	EBT303/3 Process Control	EIT302/4 Industrial Training & Engineering Innovation	EBT405/3 Non Destructive Testing	# EBT421/3 Advanced Material Engineering OR # EBT439/3 Advanced Electronic Packaging
	EBT114/3 Electrical Technology	EBT112/3 Statics	EBT251/3 Materials Physical Chemistry	EBT211/4 Physical Metallurgy	EBT323/4 Materials Characterization	EBT318/3 Surface Engineering		EBT402/3 Corrosion Engineering	
	EKT150/3 Computer Programming	ECT112/3 Engineering Skills	EBT252/4 Strength of Materials	EBT222/4 Fundamentals of Ceramics	EBT326/4 Polymer Properties	EBT329/3 Polymer Processing		# EBT429/3 Composite Materials OR # EBT424/3 Construction Materials	
			EBT212/3 Dynamics	EBT253/3 Analytical Chemistry	EBT351/3 Electronic Materials Engineering	EBT324/3 Materials Thermodynamics		EBT427/3 Technical Ceramic	
								EBT445/2 Final Year Project 1	EBT446/4 Final Year Project 2
								^ EBT447/4 Materials Selection & Design	^ EBT447/4 Materials Selection & Design
Non Engineering (19)	EQT101/3 Engineering Mathematics I	EQT102/3 Engineering Mathematics II	EQT203/3 Engineering Mathematics III	EQT271/3 Statistic For Engineer		EBT450/3 Management for Engineers		EBT451/2 Professional Engineers	
	UUT122/2 Skills & Technology in Communication								
120	12	14	17	17	14	15		16	11
University Required (16)		* UVA111/2 Foundation English II	** UVW201/2 English for General Communication		UVW312/2 English for Technical Communication				
		UUW131/2 Appreciation of Ethics and Civilization			UUW224/2 Engineering Entrepreneurship	UUW130/2 Philosophy and Current Issues			
	UUWXXX/2 or UVWXXX/2 Option Subject	UVW410/2 University Malay Language OR *** UVW110/2 Basic Malay Language				UUW322/2 Thinking Skill			
	UZWXXX/1 Co-Curriculum	UZWXXX/1 Co-Curriculum							
16	5	3	2	-	4	4	-	-	-
136	17	17	19	17	18	19	4	16	11
Total Units for Graduation 136									

^ Course begins in the first semester but total credits are given upon completion of the second semester. # Elective Subject. * Uncredited. Compulsory to students with MUET Band 2 only. This course is a prerequisite to UVW211 English for General Purposes. ** Compulsory to students with MUET Band 3 or less. This course is a prerequisite to UVW312 English for Technical Communication. *** For international students only.

UR6524005
Bachelor of Chemical Engineering Technology (Industrial Chemical Process) with Honours

Programme Educational Objective (PEO)

PEO1
Engineering technology graduates engaged in the field of chemical engineering technology as demonstrated through career advancement.

PEO2
Engineering technology graduates who are members and contribute to professional society.

PEO3
Engineering technology graduates embracing in life-long learning or pursuing continuing education opportunities.

PEO4
Engineering technology graduates who are technopreneurs.

PROGRAMME OUTCOMES (PO)

PO1
Apply knowledge of mathematics, science, engineering fundamentals and engineering specialisation principles to defined and applied engineering procedures, processes, systems or methodologies.

PO2
Identify, formulate, research literature and analyse broadly-defined engineering problems reaching substantiated conclusions using analytical tools appropriate to their discipline or area of specialization.

PO3
Design solutions for broadly-defined engineering technology problems and contribute to the design of system, components or processes to meet specified needs with appropriate consideration for public health and safety,cultural,societal, and environmental considerations.

PO4
Conduct investigations of broadly-defined problems; locate,search and select relevant data from codes, data bases and literature, design and conduct experiments to provide valid conclusions.

PO5
Select and apply appropriate techniques, resources and modern engineering and IT tools, including prediction and modeling, to broadly-defined engineering problems, with an understanding of the limitations.

PO6
Demonstrate understanding of the societal,health,safety,legal and cultural issues and the consequent responsibilities relevant to engineering technology practice and solutions to broadly-defined engineering problems.

PO7
Understand the impact of engineering technology solutions of broadly-defined engineering problems in societal and environmental context and demonstrate knowledge of and need for sustainable development.

PO8
Understand and commit to professional ethics and responsibilities and norms of engineering technology practice.

PO9
Function effectively as an individual, and as a member or leader in diverse technical teams.

PO10
Communicate effectively on broadly-defined engineering activities with the engineering community and with society at large, by being able to comprehend and write the effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11
Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member and leader in a team and to manage projects in multidisciplinary environments

PO12
Recognize the need for, and have the ability to engage in independent and lifelong learning in specialist technologies.

CURRICULUM STRUCTURE
BACHELOR OF CHEMICAL ENGINEERING TECHNOLOGY (INDUSTRIAL CHEMICAL PROCESS) WITH HONOURS ACADEMIC SESSION (2020/2021)

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEM	I	II	III	IV	V	VI	VII	VIII
Discipline Core	PCT 111/3 Engineering Skills	PTT 156/4 Principles of Chemical Process	PTT 251/3 Thermodynamics for Chemical Engineering	PTT 254/3 Mass Transfer for Chemical Engineering	PTT 355/3 Process Control & Dynamics	PTT 353/3 Final Year Project I	PTT 451/5 Final Year Project II	PIT 404 INDUSTRIAL TRAINING
	PLT 121/3 Electrical Technology	PTT 154/2 Introduction to Process Instrumentation	PTT 252/3 Fluid Mechanics	PTT 255/3 Reaction Engineering	PTT 356/3 Separation Engineering	PTT 351/2 Safety & Loss Prevention	PTT 452/3 Plant Design Project 2	
	PTT 152/2 Physical Chemistry	PTT 155/3 Organic Chemistry	PTT 253/3 Heat Transfer for Chemical Engineering	PTT 260/3 Bioresource Processing Technology	PTT 352/3 Environmental Engineering	PTT 354/3 Plant Design Project 1	PTT 458/2 Quality Assurance & Control in Chemical Engineering	
	PTT 153/3 Materials Engineering	PTT 158/3 Analytical Chemistry	PTT 259/3 Oleochemical Process & Products	PTT 261/2 Plant Utilities	PTT 365/3 Petroleum & Gas Processing Technology	PTT 366/3 Polymer Processing Technology	PTT 459/3 Particle Processing Technology	
	PTT 157/2 Engineering Graphics for Chemical Engineering			PTT 262/3 Renewable Energy				
					Elective 1/3	Elective 2/3	Elective 3/3	
Common Core	PQT 111/3 Mathematics for Engineering Technology I	PQT 112/3 Mathematics for Engineering Technology II	PQT 213/3 Mathematics for Engineering Technology III			PTT 333/3 Engineering Technology Management	PTT 444/3 Engineering Technologist in Society	
University Require	UVW 410/2 University Malay Language	UUW 322/2 Thinking Skills	UUW 224/2 Engineering Entrepreneurship	UUW 131/2 Appreciation of Ethics and Civilization	UUW 122/2 Skills & Technology in Communication			
	UVA 101/0 Preparatory English	UUW 130/2 Philosophy & Current Issues		UVW XXX/2 Option Subject (Foreign Language)				
		UVW 201/2 English for General Communication						
	UZW XXX/1 Co-Curricular Activity	UZW XXX/1 Co-Curricular Activity		UVW 312/2 English for Technical Communication				
M: 2-3	19	22	17	18	17	17	19	12
M: 4-6	19	20	17	20	17	17	19	12
Total Units for Graduation = 141								
Elective 1			Elective 2			Elective 3		
A1. PTT 367/3 Industrial Electrochemistry			B1. PTT 363/3 Pharmaceutical Processing Technology			C1. PTT454/3 Introduction to Biochemistry		
A2. PTT 361/3 Scale Up & Optimization			B2. PTT 364/3 Advanced Membrane Technology & Application			C2. PTT457/3 Food Processing Technology		

UR6524006
Bachelor of Chemical Engineering Technology (Industrial Biotechnology) with Honours

Programme Educational Objective (PEO)

PEO1
Engineering technology graduates engaged in the field of chemical engineering technology as demonstrated through career advancement.

PEO2
Engineering technology graduates who are members and contribute to professional society.

PEO3
Engineering technology graduates embracing in life-long learning or pursuing continuing education opportunities.

PEO4
Engineering technology graduates who are technopreneurs.

PROGRAMME OUTCOMES (PO)

PO1
Apply knowledge of mathematics, science, engineering fundamentals and engineering specialisation principles to defined and applied engineering procedures, processes, systems or methodologies.

PO2
Identify, formulate, research literature and analyse broadly-defined engineering problems reaching substantiated conclusions using analytical tools appropriate to their discipline or area of specialization.

PO3
Design solutions for broadly-defined engineering technology problems and contribute to the design of system, components or processes to meet specified needs with appropriate consideration for public health and safety,cultural,societal, and environmental considerations.

PO4
Conduct investigations of broadly-defined problems; locate,search and select relevant data from codes, data bases and literature, design and conduct experiments to provide valid conclusions.

PO5
Select and apply appropriate techniques, resources and modern engineering and IT tools, including prediction and modeling, to broadly-defined engineering problems, with an understanding of the limitations.

PO6
Demonstrate understanding of the societal,health,safety,legal and cultural issues and the consequent responsibilities relevant to engineering technology practice and solutions to broadly-defined engineering problems.

PO7
Understand the impact of engineering technology solutions of broadly-defined engineering problems in societal and environmental context and demonstrate knowledge of and need for sustainable development.

PO8
Understand and commit to professional ethics and responsibilities and norms of engineering technology practice.

PO9
Function effectively as an individual, and as a member or leader in diverse technical teams.

PO10
Communicate effectively on broadly-defined engineering activities with the engineering community and with society at large, by being able to comprehend and write the effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11
Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member and leader in a team and to manage projects in multidisciplinary environments

PO12
Recognize the need for,and have the ability to engage in independent and lifelong learning in specialist technologies.

CURRICULUM STRUCTURE
BACHELOR OF CHEMICAL ENGINEERING TECHNOLOGY (INDUSTRIAL BIOTECHNOLOGY) WITH HONOURS ACADEMIC SESSION (2020/2021)

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEMESTER	I	II	III	IV	V	VI	VII	VIII
DISCIPLINE CORE (99) & ELECTIVE (9)	PLT 121/3 (2+1) Electrical Technology	PTT 155 (2+1) Organic Chemistry	PTT 251/3 (2+1) Thermodynamics for Chemical Engineering	PTT 252/3 (2+1) Fluid Mechanics	PTT 351/2 (2+0) Safety & Loss Prevention	PTT 353/3 (0+3) Final Year Project I	PTT 451/5 (0+5) Final Year Project II	INDUSTRIAL TRAINING (LI) PIT 404
	PTT152/2 (2+0) Physical Chemistry	PTT 156/4 (3+1) Principles of Chemical Process	PTT255/3 (2+1) Reaction Engineering	PTT 253/3 (2+1) Heat Transfer for Chemical Engineering	PTT 356/3 (2+1) Separation Engineering	PTT 354/3 (2+1) Plant Design Project 1	PTT 452/3 (1+2) Plant Design Project 2	
	PTT 153/3 (3+0) Materials Engineering	PTT 157/2 (0+2) Engineering Graphics for Chemical Engineering	PTT 254/3 (2+1) Mass Transfer for Chemical Engineering	PTT 257/4 (3+1) Biochemistry & Enzyme Technology	PTT 358/2 (1+1) Waste Management & Utilization	PTT 355/3 (2+1) Process Control & Dynamics	PTT 453/3 (3+0) Issues & Commercialization in Biotechnology	
	PTT 154/2 (1+1) Introduction to Process Instrumentation	PTT 158/3 (2+1) Analytical Chemistry	PTT 256/4 (3+1) Industrial Microbiology	PTT 258/3 (2+1) Biomolecular & Genetic Engineering	PTT 357/3 (2+1) Cell & Tissue Culture Technology	PTT 362/3 (2+1) Biopharmaceutical Technology		
	PCT 111/3 (0+3) Engineering Skills				PTT 359/4 (3+1) Upstream & Downstream Processing Technology			
					Elective 1/3 (3+0) (A1 or A2)	Elective 2/3 (3+0) (B1 or B2)	Elective 3/3 (3+0) (C1 or C2)	
COMMON CORE (15)	PQT 111/3 (3+0) Mathematics for Engineering Technology I	PQT 112/3 (3+0) Mathematics for Engineering Technology II	PQT 213/3 (3+0) Mathematics for Engineering Technology III			PTT 333/3 (3+0) Engineering Technology Management	PTT 444/3 (3+0) Technologist in Society	
UNIVERSITY REQUIRED (19)	UUW 131/2 (2+0) Appreciation of Ethics and Civilization	UVA101/ (UNCREDITED) Preparatory English (Band 1&2)	UVW201/2 (2+0) English for General Communication (Band 1,2,3)	UUW XXX/2 (2+0) Option Subject (Foreign Subjects) (Band 4)	UVW 312/2 (2+0) English for Technical Communication (Band 1,2,3,4)			
	UUW130/2 (2+0) Philosophy and Current Issues	UVW 410/(2+0) University Malay Language	PUW 122/2 (2+0) Skills & Technology in Communication	UUW 235/2 (2+0) Ethnic Relation				
	UZW XXX/1 Co-Curricular Activity	UZW XXX/1 Co-Curricular Activity		UUW 224/2 (2+0) Engineering Entrepreneurship				
142	21	18	21	17	19	18	17	12
142	21	18	19	19	19	18	17	12
Total Units for Graduation = 142								

Elective 1	Elective 2	Elective 3
A1. PTT 360/3 (3+0) Biotechnology Facility Design A2. PTT 361/3 (3+0) Scale up & Process Optimization	B1. PTT 368/3 (3+0) Bioactive Compounds Extraction Technology B2. PTT369/3 (3+0) Sustainable Green Technology	C1. PTT 456/3 (3+0) Bioenergy Production Technology C2. PTT457/3 (3+0) Food Processing Technology
Chemical Engineering Subjects	Industrial Biotechnology Subjects	Elective Subjects

Note: Course UUW 129/2 Introduction to Philosophy is replaced with UUW130/2 Philosophy and Current Issues
Course UUW 233/2 Islamic Civilization & Asian Civilization is replaced with UUW131/2 Appreciation of Ethics and Civilization

UR6524004
Bachelor of Chemical Engineering Technology (Food Technology) With Honours

Programme Educational Objective (PEO)

PEO 1
Engineering technology graduates engaged in the field of chemical engineering technology as demonstrated through career advancement

PEO 2
Engineering technology graduates who are members and contribute to professional society.

PEO 3
Engineering technology graduates embracing in life-long learning or pursuing continuing education opportunities.

PEO 4
Engineering technology graduates who are technopreneurs.

Programme Outcomes (PO)

PO 1
Knowledge: apply knowledge of mathematics, science, engineering fundamentals and an engineering specialisation to defined and applied engineering procedures, processes, systems or methodologies.

PO 2
Problem analysis: Identify, formulate, research literature and analyse broadly-defined engineering problems reaching substantiated conclusions using analytical tools appropriate to their discipline or area of specialisation.

PO 3
Design/ development of solutions: Design solutions for broadly-defined engineering technology problems and contribute to the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

PO 4
Investigation: Conduct investigations of broadly-defined problems; locate, search and select relevant data from codes, data bases and literature, design and conduct experiments to provide valid conclusions.

PO 5
Modern Tool Usage: Select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to broadly-defined engineering problems, with an understanding of the limitations.

PO 6
The Engineer and Society: Demonstrate understanding of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technology practice and solutions to broadly-defined engineering problems.

PO 7
Environment and Sustainability: Understand the impact of engineering technology solutions of broadly-defined engineering problems in societal and environmental context and demonstrate knowledge of and need for sustainable development.

PO 8
Ethics: Understand and commit to professional ethics and responsibilities and norms of engineering technology practice.

PO 9
Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse technical teams.

PO 10
Communications: Communicate effectively on broadly-defined engineering activities with the engineering community and with society at large, by being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11
Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member and leader in a team and to manage projects in multidisciplinary environments.

PO 12
Life Long Learning: Recognize the need for, and have the ability to engage in independent and life-long learning in specialist technologies.

CURRICULUM STRUCTURE
BACHELOR OF CHEMICAL ENGINEERING TECHNOLOGY (FOOD TECHNOLOGY) WITH HONOURS
ACADEMIC SESSION (2020/2021)

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEM	I	II	III	IV	V	VI	VII	VIII
Discipline Core (87) & Elective (9)	PTT153/3 Materials Engineering	PTT152/2 Physical Chemistry	PTT251/3 Thermodynamics for Chemical Engineering	PTT255/3 Reaction Engineering	PTT351/2 Safety & Loss Prevention	PTT353/3 Final Year Project I	PTT451/5 Final Year Project II	PIT 404 INDUSTRIAL TRAINING
	PTT155/3 Organic Chemistry	PTT158/3 Analytical Chemistry	PTT252/3 Fluid Mechanics	PTT254/3 Mass Transfer for Chemical Engineering	PTT355/3 Process Control & Dynamics	PTT354/3 Plant Design Project 1	PTT452/3 Plant Design Project 2	
	PTT157/2 Engineering Graphics for Chemical Engineering	PTT156/4 Principles of Chemical Process	PTT253/3 Heat Transfer for Chemical Engineering	PTT 272/3 Food Science & Biochemistry	PTT356/3 Separation Engineering	PTT375/3 Food Waste Management & Utilization	PTT 471/3 Food Product Development & Commercialization	
	PCT111/3 Engineering Skills	PTT154/2 Introduction to Process Instrumentation	PTT 271/3 Food Microbiology	PTT 273/3 Postharvest Technology	PTT 371/3 Analysis & Instrumentation for Food Technology	PTT 376/3 Quality & Safety Management System in Food Production		
	PLT121/3 Electrical Technology				PTT 372/4 Food Processing & Preservation			
					Elective 1/3 (A1 or B1)	Elective 2/3 (A2 or B2)	Elective 3/3 (A3 or B3)	
Common Core (15)	PQT 111/3 Mathematics for Engineering Technology I	PQT 112/3 Mathematics for Engineering Technology II	PQT 213/3 Mathematics for Engineering Technology III			PTT 333/3 Engineering Technology Management	PTT 444/3 Engineering Technologist in Society	
University Required (19 or 21)	*UVA101/ 0 Preparatory English (Band 2)	**UVW 201/2 English for General Communication (MUET Band 2,3)	UVW 312/2 English for Technical Communication (MUET Band 2,3,4)	UUW XXX/2 Option Subject (MUET Band 4 & above)				
		UUW 130/2 Philosophy & Current Issues	UVW 410/(2+0) University Malay Language	UUW 131/2 Appreciation of Ethics and Civilization				
		UUW 322/2 Thinking Skills		PUW 122/2 Skills & Technology in Communication				
	UZW XXX/1 Co-Curricular Activity	UZW XXX/1 Co-Curricular Activity		UUW 224/2 Engineering Entrepreneurship				

UR6521005
Bachelor of Technology in Welding with Honours

Programme Educational Objective (PEO)

PEO 1
To produce welding technologist that perform related welding work including maintenance, fabricator, design, safety advisor and production manager.

PEO 2
To produce technopreneurs in related welding technology.

PEO 3
To produce relevant respected referred professionals in welding technology

Programme Outcomes (PO)

PO 1
Apply knowledge of technology fundamentals to broadly-defined procedures processes, systems and methodologies in welding technology.

PO 2
Able to suggest and apply latest tools and techniques to solve broadly-defined problems.

PO 3
Demonstrate strong analytical and critical thinking skills to solve broadly-defined problems in welding technology.

PO 4
Able to communicate and articulate effectively in both verbal and written among technologist communities and society at large.

PO 5
Demonstrate understanding of the societal related issues and the consequent responsibilities relevant to broadly-defined technology practices

PO 6
Recognize the needs for professional development and to engage independent lifelong learning in specialist technologists.

PO 7
Demonstrate an awareness of management and technopreneurship practices in real perspective.

PO 8
Demonstrate professionalism and social and ethical consideration.

PO 9
Demonstrate leadership quality, mentoring and work effectively in diverse teams.

CURRICULUM STRUCTURE
BACHELOR OF TECHNOLOGY IN WELDING WITH HONOURS
(INTAKE SESSIONS 2020/2021)

YEAR	FIRST			SECOND			THIRD			FOURTH
SEMESTER	I	II		III	IV		V	VI	Short	VII
COMMON CORE	VDT130/4 CAD and Welding Graphic	VDT133/3 Product Design in Welding		VDT230/4 Material Behaviour in Welding	VDT236/4 Computer Aided Analysis		VDT330/4 Welding Quality Assurance	VDT315/4 FYP 1	VDT415/6 FYP 2	VDTXX/12 Industrial Training
	VDT131/4 Safety in Welding	VDT134/4 Welding Documentation		VDT231/4 Safety Management	VDT237/4 Imperfection in Welding and Testing		VDT331/4 Economic of Welding and Procurement	VDT334/3 Cyber Physical System in Welding		
	VDT132/4 Metal Fabrication Process	VDT135/4 Non-Conventional Welding Process		VDT232/4 Welding Design Analysis	VDT238/4 Welding Electrical Equipment		VDT332/4 Non - Destructive Test	VDT335/4 Reclamation Workshop		
				ELECTIVE: VDT233/4 Welding Technology/ VDT235/4 Welding Inspection / VDT 235/4 NDT Professional	VDT239/4 Capstone Technopreneur Project 1		VDT333/4 Capstone Technopreneur Project 2	VDT336/4 Managing Production/ Supervisory		
	12	11		16	16		16	15	6	12
UNIVERSITY CORE	XXX/1 Curriculum 1	XXX/1 Curriculum 2		XXX/2 Third Language: Mandarin	UVW312/2 English Technical for Communication		UUW131/2 Appreciation of Ethics and Civilization			
	UVW410/2 University Malay Language	UUW130/2 Philosophy and Current Issues								
	PUW122/2 Skill and Technology and communication	UVW201/2 English For General Communication								
		UUW235/2 Engineering Entrepreneurship								
	5	7		2	2		2			
TOTAL CREDIT PER SEMESTER	17	18		18	18		18	15	6	12
TOTAL CREDIT FOR GRADUATION						122				

LIST OF COURSES:
ENGINEERING COURSES

EBT105	KIMIA ORGANIK [ORGANIC CHEMISTRY]
EBT109	KAWALAN MUTU KEJURUTERAAN [ENGINEERING QUALITY CONTROL]
EBT110	PENGENALAN KEPADA POLIMER [INTRODUCTION TO POLYMER]
EBT112	STATIK [STATICS]
EBT114	TEKNOLOGI ELEKTRIK [ELECTRICAL TECHNOLOGY]
EBT131	MEKANIK KEJURUTERAAN [ENGINEERING MECHANICS]
EBT151	LUKISAN KEJURUTERAAN [ENGINEERING DRAWING]
EBT207	STRUKTUR DAN SIFAT-SIFAT BAHAN [MATERIALS STRUCTURE & PROPERTIES]
EBT211	METALURGI FIZIKAL [PHYSICAL METALLURGY]
EBT212	DINAMIK [DYNAMICS]
EBT213	METALURGI EKTRAKTIF I [EXTRACTIVE METALLURGY I]
EBT222	ASAS-ASAS SERAMIK [FUNDAMENTALS OF CERAMICS]
EBT231	BAHAN-BAHAN ELASTOMERIK [ELASTOMERIC MATERIALS]
EBT232	SINTESIS POLIMER [POLYMER SYNTHESIS]
EBT235	STRUKTUR DAN SIFAT-SIFAT POLIMER [STRUCTURE AND POLYMER PROPERTIES]
EBT238	KIMIA FIZIKAL [PHYSICAL CHEMISTRY]
EBT239	TERMODINAMIK POLIMER [THERMODYNAMICS IN POLYMER]
EBT240	BAHAN-BAHAN PLASTIK [PLASTIC MATERIALS]
EBT251	KIMIA FIZIKAL BAHAN [ENGINEERING MATERIALS CHEMISTRY]
EBT252	KEKUATAN BAHAN [STRENGTH OF MATERIALS]
EBT253	KIMIA ANALITIKAL [ANALYTICAL CHEMISTRY]
EBT254	FENOMENA PENGANGKUTAN DAALM PROSES BAHAN [TRANSPORTATION PHENOMENON IN MATERIALS PROCESSING]
EBT303	KAWALAN PROSES [PROCESS CONTROL]
EBT317	MEKANIK BENDALIR [FLUID MECHANICS]
EBT318	KEJURUTERAAN PERMUKAAN [SURFACE ENGINEERING]
EBT323	PENCIRIAN BAHAN [MATERIALS CHARACTERIZATION]
EBT324	TERMODINAMIK BAHAN [MATERIALS THERMODYNAMICS]

EBT326	SIFAT-SIFAT POLIMER [POLYMER PROPERTIES]
EBT329	PEMPROSESAN POLIMER [POLYMER PROCESSING]
EBT333	PEMPROSESAN GETAH [RUBBER PROCESSING]
EBT334	PENGUJIAN DAN PENCIRIAN POLIMER [POLYMER TESTING AND CHARACTERIZATION]
EBT335	ADUNAN-ADUNAN POLIMER [POLYMER BLENDS]
EBT336	PEMPROSESAN PLASTIK [PLASTIC PROCESSING]
EBT337	PEMINDAHAN JISIM DAN HABA DALAM POLIMER [MASS AND HEAT TRANSFER IN POLYMER]
EBT338	PEMPROSESAN LATEKS [LATEX PROCESSING]
EBT351	BAHAN ELEKTRONIK KEJURUTERAAN [ELECTRONIC MATERIALS ENGINEERING]
EBT402	KEJURUTERAAN KAKISAN [CORROSION ENGINEERING]
EBT405	UJIAN TIDAK MUSNAH [NON DESTRUCTIVE TESTING]
EBT418	METALURGI KIMPALAN [WELDING METALLURGY]
EBT419	METALURGI GUNAAN [APPLIED METALLURGY]
EBT420	ANALISIS FORENSIK METALURGI [METALLURGICAL FORENSIC ANALYSIS]
EBT421	KEJURUTERAAN BAHAN TERMAJU [ADVANCED MATERIALS ENGINEERING]
EBT424	BAHAN BINAAN [CONSTRUCTION MATERIALS]
EBT427	SERAMIK TEKNIKAL [TECHNICAL CERAMIC]
EBT429	BAHAN KOMPOSIT [COMPOSITE MATERIALS]
EBT435	[POLYMER IN ELECTRONIC APPLICATION]
EBT437	KOMPOSIT POLIMER [POLYMER COMPOSITES]
EBT439	PEMBUNGKUSAN ELEKTRONIK TERMAJU [ADVANCED ELECTRONIC PACKAGING]
EBT441	REKABENTUK KEJURUTERAAN POLIMER [POLYMER ENGINEERING DESIGN]
EBT442	PROJEK REKABENTUK BERSEPADU KEJURUTERAAN POLIMER [POLYMER ENGINEERING INTEGRATED DESIGN PROJECT]
EBT445	PROJEK TAHUN AKHIR I [FINAL YEAR PROJECT I]
EBT446	PROJEK TAHUN AKHIR II [FINAL YEAR PROJECT II]
EBT447	PEMILIHAN REKABENTUK BAHAN [MATERIALS SELECTION AND DESIGN]
EBT448	PEREKAT POLIMER DAN PENGLITUP [POLYMER ADHESIVE AND COATING]
EBT449	POLIMER MESRA ALAM [ENVIRONMENTAL FRIENDLY POLYMER]
ECT112	KEMAHIRAN KEJURUTERAAN [ENGINEERING SKILLS]

ERT105	TEKNOLOGI ELEKTRIK [ELECTRICAL TECHNOLOGY]
ERT110	KIMIA ORGANIK I [ORGANIC CHEMISTRY I]
ERT111	PENGENALAN KEPADA PRINSIP-PRINSIP SAINS BIOLOGI DAN KIMIA [INTRODUCTION TO BIOLOGICAL AND CHEMICAL SCIENCE PRINCIPLES]
ERT112	SAINS BIOKIMIA [BIOCHEMICAL SCIENCE]
ERT113	PENGENALAN KEPADA KELESTARIAN [INTRODUCTION TO SUSTAINABILITY]
ERT114	MEKANIK KEJURUTERAAN [ENGINEERING MECHANICS]
ERT115	TERMODINAMIK [THERMODYNAMICS]
ERT116	KIMIA ORGANIK II [ORGANIC CHEMISTRY II]
ERT117	INSTRUMENTASI PROSES [PROCESS INSTRUMENTATIONS]
ERT201	TERMODINAMIK KEJURUTERAAN KIMIA [CHEMICAL ENGINEERING THERMODYNAMICS]
ERT204	KIMIA ANALISIS [ANALYTICAL CHEMISTRY]
ERT214	IMBANGAN BAHAN DAN TENAGA [MATERIAL AND ENERGY BALANCE]
ERT215	MEKANIK BENDALIR [FLUID MECHANICS]
ERT217	PEMINDAHAN JISIM [MASS TRANSFER]
ERT218	PEMINDAHAN HABA [HEAT TRANSFER]
ERT219	APLIKASI FENOMENA PENGANGKUTAN [TRANSPORT PHENOMENA APPLICATION]
ERT221	SISTEM BIOREAKTOR [BIOREACTOR SYSTEM]
ERT305	KEMAHIRAN DALAM PROSES PEMISAHAN [SKILLS IN SEPARATION PROCESS]
ERT316	KEJURUTERAAN TINDAKBALAS [REACTION ENGINEERING]
ERT319	RAWATAN SISA INDUSTRI [INDUSTRIAL WASTE TREATMENT]
ERT321	KAWALAN PROSES DAN DINAMIK [PROCESS CONTROL & DYNAMICS]
ERT322	KESELAMATAN DAN PENCEGAHAN KEHILANGAN [SAFETY & LOSS PREVENTION]
ERT324	PROSES PEMISAHAN [SEPARATION PROCESS]
ERT325	EKONOMI KEJURUTERAAN [ENGINEERING ECONOMICS]
ERT326	KEJURUTERAAN BIOKIMIA [BIOCHEMICAL ENGINEERING]
ERT327	SIMULASI UNTUK KEJURUTERAAN KIMIA [SIMULATION FOR CHEMICAL ENGINEERING]
ERT328	PEMPROSESAN KOLOID DAN BAHAN BIO [COLLOIDAL AND BIOMATERIALS PROCESSING]

ERT329	REKABENTUK KEJURUTERAAN BIOREAKTOR [BIOREACTOR ENGINEERING DESIGN]
ERT330	PEMANFAATAN BIOMASS [BIOMASS UTILIZATION]
ERT401	REKABENTUK LOGI KIMIA I [CHEMICAL PLANT DESIGN I]
ERT402	REKABENTUK LOGI KIMIA II [CHEMICAL PLANT DESIGN II]
ERT432	AMALAN PENGILANGAN BAIK [GOOD MANUFACTURING PRACTICE]
ERT433	PEMPROSESAN HALAL [HALAL PROCESSING]
ERT434	KEJURUTERAAN TENAGA DAN UTILITI PROSES [ENERGY AND PROCESS UTILITY ENGINEERING]
ERT435	TENAGA LESTARI [SUSTAINABLE ENERGY]
ERT436	PROSES PETROKIMIA [PETROCHEMICAL PROCESS]
ERT437	KEJURUTERAAN FARMA DAN NUTRASEUTIKAL [PHARMA AND NUTRACEUTICAL ENGINEERING]
ERT439	SEL BAHAN API [FUEL CELLS]
ERT442	JURUTERA PROFESIONAL [PROFESIONAL ENGINEERS]
ERT443	PENGURUSAN UNTUK JURUTERA [MANAGEMENT FOR ENGINEERS]
ERT445	PROJEK TAHUN AKHIR I [FINAL YEAR PROJECT I]
ERT446	PROJEK TAHUN AKHIR II [FINAL YEAR PROJECT II]
PCT111	KEMAHIRAN KEJURUTERAAN [ENGINEERING SKILLS]
PTT152	KIMIA FIZIKAL [PHYSICAL CHEMISTRY]
PTT153	KEJURUTERAAN BAHAN [MATERIALS ENGINEERING]
PTT154	PENGENALAN KEPADA PROSES INSTRUMENTASI [INTRODUCTION TO INSTRUMENTATION PROCESS]
PTT155	KIMIA ORGANIK [ORGANIC CHEMISTRY]
PTT156	PRINSIP – PRINSIP BAGI PROSES-PROSES KIMIA [PRINCIPLES OF CHEMICAL PROCESSES]
PTT157	GRAFIK KEJURUTERAAN UNTUK KEJURUTERAAN KIMIA [ENGINEERING GRAPHICS FOR CHEMICAL ENGINEERING]
PTT158	KIMIA ANALISIS [ANALYTICAL CHEMISTRY]
PTT251	TERMODINAMIK UNTUK KEJURUTERAAN KIMIA [THERMODYNAMICS FOR CHEMICAL ENGINEERING]
PTT252	MEKANIK BENDALIR [FLUID MECHANICS]
PTT253	PEMINDAHAN HABA UNTUK KEJURUTERAAN KIMIA [HEAT TRANSFER FOR CHEMICAL ENGINEERING]
PTT254	PEMINDAHAN JISIM UNTUK KEJURUTERAAN KIMIA [MASS TRANSFER FOR CHEMICAL ENGINEERING]
PTT255	KEJURUTERAAN TINDAKBALAS [REACTION ENGINEERING]

PTT256	MIKROBIOLOGI INDUSTRI [INDUSTRIAL MICROBIOLOGY]
PTT257	BIOKIMIA DAN TEKNOLOGI ENZIM [BIOCHEMISTRY AND ENZYME TECHNOLOGY]
PTT258	KEJURUTERAAN BIOMOLEKUL DAN GENETIK [BIOMOLECULAR AND GENETIC ENGINEERING]
PTT259	PROSES DAN PRODUK OLEOKIMIA [OLEOCHEMICAL PROCESS AND PRODUCTS]
PTT260	TEKNOLOGI PEMPROSESAN SUMBER BIO [BIORE SOURCES PROCESSING TECHNOLOGY]
PTT261	UTILITI LOJI [PLANT UTILITIES]
PTT262	TENAGA BOLEH BAHARU [RENEWABLE ENERGY]
PTT271	MIKROBIOLOGI MAKANAN [FOOD MICROBIOLOGY]
PTT272	SAINS DAN BIOKIMIA MAKANAN [FOOD SCIENCE AND BIOCHEMISTRY]
PTT273	TEKNOLOGI LEPASTUAI [POSTHARVEST TECHNOLOGY]
PTT333	PENGURUSAN TEKNOLOGI KEJURUTERAAN [ENGINEERING TECHNOLOGY MANAGEMENT]
PTT351	KESELAMATAN DAN PENCEGAHAN KEHILANGAN [SAFETY AND LOSS PREVENTION]
PTT352	KEJURUTERAAN ALAM SEKITAR [ENVIRONMENTAL ENGINEERING]
PTT353	PROJEK TAHUN AKHIR I [FINAL YEAR PROJECT I]
PTT354	PROJEK REKABENTUK LOJI I [PLANT DESIGN PROJECT I]
PTT355	KAWALAN PROSES DAN DINAMIK [PROCESS CONTROL AND DYNAMICS]
PTT356	KEJURUTERAAN PEMISAHAN [SEPARATION ENGINEERING]
PTT357	SEL DAN TEKNOLOGI TISU KULTUR [CELL AND TISSUE CULTURE TECHNOLOGY]
PTT358	PENGURUSAN DAN PENGGUNAAN SISA [WASTE MANAGEMENT AND UTILISATION]
PTT359	TEKNOLOGI PEMPROSESAN HULUAN DAN HILIRAN [UPSTREAM AND DOWNSTREAM PROCESSING TECHNOLOGY]
PTT360	REKABENTUK FASILITI BIOTEKNOLOGI [BIOTECHNOLOGY FACILITY DESIGN]
PTT361	PENINGKATAN SKALA DAN OPTIMUM [SCALE UP AND OPTIMISATION]
PTT362	TEKNOLOGI BIOFARMASEUTIKAL [BIOPHARMACEUTICAL TECHNOLOGY]
PTT363	TEKNOLOGI PEMPROSESAN FARMASEUTIKAL [PHARMACEUTICAL PROCESSING TECHNOLOGY]

PTT364	TEKNOLOGI MEMBRAN TERMAJU DAN APLIKASI [ADVANCE MEMBRANCE TECHNOLOGY AND APPLICATIONS]
PTT365	TEKNOLOGI PEMPROSESAN PETROLEUM & GAS [PETROLEUM & GAS PROCESSING TECHNOLOGY]
PTT366	TEKNOLOGI PEMPROSESAN POLIMER [POLYMER PROCESSING TECHNOLOGY]
PTT367	ELEKTROKIMIA INDUSTRI [INDUSTRIAL ELECTROCHEMISTRY]
PTT368	TEKNOLOGI PENGEKSTRAKAN SEBATIAN BIOAKTIF [BIOACTIVE COMPOUND EXTRACTION TECHNOLOGY]
PTT371	ANALISIS DAN INSTRUMENTASI UNTUK TEKNOLOGI MAKANAN [ANALYSIS AND INSTRUMENTATION FOR FOOD TECHNOLOGY]
PTT372	PEMPROSESAN DAN PENGAWETAN MAKANAN [FOOD PROCESSING AND PRESERVATION]
PTT373	TEKNOLOGI LELEMAK DAN MINYAK [FATS AND OIL TECHNOLOGY]
PTT374I	NGREDIEN MAKANAN [FOOD INGREDIENTS]
PTT375	PENGURUSAN DAN PENGGUNAAN SISA MAKANAN [FOOD WASTE MANAGEMENT AND UTILIZATION]
PTT376	SISTEM PENGURUSAN KUALITI DAN KESELAMATAN DALAM PENGELUARAN MAKANAN [QUALITY AND SAFETY MANAGEMENT oSYSTEM IN FOOD PRODUCTION]
PTT377	MAKANAN BERFUNGSI DAN NUTRASEUTIKAL [FUNCTIONAL FOODS AND NUTRACEUTICAL]
PTT378	TEKNOLOGI TENUSU DAN DAGING [DAIRY AND MEAT TECHNOLOGY]
PTT444	JURUTEKNOLOGI DALAM MASYARAKAT [TECHNOLOGIST IN SOCIETY]
PTT451	PROJEK TAHUN AKHIR II [FINAL YEAR PROJECT II]
PTT452	PROJEK REKABENTUK LOJI 2 [PLANT DESIGN PROJECT 2]
PTT453	ISU DAN KOMERSIALISASI DALAM BIOTEKNOLOGI [ISSUES AND COMMERCIALISATION IN BIOTECHNOLOGY]
PTT454	PENGENALAN KEPADA BIOKIMIA [INTRODUCTION TO BIOCHEMISTRY]
PTT456	TEKNOLOGI PENGHASILAN TENAGA BIO [BIOENERGY PRODUCTION TECHNOLOGY]
PTT457	TEKNOLOGI PEMPROSESAN MAKANAN [FOOD PROCESSING TECHNOLOGY]
PTT458	JAMINAN DAN KAWALAN KUALITI DALAM KEJURUTERAAN KIMIA [QUALITY ASSURANCE AND CONTROL IN CHEMICAL ENGINEERING]
PTT459	TEKNOLOGI PEMPROSESAN PARTIKEL [PARTICLE PROCESSING TECHNOLOGY]

PTT471	PEMBANGUNAN DAN PENGKOMERSILAN PRODUK MAKANAN [FOOD PRODUCT DEVELOPMENT AND COMMERCIALISATION]
PTT472	TEKNOLOGI PEMBUNGKUSAN MAKANAN [FOOD PACKAGING TECHNOLOGY]
PTT473	TEKNOLOGI POULTRI DAN IKAN [POULTRY AND FISH TECHNOLOGY]
DBT101	PENGENALAN KEPADA BAHAN KEJURUTERAAN [INTRODUCTION TO ENGINEERING MATERIALS]
DBT102	LOGAM FERUS [FERROUS METAL]
DBT107	ASAS STATIK DAN DINAMIK [BASIC STATIC & DYNAMIC]
DBT108	ASAS BENGKEL LOGAM [BASIC METAL WORKSHOP]
DBT109	TERMODINAMIK KIMIA [CHEMICAL THERMODYNAMICS]
DBT110	SAINS KEJURUTERAAN [ENGINEERING SCIENCE]
DBT111	LUKISAN KEJURUTERAAN DAN LUKISAN TERBANTU KOMPUTER [ENGINEERING DRAWING AND COMPUTER AIDED DRAFTING]
DBT202	LOGAM BUKAN FERUS [NON FERROUS METAL]
DBT203	TEKNOLOGI PENGEKSTRAKAN LOGAM METAL EXTRACTIVE TECHNOLOGY]
DBT204	TEKNOLOGI KIMPALAN LOGAM 1 [TECHNOLOGY OF METAL WELDING 1]
DBT206	TEKNOLOGI FOUNDRI [FOUNDRY TECHNOLOGY]
DBT208	TEKNOLOGI KIMPALAN LOGAM 2 [TECHNOLOGY OF METAL WELDING 2]
DBT209	PENGUJIAN LOGAM [METALS TESTING]
DBT210	KEKUATAN BAHAN [STRENGTH OF MATERIALS]
DBT211	ASAS PEMESINAN LOGAM [BASIC MACHINING OF METALS]
DBT301	METALURGI SERBUK [POWDER METALLURGY]
DBT302	RAWATAN HABA [HEAT TREATMENT]
DBT303	PERLINDUNGAN LOGAM [METALS PROTECTION]
DBT304	KESELAMATAN PEKERJAAN DAN PENGURUSAN KUALITI [OCCUPATIONAL SAFETY AND QUALITY MANAGEMENT]
DBT351	PROJEK SEMETRAL [SEMESTRAL PROJECT]

COURSE SYLLABUS:

ENGINEERING COURSES

EBT105 KIMIA ORGANIK [ORGANIC CHEMISTRY]
No of Credits: 4

Course Synopsis:
This course is developed to introduce the basic concept of organic chemistry, chemical structures and reactions, to familiar with mechanism concept of reactions and to understand the theoritical and conceptual background of organic chemistry.

Course Outcomes:
CO1 - Ability to identify chemistry fundamentals.
CO2 - Ability to explain and distinguish selected organic compounds both: aliphatic and aromatic organic compounds.
CO3 - Ability to discuss and analyze concepts and principles on mechanism of major organic reactions.
CO4 - Ability to analyze important organic phenomena related to polymer structure and properties.

EBT109 KAWALAN MUTU KEJURUTERAAN [ENGINEERING QUALITY CONTROL]
No of Credits: 3

Course Synopsis:
introduction to quality: Definition of quality, history if quality, Overview of quality management- principles and practices, Quality Management system-ISO 9000, GMP, Basic Quality tools, cost of quality, fundamental of statistics.

Course Outcomes:
CO1 - Ability to differentiate the essentials of the quality management philosophy and theories of experts including Deming and Juran. Ability to develop and implement TQM in work place as well as can contribute in developing ISO 9000 Systems.
CO2 - Ability to apply statistical process control techniques to monitor industrial process variation as well as interpret the chart to identify potential corrective plan.
CO3 - Ability to apply acceptance sampling plan curves, calculate component failure rate and reliability of the system

EBT110 PENGENALAN KEPADA POLIMER [INTRODUCTION TO POLYMER]
No of Credits: 3

Course Synopsis:
The aim of this course is to introduce the basic knowledge of polymer classification, identification, properties and their application in polymer engineering.

Course Outcomes:
CO1 - Ability to describe and differentiate the importance of polymers and classification.
CO2 - Ability to describe and compare the basic principles of polymerization reaction and polymer identification.
CO3 - Ability to analyze the basic concept of properties polymers (stress strain) related to engineering materials.
CO4 - Ability to categorize a wide range of polymer applications and understand polymer in its environmental impact.

EBT112 STATIK [STATICS]
No of Credits: 3

Course Synopsis:
The course involves the introduction to mechanics, force vector, equilibrium of particle, force system resultants,equilibrium of rigid body, structural analysis, friction, centroids and center of gravity.

Course Outcomes:
CO1 - Ability to analyze and apply the basic concept of forces and moments
CO2 - Abality to analyze and apply principles of equilibrium in particles

and rigid bodies
CO3 - Ability to analyze and solve the structures and framework problems
CO4 - Ability to determine the properties of areas
CO5 - Ability to determine and analyses of the mechanical friction

EBT114 TEKNOLOGI ELEKTRIK [ELECTRICAL TECHNOLOGY]
No of Credits: 3

Course Synopsis:
This course intended to provide students with clear understanding of the DC and AC circuits, electro-magnetism and magnatic circuits. They will also gain an understanding of the basic operating principles and performances analysis of theree most commkonly used electric machines, namely, transformers, dc machines and induction motors.

Course Outcomes:
CO1 - Ability to analyze the DC and AC circuits by using Ohm's law, Kirchhoff's current law, Kirchhoff's voltage law and Thevenin's theorem.
CO2 - Ability to calculate and evaluate properties of magnetic materials such as magnetic field, magnetic induction, eddy current etc. Using basic electromagnetic principles.
CO3 - Ability to evaluate and design dc and ac machines such as transformer, induction motors etc using properties of suitable magnetic materials.

EBT131 MEKANIK KEJURUTERAAN [ENGINEERING MECHANICS]
No of Credits: 3

Course Synopsis:
The main obejctives of this course is to expose students about basic concepts of force and resultant force. They will also learn about friction and distributed forces. Students will aplly this basic knowledge to analyze the stability and equilibrium of structures such as truss and mechanics. In terms of dynamics, the students will learn how to solve kinematics problems, which can be considered by using forces acceleration method and work energy method.

Course Outcomes:
CO1 - Ability to describe and calculate basic concepts and principles of physics related to engineering mechanics in terms of statics, such as force, First Law of Motion, Third Law of Motion, truss, frame, machine and friction.
CO2 - Ability to evaluate and solving static problems through further analysis by applying concepts and principles in describing, sketching and/or drawing free body diagram.
CO3 - Ability to describe and calculate basic concepts and principles of physics related to engineering mechanics in terms of dynamics, such as kinematic, kinetic, Second Law of Motion, position, velocity, acceleration, work, energy and impulse.
CO4 - Ability to evaluate and solving dynamic problems through further analysis by applying concepts and principles in describing, sketching and/or drawing free body diagram.

EBT151 LUKISAN KEJURUTERAAN [ENGINEERING DRAWING]
No of Credits: 3
Course Synopsis:
This course will introduce student to engineering Drawing including basic drafting skills- lines and lettering, circles and arcs, basic dimensioning.

Course Outcomes:
CO1 - Ability to describe and calculate basic concepts and principles of physics related to engineering mechanics in terms of statics, such as force, First Law of Motion, Third Law of Motion, truss, frame, machine and friction.
CO2 - Ability to evaluate and solving static problems through further analysis by applying concepts and principles in describing, sketching and/or drawing free body diagram.
CO3 - Ability to describe and calculate basic concepts and principles of physics related to engineering mechanics in terms of dynamics, such as kinematic, kinetic, Second Law of Motion, position, velocity, acceleration, work, energy and impulse.
CO4 - Ability to evaluate and solving dynamic problems through further analysis by applying concepts and principles in describing, sketching and/or drawing free body diagram.

EBT207 STRUKTUR DAN SIFAT-SIFAT BAHAN [MATERIALS STRUCTURE & PROPERTIES]
No of Credits: 4

Course Synopsis:
This course introduces students to historical perspectives, materials science and engineering, materials classification.The contents include fundamental concept of atomic structure and their bonding; the classification of crystalline and non crystalline materials and their applications. ; comprehensive guide for identification of imperfection in solids such as point defects in metals, ceramic, impurities in solids, defects in polymer, dislocations (linear defects), interfacial defects, bulk or volume defect, atomic vibrations; introduction to diffusion. Mechanical properties of materials involves stress-strain behavior, non elastic and elastic properties of materials, compression property, shear, fatigue, creep, and flexural strength, hardness of materials, electrical properties - Ohm's law, electrical conductivity, electronic and ionic conduction, electrical properties using Ohm's Law, energy band structure, conduction in terms of band and atomic bonding models, electron motion, semiconductivity, electrical conduction in materials, thermal properties - heat capacity, thermal expansion, thermal conductivity, thermal stresses, magnetic properties - diamagnetism, paramagnetisme, ferromagnetisme, antiferromagnetisme, temperature effect on the magnetic behaviour, domain and hysteresis, hard and soft magnets, superconductor and optical properties - electromagnetic ray, solid and light interaction, atomic and electronic interaction, optical properties of metals and non metals, refraction, reflection, absorption, transmission, applications of optical phenomena - laser, fibre optic in communication.

Course Outcomes:
CO1 - Able to identify and differentiate the type of atomic bonding and materials structure
CO2 - Able identify various type of defect and compare basic concepts of diffusion in materials
CO3 - Able to assess and evaluate the physical and mechanical properties of various type of materials
CO4 - Able to correlate physical and mechanical properties and predict the factor that affecting these two properties of mater

EBT211 METALURGI FIZIKAL [PHYSICAL METALLURGY]
No of Credits: 4

Course Synopsis:
This course will introduce student to differentiate between process or extractive metallurgy and physical metallurgy. General characteristic of metals, physical and mechanical properties of metals, atomic structure and bonding of metals. Phase transformation concepts in metals. Phase stability, categories of phase transformation, and kinetics of phase transformation. Solidification Process - Process of solidification and two energy involved in solidification process, distinguish between equiaxed and columnar grains. Imperfections in Solid - Imperfection in solid metals and deformation mechanism for metals (edge and screw dislocation, plastic and elastic deformation). Slip: concept of slip, dislocations, twins, and their role in plastic deformation of single crystal. Critical slip system in FCC, BCC and HCP single crystal. Resolved shear stress by using Schmid Law. Brief Introduction to Phase Diagram - Binary isomorphous system and binary eutectic system, phase diagram with intermediate phase or compound. Iron- iron carbide phase diagram, microstructure development in Fe-C alloy. Basic concept, solid state reaction kinetics, multiphase transformation, microstructure changes, and Fe-C properties. Introduction to IT Diagram - Isothermal transformation diagram (IT) and continuous cooling transformation (CCT) diagram. Strengthening Mechanism - Grain size reduction, Solid solution strengthening, Strain hardening, Dispersion strengthening by phase transformation, interfacial energy, age/precipitation hardening, and microstructural development in age hardening. Hardenability - Mechanical behaviour of Fe-C alloy, tempered martensite, hardenability, jominy test, effect of alloying to hardenability, cold work. Recovery, recrystallization and grain growth. Procedure of steel heat treatment: austenitizing, annealing, full annealing, normalizing, quenching, tempering. Surface Heat Treatment - Introduction, types of treatment (carburizing, nitriding, carbonitriding and cyaniding). Diffusion- steady and non steady state diffusion. Non Ferous Alloys - Classification, heat treatability, microstructure and general properties of aluminum alloys, copper alloys, magnesium alloys, titanium alloys, nickel alloys. Metallography Quantitative - Grain size by metallography quantitative, ASTM grain size number and average grain size diameter. Important of grain size on the behaviour of crystalline metals.

Course Outcomes:
CO1 - Ability to define and describe the important basics of physical metallurgy and phase transformation
CO2 - Ability to understand the phase diagrams and their relation with microstructures
CO3 - Ability to design heat treatment process to achieve the required properties for required application

EBT212 DINAMIK [DYNAMICS]
No of Credits: 3

Course Synopsis:
Students will be introduced to the concepts of mechanics in dynamic conditions. The course is presented in two parts: kinematics, which treats only the geometric aspects of motion, and kinetics, which is the analysis of the forces causing the motion. To develop these principles, student learns the dynamics of a particle, followed by topics in rigid-body dynamics in two and then three dimensions. Emphasis will be given on the kinematics and kinetics of a particle, planar kinematics and kinetics of a rigid body, three dimension kinematics and kinetics of a rigid body.

Course Outcomes:
CO1 - Ability to evaluate the kinematics and kinetics of particle problems
CO2 - Ability to analyze and solve the planar kinematics and kinetics of a rigid body
CO3 - Ability to analyze the three dimensional kinematics and kinetics of a rigid body

EBT213 METALURGI EKTRAKTIF I [EXTRACTIVE METALLURGY I]
No of Credits: 4

Course Synopsis:
This course will introduce student to Mineral Processing - Advantages of mineral processing. Crushing: definition, type of crusher and its characteristics, selection of crusher. Grinding: grinding mills, mill liners, grinding action, critical speed. Laboratory Sizing Control: Sizing methods (screening, sedimentation), sizing scales. Industrial sizing: type of industrial screening, screening efficiency. Gravity concentration: gravity concentration methods (heavy medium separation, jigging, sluicing). Magnetic and Electrostatic Separation: Principles, type of separators. Flotation: process, flotation reagents, conditioning and flotation circuits. Hydrometallurgy - Ore processing using hydrometallurgy method. Kinetic of heterogeneous reaction. Leaching process. Mode and leaching techniques. Solution Purification: Solvent extraction, solvent components (extraction mechanism), counter-current extraction, and application of solvent extraction in industrial worldwide. Purification of pregnant solution: ion exchange and activated carbon. Electrometallurgy - Galvanics: Redox reactions, Electrochemical cells, reactions, and EmF, Cell EmF, Standard EmFs and electrode potentials. Cell types. Electrolytic cells Electrowinning, Electrorefining, Electroextraction, Electroleaching, Electrosynthesis. Metal and metal compound recovery: crystallization, cementation, hydrogen gas reduction. Thermodynamic and hydrogen reduction kinetics.

Course Outcomes:
CO1 - Able to discuss and practice the principle and process involved in mineral processing.
CO2 - Able to discuss and differentiate the theory in hydrometallurgy.
CO3 - Able to discuss and demonstrate the concept in electrometallurgy
CO4 - Able to explain extraction process of some metals that have been established worldwide.

EBT222 ASAS-ASAS SERAMIK [FUNDAMENTALS OF CERAMICS]
No of Credits: 4

Course Synopsis:
This course covers various types of ceramics materials such as structural ceramic, glasses, glass-ceramic and whitewares. Student will be exposed to various types of ceramic raw materials, Formulation and recipes of the ceramic body including the use of binder and additives, function of ceramic component in ceramic body, production of ceramic product from mixture of raw materials. Where steps of powder preparation from raw materials which include crushing, milling, mixing, filter pressing and spray drying will also be included. The course also covers fabrication and forming concept using various shaping methods. Heat treatment process will be discussed for

glasses and glass-ceramics. While drying and firing stage will be explained in detail including type of sintering process and its mechanism. Product and glaze defect will be determined and caused of defect and solving methods will be identified. The properties of the ceramics will be correlated with the selection of raw materials as well as processing steps. Student will also be exposed on mould designing and fabrication using POP, Glaze formulation and production of various glaze appearance for aesthetic value and application will be the most interesting part.

Course Outcomes:

CO1 - Able to determine the principles and engineering knowledge for structural ceramic, white wares, glasses and glass-ceramic.
CO2 - Able to identify suitable raw materials and its function and formulate its compositions for specific application including calculating the compositions of the ceramics body and glaze using various types of raw materials or minerals.
CO3 - Able to describe fabrication process of different types of structural ceramic, whiteware glasses and glass-ceramic. Students should also able to determine the process control parameter.
CO4 - Able to analyzed sintering mechanism in ceramic processing, product defect as well as phase transition which including nucleation and the growth of the crystals.
CO5 - Able to design and fabricate ceramic mould using POP and produced ceramic product via slip casting process

EBT231 BAHAN-BAHAN ELASTOMERIK [ELASTOMERIC MATERIALS]
No of Credits: 4

Course Synopsis:

To introduce the basic knowledge of elastomeric materials on structure and properties, characterization, concept of rubber elasticity and principles of rubbers in engineering application.

Course Outcomes:

CO1 - Able to explain and discuss of the classification, structure/ properties relationship, rubber elasticity concept of elastomeric materials.
CO2 - Able to identify and distinguish different type of rubbers and illustrate structure of natural rubber and synthetic rubbers.
CO3 - Able to explain and apply principles of rubbers in engineering application.
CO4 - Able to assess on how selected rubber are commercially prepared.

EBT232 SINTESIS POLIMER [POLYMER SYNTHESIS]
No of Credits: 4

Course Synopsis:

This course is developed to introduce the basic concepts of synthesis polymer about chemical structures, reaction schemes and mechanistics aspects of polymerization. Understanding the theoretical, conceptional background and practical of synthesis polymer.

Course Outcomes:

CO1 - Ability to discuss and identify the basic concepts of materials and polymer synthesis.
CO2 - Able to apply the concept of polymerization and relationship to structure and properties.
CO3 - Able to distinguish different polymerization and kinetic of polymerization.
CO4 - Able to synthesize polymeric material and how to analyze the polymeric material.

EBT235 STRUKTUR DAN SIFAT-SIFAT POLIMER [STRUCTURE AND POLYMER PROPERTIES]
No of Credits: 4

Course Synopsis:

This course is offered to provide knowledge on principles and concept of structure/property relationship of polymeric materials. This includes the understanding on concepts of viscoelasticity, transition phenomena, mechanical and thermal properties of polymers.

Course Outcomes:

CO1 - Ability to explain and apply the principles and concept of structure/ properties of polymers.

CO2 - Ability to explain and analyze transition phenomena in polymers.
CO3 - Able to apply and propose knowledge on concepts of viscoelasticity.
CO4 - Able to interpret and compare the mechanical and thermal properties in polymeric materials.

EBT238 KIMIA FIZIKAL [PHYSICAL CHEMISTRY]
No of Credits: 3

Course Synopsis:
The aim of this course is to introduce the knowledge of physical chemistry, calculate and solve problem of physical chemistry in polymeric materials.

Course Outcomes:
CO1 - Ability to describe and calculate the fundamentals basic of physical chemistry.
CO2 - Ability to identify and calculate the polymer viscosity and justify the distribution law and phase rule in polymeric materials.
CO3 - Ability to solve problem and calculate chemical properties and kinetic in polymeric materials.
CO4 - Ability to plan and evaluate or correlation of physical and chemical properties in polymer processing.

EBT239 TERMODINAMIK POLIMER [THERMODYNAMICS IN POLYMER]
No of Credits: 4

Course Synopsis:
The aim of this course is to introduce the knowledge of thermodynamic in polymer, calculate and solve problem of thermodynamic in polymer engineering process.

Course Outcomes:
CO1 - Able to describe and calculate the fundamentals basic thermodynamics law.
CO2 - Able to calculate heat, work and other thermodynamic properties in polymer processes.
CO3 - Able to solve problem and calculate using thermodynamic in polymer engineering processes.
CO4 - Able to plan and evaluate specific equation of or correlation of chemical reaction in thermodynamics law.

EBT240 BAHAN-BAHAN PLASTIK [PLASTIC MATERIALS]
No of Credits: 3

Course Synopsis:
The aim of this course is to introduce students with the concepts and types of plastic materials. Student will be able to distinguish the structure and property relationship of plastic materials and able to provide some ideas on the concept selection principles, additives and sustainability of the plastic materials.

Course Outcomes:
CO1 - Ability to discuss the concept of plastic materials and distinguish the type of plastic materials.
CO2 - Ability to distinguish the relationship between structure and property of plastic materials.
CO3 - Ability to evaluate the concept of plastic additives and compare the principle of plastics recycling and sustainability.

EBT251 KIMIA FIZIKAL BAHAN [ENGINEERING MATERIALS CHEMISTRY]
No of Credits: 3

Course Synopsis:
Introduction to Thermodynamics - First law of thermodynamics, expansion and contraction of work, enthalpy, heat capacity, thermochemistry and it application in metallurgy. Second Law of Thermodynamics - Differentiate entropy function, cyclic process, several relations of thermodynamics which involving Gibbs Free Energy, relationship between equilibrium constant and temperature in reaction. Reaction Kinetics - Effect of reactants and products concentration, determination of order and velocity constant of reac-

tion, effect of temperature for reaction, theory of absolute reaction rates for catalyst, diffusion in solid state. Electrochemistry - Electrolytes, electrolytic conduction, electrode potentials, galvanic cell, calculation of e.m.f. and cell potential, reduction and oxidation potential, standard electrode potential series. Interface Phenomenon - Surface energy and surface tensions, interfacial energy except gas/liquid interface, interfacial of three phases, absorption and colloid.

Course Outcomes:

CO1 - Ability to describe first law of thermodynamics and it application in materials

CO2 - Ability to describe the importance of differentiate entropy function, several of thermodynamics and relationship between equilibrium constant at temperature in reaction

CO3 - Ability to describe the effect reactant and products concentration, effect of temperature, and diffusion in solid state

CO4 - Ability to describe electrochemistry, surface energy, interfacial energy expect gas /liquid interfacial, absorption and colloid

EBT252 KEKUATAN BAHAN [STRENGTH OF MATERIALS]
No of Credits: 4

Course Synopsis:
Stress analysis, stress theory, strain analysis, strain theory, relationship of stress- strain and stress- strain temperature. Axial load, torsional loading, bend loading, bending stress, strain deflection. Failure Criterion - Elastic deflection failure, excessive yielding failure, fracture failure, excessive deflection failure, and progressive failure. Statically Indeterminate Beam Analysis - Method of integration, moment- area method, method of superposition, energy method, and plastic analysis. Combined Loading - Combined axial and bending load, combined axial, bending and torsion load. Column - Buckling of column, end- support conditions, empirical formula. Joint - Rivet and bolt analysis (average shear strength and tensile strength), welding, and connection analysis.

Course Outcomes:

CO1 - Ability to analyze general concept strength of materials and its mechanical properties

CO2 - Ability to analyze the materials behaviors when different mode of load applied e.g. torsion of circular shafts, bending and deflection of beams

CO3 - Ability to analyze the effect of combined stresses and the ability to analyze the behavior of different structure of materials, e.g. columns and connections under several types of loadings

EBT253 KIMIA ANALITIKAL [ANALYTICAL CHEMISTRY]
No of Credits: 3

Course Synopsis:
The main purpose of the Course is to provide students with a strong theoretical and practical grounding in the principles and practices of Analytical Chemistry. Basically student will learn Analytical objective, Stoichiometric Calculations, General Concept of Equilibrium, Gravimetric Analysis, Complexometric Titrations, Precipitation Reactions and Titrations, Redox and Potentiometric Titrations, Chromatographic methods and Environmental Analysis. Student will undertake Analytical Chemistry Laboratory for helping student to further develop hands-on skills.

Course Outcomes:

CO1 - Ability to identify and correlate the nature and scope of analytical chemistry with the analytical reaction in the solution.

CO2 - Ability to prepare and analyze material by solvent extraction, precipitation, complexometric method and ion exchange technique.

CO3 - Ability to integrate the principles and methodology of instrumental analysis like thermal, spectrochemical, atomic spectrometric analysis, chromatographic technique and sensor for automation.

EBT254 FENOMENA PENGANGKUTAN DAALM PROSES BAHAN [TRANSPORTATION PHENOMENON IN MATERIALS PROCESSING]
No of Credits: 3

Course Synopsis:
Heat Transfer - Fourier's law and thermal conductivity, thermal conductivity of gases, thermal conductivity of solids, thermal conductivity of liquids,

thermal conductivity of bulk materials, heat transfer and the energy equation, quenching heat transfer coefficient, heat transfer coefficient in forging. Solidification of Metals - Solidification in sand moulds, solidification in metal moulds, continuous casting, crystal growth. Radiation Heat Transfer - Basic characteristic, the black radiator and emissivity, the energy distribution and the emissive power, gray bodies and adsorptivity, radiation combine with convection, radiation from gases. Fick's Law and Diffusion in Materials - Definition of fluxes, Fick's first law, diffusion in solids, diffusion under composition gradient effect, Darken's equation, diffusion based on temperature in solids, diffusion in ceramic materials, diffusion in semiconductor materials, diffusion in liquids, diffusion in gases. Diffusion in Solids - Steady state diffusion experiments, microelectronic diffusion processing, homogenization of alloys, formation of surface layers. Mass Transfer in Fluid Systems - Diffusion through a stagnant gas film, diffusion in moving gas stream, the mass transfer coefficient, mass transfer in chemical vapor deposition. Interphase Mass Transfer - Two-resistance mass transfer theory, mixed control in gas-solid reactions, iron carbonization with surface reaction and diffusion as control factor, transportation in gas phase and diffusion as control factor, silicon oxidation, alloys vaporizing during melting.

Course Outcomes:

CO1 - Understand and analyze the problem on basic behavior of fluid (static motion, also in pipe) and momentum transfer.
CO2 - Understand and analyze the problem on heat transfer by conduction, radiation and convection.
CO3 - Understand and analyze the problem on mass transfer in gases, liquid and solid.

EBT303 KAWALAN PROSES [PROCESS CONTROL]
No of Credits: 3

Course Synopsis:

The aim of this course is to introduce the principle of process control system, including continuous and batch control approaches; knowledge of control algorithm implementation for selected process; capability of selecting instrumentation for process control; proficiency of managing and handling project from designing to applying the process control approach into the system.

Course Outcomes:

CO1 - Able to discuss the objective for process control and able to distinguish the essential feature of process control.
CO2 - Able to interpret dynamic process by constructing balance equation; solve differentiation equation, and design the transfer function for open and closed-loop.
CO3 - Able to analyze the stability of the system, apply and validate the control system in physical equipment.

EBT317 MEKANIK BENDALIR [FLUID MECHANICS]
No of Credits: 3

Course Synopsis:

Course will be concentrate with fluid properties, fluid classification and force types in fluids. Thus, students will be learning about fluid properties in two different conditions, static and dynamic condition. Student also will learn momentum principles including basic equations for controlled system and volume, and then basic equations in differential form. The students will see in fluid application in flow topic in pipes and turbo-machine. The course also concentrates flow measurement aspect, like as tools and procedures which used in flow measurement.

Course Outcomes:

CO1 - Ability to describe concept and solve problems of static and dynamic of liquid state
CO2 - Ability to comprehend and analyze the concepts of fluid kinematics and momentum equation to solve engineering problem
CO3 - Ability to apply and analyze Bernoulli equation to solve piping flow problem
CO4 - Ability to analyze the design a turbo machine using energy equation for piping system

EBT318 KEJURUTERAAN PERMUKAAN [SURFACE ENGINEERING]
No of Credits: 3

Course Synopsis:
Surface Engineering is multidisciplinary activity intended to tailor properties of the surfaces of the engineering component. The desired properties or characteristic of surface-engineered components include to improve corrosion and wear resistance, improved mechanical properties and functional materials such as electronic device, sensors, solar and optical devices. This course provides the fundamentals of surface engineering, coatings, thin film and substrate. This course will be covered surface engineering types and processing, its mechanism, advantages and disadvantages and its applications. This course also discuss the technical approach and engineering design of surface engineering based on its technology especially in nanotechnology, solar, microelectronic, wear and corrosion resistance. The objectives of this course to make comprehensive understanding of surface engineering knowledge and its application especially in materials and metallurgical engineering field.

Course Outcomes:
CO1 - Ability to describe and compare the concepts, fundamental and mechanism for surface engineering, coating and thin films.
CO2 - Ability to analyze and characterize thin film, coating and surface engineering in terms of its optical, electrical, magnetic and mechanical properties.
CO3 - Ability to design, evaluate and apply the growth of thin film and surface engineering.

EBT323 PENCIRIAN BAHAN [MATERIALS CHARACTERIZATION]
No of Credits: 4

Course Synopsis:
This course is designed to expose students the basic principles of materials characterization using LM, SEM, TEM as well as the principles of crystallography , metal texture, x- ray diffraction method and follow by spectroscopic technique and analytical.

Course Outcomes:
CO1 - Ability to identify and analyze microstructure of the materials.
CO2 - Ability to interpret and analyze thermal behavior of the materials
CO3 - Ability to comprehend and analyze structure of the materials.
CO4 - Ability to apply and characterize elemental analysis of the materials.
CO5 - Ability to characterize and evaluate optical property of the materials.
CO6 - Ability to identify, analyze and compare surface characterization of the materials.

EBT324 TERMODINAMIK BAHAN [MATERIALS THERMODYNAMICS]
No of Credits: 3

Course Synopsis:
Summarised revision on thermodynamic; Phase transformation; Solid state-Reaction. Thermodynamic of the phase diagram; Consideration of the free energy, transformation kinetics - Thermodynamic and kinetics in the glass formation system, precipitation of the different phases at different composition from matrix.

Course Outcomes:
CO1 - Ability to understand the fundamental concepts of thermodynamics.
CO2 - Ability to understand the statistical themodynamics, Unary heterogeneous systems, multicomponent, homogeneous non reacting systems –solutions, multicomponent heterogeneous systems, Multicomponent heterogeneous systems and Thermodynamics of phase diagrams, and relate to the materials.
CO3 - Ability to understand thermodynamics of interfaces, the thermodynamics of electrolysis and defect in crystals, and apply to the materials process.

EBT326 SIFAT-SIFAT POLIMER [POLYMER PROPERTIES]
No of Credits: 4

Course Synopsis:
The course is designed to introduce to the students various properties of

polymer such as thermoplastic, elastomer, thermoset, aspects of polymer physic including amorfous, semi-crystalline and crosslink of polymer, reinforcement of polymer products, mechanical properties, physical properties, characterization and analysis of polymer by using equipments.

Course Outcomes:
CO1 - Ability to analyze the aspects of polymer physic and chemical such as elastomer, thermoplastic and thermoset.
CO2 - Ability to examine the importance of various types of the plastics, polymer compounds and the component of the rubber.
CO3 - Ability to evaluate and justify the various aspects of physical and mechanical properties of polymeric materials.
CO4 - Ability to assess and interpret the properties of polymeric materials by using various equipments.

EBT329 PEMPROSESAN POLIMER [POLYMER PROCESSING]
No of Credits: 3

Course Synopsis:
This course provides detail introduction to the variety of polymer materials processing, including the rheology and melt flow, equipments and important methods of polymer processing, the influence of related factors in polymer processing, the occurrence of defects due to processing and how to solve the problems.

Course Outcomes:
CO1 - Ability to measure, examine and analyse the suitable methods of polymer processing for product manufacturing.
CO2 - Ability to understand, relate and apply the basic concepts of sustainability in polymer processing and applications for environmental importance.
CO3 - Ability to discuss concepts and principles of the various processing equipment for polymer materials.
CO4 - Ability to compare and analyse various rheological and processing parameters in the actual processing equipment.

EBT333 PEMPROSESAN GETAH [RUBBER PROCESSING]
No of Credits: 4

Course Synopsis:
This course to enhance knowledge, fundamental and significant concepts of rubber processing and formulation, different processing techniques, and testing of raw materials and finished products which are important in handling and controlling rubber processing machines.

Course Outcomes:
CO1 - Able to explain and differentiate on different rubber processing techniques.
CO2 - Able to apply and propose knowledge in rubber formulation and mixing.
CO3 - Able to assess testing on rubbers: raw material and finished products.
CO4 - Able to assess handling and controlling rubber processing machines.

EBT334 PENGUJIAN DAN PENCIRIAN POLIMER [POLYMER TESTING AND CHARACTERIZATION]
No of Credits: 3

Course Synopsis:
This course introduce the basic concepts of testing and characterization, the usage of various polymer characterization equipments, understanding the analysis concept to identify and characterize the polymeric materials.

Course Outcomes:
CO1 - Able to explain and apply the basic concepts of polymer characterization.
CO2 - Able to apply and analyze the characterization and interpretation of the analysis results.
CO3 - Able to apply and propose various analysis apparatus to measure the properties of polymeric materials.
CO4 - Able to solve and select problems or defects related to polymeric materials.

EBT335 ADUNAN-ADUNAN POLIMER [POLYMER BLENDS]
No of Credits: 4

Course Synopsis:
The aim of this course to provide the knowledge of polymer blends. Promote an understanding on their properties relationship and provide knowledge on testing and characterization of polymer blends. The concept of reactive blending and engineering applications of polymer blends.

Course Outcomes:
CO1 - Able to apply and analyze concept of polymer blends.
CO2 - Able to compare and evaluate blending conditions to structure, properties, testing and characterization of polymer blends.
CO3 - Able to apply and analyse the principles of reactive and non-reactive compatibilizer in polymer blends.
CO4 - Able to design and assess polymer blends according to engineering applications.

EBT336 PEMPROSESAN PLASTIK [PLASTIC PROCESSING]
No of Credits: 4
Course Synopsis:
The aim of this course is to introduce the processing methods for thermoset and thermoplastic polymer; measure the rheology flow, employ testing, processing parameter, processing methods, throubleshooting, characterization of the products and also knowledge on compounding and additives.

Course Outcomes:
CO1 - Able to discuss and distinguish thermoset and thermoplastic processing methods.
CO2 - Able to select, apply and calculate typical rheology behavior of thermoset and thermoplastic.
CO3 - Able to operate and evaluate the operation and troubleshoot various thermoset and thermoplastic processing techniques.
CO4 - Able to identify and assess problem troubleshooting on various thermoset and thermoplastic processing technique.

EBT337 PEMINDAHAN JISIM DAN HABA DALAM POLIMER [MASS AND HEAT TRANSFER IN POLYMER]
No of Credits: 4

Course Synopsis:
The aim of this course is to introduce the knowledge of mass and heat transfer in polymer processing. Student will be able to describe the principles of convective mass transfer at boundry layer, mass transfer between phases, to calculate and solve the mass and heat transfer problem in polymer processing equipments such as injection molding and screw extruder and also capable to plan and evaluate the heat and mass transfer in conduction, convection and radiation involves during polymer processing.

Course Outcomes:
CO1 - Able to describe and differentiate fundamental mass and heat transfer.
CO2 - Able to calculate and analyze the mass transfer problem in polymer processing equipment such as injection molding and screw extruder.
CO3 - Able to calculate and apply heat transfer in conduction, convection and radiation.
CO4 - Able to plan and evaluate of heat transfer and mass transfer in conduction, convection and radiation and in polymer processing equipment such as injection molding.

EBT338 PEMPROSESAN LATEKS [LATEX PROCESSING]
No of Credits: 4

Course Synopsis:
This course emphasizes on the fundamental characteristic of natural and synthetic lattices, latex compounding and processing as well as their applications in latex industries and others.

Course Outcomes:
CO1 - Able to analyze various natural rubber latex properties including fundamental characteristic, colloidal properties behavior and handling.

CO2 - Able to prepare natural rubber latex product from different formulations and techniques.
CO3 - Able to assess various applications and related matters and issues in natural and synthetic rubber latex by consideration of health and safety aspects.

EBT351 BAHAN ELEKTRONIK KEJURUTERAAN [ELECTRONIC MATERIALS ENGINEERING]
No of Credits: 3

Course Synopsis:
Elementary materials science concept, electrical and thermal conduction in solid, elementary quantum physics, modern theory of solids, semiconductor, dielectric materials and insulator, magnetic properties and superconductivity, optical properties of materials.

Course Outcomes:
CO1 - Ability to relate the electronic structure components with the materials structure.
CO2 - Ability to solve materials related problems in semiconductor and other electronic devices.
CO3 - Ability to appraise the properties of electronic materials e.g. Dielectric, Magnetic and Optical properties.

EBT402 KEJURUTERAAN KAKISAN [CORROSION ENGINEERING]
No of Credits: 3

Course Synopsis:
Student will learn corrosion and surface engineering principles. Therefore, in this subject, the student will learn electrochemistry, corrosion type, and corrosion problems in industries. Electrochemistry principles, corrosion types, Pourbaix Diagram, Corrosion mechanism, kinetic and corrosion rate. Corrosion prevention methods, inhibitors, anodic and cathodic prevention, coating, stress corrosion cracking, selection and design, corrosion problems in industry and its solution.

Course Outcomes:
CO1 - Able to evaluate the concepts of corrosion engineering
CO2 - Able to correlate the mechanism, thermodynamic and kinetic of corrosion
CO3 - Able to evaluate the basic of corrosion testing and analysis
CO4 - Able to design corrosion protection and prevention for sustainable development

EBT405 UJIAN TIDAK MUSNAH [NON DESTRUCTIVE TESTING]
No of Credits: 3

Course Synopsis:
on-destructive testing (NDT) is a method used for inspection of an internal part of materials. Identifying defects and flaws in material which could not be seen using our naked eyes is absolutely important in determining the material lasting age and the material performance. It is formerly known that the effective method of NDT is almost depending on the knowledge and skill of the person incharge. Because of that reason, this course offers several topics which covers the general NDT methods that are normally used in engineering field such as liquid penetrant, magnetic particle, eddy current, ultrasonic, and radiography technique.

Course Outcomes:
CO1 - Ability to distinguish principle of non-destructive testing method
CO2 - Ability to describe the procedures for each NDT methods
CO3 - Ability to assess defects and select NDT tools for inspection

EBT418 METALURGI KIMPALAN [WELDING METALLURGY]
No of Credits: 3

Course Synopsis:
This course is designed to introduce the students to welding metallurgy principles and influencing factor in welding metallurgy selected. Therefore, students will be exposed to welding principle, metallurgical welding, welding types and welding mechanism, welding problems in varies industries and welding solutions.

Course Outcomes:
CO1 - Ability to identify fundamental, principles and engineering of welding metallurgy
CO2 - Ability to apply welding metallurgy practice for ferrous and non-ferrous alloys
CO3 - Ability in solving problems, analyzing and testing of welding metallurgy

EBT419 METALURGI GUNAAN [APPLIED METALLURGY]
No of Credits: 3

Course Synopsis:
This course is to introduce the students to fundamental of metal casting. Casting technology, heating and pouring. Solidification and cooling. Fluidity and fluid flow phenomena in casting processes. Casting quality and casting defects. Characterization of engineering powders. Production of metallic powders . Conventional pressing and sintering. Alternative pressing and sintering techniques. Matereials and products for Powder Metallurgy. Overview of metal forming. Material behaviour. Bulk deformation process in metal working, rolling, forging, extrution bar and wire drawing. Cutting and bending operation, drawing, shear metal forming operation. Mechanics of metal cutting and chip formation. Power and energy relationship in machining.

Course Outcomes:
CO1 - Ability to describe fundamental applied metallurgy and its application in materials (ferrous and non-ferrous)
CO2 - Ability to describe types of patterns, molds, furnaces and the different types of gating systems
CO3 - Ability to describe and analyze the products from powder metallurgy, conventional pressing and sintering
CO4 - Ability to describe and analyze the process of cutting and bending, chip formation and cutting fluid

EBT420 ANALISIS FORENSIK METALURGI [METALLURGICAL FORENSIC ANALYSIS]
No of Credits: 3

Course Synopsis:
This course is designed to introduce the students to welding metallurgy principles and influencing factor in welding metallurgy selected. Therefore, students will be exposed to welding principle, metallurgical welding, welding types and welding mechanism, welding problems in varies industries and welding solutions.

Course Outcomes:
CO1 - Ability to identify fundamental, principles and engineering of welding metallurgy
CO2 - Ability to apply welding metallurgy practice for ferrous and non-ferrous alloys
CO3 - Ability in solving problems, analyzing and testing of welding metallurgy

EBT421 KEJURUTERAAN BAHAN TERMAJU [ADVANCED MATERIALS ENGINEERING]
No of Credits: 3

Course Synopsis:
Introduction to advanced material (nanostructured, synthethic alloy, ODS alloy), the fabrication process of those materials and its applications also characterization techniques by using TEM, SEM, XRD and BET methods.

Course Outcomes:
CO1 - Ability to comprehend an advanced material concept and the characterization method.
CO2 - Ability to ‘know how’ the processing techniques of advanced materials.
CO3 - Ability to justify the application of advanced materials.

EBT424 BAHAN BINAAN [CONSTRUCTION MATERIALS]
No of Credits: 3

Course Synopsis:
Introduction to the basic construction materials including raw material, physical and mechanical properties, processing and construction material designs. Also introduction to construction industries in Malaysia and involvement of others organization in supervising construction industry such as JKR, CIDB, IEM, PAM, Sirim, Kementerian Perumahan dan Kerajaan Tempatan dan Pusat Khidmat Kontraktor.

Course Outcomes:
CO1 - Ability to determine and discuss the processing, properties and testing of various construction materials
CO2 - Ability to differentiate construction materials and its applications in construction (concrete/ masonry/ plastic/ glass/ timber/ bitumen)
CO3 - Ability to identify, formulate, and solve engineering experimental design problems

EBT427 SERAMIK TEKNIKAL [TECHNICAL CERAMIC]
No of Credits: 3

Course Synopsis:
This course is designed to exposed the students to the technical ceramic and important aspect in advance ceramic. Electro Ceramic - Materials and properties. Basic concept of ceramic to electro ceramic application including insulator, ceramic high frequency, piezoelectric transistor and superconductor. Refractory - Properties and application of different types of refractory such as silica, alumina silica, magnesit dan crome magnesit. Ceramic Structure - Materials and properties. Basic principles of ceramic to the aerospace, cutting tools, automobile and biomaterials applications. Ceramic Matrix Composites - Properties and several toughening technique. Carbon-carbon composites and hybrid composite. Processing of fiber reinforced composites including pultrusion, prepreg production process and filament winding. Bio Ceramic - Selection, properties and application. Basic concept of toughening and produce ceramic composite for biomaterials application. Non Structure Ceramic - Materials and properties. Nonstructural application including packaging, sensor, filtering and electrical optic. Glass - Mechanical, optic, electric and chemical resistance properties of glass. Glass transition temperature and structure of glass including glass forming oxides, glass modifying oxides and intermidiate oxides in glasses. Properties and application of different composition of glasses such as soda lime glass, borosilicate glass and lead glasses. Production and forming methods of glasses including heating, molding, drawing or rolling and annealing.

Course Outcomes:
CO1 - Able to distinguish and/or illustrates the concept, principles and basic properties of electro-ceramic, refractory, structural and bio-ceramic materials.
CO2 - Able to construct and/or correlates between materials used-crystal structure-processing and properties of different advanced ceramics materials.
CO3 - Able to propose and/or design mechanism, function and approach in different areas of advanced ceramic materials.
CO4 - Able to justify and/or solve problems arises in different areas of advanced ceramic materials.

EBT429 BAHAN KOMPOSIT [COMPOSITE MATERIALS]
No of Credits: 3

Course Synopsis:
This course is focusing on the three major types of composite materials which are Ceramic Matrix Composite (CMC), Metal Matrix Composite (MMC) and Polymer Matrix Composite (PMC). Lectures cover on several important aspects of composite materials. This includes the introductions, classifications, properties, applications and characterizations of composite materials, matrix and reinforcement phase, manufacturing and processing methods, types and influence of different reinforcement, inter-phase properties, mechanical and failure behavior, current and future potential applications of composite products. At the end of this course, students will have a comprehensive knowledge and well understanding regarding composite materials.

Course Outcomes:
CO1 - Able to classify different types of composite materials.
CO2 - Able to explain the properties and characteristics of each composite materials.
CO3 - Able propose a suitable fabrication technique of composite materials for specific application.
CO4 - Able to analyze problems, select and fabricate better composite system/process for greener environment applications.

EBT435 [POLYMER IN ELECTRONIC APPLICATION]
No of Credits: 3

Course Synopsis:
To provide knowledge of polymer application in electronic industries. This includes an understanding on the concepts of fabrication processes of various polymers in this application. Provide knowledge on characterization and selection principles of polymer in electronic application.

Course Outcomes:
CO1 - Able to apply the basic knowledge on the concepts of polymer in electronic application requirements.
CO2 - Able to categorize the materials involved and the production processes.
CO3 - Able to identify the importance of polymers and manage the problems in electronic application.
CO4 - Able to select testing and characterization of some polymers for electronic application.

EBT437 KOMPOSIT POLIMER [POLYMER COMPOSITES]
No of Credits: 3

Course Synopsis:
This course will provide the concepts of polymer composites with several of fabrication techniques. This course also provides knowledge on fiber reinforcement of polymer matrices and their corresponding properties. The course includes the mechanics of composites and some composite testing methods.

Course Outcomes:
CO1 - Able to categorize, differentiate and relate the concepts of polymer composites.
CO2 - Able to explain and compare the fabrication techniques of composites.
CO3 - Able to calculate, analyze and prepare composite testing methods.
CO4 - Able to evaluate and measure the mechanical properties of composites.

EBT439 PEMBUNGKUSAN ELEKTRONIK TERMAJU [ADVANCED ELECTRONIC PACKAGING]
No of Credits: 3

Course Synopsis:
In this course, students will be exposed to the following components: Introduction on the overview of microelectronic packaging such as function of an electronic package, packaging hierarchy, and brief history of microelectronic packaging technology. The advantages, disadvantages and challenges of each of the above packages towards meeting the needs of the nanometer range, needs of new devices and market will be shared. Thermal management: heat transfer theory, thermal & cooling design and thermal measurement methodology that involved the software and hardware. Package assembly and its design characteristic: Fundamentals and process of integrated circuit (IC) assembly will be shared. This includes the three primari IC assembly technology: wirebonding, tape automated bonding (TAB) and flip chip. The fundamentals and process of board assembly which typically involves mounting components on wiring board and soldering thier leads to the board. Main technologies of board assembly will be shared which includes surface mount technology (SMT) and through hole assembly technology. The generic board assembly issues which relates to material will also be shared. Soldering technology: alloy, soldering tecnique, microstructure, interconnection, no-clean solder, lead-free solder and lead-free plating.

Course Outcomes:
CO1 - Able to examine the packaging hierarchy and construct the latest types of electronic packaging used in various semiconductor

industries.

CO2 - Able to examine the materials involved and the production processes. This include ability to analyse the design, thermal problems and creating methods to overcome these problems in gaining the optimum performance while considering the environment friendliness of the materials and their processing.

CO3 - Able to analyse the conventional and advance electronic assembly automation and tolerate the challenges, facilities involved to its applications in wireless industry-based products.

EBT441 REKABENTUK KEJURUTERAAN POLIMER [POLYMER ENGINEERING DESIGN]
No of Credits: 3

Course Synopsis:
The aim of this course is to develop knowledge on the polymer engineering design specifically for plastic injection moulding activities, dies for extrusion process and a design that involves a polymerization reactor. The generate knowledge will provide an effective skill to counter and solve the common problem approach on the fundamental basis of polymer engineering design.

Course Outcomes:

CO1 - Able to describe and discuss the concept of mould and die design and its purpose to get an optimum processing conditions during polymer processing.

CO2 - Able to compose the optimize mould design and die design condition for different type of molding requirement.

CO3 - Able to apply fundamentals in the design and operation of chemical plant.

CO4 - Able to apply the concepts and methods of plant design and economic evaluation.

EBT442 PROJEK REKABENTUK BERSEPADU KEJURUTERAAN POLIMER [POLYMER ENGINEERING INTEGRATED DESIGN PROJECT]
No of Credits: 3

Course Synopsis:
This course contains foundation and knowledge on engineering design. Apply and practice knowledge on polymer engineering and properties, principle of polymer selection, process selection and sustainability of materials to reinforce the engineering knowledge through case study and designed capstone-project. This project is an open-ended and conceptual based (no end product).

Course Outcomes:

CO1 - Ability to develop design solutions based on appropriate knowledge in “polymer design” with realistic constraints.

CO2 - Ability to use engineering tools for product/system design, simulation and analysis.

CO3 - Ability to communicate effectively to share information and describe concepts and ideas with the engineering community.

CO4 - Ability to demonstrate understanding on project management and finance principles.

EBT445 PROJEK TAHUN AKHIR I [FINAL YEAR PROJECT I]
No of Credits: 2

Course Synopsis:
Research project will be conducted by the final year student. Objective of the project is to introduce the real problem in the field of engineering and familiarize the research method, problem solving, research publication and presentation of the effective results through thesis and seminar.

Course Outcomes:

CO1 - Able to plan and manage research project.

CO2 - Ability to apply theory that had been studied in research project.

CO3 - Able to write a technical report professionally.

CO4 - Able to present a research project professionally.

EBT446 PROJEK TAHUN AKHIR II [FINAL YEAR PROJECT II]
No of Credits: 4

Course Synopsis:
Research project will be conducted by the final year student. Objective of the project is to introduce the real problem in the field of engineering and familiarize the research method, problem solving, research publication and presentation of the effective results through thesis and seminar.

Course Outcomes:
CO1 - Able to plan and manage research project.
CO2 - Ability to apply theory that had been studied in research project.
CO3 - Able to write a technical report professionally.
CO4 - Able to present a research project professionally.

EBT447 PEMILIHAN REKABENTUK BAHAN [MATERIALS SELECTION AND DESIGN]
No of Credits: 4

Course Synopsis:
This course contains foundation of knowledge on engineering design and the role of materials in it. Knowledge and understanding on Engineering Materials and their properties, Material property charts, Principles of materials selection, Process and process selection and Sustainability of Material are required to reinforce the foundation of knowledge. Practical knowledge in understanding of engineering design and selection of material will be assessed through case study and designed capstone-project

Course Outcomes:
CO1 - Ability to recognize the design concept and requirement of complex engineering problem in Material Engineering field
CO2 - Ability to apply and evaluate the design concept and requirement for the selected project in Material Engineering field
CO3 - Ability to develop and integrate the specific unit process and unit operation in Material Engineering field
CO4 - Ability to conduct economic evaluation of the selected project in Material Engineering field

EBT448 PEREKAT POLIMER DAN PENGLITUP [POLYMER ADHESIVE AND COATING]
No of Credits: 3

Course Synopsis:
To introduce the basic knowledge on principles and properties of adhesion, adhesives polymer coatings. This course is focus on design formulation of adhesives and coating products, study working properties, testing and characterization and also application of them.

Course Outcomes:
CO1 - Able to explain basic concepts of adhesives and coatings for polymeric systems.
CO2 - Able to differentiate selected adhesive and coating system for certain applications.
CO3 - Able to create, formulate and characterize different polymer adhesives and coatings systems.
CO4 - Able to select and adapt main testing methods for adhesives and coatings, preparation and performance.

EBT449 POLIMER MESRA ALAM [ENVIRONMENTAL FRIENDLY POLYMER]
No of Credits: 3

Course Synopsis:
The aim of this course is to provide the knowledge of environment friendly polymer. Solve on their issues and understand the future needs of environmental polymers and create alternative ways for handling polymer issue such as degradable polymer and polymers recycling.

Course Outcomes:
CO1 - Able to analyze and solve awareness on pertinent issue of polymer recycling and predict the future needs of environment polymers.
CO2 - Able to select and evaluate with issues on polymers and additive, selection in accordance to environment requirement.
CO3 - Able to apply and distinguish of biopolymer from viewpoint of molecular, structure and processing and develop biocompatibility

aspect of biopolymer.

CO4 - Able to prepare and select of on polymer wastes, biopolymer and biodegradable polymers in various engineering application.

ECT112 KEMAHIRAN KEJURUTERAAN [ENGINEERING SKILLS]
No of Credits: 3

Course Synopsis:
This subjecf is 100% practical coursework and carried out 3 unils credit hours.This course contains six modules which are Basic Workshop, Machining, Wiring,Basic Electonics, Matlab, AutoCAD and technical Drawlng that specificaly planned for non-electronic based programs.

Course Outcomes:
CO1 - Ability to APPLY and CONSTRUCT a basic skill and standard practiced of mechanical machines and equipment.
CO2 - Ability to APPLY and CONSTRUCT the basic skills and standard practiced of domestic wiring.
CO3 - Ability to APPLY and CONSTRUCT a logic system using common controller tool (PLC).
CO4 - Ability to APPLY CONSTRUCT a standard practiced of manual technical drawing and able to design a product using common software (AutoCAD)
CO5 - Ability to APPLY and CONSTRUCT the basic skills and standard practiced of PCB layout design and fabrication process.

ERT105 TEKNOLOGI ELEKTRIK [ELECTRICAL TECHNOLOGY]
No of Credits: 3

Course Synopsis:
This course is intended to provide students with clear understanding of the DC and AC circuits, basic principles of 3-phase AC circuits, electro-magnetism and magnetic circuits. They will also gain an understanding of the basic operating principles and performance analysis of three most commonly used electric machines, namely, transformers, DC machines, and induction motors.

Course Outcomes:
CO1 - Able to APPLY knowledge of principle elements of DC and AC circuits as well as concept of magnetism and electromagnetism and its application in transformers and DC and AC machines.
CO2 - Able to ANALYSE problems related to the DC and AC circuits using Ohm's Law, Kirchhoff's Current Law, Kirchhoff's Voltage Law, Source Transformation and Thevenin's theorem.
CO3 - Able to EVALUATE problems related to polyphase systems of three phase AC system for Wye and Delta connection to meet desired economic and operational advantages.

ERT110 KIMIA ORGANIK I [ORGANIC CHEMISTRY I]
No of Credits: 2

Course Synopsis:
The course introduces the fundamental theories (atomic orbital, molecular orbital theories) and emphasizing on the introduction to alkane, alkene and alkyne as well as their related reactions. Also, there is introduction of nucleophilic substitution and elimination reactions of the alkylhalides. The topic also covers on stereochemistry as well as physical and chemical properties and chemical reactions involving aromatic compounds.

Course Outcomes:
CO1 - Ability to demonstrate the basic concepts theoretically and apply the knowledge of science such as the physical and chemical properties of each functional group
CO2 - Ability to illustrate theoretical organic chemical reactions of alkenes, alkynes and alkylhalides at molecular level and solve complex engineering problems
CO3 - Ability to analyze the concept on the stereochemistry and reactions involving aromatic compounds

ERT111 PENGENALAN KEPADA PRINSIP-PRINSIP SAINS BIOLOGI DAN KIMIA [INTRODUCTION TO BIOLOGICAL AND CHEMICAL SCIENCE PRINCIPLES]
No of Credits: 3

Course Synopsis:
This course introduces the relevant fundamentals of biochemistry and microbiology, which includes important topics like microbial diversity, cell construction and nutrients, enzymes, molecular cell biology, metabolism and microbial growth. Application of these principles in chemical engineering are also featured with reference to medical, food, waste management and other related processes in chemical industries.

Course Outcomes:
CO1 - Ability to acquire and apply knowledge of biological basics, enzymes, cell function and metabolisms.
CO2 - Ability to conduct investigations into complex problems as well as to analyze and interpret data related to batch growth kinetic, alteration of cellular informations, using modern softwares.
CO3 - Ability to evaluate the solutions of engineering problem related to the application of biochemistry and microbiology in chemical industry.

ERT112 SAINS BIOKIMIA [BIOCHEMICAL SCIENCE]
No of Credits: 1

Course Synopsis:
This course combines the study of biochemistry with microbiology. This course describes the synthesis and characterization of carbohydrates, proteins, lipids, and amino acids. This course introduces basic techniques in microbiological testing, sample preparation and analysis. This course allows students individually or in a group, to test or apply the hypotheses, collect data and take measurements accurately in the experimental tasks, analyze and interpret the results, and also evaluate and conclude the results.

Course Outcomes:
CO1 - Ability to explain and characterize the properties of biomolecules and microbial samples
CO2 - Ability to design and conduct experimental tasks individually or in a group with a special emphasis of the development of safe working practices during laboratory exercises
CO3 - Ability to write a good and effective report with appropriate data analysis and presentation

ERT113 PENGENALAN KEPADA KELESTARIAN [INTRODUCTION TO SUSTAINABILITY]
No of Credits: 3

Course Synopsis:
This course introduces the academic approach of sustainability and explores how today's human societies can endure in the face of global change, ecosystem degradation and resource limitations. The course focuses on key knowledge areas of sustainability theory and practice, including population, ecosystems, global change, energy, agriculture, water, and environmental economics. The course also introduces the environmental law and policy practices in Malaysia. Lastly, implementation of sustainable production and production of sustainable products based on analysis of environmental aspects of a product system, integration of significant environmental aspects into product design, and selection of the innovative methods and tools are introduced.

Course Outcomes:
CO1 - Ability to understand and analyse the need of the sustainability in the solutions of complex engineering problems for environmental and sustainable development
CO2 - Ability to apply contextual knowledge to assess global issues and the consequent responsibilities relevant to professional engineering practice
CO3 - Ability to evaluate a viable solution to a particular challenge to sustainability and defend a persuasive proposal that advocates this solution.

ERT114 MEKANIK KEJURUTERAAN [ENGINEERING MECHANICS]
No of Credits: 2

Course Synopsis:
This course emphasizes about basic concepts of forces and resultant force through the concepts of free body diagram in two and three dimensions and apply the knowledge to solve problems that fall under the concepts of equilibrium of a particle and rigid body. Students will also be exposed on the concepts of the moment of a force in two and three dimensions. Friction, concepts of center of gravity and center of a mass and moment inertia will also be discussed to understand the overall basic of engineering mechanics.

Course Outcomes:
CO1 - Ability to apply knowledge of mathematics, sciences, and engineering to analyze the basic principles of statics on mechanism and bodies.
CO2 - Ability to identify and assess solutions to the problems related to different force systems of a particle and rigid body in two and three dimensions
CO3 - Ability to evaluate and provide solutions to the problems related to frictions, centre of gravity, centre of mass for a system and moment of inertia of an area.

ERT115 TERMODINAMIK [THERMODYNAMICS]
No of Credits: 2

Course Synopsis:
This course provides an insight that deals with basic concept of energy and thermodynamics as a part of essential essence in chemical engineering field. This course emphasizes on the basic principles of thermodynamics including the fundamental properties of pure substance, a closed system analysis, the first and second law of thermodynamics. Applying thermodynamic principles to the operation of a heat pump or a refrigerator and the power generation of heat systems is also discussed in this course.

Course Outcomes:
CO1 - Ability to demonstrate the basic concept and design solution of energy and its relation to thermodynamics and apply the principle in First Law of thermodynamics.
CO2 - Ability to analyze the fundamental properties of pure substance and problems relating to closed systems using mathematics, natural science and engineering science.
CO3 - Ability to evaluate second law of thermodynamics in heat pump, refrigeration cycles for complex engineering problem

ERT116 KIMIA ORGANIK II [ORGANIC CHEMISTRY II]
No of Credits: 2

Course Synopsis:
The course introduces physical and chemical properties and chemical reactions involving alcohol, ether, carboxylic acid, aldehyde and ketone. The course also covers the application of organic chemical process in terms of biopharmaceutical production. The determination of structure organic compounds using Nuclear Magnetic Resonance (NMR) spectroscopy and mass spectrometry (MS) are included in this course. The fundamental theorieson the NMR spectroscopy and MS as well as analysis of the NMR and MS spectra also are discussed. Also this course introduces the properties of amine, thiol and sulfide compounds as well as the chemical reactions related to these compounds.

Course Outcomes:
CO1 - Ability to apply the knowledge of chemical reactions involving organic compounds such as alcohol, ether, carboxylic acid, aldehyde and ketone to the solution of complex engineering problem.
CO2 - Ability to propose complex engineering problems reaching substantiated conclusions using principles of organic chemistry of drugs, NMR spectroscopy and mass spectrometry.
CO3 - Ability to examine the chemistry of amines, thiols and sulfides compounds and their chemical reaction to design solutions for complex engineering problem.

ERT117 INSTRUMENTASI PROSES [PROCESS INSTRUMENTATIONS]
No of Credits: 2

Course Synopsis:
The objective of this course is to prepare the students with necessary skills in the process industry. The course begins with introduction to the course content of Process Instrumentation, followed by introduction to fundamental of industrial valves. Basic knowledge of pumps, fans, blowers and compressors are also covered. Students are taught about ISA symbology, where they are exposed with the universal symbols used in process industry, writing the identification letter as well as the tag numbers for unit operation and piping. To complete the course, students are exposed in reading and developing process flow diagram (PFD) and also piping and instrumentation diagram (P & ID).

Course Outcomes:
CO1 - Ability to identify different types of valves and produce solutions for complex engineering problems involving valves by calculating the valve sizing.
CO2 - Ability to design and communicate solutions for complex engineering problems regarding various types of pumps, fans, blowers, compressors; and calculate the power input and efficiency of those instruments.
CO3 - Ability to apply techniques, skills and modern engineering tools to develop PFD and P&ID for bio and chemical processes; and utilize the skills to engage in life-long learning.
CO4 - Ability to conduct experiments, identify different types of valves, develop PFDs and P&IDs for both simple and complex engineering systems.

ERT201 TERMODINAMIK KEJURUTERAAN KIMIA [CHEMICAL ENGINEERING THERMODYNAMICS]
No of Credits: 3

Course Synopsis:
This course introduces students to the chemical engineering thermodynamic theories and applications in the areas of volumetric properties of fluids, heat effects, thermodynamic properties of fluids, thermodynamics of solutions, and physical and chemical equilibria.

Course Outcomes:
CO1 - Ability to analyse and calculate volumetric and thermodynamic properties at specified conditions using appropriate thermodynamic approaches.
CO2 - Ability to apply the thermodynamic property relations for fluids to solve complex thermodynamic problems.
CO3 - Ability to design solutions for complex thermodynamic equilibria problems using chemical engineering principles, individually and can communicate in team.
CO4 - Ability to use techniques and skills to solve thermodynamics related problems using modern engineering tools.

ERT204 KIMIA ANALISIS [ANALYTICAL CHEMISTRY]
No of Credits: 3

Course Synopsis:
This course introduces and discusses the basic principle of analytical chemistry that covers data analysis and interpretation. Basic statistics and the utilization of statistics are applied in most of the analytical methods. In this course students are able to apply classical analytical methods such as gravimetry and titrimetry as well as applying modern methods in analytical chemistry such as chromatographic and spectroscopic techniques.

Course Outcomes:
CO1 - Ability to apply knowledge of mathematics in statistical method for data and steps in analytical analysis.
CO2 - Ability to assess complex problem regarding concentration of analytes of various classical titrimetric and gravimetric methods for mass determination.
CO3 - Ability to propose techniques, skills, and modern engineering tools for complex engineering problems regarding sample concentration, complex chromatography and spectroscopic methods.
CO4 - Ability to conduct appropriate engineering techniques for complex engineering problems and experiments involving various knowledge of analytical and organic chemistry.

ERT214 IMBANGAN BAHAN DAN TENAGA [MATERIAL AND ENERGY BALANCE]
No of Credits: 4

Course Synopsis:
This course starts with engineering calculations. Students are taught to interpret series of data and to interpret graphs. Material balance as well as energy balance also will be covered in the course. The course will be completed with the introduction of several methods in calculating material balance and energy balance in a system.

Course Outcomes:
CO1 - Ability to solve basic engineering calculations, convert units in the same dimensions and scientifically interpret series of data.
CO2 - Ability to identify single unit and multiple unit processes, distinguish parameters given in order to find a solution. Students are able to discuss mass balance concept and solv e material balance problems.
CO3 - Ability to measure parameters, solve energy balance problems and discuss energy balance concepts.
CO4 - Ability to evaluate steam tables to solve problems in a system and also analyze all possible information data given in a system to provide a solution combining of material and energy balance.

ERT215 MEKANIK BENDALIR [FLUID MECHANICS]
No of Credits: 3

Course Synopsis:
This course emphasizes fundamental concepts and problem-solving techniques. Topics to be covered include fluid properties, static and kinematics, control volume analysis, momentum analysis of flow system, dimensional analysis, internal flows (pipe flows), differential analysis, and external flows (lift and drag).

Course Outcomes:
CO1 - Ability to analyze the essential parameters describing a fluid system and demonstrate dimensional analysis and homogeneity.
CO2 - Ability to calculate pressures, forces, and stability in static fluid systems and identify whether a flow is steady or unsteady, uniform or non-uniform, laminar of turbulent and flow rate in dynamic fluid system and distinguish the link between conserved quantities and the equations of fluid mechanics.
CO3 - Ability to evaluate appropriate control volumes and surfaces for developing the equations of fluid mechanics and analyse phenomena associated with external flow.

ERT217 PEMINDAHAN JISIM [MASS TRANSFER]
No of Credits: 3

Course Synopsis:
This course explains the principle of mass transfer and its practical application in industrial processes. The course provides the knowledge and skills required to solve problems for the design, assessment, and analysis of mass transfer processes. Several approaches (including analytical solutions, use of numerical methods and empirical approaches based on experimental data) will be introduced to solve problems of mass transfer system in industrial and real-life applications in the chemical processes.

Course Outcomes:
CO1 - Ability to calculate mode of mass transferred.
CO2 - Ability to evaluate mass transfer knowledge as well as designing mass transfer equipment.
CO3 - Ability to apply numerical and/or empirical approaches to solve problems of mass transfer system

ERT218 PEMINDAHAN HABA [HEAT TRANSFER]
No of Credits: 3

Course Synopsis:
This course covers the modes of heat transfer, which are conduction, convection and radiation, the application of the principle in various unit operations in a chemical plant. The course provides the knowledge and skills required to solve problems for the design, assessment, and analysis of heat transfer processes. Several approaches (including analytical solutions, use

of numerical methods and empirical approaches based on experimental data) will be introduced to solve problems of heat transfer system in industrial and real-life applications in the chemical processes.

Course Outcomes:
CO1 - Ability to calculate mode of heat transferred.
CO2 - Ability to evaluate heat transfer knowledge as well as designing heat transfer equipment.
CO3 - Ability to apply numerical and/or empirical approaches to solve problems of heat transfer system.

ERT219 APLIKASI FENOMENA PENGANGKUTAN [TRANSPORT PHENOMENA APPLICATION]
No of Credits: 1

Course Synopsis:
This course explains the transport phenomena in chemical engineering, which included transport of momentum, heat and mass. This course develops the practical skills needed for engineering practice and development and design of unit operations in chemical industries. This course allows students individually or in a group, to test or apply the hypotheses, collect data and take measurements accurately in the experimental tasks, analyze and interpret the results, and also evaluate and conclude the results.

Course Outcomes:
CO1 - Ability to explain the transport phenomena in chemical and mechanical processes.
CO2 - Ability to design and conduct experimental tasks individually or in a group with a special emphasis of the development of safe working practices during laboratory exercises.
CO3 - Ability to write a good and effective report with appropriate data analysis and presentation.

ERT221 SISTEM BIOREAKTOR [BIOREACTOR SYSTEM]
No of Credits: 3

Course Synopsis:
This course will provide an introduction to the fundamental ideas of the bioreactor design and operations. It will also develop students' knowledge and understanding the important principles and techniques that are used in the design and analysis of various types of bioreactor system for microbial, animal and plant cell cultures. It also covers relevant issues in bioreactor system such as scaling up/down, instrumentation and control of bioreactor as well as sterilization.

Course Outcomes:
CO1 - Ability to design and formulate fermentation media and decide on the types of carbon and nitrogen source.
CO2 - Ability to recognize, compare and draw the schematic diagram for specific types of bioreactors.
CO3 - Ability to design a stirred tank bioreactor according to the specific application.
CO4 - Ability to develop scale up based on geometric similarities or constant power number.

ERT305 KEMAHIRAN DALAM PROSES PEMISAHAN [SKILLS IN SEPARATION PROCESS]
No of Credits: 1

Course Synopsis:
This course introduces the typical separation processes in chemical industries such as distillation, evaporation, leaching, microfiltration, and absorption. This course provides the practical skills to students via experimental and/or numerical works on a distillator, evaporator, and filtration system. This course allows students individually or in a group, to test or apply the hypotheses, collect data and take measurements accurately in the experimental tasks, analyze and interpret the results, and also evaluate and conclude the results.

Course Outcomes:

CO1 - Ability to explain the separation processes in chemical industries such as distillation, evaporation, leaching, microfiltration, and absorption.
CO2 - Ability to design and conduct experimental tasks individually or in a group with a special emphasis of the development of safe working practices during laboratory exercises.
CO3 - Ability to write a good and effective report with appropriate data analysis and presentation.

ERT316 KEJURUTERAAN TINDAKBALAS [REACTION ENGINEERING]
No of Credits: 3

Course Synopsis:

This course is concerned with the exploitation of reactions on a commercial scale. Its goal is to familiarize with different designs of reactors. It also emphasizes qualitative arguments, simple reactor sizing method, graphical procedures, and frequent comparison of capabilities of the major reactor types. Simple ideas are treated first, and then extended to more complex problems.

Course Outcomes:

CO1 - Ability to categorize design equation for most common industrial reactors and calculate the rate law and rate law parameters.
CO2 - Ability to calculate Residence Time Distribution (RTD) functions in non-ideal reactors.
CO3 - Ability to develop conversion and sizing for chemical reactors and to explain steady-state isothermal reactor.
CO4 - Ability to evaluate the difference of catalysis and catalytic reactions.

ERT319 RAWATAN SISA INDUSTRI [INDUSTRIAL WASTE TREATMENT]
No of Credits: 3

Course Synopsis:

This course covers waste treatment methods that are commonly used in industries. It's introduced to the terms that are related to waste and how to calculate the properties such as biological oxygen demand (BOD), chemical oxygen demand (COD) and total carbon (TOC). From these calculations and other given information, basic unit operations involved in the treatment of waste can be design. This course also give an understanding on the processes involved in waste treatment for different industries keeping in view of the Environmental Impact Assessment (EIA), Life Cycle Assessment (LCA) and legal framework.

Course Outcomes:

CO1 - Ability to calculate the physical, chemical, and biological properties of waste material.
CO2 - Ability to calculate and compare the treatment methods for particular waste.
CO3 - Ability to design and evaluate various unit operations for waste treatments.
CO4 - Ability to propose the landfill, incineration waste treatments and waste management systems.

ERT321 KAWALAN PROSES DAN DINAMIK [PROCESS CONTROL & DYNAMICS]
No of Credits: 4

Course Synopsis:

This course includes an introduction to process control and dynamics, feedback controllers, control system instrumentation, overview of control system design, theoretical models, dynamic behavior of processes, PID controller design and troubleshooting. The theory is supported by performing laboratory experiments.

Course Outcomes:

CO1 - Ability to derive and develop theoretical model of chemical processes, analyze Laplace transform techniques to simplify first order and second order processes and creat transfer functions and state space models.
CO2 - Ability to develop dynamic behavior of first and second order processes, analyze dynamic response characteristics of more complicated processes and development of empirical models from process data.

CO3 - Ability to analyze control system instrumentation and propose feedback control system for bioprocess and chemical processes.
CO4 - Ability to calculate and analyze dynamic behavior of closed-loop control system.

ERT322 KESELAMATAN DAN PENCEGAHAN KEHILANGAN [SAFETY & LOSS PREVENTION]
No of Credits: 3
Course Synopsis:
This course covers the fundamental of process safety specifically toxicology, industrial hygiene, sources model, fires and explosions as wells as relief concept design. The students are also exposed to hazard identification, risk assessment and accident investigation. The course will be concluded with biohazard and biosafety in chemical processes.

Course Outcomes:
CO1 - Ability to analyze the source, toxic release and dispersion models and evaluate the significance of the events.
CO2 - Ability to distinguish fires and explosion as well as examine ways to prevent it.
CO3 - Ability to evaluate relief concepts as well as calculate or sizing the relief system.
CO4 - Ability to propose and evaluate process safety to identify the hazard and risk in the industry.

ERT324 PROSES PEMISAHAN [SEPARATION PROCESS]
No of Credits: 3

Course Synopsis:
This course introduces different types of unit operations that can be found in chemical and bioprocessing industries for product separation. The unit operations involved evaporation, humidification, absorption and distillations which are designed based on mass and heat transfer principles. Lastly, the course explains the unit operations for size reduction, screening and fluidization of particulate solids.

Course Outcomes:
CO1 - Ability to acquire and apply knowledge of material and energy balances for the selected important operations such as evaporation, distillation, absorption, adsorption, solvent extraction, solid leaching and etc.
CO2 - Ability to identify, formulate and solve problems related to the basic parameters of the selected unit operations.
CO3 - Ability to design solutions in optimizing the operating conditions of the selected unit operations to meet economically attractive for industrial needs.

ERT325 EKONOMI KEJURUTERAAN [ENGINEERING ECONOMICS]
No of Credits: 3

Course Synopsis:
This course introduces the concepts, principles and methods of economy and accounting with the relation in engineering fields. The course enables the students to formulate cash-flow, perform analysis on engineering economic problems and evaluate the alternatives of engineering investment/ projects for decision making. Moreover, the cost estimation using conventional and advanced techniques in production process is introduced. Interpretation and simple analysis of financial statement and performance of a business firm is discussed. This is important for decision making and business control by engineers.

Course Outcomes:
CO1 - Ability to apply a suitable economy technique in solving engineering problems for decision making.
CO2 - Ability to estimate the cost of a production process and identify alternatives in an engineering project.
CO3 - Ability to evaluate the financial performance of a business firm from its financial statement.
CO4 - Ability to prepare a business plan for an engineering entrepreneurship project.

ERT326 KEJURUTERAAN BIOKIMIA [BIOCHEMICAL ENGINEERING]
No of Credits: 3

Course Synopsis:
This course focuses on the interaction between chemical engineering, biochemistry, and microbiology. Mathematical representations of microbial systems are featured among lecture topics. Kinetic of growth, death and metabolism are also covered. Batch and continuous fermentation and the effect of agitation, mass transfer and enzyme technology are included. The laboratory exercises introduce students to the fundamental practices in biochemical engineering.

Course Outcomes:
CO1 - Ability to develop enzyme reactions based on its kinetics study and applied catalysis.
CO2 - Ability to evaluate microbial system based on its metabolic pathways and kinetics study in batch and continuous cultures.
CO3 - Ability to propose bioconversion technologies of microbial, plant and animal cell culture for the production of value-added product.

ERT327 SIMULASI UNTUK KEJURUTERAAN KIMIA [SIMULATION FOR CHEMICAL ENGINEERING]
No of Credits: 2

Course Synopsis:
The course covers introduction of simulation of chemical processes, material and energy balances, equipment sizing and costing, and environmental impact assessment. Students are exposed to the usage of SuperPro design software for modeling and simulation purposes. Subsequently, sustainability assessment will be introduced, emphasizing on economic and profitability analysis.

Course Outcomes:
CO1 - Ability to apply and analyze engineering calculation like mass and energy balance, stoichiometry and kinetics of the chemical processes.
CO2 - Ability to analyze process and organize unit operation in chemical processes using simulation software.
CO3 - Ability to analyze, collect and organize economic process data and apply environmental impact and sustainability assessment.

ERT328 PEMPROSESAN KOLOID DAN BAHAN BIO [COLLOIDAL AND BIOMATERIALS PROCESSING]
No of Credits: 3

Course Synopsis:
This course brings together colloidal systems, various biomaterials production and processing aspects, including tissue engineering scaffold materials, drug delivery systems, nanobiomaterials, biomedical diagnostics, therapeutics, pharmaceutics, and biosensors. This course explains the fundamental of colloidal systems and polymeric biomaterials as well as the development of new materials. The structure and properties of colloidal particles and polymeric polymers are discussed. Lastly, the application of colloidal particles and biomaterial in various applications are discussed.

Course Outcomes:
CO1 - Ability to differentiate various colloidal systems and biomaterials production and processing.
CO2 - Ability to explain the structure and properties of colloidal particles and polymeric polymers.
CO3 - Ability to formulate a suitable biomaterial for a specific application.

ERT329 REKABENTUK KEJURUTERAAN BIOREAKTOR [BIOREACTOR ENGINEERING DESIGN]
No of Credits: 3

Course Synopsis:
This course provides the elements in a bioreactor design including bioreactor overview (components of bioreactors and importance; classification of bioreactors), bioreactor design and development using microbial cells, mammalian cell culture, and plant cell culture for food, biotechnology and environmental applications, advance bioreactor designs for combined reactions and separations. This course also explains the operation of bioreactor, the modelling of bioreactor systems, and transport processes and control in bioreactors using numerical tools.

Course Outcomes:

CO1 - Ability to describe the elements, components, classification, function and application of a bioreactor.
CO2 - Ability to design a bioreactor system for a specific application.
CO3 - Ability to propose the operation of a bioreactor system using numerical tools.

ERT330 PEMANFAATAN BIOMASS [BIOMASS UTILIZATION]
No of Credits: 3
Course Synopsis:
This course covers all the aspects of biomass production and utilization, including fundamental principles and practical applications of biomass. The course explains the pretreatment of biomass, the production of fuels and solvents, and the production of single cell protein. This course also includes the production and action of cellulases and other biomass conversion technologies. Lastly, this course introduces the guidelines to assess sustainability of biomass utilisation with respect to environmental, economic, and social impact.

Course Outcomes:

CO1 - Ability to explain the properties, pretreament, and processing of biomass.
CO2 - Ability to propose a biomass conversion system for fuels, solvents, or single cell protein production.
CO3 - Ability to assess sustainability of biomass utilisation with respect to environmental, economic, and social impact.

ERT401 REKABENTUK LOGI KIMIA I [CHEMICAL PLANT DESIGN I]
No of Credits: 3

Course Synopsis:
Chemical plant design is a two part course covering aspects of engineering design related to open-ended design projects at professional level engineering design task in bioprocess engineering field. The design project is a team-based approach to provide capstone design experience emphasizing on the application of sciences, mathematics and engineering science acquired in earlier course work in design of projects. The scope of the course covers the knowledge on the elements in project formulation, planning/scheduling, management and communication, engineering economics including cost-benefits analysis and budgeting, critical thinking, ethics and safety in engineering design, fundamental in engineering design methodology (the process and tools) and systems engineering. Analysis of case studies pertaining to engineering issues in design.

Course Outcomes:

CO1 - Ability to differentiate between ethical and legal issues and relate how these are related to design projects in chemical engineering field.
CO2 - Ability to demonstrate team work through group weekly meetings, project planning and management, analysis of case studies and class presentation.
CO3 - Ability to analyze and assess the impact of design and engineering solutions on society and environment.
CO4 - Ability to evaluate economic and feasibility study of a design project in chemical engineering.
CO5 - Ability to compose engineering problems and alternative solutions and formulate a sound proposal in chemical engineering project using systematic design process.

ERT402 REKABENTUK LOGI KIMIA II [CHEMICAL PLANT DESIGN II]
No of Credits: 4

Course Synopsis:
This course requires student to work in a pre-determined group to solve a practical and industrially relevant design problem in the same way as might be expected in an industrial situation. The scope of the class is to develop and evaluate process alternatives via rigorous simulation, perform equipment sizing, optimise various process units, analyse the safety and environmental impact of the process, estimate capital and operating costs, and assess plant profitability to meet desired project needs within realistic constraint. The use of modern engineering design practices, tools and product/solution development process, trouble-shooting methodology, learn and utilise a realistic simulation of the real-world design process, engineering analysis and synthesis through their projects Knowledge integration from

other Bioprocess Engineering courses is required to identify, solve, and design solution for complex engineering problems.

Course Outcomes:

CO1 - Ability to conduct engineering analysis and adeptly apply principles and tools of mathematics and science to solve multi-facetted design project to produce credible conclusions.
CO2 - Ability to formulate and produce solutions that properly address critical issues and assumptions that are conceptually and contextually valid and meet client expectation.
CO3 - Ability to design component, equipment, process, plant and systems in bioprocess engineering using engineering tools and design softwares for optimum performance.
CO4 - Ability to display understanding of bioprocess engineering project and integrate the design for manufacturability, utility and sustainability.
CO5 - Ability to write project report that conforms to engineering professional standard and to perform verbal presentation on the project.

ERT432 AMALAN PENGILANGAN BAIK [GOOD MANUFACTURING PRACTICE]
No of Credits: 3

Course Synopsis:

This course gives complete overview about the production facility from start of the project up to the production process and how to carry out all project steps according to the guidelines of the GMP. Topics include the background to GMP and cGMP regulations and guidelines and their relevance in the laboratory, process development and pilot plant.

Course Outcomes:

CO1 - Ability to analyze the concepts and the requirements of GMP and Validation, the Standard Operation Procedure (SOP) and Safety and Health Environment (SHE) aspects.
CO2 - Ability to develop the GMP requirement and primary and secondary bioprocess engineering products, together with the Hazard Analysis and Critical Control Point (HACCP).
CO3 - Ability to evaluate the utilities and services, laboratory design, process development facilities and pilot manufacturing facilities.

ERT433 PEMPROSESAN HALAL [HALAL PROCESSING]
No of Credits: 3

Course Synopsis:

This course introduces various aspects of halal processing. Halal food industries emerge as one of the important international trades in providing and supplying clean and permissible food to not only muslim populations but also people across the globe. The requirements for producing halal food are very crucial to be upheld and becoming one of the important subject in the food industries. Thus, this course discusses various halal requirements for the main food including meat, dairy, fish and seafood, and cereals. some food ingredients for example gelatin, enzymes and alcoholic materials will also be examined in terms of their requirements in the food processing. Towards the end of the course, student will learn about the current trend on biotechnology based processing food or GMO and their processing and packaging

Course Outcomes:

CO1 - Ability to evaluate and apply knowledge of basic concept of Halal food laws, regulations and guidelines to meet domestic and international requirements and comparison of kosher, halal and vegetarian.
CO2 - Ability to distinguish complex engineering problem related to halal production and propose halal control points of the production.
CO3 - Ability to assess the professional and ethical responsibilities and commitment to the community related to halal production requirements and halal food ingredients to meet the halal regulations.

ERT434 KEJURUTERAAN TENAGA DAN UTILITI PROSES [ENERGY AND PROCESS UTILITY ENGINEERING]
No of Credits: 3

Course Synopsis:
This course introduces exploring methods and techniques to optimize processing energy efficiency in process plants. The course presents several approaches that considers optimizing process conditions, changing process flow schemes, modifying equipment internals, and upgrading process technology for the optimization of energy and process in chemical industries. The course describes technical solutions to reduce energy consumption leading to significant returns on capital and the methods and tools for continuous energy and process improvements.

Course Outcomes:
CO1 - Ability to identify thermal and chemical constraints and incorporate them into optimization models and solutions.
CO2 - Ability to assess energy, process and utility system and propose system optimization.
CO3 - Ability to evaluate retrofit project and its implementation,

ERT435 TENAGA LESTARI [SUSTAINABLE ENERGY]
No of Credits: 3

Course Synopsis:
This course introduces energy production that can be generated from bioresources or biomass which is an alternative way of producing energy from fossil-based fuels. This course emphasizes the use of more environmental-friendly technologies which can lead to reduction of pollution, thus sustaining the ecology system. The contents cover the characteristics of biofuels, bioresources suitable for conversion technologies, biological routes and chemical routes in producing fuels, and also the limitations of bioconversion processes.

Course Outcomes:
CO1 - Ability to differentiate the characteristics of biofuels and compare the process descriptions of various biofuel production.
CO2 - Ability to evaluate the limitations of biofuel productions processes.
CO3 - Ability to propose a biofuel production process from potential biological feedstocks.

ERT436 PROSES PETROKIMIA [PETROCHEMICAL PROCESS]
No of Credits: 3

Course Synopsis:
This course provides a holistic understanding of petroleum and petrochemical products manufacturing, presents the entire supply chain in a step-by-step sequence. The course explains the essential preliminaries for the exploration and production of crude petroleum oil and gas, which including the analysis of crude oil and its petroleum products. The processing of petroleum in refineries is described. The course also introduces the raw materials and end product of petrochemicals and the manufacturing principles of industrially important products. Theories and problems of unit operations and the processes involved in refineries and petrochemical plants are discussed. The start up, shutdown, maintenance, fire, and safety operations of refineries and petrochemical plants are explained.

Course Outcomes:
CO1 - Ability to explain the basic procedures and role of all fundamental systems used in crude petroleum oil and gas production.
CO2 - Ability to differentiate raw materials, end product and manufacturing process of petrochemicals.
CO3 - Ability to describe basic concepts of reservoir engineering, methods and technologies for petroleum oil recovery.
CO4 - Ability to analyse the key issues in the design and optimisation of refineries and petrochemical plants.

ERT437 KEJURUTERAAN FARMA DAN NUTRASEUTIKAL [PHARMA AND NUTRACEUTICAL ENGINEERING]
No of Credits: 3

Course Synopsis:
The course includes the principles of drug pharmacokinetics: absorption, distribution, metabolism and excretion of drugs. The course introduces

the nutritional and nutraceutical sciences of the dietary supplements and functional foods. This course also covers the scientific and technological aspects of the designing and manufacturing of pharmaceutical and nutraceutical products.

Course Outcomes:
CO1 - Ability to explain the basic concept of drug absorption and disposition and analyze the related pharmacokinetics.
CO2 - Ability to explain how nutrients, phytochemicals, toxins and food processing products, including the dietary supplements and functional foods affect the body.
CO3 - Ability to evaluate the pharmaceutical engineering processes in formulation and production of pharmaceutical and nutraceutical products.
CO4 - Ability to design pharmaceutical and nutraceutical manufacturing facilities.

ERT439 SEL BAHAN API [FUEL CELLS]
No of Credits: 3

Course Synopsis:
This course provides the fundamentals of fuel cell operation and design, and incorporates techniques and methods designed to analyze different fuel cell systems. The first part of the course emphasises on basic principles of fuel cell, which contains background information on fuel cells, fundamental principles such as electrochemistry, thermodynamics, and kinetics of fuel cell reactions as well as mass and heat transfer in fuel cells. The second part of the course explains on design explores, important characteristics associated with various fuel cell components, electrodes, electrocatalysts, and electrolytes. The last part of the course is on analysis examines phenomena characterization and modeling both at the component and system levels.

Course Outcomes:
CO1 - Ability to describe the basic principles of fuel cell.
CO2 - Ability to analyse the properties of fuel cells components.
CO3 - Ability to design a theoretical fuel cell.

ERT442 JURUTERA PROFESIONAL [PROFESIONAL ENGINEERS]
No of Credits: 2

Course Synopsis:
This course aims to explain the main concepts in engineering ethics, risk management and occupational safety and health as well as to expose the students to basic of law in the engineering context. The materials will be of introductory nature to enable engineers to appreciate factors that have to be taken into account in decision-making. At the end of the course, students will be able to identify and discuss issues and challenges faced by engineers relating to engineering ethics, risk management and to understand the legal requirements related to engineering field.

Course Outcomes:
CO1 - Ability to understand, identify and evaluate the issues and challenges of engineering ethics.
CO2 - Ability to explain and identify hazards, evaluate and review the function of risk management and occupational safety and health (OSHA).
CO3 - Ability to identify, discuss and evaluate the aspects and procedures of legal on engineering issues.

ERT443 PENGURUSAN UNTUK JURUTERA [MANAGEMENT FOR ENGINEERS]
No of Credits: 3

Course Synopsis:
This course aims to teach students on how to apply project management skills when undertaking projects and to provide basic tools of engineering economy to enable the students to carry out professional quality economic evaluations. At the end of the course, students will be able to identify and discuss issues and challenges faced by engineers relating to project management in the current economic scenarios.

Course Outcomes:
CO1 - Ability to analyze and evaluate project requirements and integrate the processes of project management like work plans, scheduling,

cost estimation and perform project evaluation.

CO2 - Ability to analyze and evaluate economic scenarios and integrate decision making process to manage and plan engineering projects and business ventures.

ERT445 PROJEK TAHUN AKHIR I [FINAL YEAR PROJECT I]
No of Credits: 2

Course Synopsis:
This course consists of lecture and independent study on the technique of conducting literature review, identification of problem statements, project objectives and research methodology. The students are guided on the proper techniques and format of thesis writing, submit the project proposal and present to the internal examiners.

Course Outcomes:
CO1 - Ability to synthesize information including standards, code of practice, journals, policies, field data, etc, relevant to the specific research to be undertaken and relate with societal and global issues.Ability to review information source then recognize, construct and justify the suitable research information.
CO2 - Ability to analyze scenario and compose the problem statements and the research objectives of the project.
CO3 - Ability to formulate research methodology incorporating clear fundamentals, theories and benchmarked against standard practices governing the research project.
CO4 - Ability to prepare and defend research proposal with effective communication skills.

ERT446 PROJEK TAHUN AKHIR II [FINAL YEAR PROJECT II]
No of Credits: 4

Course Synopsis:
This course consists of lectures and independent study on the techniques of conducting laboratory and/or field experiments. The students are guided on the techniques and implementation of research and monitored based on the research plan, data analysis, interpretation and conclusion. The students are required to write, submit and defend their thesis to the internal examiner.

Course Outcomes:
CO1 - Ability to conduct research experiments, analyze and interpret data and deduce a good conclusion.
CO2 - Ability to use techniques and modern tools to solve research problems.
CO3 - Ability to plan activities pertaining to research project and execute the plan to meet the required research objectives and datelines.
CO4 - Ability to write research report that conforms to standard thesis format and performs verbal presentation.

PCT111 KEMAHIRAN KEJURUTERAAN [ENGINEERING SKILLS]
No of Credits: 3

Course Synopsis:
This subject is 100% practical coursework and carried out 3 unils credit hours.This course contains six modules which are Basic Workshop, Machining, Wiring, PCB Design, PLC, AutoCAD and technical Drawlng that specificaly planned for electronic based programs.

Course Outcomes:
CO1 - Ability to APPLY and CONSTRUCT a basic skill and standard practiced of mechanical machines and equipment.
CO2 - Ability to APPLY and CONSTRUCT the basic skills and standard practiced of domestic wiring.
CO3 - Ability to APPLY and CONSTRUCT a logic system using common controller tool (PLC).
CO4 - Ability to APPLY CONSTRUCT a standard practiced of manual technical drawing and able to design a product using common software (AutoCAD
CO5 - Ability to APPLY and CONSTRUCT the basic skills and standard practiced of PCB layout design and fabrication process.

PTT152 KIMIA FIZIKAL [PHYSICAL CHEMISTRY]
No of Credits: 2

Course Synopsis:
The course discusses the concept of equilibrium in terms of thermodynamics, particularly enthalphy and entrophy. The course also covers the calculations of material equilibrium, reaction equilibrium, reaction kinetics, phase diagrams and equilibrium electrochemistry.

Course Outcomes:
CO1 - Ability to APPLY the basic concepts, laws and principles in physical chemistry.
CO2 - Ability to CALCULATE problem concerning the basic concepts, laws and principles in physical chemistry
CO3 - Ability to ASSESS and SOLVE problems concerning laws and principles in physical chemistry.

PTT153 KEJURUTERAAN BAHAN [MATERIALS ENGINEERING]
No of Credits: 3

Course Synopsis:
This course covers the introduction to materials science and engineering which emphasizes on material properties and structures. The course encompasses the fundamental of material structures, class of material properties, and measurement of the properties. The common micro-structural characteristics of different material classes as well as the aspects of materials synthesis and design are also embedded in the course.

Course Outcomes:
CO1 - Abilty to DESCRIBE types of material families, material structures, and material characteristics.
CO2 - Ability to EVALUATE the behavior of structural materials, the phases in material and material reliability.
CO3 - Ability to PROPOSE the suitability of material in engineering-related projects.

PTT154 PENGENALAN KEPADA PROSES INSTRUMENTASI [INTRODUCTION TO INSTRUMENTATION PROCESS]
No of Credits: 2

Course Synopsis:
This course provides its attendees the introductory fundamentals and application knowledge of the essential process instruments (including valves, pumps, compressors, blowers, fans) which are commonly used in the process industries. Attendees are also trained with the ability to examine both process flow diagram (PFD) and piping & instrument diagram (P&ID) using the Instrumentation Systems and Automation Society (ISA) symbology and tagging systems. Ultimately, the design and development of both PFD and P&ID of both simple and complex systems are studied and practiced.

Course Outcomes:
CO1 - Ability to ANALYSE the function of various industrial process instrumentation and application of engineering drawings.
CO2 - Ability to APPLY the ISA symbology and tagging as well as numbering.
CO3 - Ability to CONSTRUCT Process Flow Diagram (PFD) and Piping & Instrumentation Diagram (P&ID) using appropriate tools.

PTT155 KIMIA ORGANIK [ORGANIC CHEMISTRY]
No of Credits: 3

Course Synopsis:
This course introduces the fundamental theories and its application in reactions involving alkenes and alkynes. Then, focusing on conformational analysis of alkanes and emphasizing on the nucleophilic substitution reaction of alkylhalides. The course also coverson physical and chemical properties and chemical reactions involving alcohol and ester, aldehyde and ketone, carboxylic acid and aromatic compound the application of organic chemical process in chemical and biotechnological industries are discussed.

Course Outcomes:

CO1 - Ability to DIFFERENTIATE different classes of organic compounds based on nomenclature, structure, physical and chemical properties.

CO2 - Ability to DECIDE on which types of organic reaction and mechanism involved based on starting materials, functional groups, reaction intermediate and condition.

CO3 - Ability to FOLLOW standard procedure for handling laboratory equipment and techniques such as distillation and reflux.

PTT156 PRINSIP – PRINSIP BAGI PROSES-PROSES KIMIA [PRINCIPLES OF CHEMICAL PROCESSES]
No of Credits: 4

Course Synopsis:

The course highlights the basic concept of material and energy balance in different systems. The aims are to teach students how to formulate and solve materials balances in various processing systems. Exposure on the concept and understanding of material and energy balances are emphasized which covers single and multiphase systems and nonreactive and reactive processes. These concepts are applied to analyze and solve problems in chemical systems.

Course Outcomes:

CO1 - Ability to APPLY knowledge of engineering fundamentals to define and solve, engineering processes and methodologies, together with basic engineering calculations.

CO2 - Ability to calculate and ANALYZE information broadly, using appropriate tools and technique with appropriate consideration related to material balances for chemical systems.

CO3 - Ability to calculate and EVALUATE information broadly, using appropriate tools and technique with consideration related energy balances and combination of material and energy balances for chemical systems.

PTT157 GRAFIK KEJURUTERAAN UNTUK KEJURUTERAAN KIMIA [ENGINEERING GRAPHICS FOR CHEMICAL ENGINEERING]
No of Credits: 2

Course Synopsis:

This course is a basic introduction to the techniques of engineering graphics designed to develop an ability to visualize, analyze, and understand engineering drawings and designs, and to develop skill and accuracy in producing drawings. The application of computer-aided engineering graphics using an appropriate software package will be an integrated part of the course.

Course Outcomes:

CO1 - Ability to CREATE 2D plans and 3D models using AutoCAD.

CO2 - Ability to CONSTRUCT parallel and perspective projections using AutoCAD.

CO3 - Ability to DEMONSTRATE functions and commands to solve drafting and design problems in AutoCAD.

PTT158 KIMIA ANALISIS [ANALYTICAL CHEMISTRY]
No of Credits: 3

Course Synopsis:

The first part of the course covers the basic principle of analytical chemistry which includes data analysis and its interpretation. The second part provides an introduction and application of classical analytical methods such as gravimetry and titrimetry as well as modern methods in analytical chemistry such as chromatographic and spectroscopic technique.

Course Outcomes:

CO1 - Ability to understand and APPLY the basic chemical concepts that are particularly important to analytical chemistry.

CO2 - Ability to understand and APPLY basic principle of different analytical techniques and to CALCULATE and solve analytical problems by intergrating different analytical techniques

CO3 - Ability to PROPOSE the use of different analytical techniques

PTT251 TERMODINAMIK UNTUK KEJURUTERAAN KIMIA [THERMODYNAMICS FOR CHEMICAL ENGINEERING]
No of Credits: 3

Course Synopsis:
This course introduces students to the basic thermodynamics for chemical engineering application and problem solving which covers first and second laws of thermodynamics. The course also highlights substances properties, mass and energy analysis, entropy, refrigeration cycles as well as thermodynamic property relation and solution, and chemical and phase equilibrium.

Course Outcomes:
CO1 - Ability to APPLY the fundamentals properties and law of thermodynamics in engineering system.
CO2 - Ability to ANALYZE heat, work and energy of the system and thermodynamic property relations.
CO3 - Ability to EVALUATE the theory of the solution of thermodynamics, gas mixtures and chemical and phase equilibrium.

PTT252 MEKANIK BENDALIR [FLUID MECHANICS]
No of Credits: 3

Course Synopsis:
This course emphasizes fundamental concepts and problem-solving techniques. It covers properties of fluid such as viscosity and surface tension ,principlesof mass and energyconservation, Bernoulli and general energy equations, momentum analysis, dimensional analysis and modelling and fluid flowssuch internal and external flows and compressible flow

Course Outcomes:
CO1 - Ability to CLASSIFY fluid flows and analyze essential properties describing them.
CO2 - Ability to DEMONSTRATE and calculate fluid flows parameters using fluid mechanics devices
CO3 - Ability to EVALUATE fluid flow problems with the concept of mass, momentum and energy equations

PTT253 PEMINDAHAN HABA UNTUK KEJURUTERAAN KIMIA [HEAT TRANSFER FOR CHEMICAL ENGINEERING]
No of Credits: 3

Course Synopsis:
This course emphasizes the fundamental concepts and problem-solving techniques related to heat transfer in process engineering. The fundamental theoretical concepts and mechanisms of conduction, convection and radiation of heat transfer and the design fundamentals of basic industrial heat exchangers are analyzed. The use of various equations to estimate total heat capacity and overall heat transfer coefficient, subsequently to be applied to calculate the duty of heat transfer equipment are also presented and discussed.

Course Outcomes:
CO1 - Ability to DEMOSTRATE the principles of conduction, convection and radiation heat transfer.
CO2 - Ability to ANALYZE the problems related to heat transfer process.
CO3 - Ability to DESIGN the heat exchanger systems related to industries.

PTT254 PEMINDAHAN JISIM UNTUK KEJURUTERAAN KIMIA [MASS TRANSFER FOR CHEMICAL ENGINEERING]
No of Credits: 3

Course Synopsis:
This course emphasizes the fundamental concepts and problem-solving techniques on mass transfer operations and principles. This course provides the knowledge on mass transfer operations at basic to an intermediate level that covers with the theoretical and analytical background to solve the mass transfer operations problems. Topics to be covered include mass transfer mechanism which is diffusion, Ficks Law, Maxwell Law, and principles of absorption, evaporation and drying.

Course Outcomes:
CO1 - Ability to DEMONSTRATE the diffusion mass transfer principles.
CO2 - Ability to CALCULATE the mass transfer coefficient.
CO3 - Ability to ANALYZE mass transfer systems related to industry.

PTT255 KEJURUTERAAN TINDAKBALAS [REACTION ENGINEERING]
No of Credits: 3

Course Synopsis:
This course highlights the principles of chemical reactions engineering involving knowledge exploitation of industrial scale reactor design. Fundamental concepts are emphasized through the knowledge of mole balance, conversion and reactor sizing as well as rate law and stoichiometry. Problem-solving techniques are also applied in solving various problem related to isothermal reactor design, collection and analysis of rate data, catalysis and catalytic reaction mechanism, and distributions of residence time for reactors.

Course Outcomes:
CO1 - Ability to DEMONSTRATE the principles of chemical reaction engineering design for industrial reactors.
CO2 - Ability to ANALYZE and solve various problem related to reactor design and reaction process.
CO3 - Ability to EVALUATE the catalytic reaction mechanism and Residence Time Distribution (RTD) functions in reactors.

PTT256 MIKROBIOLOGI INDUSTRI [INDUSTRIAL MICROBIOLOGY]
No of Credits: 4

Course Synopsis:
The course refreshes microbial fundamentals which include characterization of micro-organisms; aseptic techniques, microscopy, microbial structure, nutrition, energy generation, reproduction, control of microbial populations and microbial diversity as well as strain improvement for new products and productivity improvement. This course also emphasizes on the microbiological industry development, scope of microbiological industries, microbes in microbiological industries, biomass and metabolite production, microbes in bioremediation and in waste treatment industries.

Course Outcomes:
CO1 - Ability to demonstrate practical skills in fundamental microbiological methods.
CO2 - Ability to develop bioprocessing systems for industrial products by applying fundamentals of microbial classification, physiology and metabolisms.
CO3 - Ability to evaluate microbiological processes involved in applications production of a range of industrial products.

PTT257 BIOKIMIA DAN TEKNOLOGI ENZIM [BIOCHEMISTRY AND ENZYME TECHNOLOGY]
No of Credits: 4

Course Synopsis:
This course covers the properties and structure of water, classification and function of biomolecules such as carbohydrates, lipids and amino acids, role of proteins and enzymes in biochemistry, metabolism and photosynthesis. Also covering advance topics in production, isolation, purification, immobilization, and application of enzymes in a various reaction systems, together with examples of specific applications for immobilized enzymes. The course also covers applications of free and immobilized enzymes in the food, chemical and pharmaceutical industries, as well as probable future trends in enzyme technology.

Course Outcomes:
CO1 - Ability to differentiate basic structure, properties, functions and classification of biomolecules.
CO2 - Ability to illustrate electron transport, citric acid cycle and photosynthesis.
CO3 - Ability to distinguish techniques for enzymes isolation, purification and immobilization.
CO4 - Ability to assemble the current and future trends of biomolecules applications in bio-analysis, biotechnology and industrial sectors.

PTT258 KEJURUTERAAN BIOMOLEKUL DAN GENETIK [BIOMOLECULAR AND GENETIC ENGINEERING]
No of Credits: 3

Course Synopsis:
This course provides fundamental knowledge on molecular biology and the basic principles of genetic engineering which encompass the doctrines of DNA, RNA, and protein biosynthesis. This course also covers on the regulations of their interactions and the techniques employed in gene cloning and recombinant DNA technology.

Course Outcomes:
CO1 - Ability to ILLUSTRATE gene transfer and mutation in bacteria.
CO2 - Ability to COMPARE and CONTRAST the mechanisms of bacterial and eukaryotic DNA replication, DNA repair, transcription, and translation.
CO3 - Ability to ASSESS the techniques used in the isolation, manipulation and cloning of heterologous DNA.

PTT259 PROSES DAN PRODUK OLEOKIMIA [OLEOCHEMICAL PROCESS AND PRODUCTS]
No of Credits: 3

Course Synopsis:
This course emphasize to the palm oil and oleochemical industries in Malaysia, processes involved in palm oil mills, palm oil refineries and any related process to production of oil from various plants. Besides that, this course also discusses the major oleochemical products in the industry, application of the products and formulation, the quality management and troubleshooting.

Course Outcomes:
CO1 - Ability to define and describe the oleochemical basic concept.
CO2 - Ability to describe and explain the important processes in oleochemical industry.
CO3 - Ability to describe and apply the oleochemical products and formulations.

PTT260 TEKNOLOGI PEMPROSESAN SUMBER BIO [BIORESOURCES PROCESSING TECHNOLOGY]
No of Credits: 3

Course Synopsis:
This course aim to enrich students with the knowledge of bioresource utilization. The course include understanding the need and demand of bioresources industries by learning the types of bioresources, highlighting the important role of bioresources as raw material in industrial processing, knowledge on different types of bioresources processing technology, potential application of bioresources and challenges of bioresource in traditional chemical industry.

Course Outcomes:
CO1 - Ability to EXPLAIN the need, principle and demand of bioresource industry as renewable resources.
CO2 - Ability to EXPLAIN and DISTINGUISH the different types of bioresources processing technology.
CO3 - Ability to EVALUATE the application and environmental impact and economic factor of this renewable resource

PTT261 UTILITI LOJI [PLANT UTILITIES]
No of Credits: 2

Course Synopsis:
This course covers the requirement of different utilities for the process plant, along with its generation and its effective utilization. Main utilities required for process plants are water, steam, air & refrigerants.
Steam & non-steam heating media are important for conversion of raw material to products in reactors & to elevate the temperature in the chemical processes. Refrigeration is important to maintain the temperature in the process plant.

Course Outcomes:
CO1 - Ability to describe the process involved water in chemical plant.
CO2 - Ability to distinguish the principle involved steam & non-steam

heating.

CO3 - Ability to evaluate the principle involved air and refrigerant and its applicaions.

PTT262 TENAGA BOLEH BAHARU [RENEWABLE ENERGY]
No of Credits: 3

Course Synopsis:
This subject aims to introduce students to renewable energy resources, their technology application and environmental assessments. The course includes renewable energy sources such as solar, wind power, geothermal, hydro and biomass. More emphasis is given to bioenergy technologies to convert biomass into biofuels. The course has been designed to provide students with a knowledge of the renewable energy sources and the engineering skills associated with them.

Course Outcomes:
CO1 - Ability to explain the principle and the environmental aspect of renewable energy.
CO2 - Ability to explain and distinguish the different types of renewable energy resources.
CO3 - Ability to evaluate and compare the biomass energy process in producing biofuels.

PTT271 MIKROBIOLOGI MAKANAN [FOOD MICROBIOLOGY]
No of Credits: 3

Course Synopsis:
The early part of this course introduces the features of microorganisms typically involved in food industry namely foodborne, waterborne and spoilage microorganisms, followed by the methods of their isolation, detection and identification. Then, the intrinsic and extrinsic conditions with factors that affect the growth, survival and death of microorganisms in foods are covered in the later part. Finally in food application, the indicators of food safety and quality, principles of quality control, microbial criteria as well as foodborne diseases are established.

Course Outcomes:
CO1 - Ability to DESCRIBE the characteristics of foodborne, waterborne, and spoilage microorganims, as well as methods of their isolation, detection, and identification.
CO2 - Ability to ANALYSE the intrinsic and extrinsic conditions affecting the growth, survival and death of microorganisms in foods.
CO3 - Ability to ESTABLISH indicators of food safety and quality, principles of quality control, microbial criteria and foodborne diseases.

PTT272 SAINS DAN BIOKIMIA MAKANAN [FOOD SCIENCE AND BIOCHEMISTRY]
No of Credits: 3

Course Synopsis:
This course highlighted on chemical/biochemical reaction of carbohydrate, lipids, proteins, vitamins, water and minerals in fresh and processed foods with respect to food quality and health. It also covers on biochemical and functional properties of food components, enzymes and food additives (emulsifiers, pigments, colours, flavours, sweeteners, preservatives,etc). Metabolism and processes of nutritive aspect of food constituents are also emphasized.

Course Outcomes:
CO1 - Ability to APPLY the basic principles of food science and biochemistry into real-world food science and nutritional studies.
CO2 - Ability to DIFFERENTIATE the chemical structure of food components including proteins, carbohydrates, fats and vitamins; and how these structures determines functional behaviour of these food components with respect to food quality, nutrition and safety.
CO3 - Ability to PROPOSE the chemicals interactions with food components and their effects on the sensory, nutritional composition and functional properties of foods.

PTT273 TEKNOLOGI LEPASTUAI [POSTHARVEST TECHNOLOGY]
No of Credits: 3

Course Synopsis:
This course provides the overview on postharvest handling technology of agricultural produce. The course emphasizes the basic of postharvest handling technology, pre-harvest and harvesting factors affecting the postharvest quality, postharvest operations in the packinghouse and appropriate equipment or chemicals that relates to postharvest treatments and storage of agricultural products, quality assurance and preparation of fresh-cuts, and postharvest socio-economics.

Course Outcomes:
CO1 - Ability to ANALYSE the chemical and physical properties of agricultural products in order to apply the appropriate post-harvest handling technology.
CO2 - Ability to MANAGE the factors during pre-harvest, harvesting and postharvest handlings that affect the quality of the produces
CO3 - Ability to ASSESS the socio-economic factors and impact to prevent loss in post-harvest operation.

PTT333 PENGURUSAN TEKNOLOGI KEJURUTERAAN [ENGINEERING TECHNOLOGY MANAGEMENT]
No of Credits: 3

Course Synopsis:
This course aims to teach students on how to apply the project management skills and economic techniques in evaluating the design. The role of economics is to assess the appropriateness of a given project, estimate its value, and justify it from an engineering technology standpoint. At the end of the course, students will be able to identify and discuss issues and challenges faced by engineering technologist relating to project management in the current economic scenarios.

Course Outcomes:
CO1 - Ability to evaluate the process of project management, develop work plans, do cost estimation and perform project evaluation.
CO2 - Ability to evaluate economic scenarios and apply decision making process to engineering project and business venture.

PTT351 KESELAMATAN DAN PENCEGAHAN KEHILANGAN [SAFETY AND LOSS PREVENTION]
No of Credits: 2

Course Synopsis:
The course emphasizes the technical fundamentals of process safety. The course includes the issues in safety associated with toxicology, industrial hygiene, source and dispersion models. Characteristics and possible prevention steps of fires and explosions are also included in this course. Subsequently, the course covers the concept and design of relief system, hazard identification as well as risk assessment. The course is concluded with the lesson in accident investigation.

Course Outcomes:
CO1 - Ability to ANALYZE the type of hazards and dispersion model in chemical engineering processes.
CO2 - Ability to PROPOSE suitable methods to prevent fires and explosion and to design relief system for process vessels.
CO3 - Ability to EVALUATE safety procedures and designs using proper hazard identification and accident investigation techniques.

PTT352 KEJURUTERAAN ALAM SEKITAR [ENVIRONMENTAL ENGINEERING]
No of Credits: 3

Course Synopsis:
This course introduces the cause, effect and method to control pollution from industries. The course covers the three major categories of industrial pollution; water pollution, air pollution and industrial waste management. In the first part, the course includes the source and types of water pollutants, environmental regulations pertaining to waste water discharge, and techniques to treat waste water before discharging to the environment. The second part of the course covers the source and effect of air pollution, regulations requirement for air pollution control, and technology to control air

pollution emissions from industries. The third part covers the management of industrial waste that includes definition of scheduled waste, scheduled waste regulations, and techniques to manage the waste.

Course Outcomes:

CO1 - Ability to ANALYZE legislative act for waste management in industry.
CO2 - Ability to ANALYZE types of pollution emission from industries and effect of industrial pollution to the environment and public health.
CO3 - Ability to PROPOSE air pollution control and wastewater treatment system.

PTT353 PROJEK TAHUN AKHIR I [FINAL YEAR PROJECT I]
No of Credits: 3

Course Synopsis:

Final year project is the culmination of study towards the Bachelor of Chemical Engineering Technology degree that requires the application of knowledge learned throughout the program. This course consists of the combination between guided supervision and independent study focusing on the technique of identification of problem statements, research objectives, conducting literature review and proposing research methodology. This course also covers scientific and technical guidance on proposal writing and preparation. Presentation of the research proposal to internal examiners is conducted.

Course Outcomes:

CO1 - Ability to analyze scientific information including standards, code of practice, journals, policies, field data, relevant to the specific research to be undertaken and relate with societal and global issues and thus COMPOSE problem statements and research objectives of the project.
CO2 - Ability to FORMULATE research methodology incorporating clear fundamentals, theories and benchmarked against standard practices governing the research project and to plan activities pertaining to research project to meet the required research objectives and datelines.
CO3 - Ability to PREPARE and defend research proposal with effective communication skills.

PTT354 PROJEK REKABENTUK LOJI I [PLANT DESIGN PROJECT I]
No of Credits: 3

Course Synopsis:

This course contains the preliminary design of industrial process plant. It focuses on process synthesis of a typical product with material balance analysis and process equipment design. The design project is a team-based approach to provide capstone design experience emphasizing on the application of sciences, mathematics and fundamental chemical engineering knowledge acquired in earlier courses.

Course Outcomes:

CO1 - Ability to evaluate the key steps in carrying out a process synthesis of a typical process plant.
CO2 - Ability to develop mass and energy balance for the process plant based on the chosen plant capacity and process synthesis.
CO3 - Ability to design unit operations in process plant based on material balance, heat and mass transfer, thermodynamics, separation, reaction and other engineering principles.

PTT355 KAWALAN PROSES DAN DINAMIK [PROCESS CONTROL AND DYNAMICS]
No of Credits: 3

Course Synopsis:

The course aims to introduce the concept of process control by applying theoretical models of chemical processes for steady and unsteady-state models (dynamic model) of chemical processes. Topics to be covered such as dynamic behavior of processes including Laplace transform, transfer function models, dynamic behavior of first-order and second-order processes. Introduction to feedback control also will be learned in this course including feedback controllers, control system instrumentation, overview of control system design and dynamic behavior of closed-loop control system, PID controller design, tuning, and troubleshooting. The theories are supported by performing laboratory experiments

Course Outcomes:
CO1 - Ability to ANALYZE basic concepts of process control and theoretical model of chemical processes.
CO2 - Ability to DEVELOPE dynamic behavior of process control.
CO3 - Ability to EVALUATE the feedback and feedforward control system for chemical processes.

PTT356 KEJURUTERAAN PEMISAHAN [SEPARATION ENGINEERING]
No of Credits: 3

Course Synopsis:
This course emphasizes the theory and basic principles of separation processes based on equilibrium stage concepts and mass transfer rate control. This course provides the knowledge of basic design criteria required for binary and multi component separations processes. Topics to be covered include liquid-liquid extraction, vapour-liquid extraction (distillation), solid-fluid extraction (leaching, crystallization and adsorption), mechanical-physical separation process (filtration and centrifugation), and membrane separation technology.

Course Outcomes:
CO1 - Ability to ANALYZE the scientific and engineering technology principles to examine basic design/operation of liquid-liquid and solid-fluid extraction process.
CO2 - Ability to apply, calculate, and EVALUATE based on principles of mechanical-physical separation process.
CO3 - Ability to apply principles and theory to DEVELOP basic design/operation of separation process involving vapor and liquid.

PTT357 SEL DAN TEKNOLOGI TISU KULTUR [CELL AND TISSUE CULTURE TECHNOLOGY]
No of Credits: 3

Course Synopsis:
This course introduces the basic knowledge and principle of plant and animal cell and tissue cultures with the incorporation of cutting-edge technology. The topic covers include media preparation, sterilization methods, aseptic techniques pertaining to cell culture and applications of plant and animal cell as well as tissue cultures in various fields.

Course Outcomes:
CO1 - Ability to operate laboratory equipment and sterilization methods for plant and animal tissue cultures.
CO2 - Ability to differentiate techniques involved in plant and animal tissue cultures.
CO3 - Ability to evaluate important uses of plant and animal tissue culture technology in industrial biotechnology.

PTT358 PENGURUSAN DAN PENGGUNAAN SISA [WASTE MANAGEMENT AND UTILISATION]
No of Credits: 2

Course Synopsis:
This course introduced the types of waste material such as waste water, solid waste and hazardous watse generated by various industries and discusses the utilization of the food industry waste and treatments necessary to discard waste environmental acceptors. Topic cover include classification of hazardous waste, physical and chemical properties of waste and its toxicology, treatment and disposal methods, current management practices as well as specific degradation of solid wastes including their direct practical applicability.

Course Outcomes:
CO1 - Ability to DEMONSTRATE the general concept of waste treatment and management and discuss the physical and chemical properties and waste material and describe its toxicology.
CO2 - Ability the ANALYZE and choose appropriate treatment and disposal methods for waste and discuss on the courses and harmful effects of solids and hazardous waste.
CO3 - Ability to ASSESS and propose the current management practices used to control and utilize the waste in bioprcessing industries.

PTT359 TEKNOLOGI PEMPROSESAN HULUAN DAN HILIRAN [UPSTREAM AND DOWNSTREAM PROCESSING TECHNOLOGY]
No of Credits: 4

Course Synopsis:
The course covers the upstream processes on the media formulation, modes of fermentation, basic principle of bioreactor design, sterilization techniques, fermenter instrumentation and control. This course also emphasizes on the downstream strategies which can be generalized to four primary functions as follows: separation of insoluble products and other solids, concentration of products, purification followed by product preparation.

Course Outcomes:
CO1 - Ability to ANALYZE the effect of media formulation on the microbial growth kinetics.
CO2 - Ability to DESIGN the fermenter instrumentation and control based on specific parameters.
CO3 - Ability to PROPOSE a suitable integrated recovery and purification system based on the product.

PTT360 REKABENTUK FASILITI BIOTEKNOLOGI [BIOTECHNOLOGY FACILITY DESIGN]
No of Credits: 3

Course Synopsis:
This course exposes an overview of biotechnology facilities design which parallel to the regulatory compliance in manufacturing process. The topics emphasized on the general equipments design involves in producing and processing biological products, instrumentation and controls in bioprocess, aseptic processing and sanitary design, as well as utilities system. This course also covers on regulatory compliance according to current Good Manufacturing Practices (cGMP), and documentation for validation of bio-technology facilities.

Course Outcomes:
CO1 - Ability to ANALYZE the biotechnology process facility design based on industrial regulatory demand.
CO2 - Ability to EVALUATE the basic instrumentations and utilities system design in biotechnology industry.
CO3 - Ability to DEVELOPE the validation scheme for systems and equipments facility to meet the regulatory compliance.

PTT361 PENINGKATAN SKALA DAN OPTIMUM [SCALE UP AND OPTIMISATION]
No of Credits: 3

Course Synopsis:
This course covers introduction to scale-up methods, pilot plants, models and principles used in chemical/biotechnological processes. The content of the course also consists of theory and applications of optimization techniques. The knowledge of scale up and optimization techniques are applied to solve problems related to chemical/biotechnological processes.

Course Outcomes:
CO1 - Ability to apply principles of scale up and to ANALYZE scale up methods in related chemical/biotechnological processes.
CO2 - Ability to demonstrate theories of optimization and to ANALYZE optimization methods in related chemical/biotechnological processes.
CO3 - Ability to DEVELOP a solution to chemical/biotechnological related problems using selected scale up and optimization methods.

PTT362 TEKNOLOGI BIOFARMASEUTIKAL [BIOPHARMACEUTICAL TECHNOLOGY]
No of Credits: 3

Course Synopsis:
This course is designed to provide the students with the knowledge in the biopharmaceutical technology, its importance, the corresponding techniques and technologies in drug development, analytical methods used to assess its physico-chemical properties and quality and the applications of biopharmaceuticals in drug development.

Course Outcomes:
CO1 - Ability to CATEGORIZE various biopharmaceuticals and biopharmaceuticals regulatory compliance.
CO2 - Ability to DESIGN the production process of biopharmaceuticals
CO3 - Ability to EVALUATE the biotechnology products in the development of biopharmaceuticals technology.

PTT363 TEKNOLOGI PEMPROSESAN FARMASEUTIKAL
[PHARMACEUTICAL PROCESSING TECHNOLOGY]
No of Credits: 3

Course Synopsis:
This course provides an overview of the pharmaceutical processing technology include Particle size reduction, powder mixing, granulation and, drying, tabletting, coating, hard and soft capsules, microparticles, milling, sieving, , mixing solid substances, granulating, tableting, coating and dosages formulation includes liquid dosage (solutions, suspensions, emulsions, sterile/ parenteral dosage forms), solid dosage (tablets, capsules), semisolid topical dosage (gels, ointments, creams, pastes) and injectables.

Course Outcomes:
CO1 - Ability to EVALUATE the pharmaceutical production and dose formulation.
CO2 - Ability to DESIGN pharmaceutical production facilities and processes.
CO3 - Ability to demonstrate and ASSESS pharmaceuticals processing technique.

PTT364 TEKNOLOGI MEMBRAN TERMAJU DAN APLIKASI
[ADVANCE MEMBRANCE TECHNOLOGY AND APPLICATIONS]
No of Credits: 3

Course Synopsis:
This course emphasizes the fundamental concepts of membrane science which are the membrane materials and characterization, transport theory which are Fick's Law Diffusion and solution diffusion model. Evaluation on the idea of concentration polarizations in the membrane are been emphasized. The fundamental concept is applied in membrane applications that are used in industries such as reverse osmosis, micro and ultrafiltration, gas separation and pervapourization and also for medical application such as hemodialysis, drug delivery and blood oxygenators.

Course Outcomes:
CO1 - Ability to differentiate membrane types, membrane materials and membrane surface characterization.
CO2 - Ability to evaluate the transport theory and concentration polarization in membrane processes.
CO3 - Ability to evaluate the fundamental concept of membrane theory in membrane application processes.

PTT365 TEKNOLOGI PEMPROSESAN PETROLEUM & GAS
[PETROLEUM & GAS PROCESSING TECHNOLOGY]
No of Credits: 3

Course Synopsis:
This course introduces the students to processes and technology involved in oil and gas production field. Topics covered including history and background of refinery process, separation of produced fluids and treatment of crude oil. Apart from that, student will also be exposed to the field processing and treatment of natural gas as well as petroleum refinery process.

Course Outcomes:
CO1 - Able to recognize and explain background, formation and production of oil and gas.
CO2 - Able to compare and select separation process of produced fluids and treatment process of crude oil and water.
CO3 - Able to demonstrate understanding and distinguish field processing and treatment of natural gas.

PTT366 TEKNOLOGI PEMPROSESAN POLIMER [POLYMER PROCESSING TECHNOLOGY]
No of Credits: 3

Course Synopsis:
This course covers the fundamental of chemistry, and synthesis mechanism of polymer. Polymer characteristics, polymer characterization, rheology and morphology of polymer are included in this course. The course is concluded with the processing technology of the polymer which comprises of extrusion, mixing, moulding and vulcanization.

Course Outcomes:
CO1 - Ability to explain and DIFFERENTIATE the chemistry and synthesis mechanism of polymers.
CO2 - Ability to ANALYZE the characteristics and properties of polymers.
CO3 - Ability to EVALUATE different polymer processing methods.

PTT367 ELEKTROKIMIA INDUSTRI [INDUSTRIAL ELECTROCHEMISTRY]
No of Credits: 3

Course Synopsis:
This subject aims to provide students with the fundamental concepts on electrochemistry and electrode processes. Examples of application of electrochemistry are also presented. This course will integrate the fundamental concepts with electrochemical applications such as electroplating, batteries, fuel cells, corrosion and electroanalysis.
Course Outcomes:
CO1 - Ability to DEMONSTRATE the importance of knowledge of electrochemistry.
CO2 - Ability to EVALUATE integrate the fundamental concepts with electrochemical applications such as electroplating, batteries, fuel cells, corrosion and electroanalysis.
CO3 - Ability to DESIGN the application of most recent developments in electrochemical technology.

PTT368 TEKNOLOGI PENGEKSTRAKAN SEBATIAN BIOAKTIF [BIO-ACTIVE COMPOUND EXTRACTION TECHNOLOGY]
No of Credits: 3

Course Synopsis:
The course discusses various sources of natural bioactive compound as well as their extraction methods. The methods are steam distillation, distillation, low-pressure solvent extraction (solid–liquid), high-pressure extraction, liquid–liquid extraction and adsorption besides its applications in related industries. Several analysis to obtain high-quality bioactive extracts and purified compounds are also discussed.

Course Outcomes:
CO1 - Ability to EXAMINE variability of bioactive compounds.
CO2 - Ability to SUGGEST the extraction method for related problem.
CO3 - Ability to EVALUATE various analysis to obtain high quality and purified compound.

PTT371 ANALISIS DAN INSTRUMENTASI UNTUK TEKNOLOGI MAKANAN [ANALYSIS AND INSTRUMENTATION FOR FOOD TECHNOLOGY]
No of Credits: 3

Course Synopsis:
This course provides students with the knowledge in the application of analytical procedures and instrumentations used for physical and chemical characterization of foods. The characterization includes physical properties (rheology, texture, color etc.) and chemical composition using chemical analyses (Proximates: Moisture, ash, fiber, protein, carbohydrates and fats). The course also covers the instruments for analytical techniques of spectrophotometry (UV-Vis, MS, AAS, Elemental analyzer (CHNS/O) and ICP), chromatography (TLC,GC and HPLC), FTIR, NMR, and calorimetric (Bomb calorimeter) utilized for the characterization. These are important factors that determine the properties of food and to produce food that are consistently nutritious and safe.

Course Outcomes:
CO1 - Ability to DEMONSTRATE understanding on the principle of food analysis
CO2 - Ability to DIFFERENTIATE the type of instruments used for food analysis
CO3 - Ability to DEDUCE appopriate methods and suitable instrument for the food sample analysis

PTT372 PEMPROSESAN DAN PENGAWETAN MAKANAN [FOOD PROCESSING AND PRESERVATION]
No of Credits: 4

Course Synopsis:
This course covers multidisciplinary fields of food processing technology and related industries. Topics covered include physico-chemical, sensory and nutritional properties of foods, food spoilage, food production systems and preservation processes including thermal and non-thermal processes, chilling and freezing, freeze-drying, irradiation, texturization, extrusion, mechanical separation, packaging, chemical preservation, fermentation and food biotechnology.

Course Outcomes:
CO1 - Ability to DIFFERENTIATE the principles and technology of food processing and preservation.
CO2 - Ability to EVALUATE the effects of processing on physico-chemical, sensory and nutritional properties of food.
CO3 - Ability to ASSESS problems and issues involved in food production.

PTT373 TEKNOLOGI LELEMAK DAN MINYAK [FATS AND OIL TECHNOLOGY]
No of Credits: 3

Course Synopsis:
This course is designed to provide the students with the knowledge in the chemistry of fats and oils, its sources, the corresponding techniques and technologies in fats and oils processing, analytical methods used to assess its physico-chemical properties and quality, the applications of fats and oils in food manufacturing as well as the method of handling and preservation of the oils and fats products.

Course Outcomes:
CO1 - Ability to DIFFERENTIATE the sources of edible fats and oil, their physico-chemical properties as well as their function as ingredient in food
CO2 - Ability to PROPOSE the best methods of handlings and preservations of fats and oil products based on their types and properties
CO3 - Ability to EVALUATE the technology used in the processing techniques and methods for quality assessment of fats and oil products

PTT374 INGREDIEN MAKANAN [FOOD INGREDIENTS]
No of Credits: 3

Course Synopsis:
This course provides the knowledge in major food ingredients such as water, sugars, carbohydrates, lipids and proteins with other constituents of foods. This includes different categories of food ingredients such as flour, fats and oil, gums, spices, starch, vitamins, sweetener and other food additives. The course also emphasizes on technical information in the area of ingredient interactions pertaining to foods in order to optimize ingredient performance in food formulations and obtaining high quality food products.

Course Outcomes:
CO1 - Ability to INTERPRET the mechanism of the techno-functionality or bio-functionality as well as physicochemical properties of food ingredients
CO2 - Ability to PROPOSE the right ingredients for food formulations in food manufacturing.
CO3 - Ability to PREDICT and assess the effect of the interaction between ingredient and complex food matrix under different conditions.

PTT375 PENGURUSAN DAN PENGGUNAAN SISA MAKANAN [FOOD WASTE MANAGEMENT AND UTILIZATION]
No of Credits: 3

Course Synopsis:
This course covers the sources and the properties of food wastes. Management of food wastes in order to minimize their effect on the environment which in compliance with Department of Environment (DOE) are highlighted. Treatment of domestic and industrial food wastes and its utilization in relation to pollution control and value-added commercial by products are included.

Course Outcomes:
CO1 - Ability to ANALYSE the suitable physical, chemical and biological treatments of industrial and domestic food wastes.
CO2 - Ability to DESIGN systems for the collection, handling, treatments and utilization of wastes.
CO3 - Ability to PROPOSE the suitable utilization technique for food waste and wastewater for environmental sustainability.

PTT376 SISTEM PENGURUSAN KUALITI DAN KESELAMATAN DALAM PENGELUARAN MAKANAN [QUALITY AND SAFETY MANAGEMENT SYSTEM IN FOOD PRODUCTION]
No of Credits: 3

Course Synopsis:
This course provides an overview on food quality and safety in food production such as sources and types of contaminants and toxins in foods, food safety policy and laws, methods of analyses and measurements of the risk of toxicity and methods of detoxification. It also emphasizes on the quality and safety management systems such as good manufacturing practices (GMP), Good hygiene Practices (GHP) and good distribution practices (GDP) as well as Standards in Malaysia and in advanced countries which compliance with global food safety initiatives (GFSI) including HACCP, Halal and quality and safety requirements for obtaining accreditation from authority by the food manufacturers for export.

Course Outcomes:
CO1 - Ability to ANALYSE the quality and safety of food in relation to the principles of food chemistry, allergens, food law, sanitation, microbiology, engineering, packaging technology and environmental science
CO2 - Ability to EVALUATE the importance of quality and safety management system in food production.
CO3 - Ability to PROPOSE solutions for the quality and safety-based problems in food production.

PTT377 MAKANAN BERFUNGSI DAN NUTRASEUTIKAL [FUNCTIONAL FOODS AND NUTRACEUTICAL]
No of Credits: 3

Course Synopsis:
This course discusses the relation of functional foods and nutraceuticals to food and drugs. The course also focuses on chemistry, processing, analyses, bioavaibility and health benefits of bioactive food components. The safety and efficacy of individual functional foods and nutraceuticals products, and the regulatory issues that influence the development and commercialization of functional foods and nutraceuticals in global markets are also emphasized.

Course Outcomes:
CO1 - Ability to ANALYZE the concepts and analytical methods related to functional foods and nutraceuticals.
CO2 - Ability to EVALUATE the effect of processing on the bioactivity of functional and nutraceutical ingredients in foods.
CO3 - Ability to ASSESS the latest development of research and markets in functional foods and nutraceuticals.

PTT378 TEKNOLOGI TENUSU DAN DAGING [DAIRY AND MEAT TECHNOLOGY]
No of Credits: 3

Course Synopsis:
This course provides students with the knowledge in milk and meat compo-

sitions, handling, the processing techniques and technologies to preserve various types of dairy and meat products. Methods used to assess the quality, of the processed dairy and meat products are also emphasized.

Course Outcomes:
CO1 - Ability to DEMONSTRATE the understanding on composition and properties of dairy and meat.
CO2 - Ability to DISTINGUISH the processing techniques and technology as well as method used to assess the quality of dairy and meat products.
CO3 - Ability to EVALUATE the appropriate methods of handlings, processing and preservation of dairy and meat products.

PTT444 JURUTEKNOLOGI DALAM MASYARAKAT [TECHNOLOGIST IN SOCIETY]
No of Credits: 3

Course Synopsis:
The course aims to explain the main concepts in engineering and technology ethics, risk management and occupational safety and health as well as to expose the students to basic of law in engineering and technology context. The course presents the introductory nature to enable technologists to appreciate factors that have to be taken into account in decision making. Examine and assess issues and challenges faced by technologists relating to engineering and technology ethics, risk management and to understand the legal requirement related engineering technology field.

Course Outcomes:
CO1 - Ability to EXAMINE the issues and challenges of engineering and technology ethics.
CO2 - Ability to ASSESS hazards, the function of risk management and occupational safety and health (OSHA).
CO3 - Ability to EVALUATE the aspects and procedures of legal on engineering and technology issues.

PTT451 PROJEK TAHUN AKHIR II [FINAL YEAR PROJECT II]
No of Credits: 5

Course Synopsis:
Final year project is the culmination of study towards the Bachelor of Chemical Engineering Technology degree that requires the application of knowledge learned throughout the program. This course consists of combination between guided supervision and independent study focusing on the techniques of conducting laboratory and/or field experiments. This course also covers the implementation of research activities based on research plan or gantt chart. The experimental data are analysed and written in a scientific manner and oral presentation on project findings is conducted and assessed by the appointed internal examiners. Finally, a thesis is submitted indicating the course completion.

Course Outcomes:
CO1 - Ability to PLAN activities pertaining to research project to meet the required research objectives and datelines.
CO2 - Ability to ASSESS techniques and modern tools to solve research problems.
CO3 - Ability to EVALUATE experimental data and deduce good conclusion.
CO4 - Ability to produce standard thesis and DEFEND the findings.

PTT452 PROJEK REKABENTUK LOJI 2 [PLANT DESIGN PROJECT 2]
No of Credits: 3

Course Synopsis:
This course is a complementary course of Plant Design Project 1. It focused on the engineering economic knowledge comprises of estimation of total capital cost investment, cost of manufacture and profitability analysis. This course also cover on design of control system, waste management system and safety precaution.

Course Outcomes:
CO1 - Ability to develop piping and instrumentation diagram (P&ID) and control system for the process plant.

CO2 - Ability to propose waste management system and suitable safety of the process plant.
CO3 - Ability to evaluate costing and economic analysis of the process plant

PTT453 ISU DAN KOMERSIALISASI DALAM BIOTEKNOLOGI [ISSUES AND COMMERCIALISATION IN BIOTECHNOLOGY]
No of Credits: 3

Course Synopsis:
The course covers the current status in biotechnology research and commercialization aspects of biotechnology products. There also information on patenting, intellectual property and licensing of biotechnology products as well as developing business plans to meet the market needs. There also guidelines, agreements and policy in commercialization networking as well as the preparation of pre-commercialization phase and entrepreneurial skills that should be possesses by the students.

Course Outcomes:
CO1 - Ability to ASSESS the commercial aspects of biotechnology products.
CO2 - Ability to select a potential product and PREPARE a business plan for that particular product.
CO3 - Ability to APPRAISE entrepreneurial skills and cultures for success entrepreneur's business.

PTT454 PENGENALAN KEPADA BIOKIMIA [INTRODUCTION TO BIOCHEMISTRY]
No of Credits: 3

Course Synopsis:
The course aims to introduce the concept of biochemistry which is the study of chemical processes within and relating to living organisms. The field of biochemistry draws on many disciplines and its multidisciplinary nature allows it to use results from many sciences to provide knowledge about the molecular nature of life processes.

Course Outcomes:
CO1 - Ability to DESCRIBE basic chemical elements of life.
CO2 - Ability to ANALYZE the main classes of molecules in biochemistry.
CO3 - Ability to EVALUATE the used technology in biochemical identification and processes.

PTT456 TEKNOLOGI PENGHASILAN TENAGA BIO [BIOENERGY PRODUCTION TECHNOLOGY]
No of Credits: 3

Course Synopsis:
This course is designed to provide the students with he principles of bioenergy production technology, its importance and the current advancement. The students will be exposed to the potential of different bioenergy sources that have been developed in recent years as future sustainable and renewable energy sources, their limitations and the required technologies for commercialization. Other issues related to bioenergy production including economics and environmental policy will also be discussed in this course to enhance students' awareness.

Course Outcomes:
CO1 - Ability to ANALYZE the advantages of renewable and sustainable bioenergy.
CO2 - Ability to APPRAISE different bioenergy technologies, the process, principles and application of each technology.
CO3 - Ability to EVALUATE feasibility of new bionergy technologies and ASSESS the impact of bioenergy technology on economics and environmental policy.

PTT457 TEKNOLOGI PEMPROSESAN MAKANAN [FOOD PROCESSING TECHNOLOGY]
No of Credits: 3

Course Synopsis:
This course covers multidisciplinary fields of food processing technology and related industries. Topics covered include food science, sensory and nutritional properties of foods, food spoilage, food production systems and

preservation processes including thermal and non-thermal processes, chilling and freezing, freeze-drying, irradiation, extrusion, packaging, texturization, mechanical separation and genetically-modified foods.

Course Outcomes:
CO1 - Ability to DIFFERENTIATE the principles of food processing technology.
CO2 - Ability to EVALUATE the effects of processing on sensory and nutritional properties of food.
CO3 - Ability to EVALUATE problems involved in food production.

PTT458 JAMINAN DAN KAWALAN KUALITI DALAM KEJURUTERAAN KIMIA [QUALITY ASSURANCE AND CONTROL IN CHEMICAL ENGINEERING]
No of Credits: 2

Course Synopsis:
This course aimed to introduce students with principles of quality assurance and quality control that can be applied in related fields of chemical engineering. The course covers related process and standard (ISO 1900) commonly used in industry. The course also discuss on the statistical method and acceptance sampling as tool and techniques that broadly implemented in quality assurance and quality control.

Course Outcomes:
CO1 - Ability to differentiate the principles between quality assurance and quality control.
CO2 - Ability to formulate the processes in quality assurance and quality control with statistical method.
CO3 - Ability to evaluate acceptance sampling procedure in quality assurance and quality control.

PTT459 TEKNOLOGI PEMPROSESAN PARTIKEL [PARTICLE PROCESSING TECHNOLOGY]
No of Credits: 3

Course Synopsis:
This course emphasizes the fundamental concepts and problem-solving techniques on particle processing technology. This course covers many of the aspects related to particle processing and handling, including particle analysis, particle flow pattern, particle separation, storage and transporting of particles, mixing and segregation, particle size reduction and enlargement, as well as hazard of fine powders.

Course Outcomes:
CO1 - Ability to ANALYZE the fundamental of the particles and particulate systems.
CO2 - Ability to EVALUATE the mechanisms and unit operation used for particle processing and handling.
CO3 - Ability to DEVELOP a proficient use of mathematics and science skills in solving chemical engineering problems associated with particulate processes.

PTT471 PEMBANGUNAN DAN PENGKOMERSILAN PRODUK MAKANAN [FOOD PRODUCT DEVELOPMENT AND COMMERCIALISATION]
No of Credits: 3

Course Synopsis:
This course covers the current trends of food innovations and commercialization in the market starting from idea generation, market analysis and costing, product design and development, product quality and management, product sensory evaluation and statistical analysis, packaging and shelf life, and implementation to market launch which combine current theoretical practices from food industry to illustrate the subject matter. Students will work in small groups to integrate knowledge in food technology for a food product development project which involve the planning, management and assessment of a product from conceptualization to launch.

Course Outcomes:

CO1 - Ability to ANALYZE the different categories of new food products by identifying specific aspects of product development in the food industry.

CO2 - Ability to CREATE new knowledge in design, development and commercialization and manage the need to ensure the necessary product, processing, distribution and marketing knowledge in the food company.

CO3 - Ability to ASSESS on evaluating and improving product development which include the collection of knowledge from the project, analysis of the knowledge and setting improvements for future projects.

PTT472 TEKNOLOGI PEMBUNGKUSAN MAKANAN [FOOD PACKAGING TECHNOLOGY]
No of Credits: 3

Course Synopsis:

The course introduces the basic knowledge on food packaging materials, equipment, design and technology with an overview on the packaging science and technology applied to the preservation and shelf life, distribution and marketing of various food products, different procedures involved and food safety requirements for developing, evaluating and testing of food packages in accordance to international standards.

Course Outcomes:

CO1 - Ability to DEMONSTARATE the understanding on the importance and functions of a packaging system in relation to food preservation.

CO2 - Ability to ANALYSE the manufacture, properties and economic use of packaging materials (glass, plastic, paper and aluminum).

CO3 - Ability to EVALUATE how packaging materials interact with diverse food products in order to maximize quality and shelf-life of the products.

PTT473 TEKNOLOGI POULTRI DAN IKAN [POULTRY AND FISH TECHNOLOGY]
No of Credits: 3

Course Synopsis:

This course provides students with the knowledge on the chemical, biochemical and nutritional compositions of poultry and fish from different species and the appropriate handling procedures which based on the GHP, HACCP, Halal and food regulations. It will also cover on the concept of processing techniques, equipment and technologies adopted to produce various types of poultry and fish products. Methods used to assess the quality and safety, handling and preservation of the products originating from poultry and fish will also be emphasized.

Course Outcomes:

CO1 - Ability to DEMONSTRATE the understanding on the chemical and biochemical constitution of poultry and fish of different species.

CO2 - Ability to DISTINGUISH the processing techniques, equipment and technology adopted including methods used to assess the quality of various types of poultry and fish products.

CO3 - Ability to PROPOSE the appropriate methods of handlings and preservation of poultry- and fish-based products.

DBT101 PENGENALAN KEPADA BAHAN KEJURUTERAAN [INTRODUCTION TO ENGINEERING MATERIALS]
No of Credits: 3

Course Synopsis:

To introduce basic concepts in the field of engineering materials: Introduction to engineering materials such as metal, ceramic, polymer and composite. Students will be exposed to the structure, properties and application of each material group.

Course Outcomes:

CO1 - Able to describe types of material that suitable for engineering application

CO2 - Able to formulate crystalline and non-crystalline material structures, Miller index, lattice coordinate, direction and plane in unit cell.
CO3 - Able to interpret and categorize classes, properties and applications of metals, polymers, ceramics, composites, glasses, and advance materials.

DBT102 LOGAM FERUS [FERROUS METAL]
No of Credits: 3

Course Synopsis:
In this subject the student will learn about the classification of ferrous metals and its properties; i.e. steel and iron. Students will be expose to the iron-carbon system which characterise the steel and iron properties. A metallographic analysis technique is introduce to enhance the subject understanding. Student will learn the metal fabrication processes at the end of the subject.

Course Outcomes:
CO1 - Able to Identify the application of ferrous metal and describe the steel composition and phases exist.
CO2 - Able to compare the properties and microstructure of various steels and iron
CO3 - Able to decide and recommend the metal fabrication processes

DBT107 ASAS STATIK DAN DINAMIK [BASIC STATIC & DYNAMIC]
No of Credits: 3

Course Synopsis:
This course aims to expose the students on basic concept of force, moments, moments of couple and resultant force. As for application to this static system, student will study on structure's equilibrium and stability such as truss, frame and machine. In dynamics, students will be exposed to kinematics and kinetics for particles and rigid bodies which involved the solution by using appropriate methods

Course Outcomes:
CO1 - Able to solve basic problems of forces and moments in two- and three-dimension, and resultant of force from a system of force.
CO2 - Able to calculate the equilibrium of static and dynamics of a particle and rigid body.
CO3 - Able to relate the kinematics and kinetics for particle and rigid body.

DBT108 ASAS BENGKEL LOGAM [BASIC METAL WORKSHOP]
No of Credits: 2

Course Synopsis:
This subject addresses the basic techniques of measurement of geometrically defined dimensions. It also covers the corrective processes of errors and deviations which occur during measurement. The students are also introduced to the cutting, deburring, drilling and tapping processes.

Course Outcomes:
CO1 - Able to describe fundamental of basic metal workshop.
CO2 - Able to apply safety procedure in the workshop.
CO3 - Able to apply fundamental of metrology and hand tools according to its characteristic and features in the workshop.

DBT109 TERMODINAMIK KIMIA [CHEMICAL THERMODYNAMICS]
No of Credits: 3

Course Synopsis:
Topics which will be covered in this course are as follow: Theory of atoms, molecules, and ions, first law of thermodynamics, second law of thermodynamic, Hess law methods, chemical equilibrium and reaction kinetics.

Course Outcomes:
CO1 - Able to employ the basic concept of thermodynamic principles.
CO2 - Able to calculate the basic principles of First Law and Second Law of Thermodynamic
CO3 - Able to compare the principles of Chemical Equilibrium and Kinetic Reaction.

DBT110 SAINS KEJURUTERAAN [ENGINEERING SCIENCE]
No of Credits: 3

Course Synopsis:
This course is to familiarize the student about basic engineering that involve physics and chemistry of materials. Students could understand the theories, principles and standard units that have been focused in the syllabus.

Course Outcomes:
CO1 - Able to describe the concept of material's physic and chemistry.
CO2 - Able to describe force, momentum, circular motion principles and wave.
CO3 - Able to solve problems on the basics of electrostatic, electromagnetism and simple DC circuit.

DBT111 LUKISAN KEJURUTERAAN DAN LUKISAN TERBANTU KOMPUTER [ENGINEERING DRAWING AND COMPUTER AIDED DRAFTING]
No of Credits: 2

Course Synopsis:
The course will cover the details of Engineering Drawing for beginners before going in depth on projection systems followed by oblique and isometric sketches. Knowledge in dimensioning and geometrical tolerance will enhance student's ability in interpreting and assessing information from basic raw data of an engineering drawing. Students will also have the advantage to experience practical engineering drawing projects for familiarity from conceptual exposures and classroom theories taught by the experienced lecturers and teaching engineers. Then, from manual hand drawing, students are taught into the usage of AutoCAD software, which focus on producing drawing in 2D and 3D.

Course Outcomes:
CO1 - Able to apply basic skills of engineering drawing in metallurgical engineering related problems.
CO2 - Able to produce engineering drawing by using proper techniques.

DBT202 LOGAM BUKAN FERUS [NON FERROUS METAL]
No of Credits: 3

Course Synopsis:
Students will learn and study the fundamental of non ferrous metal, identification technique, various types of non ferrous metal and their properties and also the various fabrication techniques of non ferrous metals.

Course Outcomes:
CO1 - Able to describe non ferrous metal, its application and processing techniques.
CO2 - Able to demonstrate the microstructure of alloys, mechanical behavior and appropriate testing.
CO3 - Able to investigate between ferrous metal and non ferrous metal.

DBT203 TEKNOLOGI PENGEKSTRAKAN LOGAM [METAL EXTRACTIVE TECHNOLOGY]
No of Credits: 3

Course Synopsis:
This course is proposed to provide students with fundamentals of metal extraction from ores using pyrometallurgy process, hydrometallurgy process and electrometallurgy process. Knowledge on theory acquired in lecture is also enhanced with a practical work conducted in laboratory.

Course Outcomes:
CO1 - Able to explain the principle of extractive metallurgy.
CO2 - Able to apply fundamental of extractive metallurgy in hydrometallurgy process.
CO3 - Able to compare between pyrometallurgy and electrometallurgy process.

DBT204 TEKNOLOGI KIMPALAN LOGAM 1 [TECHNOLOGY OF METAL WELDING 1]
No of Credits: 3

Course Synopsis:
Introduction to the basic theory of welding, brazing and soldering. The course also covers the equipments, procedures and applications of various welding processes such as shielded metal arc welding (SMAW), oxyacetylene welding (OAW), and resistance welding. The students will also be exposed to the welding metallurgy, microstructure examination and destructive welding tests.

Course Outcomes:
CO1 - Able to describe the fundamental theory, principles, process, equipment and application of welding, brazing and soldering.
CO2 - Able to apply skills in Shielded Metal Arc Welding (SMAW).
CO3 - Able to plan weld evaluation via destructive welding tests and microstructure examination.

DBT206 TEKNOLOGI FOUNDRI [FOUNDRY TECHNOLOGY]
No of Credits: 3

Course Synopsis:
This course is developed to expose the students to the fundamentals, step-by-step processes involved in castings and aspects that affect the quality of the castings. The topics which will be covered in this course are as follows; introduction to foundry technology, metallurgy in casting, technology of pattern making, technology of molding and coremaking, gating system of casting, technology of melting and casting, technology of molding and casting, defects in castings, castings evaluation tests.

Course Outcomes:
CO1 - Able to analyze the technology of foundry and the processes of casting.
CO2 - Able to assemble pattern making process, mold making, melting and casting, and casting finishing.
CO3 - Able to analyze casting defects, causes and remedies.

DBT208 TEKNOLOGI KIMPALAN LOGAM 2 [TECHNOLOGY OF METAL WELDING 2]
No of Credits: 3

Course Synopsis:
The course covers the basic theories and practical knowledge of Gas Metal Arc Welding (GMAW), Gas Tungsten Arc Welding (GTAW), welding evaluation and various types of non-destructive tests. The course also exposes the students to other welding processes such as surfacing, cutting operations and repair welding. The students are also introduced to the general welding considerations of carbon and alloy steels, tool steels and cast irons, stainless steels and nonferrous metals.

Course Outcomes:
CO1 - Able to understand, perform and improve skills in Gas Metal Arc Welding (GMAW) and Gas Tungsten Arc Welding (GTAW) techniques.
CO2 - Able to understand and describe the welding technology and the processes of surfacing, cutting and repair welding.
CO3 - Able to assess welding quality and perform weld evaluation via non-destructive welding examinations.

DBT209 PENGUJIAN LOGAM [METALS TESTING]
No of Credits: 3

Course Synopsis:
This subject will introduce the students to the theory and practical aspects of conducting the destructive and non-destructive tests such as compression test, Charpy impact testing, hardness test, magnetic particle test and liquid penetration test. The students are also exposed to the specific uses and operation of each test.

Course Outcomes:
CO1 - Able to describe the important of metal testing and defects.
CO2 - Able to identify and operate the destructive metal testing machine.
CO3 - Able to analyze several types of non-destructive testing.

DBT210 KEKUATAN BAHAN [STRENGTH OF MATERIALS]
No of Credits: 3

Course Synopsis:
The main objective of this course is to expose the student on basic concept of strength of materials which dealing with relationships between the external loads applied to an elastic body and the intensity forces acting within the body, axial load, mechanical properties of materials, torsion, shear forces and bending moments in beams and combined stresses.

Course Outcomes:
CO1 - Able to define and describe the basic concept of stresses.
CO2 - Able to define and describe stress-strain diagram, allowable stresses, factor of safety, centroid of gravity and moment of inertia.
CO3 - Able to identify and calculate stress distribution and the angle of twist subjected to torsional loads.
CO4 - Able to identify the types of beam and evaluate the loadings and flexure formula for a beam, shear force and moment diagrams.

DBT211 ASAS PEMESINAN LOGAM [BASIC MACHINING OF METALS]
No of Credits: 3

Course Synopsis:
The subject covers the basic of metallurgy in machining and basic operation of grinding, lathe and milling. The students are expected to understand the basic machine tool technology and able to setup and operate grinding, lathe and milling machines.

Course Outcomes:
CO1 - Able to identify the metallurgy in machining and factors affecting the machinability of metals.
CO2 - Able to apply fundamental of conventional machining processes.
CO3 - Able to describe fundamental of advanced machining processes.

DBT301 METALURGI SERBUK [POWDER METALLURGY]
No of Credits: 3

Course Synopsis:
The course focuses on the basic principles of powder metallurgy technology and the practical skills of the metalworking techniques. The students will be taught on the basic theory and principles of powder characterization and fabrication, pre-compaction powder handling, compaction, sintering and compact characterization. In the laboratory projects, students will be exposed to the powder metallurgy techniques such as powder characterization analysis, powder mixing and blending, powder compaction, sintering process, microstructural features, pore characteristics and mechanical properties.

Course Outcomes:
CO1 - Able to describe the basic of powder metallurgy principles and technology
CO2 - Able to practice the techniques involves and produce powder metallurgical product
CO3 - Able to construct the microstructure, pore characteristics and mechanical properties of powder metallurgical product.

DBT302 RAWATAN HABA [HEAT TREATMENT]
No of Credits: 3

Course Synopsis:
This course is offered to deliver the knowledge of phase diagram, microstructure and composition in metals and alloys, develop ability to describe the principles and applications of heat treatment and to relate the properties of metals after the heat treatment processes. The topics which will be covered in this course are as follows; Introduction of Solidification Process; Phase Diagram for Pure Elements, The Gibbs Phase Rule, Cooling Curve; Binary Phase Diagram; Lever Rule; Non-equilibrium Solidification of Alloy; Heat Treatment and Application; Principles of Heat Treatment for steel and non-ferrous metal; and Solution Treatment.

Course Outcomes:
CO1 - Able to interpret phase diagrams, microstructure and composition in metals and alloys.
CO2 - Able to propose different heat treatment process for different application.
CO3 - Able to evaluate the properties of metals after heat treatment process.

DBT303 PERLINDUNGAN LOGAM [METALS PROTECTION]
No of Credits: 3

Course Synopsis:
This course is to expose students to the theory of metals corrosion in different environments, its damage to the community and its possible preventions and countermeasures. The topics covered in this course are as follows; the principles of corrosion, types of corrosion, surface technology, tribology, surface coatings and metals protection methods.

Course Outcomes:
CO1 - Able to analyze the theory, principles, and processes of metals corrosion.
CO2 - Able to analyze the types of metals corrosion and their causes.
CO3 - Able to construct corrosion prevention and metals protection methods.

DBT304 KESELAMATAN PEKERJAAN DAN PENGURUSAN KUALITI [OCCUPATIONAL SAFETY AND QUALITY MANAGEMENT]
No of Credits: 3

Course Synopsis:
This course is intended to provide an introductory knowledge in occupational safety and quality management. It provides basic information and common theories for prospective safety and quality personnel to oversee a program that encompasses both areas of responsibility. At the end of this course, students are expected to be able to identify suitable quality techniques and tools to be implemented in production management and can apply Industrial Safety standards in real industrial environment.

Course Outcomes:
CO1 - Ability to define and describe the fundamental of occupational safety and apply the theories of accident causation.
CO2 - Ability to evaluate safety rules and regulations by comparing them to specific standards of OSH act and occupational hazards.
CO3 - Ability to apply and compare the various types of quality management and system, statistical process control (SPC) and quality standard.

DBT351 PROJEK SEMETRAL [SEMESTRAL PROJECT]
No of Credits: 3

Course Synopsis:
This course is a small scale research projects for final year students and expected to be completed within the same. The projects are based of solving the engineering problem by understand the problems, troubleshooting, identify, solves and finally report writing for the documentation purposes.

Course Outcomes:
CO1 - Able to identify solution based on problem study.
CO2 - Able to design engineering solution utilizing an engineering practice.
CO3 - Able to perform an engineering project.
CO4 - Able to propose a technical report and communicate in oral presentation.

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UR6526001
Bachelor of Civil Engineering with Honours

Programme Educational Objective (PEO)

PEO 1
Graduates who have developed career advancement in the field of Civil Engineering or related engineering field.

PEO 2
Graduates who are involved in a professional body or society.
PEO3

Graduates who pursue lifelong learning.

Programme Outcomes (PO)

PO 1
Ability to acquire and apply knowledge of mathematics, science, engineering and an in-depth technical competence to the solution of complex engineering problems in civil engineering discipline.

PO2
Ability to identify, formulate and solve complex engineering problems

PO3
Ability to design solutions for complex engineering problems and design systems, components or processes to meet desired needs.

PO4
Ability to conduct investigation into complex engineering problems as well as to analyse and interpret data.

PO5
Ability to use techniques, skills and modern engineering tools, necessary for complex engineering activities and practices so as to be easily adaptable to industrial needs.

PO6
Understanding of the social, cultural, global and environmental responsibilities of a professional engineer.

PO7
Ability to understanding entrepreneurship, the process of innovation and the need for environmental and sustainable development

PO8
Understanding of professional & ethical responsibilities & commitment to the community

PO9
Ability to function on multi-disciplinary teams.

PO10
Ability to communicate effectively on complex engineering activities with the engineering community and with society at large.

PO11
Recognition of the need for, and an ability to engage in life-long learning.

PO12
Demonstrate understanding of project management and finance principles

CURRICULUM STRUCTURE
BACHELOR OF CIVIL ENGINEERING WITH HONOURS
ACADEMIC SESSION (2020/2021)

YEAR	FIRST		SECOND		THIRD			FOURTH	
	I	II	III	IV	V	VI		VII	VIII
ENGINEERING CORE (104)		EKT 150/3 Introduction to Computer Programming	EAT 251/3 Structural Theory[c]	EAT212/4 Soil Mechanics[e]	EAT 314/4 Geotechnical Engineering[f]	EAT 360/4 Highway & Transportation Engineering	EIT 302/4 INDUSTRIAL TRAINING	EAT 455/3 Industrialized Building System	
	EAT 102/4 Mechanics and Material Engineering[a]	EAT 115/4 Strength of Materials[b]	EAT 252/4 Fluid Mechanics Engineering	EAT 237/3 Water Supply Engineering	EAT 361/3 Reinforced Concrete Structures Design I	EAT 367/3 Steel Structure Design		EAT461/2 Final Year Project I	EAT 462/4 Final Year Project II
	EAT152/2 Engineering Geology		EAT 258/3 Building Material Engineering	EAT 253/3 Structural Analysis I [d]	EAT 353/3 Structural Analysis II	EAT 356/4 Water & Wastewater Engineering		EAT XXX/3 Elective I	EAT XXX/3 Elective II
	EAT 112/4 Geomatic Engineering	ECT 112/3 Engineering Skills	EAT 249/3 Engineering Drawing	EAT 259/3 Hydraulics	EAT 357/3 Construction Management	EAT 362/3 Reinforced Concrete Structures Design II		EAT 484/3 Integrated Design Project I	EAT 485/3 Integrated Design Project II
					EAT 363/3 Hydrology & Water Resources Engineering			EAT 483/3 Construction Contract, Estimating & Finance	EAT 440/2 Professional Engineers
NON ENGINEERING (14)	EQT 101/3 Engineering Mathematics I	EQT 102/3 Engineering Mathematics II	EQT 203/3 Engineering Mathematics III	EQT 271/3 Engineering Statistics					
	UUW 322 /2 Thinking Skills								
UNIVERSITY REQUIREMENT (18)	UZW XXX/1 Co-curriculum	UZW XXX/1 Co-curriculum				UUT 122/2 Skills and Technology in Communication		UUW 130/2 Philosophy and Current Issues or * **UUW237/2 Malaysian Cultures	UUW 131/2 Appreciation Ethic and Civilization
		UVW 410/2 University Malay Language or ***UVW 110/2 Basic Malay Language	UUW 224/2 Engineering Entrepreneurship						
	*UVA 101/2 Preparatory English	UUWXXX/2 Option or **UVW 201/2 English for General Communication		UVW 312/2 English for Technical Communication					
136	16	18	18	18	16	16	4	16	14
TOTAL UNITS FOR GRADUATION IS 136									

ELECTIVES COURSES:

Elective I: EAT 412/3 Advanced Reinforced Concrete Structures Design, EAT 456/3 Foundation Engineering, EAT 476/3 Urban Stormwater Management

Elective II: EAT 453/3 Advanced Structural Analysis, EAT 477/3 Advanced Steel Design, EAT 475/3 Construction Contract and Law, EAT 478/3 Building Information Modelling, EAT 479/3 Civil/Environmental Engineers for Society

COURSE [a] IS A PRE-REQUISITE TO COURSE [b]
COURSE [c] IS A PRE-REQUISITE TO COURSE [d]
COURSE [e] IS A PRE-REQUISITE TO COURSE [f]

*Uncredited. Compulsory to students with MUET Band 2 only. This course is prerequisite to UVW201 English for General Communication.
**Compulsory to students with MUET Band 3 or less. This course is a prerequisite to UVW213 English for Technical Communication.

UR6526002
Bachelor of Enviromental Engineering with Honours

Programme Educational Objective (PEO)

PEO 1
Graduates who have developed career advancement in the field of Civil Engineering or related engineering field.

PEO 2
Graduates who are involved in a professional body or society.

PEO3
Graduates who pursue lifelong learning.

Programme Outcomes (PO)

PO 1
Ability to acquire and apply knowledge of mathematics, science, engineering and an in-depth technical competence to the solution of complex engineering problems in environmental engineering discipline.

PO2
Ability to identify, formulate and solve complex engineering problems.

PO3
Ability to design solutions for complex engineering problems and design systems, components or processes to meet desired needs.

PO4
Ability to conduct investigation into complex engineering problems as well as to analyse and interpret data.

PO5
Ability to use techniques, skills and modern engineering tools, necessary for complex engineering activities and practices so as to be easily adaptable to industrial needs.

PO6
Understanding of the social, cultural, global and environmental responsibilities of a professional engineer.

PO7
Ability to understanding entrepreneurship, the process of innovation and the need for environmental and sustainable development

PO8
Understanding of professional & ethical responsibilities & commitment to the community

PO9
Ability to function on multi-disciplinary teams.

PO10
Ability to communicate effectively on complex engineering activities with the engineering community and with society at large.

PO11
Recognition of the need for, and an ability to engage in life-long learning.

PO12
Demonstrate understanding of project management and finance principles.

CURRICULUM STRUCTURE
BACHELOR OF ENVIROMENTAL ENGINEERING WITH HONOURS
ACADEMIC SESSION (2020/2021)

YEAR	FIRST		SECOND		THIRD			FOURTH	
	I	II	III	IV	V	VI		VII	VIII
ENGINEERING CORE (104)	EAT 131/4 Environmental Chemistry	EKT 150/3 Introduction to Computer Programming	EAT 213/4 Fluid Mechanics and Hydraulics	EAT 238/3 Hydrology	EAT 347/4 Mass Transfer[b]	EAT 342/3 Noise Pollution Engineering	EIT302/4 INDUSTRIAL TRAINING	EAT XXX/3 Elective I	EAT XXX/3 Elective II
	EAT 102/4 Mechanics and Material Engineering	EAT 101/4 Basic Ecology	EAT 231/3 Thermodynamics[a]	EAT 208/3 Environmental Law, Health and Safety	EAT 348/3 Water Supply Engineering	EAT 343/3 Public Health and Occupational Hygiene		EAT465/3 Engineering Project Management	EAT 482/3 Integrated Environmental Engineering Design Project II
		EAT 153/3 Fundamental of Chemical Processes	EAT 232/3 Fundamental of Environmental Engineering	EAT 235/3 Geo environmental Engineering	EAT 341/3 Solid and Hazardous Waste Engineering	EAT 344/3 Environmental Management System		EAT461/2 Final Year Project I	EAT 462/4 Final Year Project II
		ECT 112/3 Engineering Skills	EAT 233/3 Environmental Engineering Skills[c]	EAT 260/3 Environmental Transport Processes	EAT 332/3 Environmental Impact Assessment	EAT 303/4 Wastewater Engineering		EAT 441/3 Environmental Remediation	
						EAT 301/4 Air Pollution Engineering		EAT 481/3 Integrated Environmental Engineering Design Project I	EAT440/2 Professional Engineers
NON ENGINEERING (16)	EQT 101/3 Engineering Mathematics I	EQT 102/3 Engineering Mathematics II	EQT 203/3 Engineering Mathematics III	EQT 271/3 Engineering Statistics					
						UUT 122/2 Skills and Technology in Communication			
UNIVERSITY REQUIREMENT (16)	UUW 322/2 Thinking Skills	UZW XXX/1 Co-curriculum		UVW 312/2 English for Technical Communication	UUW XXX/2 Option Subject			UUW 130/2 Philosophy and Current Issues	UUW 131/2 Appreciation Ethic and Civilization
	UZW XXX/1 Co-curriculum								
	UVW 410/2 University Malay Language or UVW 110/2 Basic Malay Language***								
	UVA 101/2 Preparatory English*	UVW211/2 English for General Communication**		UUW 224/2 Engineering Entrepreneurship					
136	16	17	16	19	15	19	4	16	14

TOTAL UNITS FOR GRADUATION IS 136

ELECTIVE COURSES:
Elective I: EAT 445/3 Remote Sensing[d], EAT 449/3 Environmental Process Control & Instrumentation, EAT 472/3 Advanced Wastewater Engineering, EAT 476/3 Urban Stormwater Management.
Elective II: EAT 447/3 Environmental Informatics, EAT 443/3 Built Environment, EAT470/3 Sustainable Energy, EAT471/3 Environmental Risk Assessment
*Uncredited. Compulsory to students with MUET Band 2 only. This course is prerequisite to UVW201 English for General Communication.
** **Compulsory to students with MUET Band 3 or less. This course is a prerequisite to UVW213 English for Technical Communication.
***For international students only.

COURSE [a] IS A PRE-REQUISITE TO COURSE [b]
COURSE [c] IS A PRE-REQUISITE TO COURSE [d]

UR6526003
Bachelor of Civil Engineering Technology (Construction) with Honours

Programme Educational Objective (PEO)

PEO1
Engineering technology graduates engaged in the field of civil engineering technology as demonstrated through career advancement

PEO2
Engineering technology graduates who are members and contribute to professional society

PEO3
Engineering technology graduates embracing in life-long learning or pursuing continuing education opportunities

PEO4
Engineering technology graduates who are technopreneurs

Program outcomes (PO)

PO1
Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialisation to defined and applied engineering procedures, processes, systems or methodologies

PO2
Identify, formulate, research literature and analyse broadly-defined engineering problems reaching substantiated conclusions using analytical tools appropriate to their discipline or area of specialisation

PO3
Design solutions for broadly-defined engineering technology problems and contribute to the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations

PO4
Conduct investigations of broadly-defined problems, locate, search and select relevant data from codes, data bases and literature, design and conduct experiments to provide valid conclusions

PO5
Select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to broadly-defined engineering problems, with an understanding of the limitations

PO6
Demonstrate understanding of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technology practice and solutions to broadly-defined engineering problems

PO7
Understand the impact of engineering technology solutions of broadly-defined engineering problems in societal and environmental context and demonstrate knowledge of and need for sustainable development

PO8
Understand and commit to professional ethics and responsibilities and norms of engineering technology practice

PO9
Function effectively as an individual, and as a member or leader in diverse technical teams

PO10
Communicate effectively on broadly-defined engineering activities with the engineering community and with society at large, by being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions

PO11
Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member and leader in a team and to manage projects in multidisciplinary environments

PO12
Recognise the need for, and have the ability to engage in independent and life-long learning in specialist technologies

CURRICULUM STRUCTURE
BACHELOR OF CIVIL ENGINEERING TECHNOLOGY (CONSTRUCTION) WITH HONOURS
ACADEMIC SESSION (2020/2021)

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEM	I	II	III	IV	V	VI	VII	VIII
Discipline Core	PAT 101/2 Fundamental of Engineering Mechanics	PAT 151/3 Fundamental of Solid Mechanics	PAT 201/2 Structural Theory	PAT 251/2 Structural Analysis	PAT 301/3 Structure Design I	PAT 351/3 Structural Design II	PAT 401/3 Industrialized Building Construction Technology	PIT 404 INDUSTRIAL TRAINING
	PAT 102/3 Physics Technology	PAT 152/3 Fundamental of Fluid Mechanics	PAT 202/3 Hydraulic and Hydrology	PAT 252/3 Construction Project Management	PAT 302/3 Construction Technology I	PAT 352/3 Construction Technology II	PAT 402/4 Construction Technology Integrated Project	
	PAT 103/2 Introduction to Civil Engineering Technology	PAT 153/3 Geomatic	PAT 203/2 Soil Mechanics	PAT 254/3 Construction Value Estimation	PAT 303/3 Highway and Traffic Technology	PAT 355/4 Bachelor's Degree Project I	PAT 455/6 Bachelor's Degree Project II	
	PAT 104/2 Technical Drawing	PAT 154/2 Construction Drawing	PAT 204/3 Construction Material	PAT 255/3 Building Services II	PAT 304/2 Contract and Site Administration	PAT 353/3 Basic Environmental Engineering and Management		
			PAT 205/3 Building Services I	PAT 256/3 Management of Occupational Safety and Health	Elective 1/3	Elective 2/3	Elective 3/3	
				PAT 257/3 Geotechnics				
Common Core	PQT 111/3 Mathematics for Engineering Technology I	PQT 112/3 Mathematics for Engineering Technology II	PQT 213/3 Mathematics for Engineering Technology III		PTT 444/3 Engineering Technologist in Society	PTT 333/3 Engineering Technology Management		
University Required	UUW 130/2 Philosophy and Current Issues	UVW 410/2 University Malay Language		UUW 224/2 Engineering Entrepreneurship				
	*UVA101/0 Preparatory English	UVW201/2 English for General Communication OR	UVW 312/2 English for Technical Communication	UUW 131/2 Appreciation of Ethics and Civilization				
	UUW 322/2 Thinking Skills	***UUW XXX/2 Option Subject (Foreign Language)						
	PUW 122/2 Skills & Technology in Communication							
	UZW XXX/1 Co-Curricular Activity	UZW XXX/1 Co-Curricular Activity						
CREDIT	19	19	18	21	17	19	16	12
Total Units for Graduation = 141								

Elective 1	Elective 2	Elective 3
A1. PAT 308/3 Financial & Human Resource Management	B1. PAT 358/3 Construction Tech. of Highway & Bridge	C1. PAT 408/3 Advanced Structural Design
A2. PAT 309/3 Building Survey	B2. PAT 359/3 Construction Risk Management	C2. PAT 409/3 Construction Technology of Highrise Building

Notes:

MUET Band 2: UVA 111/0 Preparatory English > UVW 201/2 English for General Communication> UVW 312/2 English for Technical Communication, *Option Subject is NOT COMPULSORY

MUET Band 3: UVW 201/2 English for General Communication > UVW 312/2 English for Technical Communication, *Option Subject is NOT COMPULSORY

MUET Band 4 and above: UVW 312/2 English for Technical Communication, *Option Subject is COMPULSORY

UR6582001
Bachelor of Technology In Building Construction with Honours

Programme Educational Objective (PEO)

PEO 1
To produce industrial electronic automation technologist who can perform automation tasks and solve problems in automation work.

PEO 2
To produce technopreneurs in electronic related technology.

PEO 3
To produce relevant, respected and referred professionals in industrial electronic automation technology.

Program outcomes (PO)

PO1
Apply knowledge of technology fundamentals to broadly-defined procedures processes, systems and methodologies in building construction.

PO2
Able to suggest and apply latest tools and techniques to solve broadly-defined problems.

PO3
Demonstrate strong analytical and critical thinking skills to solve broadly-defined problems in building construction.

PO4
Able to communicate and articulate effectively in both verbal and written among technologist communities and society at large.

PO5
Demonstrate understanding of the societal related issues and the consequent responsibilities relevant to broadly-defined technology practices.

PO6
Recognize the needs for professional development and to engage independent lifelong learning in specialist technologists.

PO7
Demonstrate an awareness of management and technopreneurship practices in real perspective.

PO8
Demonstrate professionalism and social and ethical consideration.

PO9
Demonstrate leadership quality, mentoring and work effectively in diverse teams.

CURRICULUM STRUCTURE
BACHELOR OF TECHNOLOGY IN BUILDING CONSTRUCTION WITH HONOURS
ACADEMIC SESSION (2020/2021)

YEAR	FIRST			SECOND			THIRD			FOURTH
SEM	I	II	III	IV	V	VI	VII	VIII	IX	X
COMMON CORE	VST111/6 Building Technology 1	VST121/5 Building Technology 2		VST211/6 Project Quality Management	VST221/4 Human Resource and Professional Ethics		VST311/6 Demolition Technique and Construction Waste Management	VST321/5 Building Requirements and Law	VST331/6 Final Year Project 2	VST411/12 Industrial Training
	VST112/6 Building Services Technology 1	VST122/5 Building Services Technology 2		VST212/6 Construction Project Management	VST222/4 Safety, Health And Environmental Management		VST312/6 Building Information Modelling	VST322/5 Building Assessment and Reporting		
		VST123/3 Industrial Revolutions		VST213/3 Psychology in Industry	VST223/4 Construction Value Estimation and Procurement		VST313/4 Technopreneur Project 2	VST323/4 Final Year Project 1		
					VST224/4 Technopreneur Project 1					
	12	13		15	16		16	14	6	12
UNIVERSITY CORE	UZWXXX/1 Co-Curriculum 1	UZWXXX/1 Co-Curriculum 2		XXX/2 Third Language	UUW224/2 Engineering Entrepreneurship		UUW 131/2 Appreciation of Ethics and Civilization			
	UVW410/2 University Malay Language	UUW 130/2 Philosophy and Current Issues		UVW312/2 English for Technical Communication						
	*UVA101/2 Preparatory English	** UVW211/2 English for General Purposes								
	PUW122/2 Skills and Technology in Communication									
	5	5		4	2		2		0	
TOTAL CREDIT	17	18		19	18		18	14	6	12
									TOTAL CREDIT FOR GRADUATION	122

LIST OF COURSES:
ENGINEERING COURSES

EAT101	BASIC ECOLOGY [EKOLOGI ASAS]
EAT102	MECHANICS & MATERIAL ENGINEERING [KEJURUTERAAN MEKANIK & BAHAN]
EAT112	GEOMATIC ENGINEERING [KEJURUTERAAN GEOMATIK]
EAT115	STRENGTH OF MATERIALS [KEKUATAN BAHAN]
EAT131	ENVIRONMENTAL CHEMISTRY [KIMIA PERSEKITARAN]
EAT152	ENGINEERING GEOLOGY [KEJURUTERAAN GEOLOGI]
EAT153	FUNDAMENTAL OF CHEMICAL PROCESS [ASAS PROSES KIMIA]
EAT208	ENVIRONMENTAL LAW, HEALTH & SAFETY [PERUNDANGAN ALAM SEKITAR, KESIHATAN & KESELAMATAN]
EAT212	SOIL MECHANICS [MEKANIK TANAH]
EAT213	FLUIDS MECHANIC & HYDRAULICS [MEKANIK BENDALIR & HIDRAULIK]
EAT231	THERMODYNAMICS [TERMODINAMIK]
EAT232	FUNDAMENTAL OF ENVIRONMENTAL ENGINEERING [ASAS KEJURUTERAAN ALAM SEKITAR]
EAT233	ENVIRONMENTAL ENGINEERING SKILLS [KEMAHIRAN KEJURUTERAAN ALAM SEKITAR]
EAT235	GEOENVIRONMENTAL ENGINEERING [KEJURUTERAAN GEOPERSEKITARAN]
EAT237	WATER SUPPLY ENGINEERING [KEJURUTERAAN SUMBER AIR]
EAT238	HYDROLOGY [HIDROLOGI]
EAT249	ENGINEERING DRAWING [LUKISAN KEJURUTERAAN]
EAT251	STRUCTURE THEORY [TEORI STRUKTUR]
EAT252	FLUID MECHANICS ENGINEERING [KEJURUTERAAN MEKANIK BENDALIR]
EAT253	STRUCTURAL ANALYSIS I [ANALISIS STRUKTUR I]
EAT258	BUILDING MATERIAL ENGINEERING [KEJURUTERAAN BAHAN BANGUNAN]
EAT259	HYDRAULICS [HIDRAULIK]
EAT260	ENVIRONMENTAL TRANSPORT PROCESS [PROSES PENGANGKUTAN PERSEKITARAN]
EAT301	AIR POLLUTION ENGINEERING [KEJURUTERAAN PENCEMARAN UDARA]
EAT303	WASTEWATER ENGINEERING [KEJURUTERAAN AIR SISA]
EAT314	GEOTECHNICAL ENGINEERING [KEJURUTERAAN GOETEKNIK]
EAT332	ENVIRONMENTAL IMPACT ASSESSMENTS [PENILAIAN KESAN ALAM SEKITAR]

EAT341	SOLID & HAZARDOUS WASTE ENGINEERING [KEJURUTERAAN SISA PEPEJAL & BERBAHAYA]
EAT342	NOISE POLLUTION ENGINEERING [KEJURUTERAAN PENCEMARAN BUNYI]
EAT343	PUBLIC HEALTH & OCCUPATIONAL HYGIENE [KESIHATAN AWAM & HIGIN PEKERJAAN]
EAT344	ENVIRONMENTAL MANAGEMENT SYSTEM [SISTEM PENGURUSAN ALAM SEKITAR]
EAT347	MASS TRANSFER [PEMINDAHAN JISIM]
EAT348	WATER SUPPLY ENGINEERING [KEJURUTERAAN SUMBER AIR]
EAT353	STRUCTURAL ANALYSIS II [ANALISIS STRUKTUR II]
EAT356	WATER & WASTEWATER ENGINEERING [KEJURUTERAAN AIR & AIR SISA]
EAT357	CONSTRUCTION MANAGEMENT [PENGURUSAN PEMBINAAN]
EAT360	HIGHWAY & TRANSPORTATION ENGINEERING [KEJURUTERAAN LEBUHRAYA & PENGANGKUTAN]
EAT361	REINFORCED CONCRETE STRUCTURE DESIGN I [REKABENTUK STRUKTUR KONKRIT BERTETULANG I]
EAT362	REINFORCED CONCRETE STRUCTURE DESIGN II [REKABENTUK STRUKTUR KONKRIT BERTETULANG II]
EAT363	HYDRALOGY & WATER RESOURCE ENGINEERING [KEJURUTERAAN SUMBER AIR & HIDROLOGI]
EAT367	STEEL STRUCTURE DESIGN [REKABENTUK STRUKTUR KELULI]
EAT412	ADVANCED REINFORCED CONCRETE STRUCTURE DESIGN [REKABENTUK STRUKTUR KONKRIT BERTETULANG LANJUTAN]
EAT441	ENVIRONMENTAL REMEDIATION [REMEDIASI ALAM SEKITAR]
EAT443	BUILT ENVIRONMENT [PERSEKITARAN TERBINA]
EAT445	REMOTE SENSING [PENDERIAAN JAUH]
EAT447	ENVIRONMENTAL INFORMATICS [INFORMATIK ALAM SEKITAR]
EAT449	ENVIRONMENTAL PROCESS CONTROL & INSTRUMENTATION [KAWALAN PROSES ALAM SEKITAR & INSTRUMENTASI]
EAT453	ADVANCED STRUCTURE ANALYSIS [ANALISIS STRUKTUR LANJUTAN]
EAT455	INDUSTRIALISED BUILDING INFORMATION (IBS) [SISTEM BINAAN BERINDUSTRI (IBS)]
EAT456	FOUNDATION ENGINEERING [KEJURUTERAAN ASAS]
EAT461	FINAL YEAR PROJECT I [PROJEK TAHUN AKHIR I]

EAT462	YEAR PROJECT II [PROJEK TAHUN AKHIR II]
EAT464	ENGINEERING MANAGEMENT [PENGURUSAN KEJURUTERAAN]
EAT470	SUSTAINABLE ENERGY [TENAGA LESTARI]
EAT471	ENVIRONMENTAL RISK ASSESSMENT [PENILAIAN RISIKO ALAM SEKITAR]
EAT472	ADVANCED WASTEWATER TREATMENT [RAWATAN AIR SISA LANJUTAN]
EAT475	CONSTRUCTION PROJECT & LAW [PROJEK PEMBINAAN & UNDANG-UNDANG]
EAT476	URBAN STORMWATER MANAGEMENT [PENGURUSAN AIR RIBUT BANDAR]
EAT477	ADVANCED STEEL DESIGN [REKABENTUK KELULI LANJUTAN]
EAT478	BUILDING INFORMATION MODELLING (BIM) [INFORMASI PERMODELAN BANGUNAN (BIM)]
EAT481	INTEGRATED ENVIRONMENTAL ENGINEERING DESIGN PROJECT I [REKABENTUK PROJEK KEJURUTERAAN ALAM SEKITAR BERSEPADU I]
EAT482	INTEGRATED ENVIRONMENTAL ENGINEERING DESIGN PROJECT II [REKABENTUK PROJEK KEJURUTERAAN ALAM SEKITAR BERSEPADU II]
EAT483	CONSTRUCTION CONTRACT, ESTIMATING & FINANCE [KONTRAK PEMBINAAN, ANGGARAN & KEWANGAN]
EAT484	INTEGRATED DESIGN PROJECT I [REKABENTUK PROJEK BERSEPADU I]
EAT485	INTEGRATED DESIGN PROJECT II [REKABENTUK PROJEK BERSEPADU II]
ECT112	KEMAHIRAN KEJURUTERAAN [ENGINEERING SKILLS]

ENGINEERING TECHNOLOGY COURSES

PAT101	ASAS MEKANIK KEJURUTERAAN [FUNDAMENTAL OF ENGINEERING MECHANICS]
PAT102	TEKNOLOGI FIZIK [PHYSIC TECHNOLOGY]
PAT103	PENGENALAN KEPADA TEKNOLOGI KEJURUTERAAN AWAM [INTRODUCTION TO CIVIL ENGINEERING TECHNOLOGY]
PAT104	LUKISAN TEKNIK [TECHNICAL DRAWING]
PAT151	ASAS MEKANIK PEPEJAL [FUNDAMENTAL OF SOLID MECHANIC]
PAT152	ASAS MEKANIK BENDALIR [FUNDAMENTAL OF FLUID MECHANIC]
PAT153	GEOMATIK [GEOMATIC]
PAT154	LUKISAN PEMBINAAN [CONSTRUCTION DRAWING]
PAT201	TEORI STRUKTUR [STRUCTURAL THEORY]
PAT202	HIDARULIK DAN HIDROLOGI [HYDRAULIC AND HYDROLOGY]

PAT203	MEKANIK TANAH [SOIL MECHANIC]
PAT204	BAHAN BINAAN [CONSTRUCTION MATERIAL]
PAT205	KHIDMAT BANGUNAN 1 [BUILDING SERVICES 1]
PAT251	ANALISIS STRUKTUR [STRUCTURAL ANALYSIS]
PAT252	PENGURUSAN PROJEK PEMBINAAN [CONSTRUCTION PROJECT MANAGEMENT]
PAT254	ANGGARAN NILAI PEMBINAAN [CONSTRUCTION VALUE ESTIMATION]
PAT255	KHIDMAT BANGUNAN 2 [BUILDING SERVICES 2]
PAT256	PENGURUSAN KESELAMATAN DAN KESIHATAN PEKERJAAN [MANAGEMENT OF OCCUPATIONAL SAFETY AND HEALTH]
PAT257	GEOTEKNIK [GEOTECHNIC]
PAT301	REKABENTUK STRUKTUR 1 [STRUCTURE DESIGN 1]
PAT302	TEKNOLOGI PEMBINAAN 1 [CONSTRUCTION TECHNOLOGY 1]
PAT303	TEKNOLOGI LEBUHRAYA DAN TRAFIK [HIGHWAY AND TRAFFIC TECHNOLOGY]
PAT304	PENTADBIRAN KONTRAK DAN TAPAK [CONTRACT AND SITE ADMINISTRATION]
PAT308	PENGURUSAN KEWANGAN DAN SUMBER MANUSIA [FINANCIAL AND HUMAN RESOURCES MANAGEMENT]
PAT309	UKUR BANGUNAN [BUILDING SURVEY]
PAT351	REKABENTUK STRUKTUR 2 [STRUCTURE DESIGN 2]
PAT352	TEKNOLOGI PEMBINAAN 2 [CONTRUCTION TECHNOLOGY 2]
PAT353	ASAS KEJURUTERAAN DAN PENGURUSAN ALAM SEKITAR [BASIC ENVIRONMENTAL ENGINEERING AND MANAGEMENT]
PAT355	PROJEK SARJANA MUDA 1 [BACHELOR DEGREE PROJECT 1]
PAT358	TEKNOLOGI PEMBINAAN LEBUHRAYA DAN JAMBATAN [CONSTRUCTION TECHNOLOGY OF HIGHWAY AND BRIDGE]
PAT359	PENGURUSAN RISIKO PEMBINAAN [CONSTRUCTION RISK MANAGEMENT]
PAT401	TEKNOLOGI PEMBINAAN BANGUNAN BERINDUSTRI [INDUSTRIALISED BUILDING CONSTRUCTION TECHNOLOGY]
PAT402	TEKNOLOGI PEMBINAAN PROJEK BERSEPADU [CONSTRUCTION TECHNOLOGY INTEGRATED PROJECT]
PAT408	REKABENTUK STRUKTUR TERMAJU [ADVANCED STRUCTURE DESIGN]

PAT409	TEKNOLOGI PEMBINAAN BANGUNAN TINGGI [CONSTRUCTION TECHNOLOGY OF HIGHRISE BUILDING]
PAT455	PROJEK SARJANA MUDA 2 [BACHELOR DEGREE PROJECT 2]

COURSE SYLLABUS:

ENGINEERING COURSES
EAT101 BASIC ECOLOGY [EKOLOGI ASAS]

No of Credits: 4

Course Synopsis:
The study of basic ecology in understanding nature and environment and the relationship between the organism and environment. Students will understand the effect of global environmental changes to the environment and how to preserve the environment. The syllabus covers on ecology, ecosystems, population, community, biogeochemical cycles, global environmental changes and microbiology.
Course Outcomes:

CO1 - Ability to define and describe basic concept of ecology and environment.
CO2 - Ability to define and describe the energy flow in ecosystems.
CO3 - Ability to define and describe the relationship among the organism in ecosystems.
CO4 - Ability to describe the basic concepts of soil composition, biochemistry and metabolism pathways of microorganisms in soil, water and wastewater treatment.

EAT102 MECHANICS & MATERIAL ENGINEERING [KEJURUTERAAN MEKANIK & BAHAN]
No of Credits: 4

Course Synopsis:
The aim of this course is to enable the students to learn the basic of mechanics and material engineering. In engineering mechanics portion, students will be introduced to fundamentals and principles of static and dynamics mechanics. Resultant and equilibrium of coplanar force system as well as spatial force system will be covered in static portion while kine-

matics and kinetics of particle in dynamics potion. In material engineering portion, the student will be also taught on structure of crystalline solids, imperfection of solid as well as strength of material.

Course Outcomes:

CO1 - Able to apply the knowledge of mechanics and materials engineer.
CO2 - Able to analyse engineering mechanic of statics and dynamics problems
CO3 - Able to analyse materials engineering problems based on its properties and structures.
CO4 - Able to demonstrate the principles of mechanics and material engineering through laboratory experiments.

EAT112 GEOMATIC ENGINEERING [KEJURUTERAAN GEOMATIK]

No of Credits: 4

Course Synopsis:

In this course student will be introduce basic surveying involved in engineering. It starts from linear measurement on plane. Students will do levelling after they learn 2 different data logging. With their knowledge in tapping and levelling, they have to do traversing and tachymetry. From all the data they have, student will ask to transform all the data to map using engineering drawing and AutoCAD. Lastly, students will be test in real work, in geomatics camp.

Course Outcomes:

CO1 - Ability to understand basic concept of geomatics.
CO2 - Ability to analyse and interpret surveying data
CO3 - Ability to perform surveying techniques, skills and procedures

EAT115 STRENGTH OF MATERIALS [KEKUATAN BAHAN]

No of Credits: 4

Course Synopsis:

The aim of this course is to enable students focused on strength of material which begins with the concept of stress and strain. The concept of axial load, torsion, and bending are also discussed. The stress results from combined loadings will be covered in this course, as well as the concepts for transforming multiaxial states of stress and in similar manner, the methods for strain transformation. Besides that the buckling of column also will be exposed to the student.

Course Outcomes:

CO1 - Ability to determine the stresses, strains and deformation of members in simple one-dimensional elastic system.
CO2 - Ability to analyze torque-loaded member and evaluate the values and distribution of bending and shear stresses in beam section.
CO3 - Ability to apply stress caused by combined loadings and buckling of column.
CO4 - Ability to calculate stresses on inclined plane using Mohr's Circle.

EAT131 ENVIRONMENTAL CHEMISTRY [KIMIA PERSEKITARAN]

No of Credits: 4

Course Synopsis:

The study of environmental chemistry is fundamental to an understanding of the natural and anthropogenic processes occurring on our planet. The course aimed to familiarize the students with qualitative and quantitative aspects of chemical and biological principles of environmental engineering and their application to pollution control. The syllabus focuses on the fundamentals of chemistry, water chemistry, atmospheric chemistry and soil chemistry.

Course Outcomes:
CO1 - Ability to explain basic concepts of fundamental chemistry.
CO2 - Ability to define and discuss the chemical principles of water and wastewater pollution or treatment.
CO3 - Ability to describe and calculate soil chemistry and chemical reactions involved.
CO4 - Ability to discuss the chemistry, photochemistry and cyclic processes in atmospheres.

EAT152 ENGINEERING GEOLOGY [KEJURUTERAAN GEOLOGI]

No of Credits: 2

Course Synopsis:
This course provides the fundamental aspects of physical geology, structural geology and engineering geology for civil engineering works. Principles of engineering geology will be focus in areas of applied geology and rock mechanics. At the end of the course, students should be able to comprehend and apply the relevant principle of geology in civil engineering structures.

Course Outcomes:
CO1 - Ability to describe the knowledge of engineering geology.
CO2 - Ability to discuss different types of rock , rock mass and geological structure.
CO3 - Ability to solve calculation of rock and rock mass.

EAT153 FUNDAMENTAL OF CHEMICAL PROCESS [ASAS PROSES KIMIA]

No of Credits: 3

Course Synopsis:
This course aims to introduce students on how to solve problems on basic process calculations and process system variables. Then, student will be taught on how to analyse and solve material balances on nonreactive and reactive process units. Furthermore, the students will be familiarized with solving problems on material and energy balances on reactive and nonreactive processes.

Course Outcomes:
CO1 - Able to calculate the basic process calculation and process system variables.
CO2 - Able to assess material and energy balances on nonreactive processes and reactive multiple-unit processes.

EAT208 ENVIRONMENTAL LAW, HEALTH & SAFETY [PERUNDANGAN ALAM SEKITAR, KESIHATAN & KESELAMATAN]

No of Credits: 3

Course Synopsis:
Students will be exposed to Malaysian related laws and regulations on occupational safety and health (e.g. OSHA 1994) and environment (e.g. EQA 1974) and how to interpret the requirements stipulated under these documents. This course will also provide students the necessary information in identifying hazards, assessment and managing the risks that may be harmful to humans in the workplace.

Course Outcomes:
CO1 - Ability to comprehend and explain the legal requirement of environmental, safety and health laws and regulations.
CO2 - Ability to describe and evaluate hazards in the workplace.
CO3 - Ability to describe and evaluate the magnitude of risks on humans associated with the hazards in the workplace.
CO4 - Ability to outline the management plan in managing the hazards and risks in the work place.

EAT212 SOIL MECHANICS [MEKANIK TANAH]

No of Credits: 4

Course Synopsis:
The course introduces the students with the basic and background of the properties and behavior of soil deposits and the applications of soil mechanics theory. It includes brief introduction on geological and physical characteristics of soils. Also includes identification, classification and description of soil for engineering purposes. Application of mechanics on soil such as phase relationship, compaction, permeability and seepage, stresses and effective stresses, shear strength and consolidation are also covered.

Course Outcomes:
CO1 - Able to analyse the knowledge of soil mechanics.
CO2 - Able to solve the calculation of soil mechanics problems.
CO3 - Able to conduct the experiments associated with soil classification and parameters.

EAT213 FLUIDS MECHANIC & HYDRAULICS [MEKANIK BENDALIR & HIDRAULIK]

No of Credits: 3

Course Synopsis:
This course introduces the fundamental concept of fluid mechanics applied in Environmental Engineering. Topics to be covered include properties of fluids, fluid static and kinematics, Bernoulli's equation, energy equation, analysis of flow in open channel and pipeline system. The content of this course is considered as an essential element to be applied in the subsequent wastewater and water supply engineering. At the end of the course, students should be able to apply the theory to solve problems related to Environmental Engineering fluid mechanics.

Course Outcomes:
CO1 - Ability to define and describe the properties of fluids.
CO2 - Ability to identify and analyse some fluid static and fluid dynamic theories and applications.
CO3 - Ability to describe and solve problems related to fluid flow in pipeline system.
CO4 - Ability to describe and solve problems related to fluid flow in open channel system.

EAT231 THERMODYNAMICS [TERMODINAMIK]

No of Credits: 3

Course Synopsis:
Thermodynamics is a study related to the science of energy and their relation to heat and work. This course will discuss the basic concepts and properties of thermodynamics and the forms of energy and energy transfer. The first and second law of thermodynamics are useful in performing energy analysis and measuring thermal efficiency of a system. The second law leads to another property called entropy, which is a quantitative measure of microscopic disorder for a system.

Course Outcomes:
CO1 - Able to use thermodynamic tables, charts and equation of state to obtain appropriate property data in solving thermodynamics problems.
CO2 - Able to evaluate fundamental engineering problems in thermodynamics involving closed systems, open systems under steady state and transient conditions by applying the f irst and second laws of thermodynamics.
CO3 - Able to apply second law analysis methods for thermodynamic systems.

EAT232 FUNDAMENTAL OF ENVIRONMENTAL ENGINEERING [ASAS KEJURUTERAAN ALAM SEKITAR]

No of Credits: 3

Course Synopsis:
This course focuses on fundamental concepts of environmental engineering. Students will be exposed briefly about the main component in environmental engineering that are water, air, solid waste and noise. The definition, causes, impacts and controls of every pollution (as above) will be described briefly. Furthermore, the Environmental Quality Act (EQA) 1974, limitation and guidelines that have been applied in Malaysia will also be described in this course.

Course Outcomes:
CO1 - Ability to describe or calculate the water quality parameters, legislation of water quality and pollution control and the principle of water and wastewater in industrial and domestic sewage.
CO2 - Ability to describe or calculate classification of pollutant and particulate, the effect of pollutants and meteorology of air.
CO3 - Ability to describe or calculate the physical properties of sound, noise measurement and control and related legislation.
CO4 - Ability to describe or calculate solid and hazardous waste generations, characteristics, landfilling and related legislation.

EAT233 ENVIRONMENTAL ENGINEERING SKILLS [KEMAHIRAN KEJURUTERAAN ALAM SEKITAR]

No of Credits: 3

Course Synopsis:
Environmental engineering skill plays an important role in environmental engineering for decision making and problem solving. The course explores the growth and the effectiveness of several sophisticated techniques in seeking reliable information and precision in many environmental engineering activities such as environmental monitoring and surveying, environmental database and information systems. Through this course the students are enabled to perform surveying tasks, utilize Geographical Information System (GIS), AutoCAD drawing and editing for aiding in decision making and problem solving in various environmental engineering disciplines as well as basic plotting using MATLAB. This course also aims to develop basic skills in using GIS, AutoCAD and MATLAB softwares.

Course Outcomes:
CO1 - Able to provide knowledge and perform surveying task and procedure.
CO2 - Able to provide knowledge and practice the basic AutoCAD software package.
CO3 - Able to produce map using Geographical Information System (GIS).

EAT235 GEOENVIRONMENTAL ENGINEERING [KEJURUTERAAN GEOPERSEKITARAN]

No of Credits: 3

Course Synopsis:
This course presents the principles of geo-environmental engineering. It covers the chemical and geo-chemistry background of soil, rock classification, groundwater flow and contaminant fate and transport. This course also discusses the sources of contaminants and available remediation technologies which are widely used for groundwater treatment.

Course Outcomes:
CO1 - Ability to discuss and apply the component, concept and principle available in soil composition and properties.
CO2 - Ability to utilizes and apply the knowledge of groundwater flow and transportation process in porous media.
CO3 - Ability to discuss and apply the knowledge of the processes affecting the fate and transport of contaminants.
CO4 - Ability to identify and utilizes the basic principles and remediation technologies available in subsurface contamination.

CO5 - Ability to discuss and illustrate barriers and liner systems for contaminated land.

EAT237 WATER SUPPLY ENGINEERING [KEJURUTERAAN SUMBER AIR]

No of Credits: 3

Course Synopsis:
This course introduces the student of Civil and Environmental Engineering on the application of basic science and engineering knowledge to solve water supply issues. The topics to be covered include water sources, quality and demand, water treatment plant design covering water intake, pre-treatment, primary treatment and advance water treatment processes, and water distribution system analysis.

Course Outcomes:
CO1 - Ability to identify water sources, water quality and consumption, and to forecast water demand.
CO2 - Ability to identify the technology of water treatment processes.
CO3 - Ability to design water treatment unit.
CO4 - Ability to describe and analyze water distribution system.

EAT238 HYDROLOGY [HIDROLOGI]

No of Credits: 3

Course Synopsis:
Introduces the fundamental of hydrological process such as hydrologic cycle, atmospheric circulation, precipitation, evaporation, evapotranspiration and infiltration. Students will be introduced to equations to calculate, and equipment to measure many important hydrologic data including rainfall amount, evaporation rate and infiltration rate. Analysis will be done to look at the relationship between these values especially between rainfall, landuse, and streamflow values. Emphasis will be given for measurement technique of flowrate in river, and usage of Rating Curve to find the relationship between water level and streamflow values. Unit Hydrograph and it's usage and it's derivation will also be included.

Course Outcomes:
CO1 - Ability to discuss and perform the computation for hydrological process.
CO2 - Ability to compute the flood hydrographs using various hydrograph methods.
CO3 - Ability to analyze and apply the frequency analysis in hydrology.
CO4 - Ability to compute the flood routing.

EAT249 ENGINEERING DRAWING [LUKISAN KEJURUTERAAN]

No of Credits: 3

Course Synopsis:
The course equips students with the manual and computer-aided drawing skill for general engineering drawing, especially the drawing for Civil Engineering profession. This includes the structural plan, cross section drawing and structural detailing. Through lectures, students will learn the basic characteristics of professional Civil Engineering drawing and computer-aided drawing program. Through hands-on sessions using drawing software packages, this course enables the students to have firsthand practice on the drawing for some idealized and actual projects. Mini project cover several disciplines of Civil Engineering profession will be integrated through a series of these hand-on sessions. Moreover, students will learn about bill of quantity.

Course Outcomes:
CO1 - Able to describe the knowledge of engineering drawing and bill of quantity.
CO2 - Able to solve engineering problems related to bill of quantity.
CO3 - Able to use techniques, skills and modern engineering tools for engineering activities. Able to presents effectively on engineering activities.

EAT251 STRUCTURE THEORY [TEORI STRUKTUR]

No of Credits: 3

Course Synopsis:
This course provides students with a clear and through presentation of the theory and application of structural analysis as it applies to beams, trusses and frames. It introduces analysis of statically determinate structures for beams, trusses and frames. Besides that, it also introduces deflections using geometrical method for the beams and also virtual work method for trusses, beams, and frames. Cables and arches also will be discussed at the end of this course.

Course Outcomes:
CO1 - Able to identify the statically determinate and indeterminate structures.
CO2 - Able to analyse the support and internal loading developed in determinate structure.
CO3 - Able to calculate the internal forces in cable and arch.
CO4 - Able to determine the deformation of determinate structure.

EAT252 FLUID MECHANICS ENGINEERING [KEJURUTERAAN MEKANIK BENDALIR]

No of Credits: 4

Course Synopsis:
This course provides student knowledge in the patterns of movement of fluid particles. By the end of this subject student will be expected to understand the basic characteristics of fluid mechanics and fluid statics, be able to analyze the hydrostatics and basic hydrodynamics in fluid. Student also will be able to analyze and differentiate between the flow in pipe and flow in open channels. In this subject, student will be introduced to the Darcy-Weisbach equation, Moody diagram, Energy losses in pipelines, Minor losses, and multiple pipe systems.

Course Outcomes:
CO1 - Able to apply the knowledge of fluid static.
CO2 - Able to analyse the flow in close channel.
CO3 - Able to analyse the pipe flow system and open channel.
CO4 - Able to conduct experiment associated to fluid mechanics and closed channel.

EAT253 STRUCTURAL ANALYSIS I [ANALISIS STRUKTUR I]

No of Credits: 3

Course Synopsis:
This course provides student with understanding of influence lines for statically determinate structures and approximate analysis of statically indeterminate structures. Student also will be introduce with beam, trusses and plane frame analysis using slope deflection and moment distribution methods. This course requires pre-requisites EAT 251/3 – Structural Theory.

Course Outcomes:
CO1 - Able to analyze the knowledge of stuctural analysis.
CO2 - Able to solve the calculation of statically determinate and indeterminate structures.
CO3 - Able to analyze structures using the displacement method of analysis.

EAT258 BUILDING MATERIAL ENGINEERING [KEJURUTERAAN BAHAN BANGUNAN]

No of Credits: 3

Course Synopsis:
This course exposes students to different types of construction materials in building engineering. It covers type and function of cement, function of aggregates in concrete, water, admixtures, properties of fresh and hardened concrete, concrete mix design, manufacturing concrete on site. Properties and application of timbers, types and characteristics of bricks and blocks,

ferrous and non-ferrous metals, and other current materials in the construction industry are also discussed.

Course Outcomes:

CO1 - Able to describe various building materials namely concrete, steel, timber, bricks and differentiate its influence to their properties.
CO2 - Able to explain the materials used to make concrete; including their sources, production and properties.
CO3 - Able to formulate the properties of timber and composite as a building materials.
CO4 - Able to apply the knowledge gain above for various application related to civil engineering work and discuss the innovations, new applications and new construction material for sustainable development.

EAT259 HYDRAULICS [HIDRAULIK]

No of Credits: 3

Course Synopsis:

This course builds on the fundamentals given in Fluid Mechanics and reinforces students' understanding of the behaviour of fluids, through the study of the flow of water in typical civil engineering applications. The course covers the study of steady incompressible flow in pipelines and pipe networks, uniform and non-uniform flow in open channels, dimensional analysis and similitude and hydraulics machinery.

Course Outcomes:

CO1 - Able to analyse and design the fluid flowing in an closed channel.
CO2 - Able to analyse and design the fluid flowing in an open channel.
CO3 - Ability to conduct and demonstrate open channel experiments according to experimental procedure.

EAT260 ENVIRONMENTAL TRANSPORT PROCESS [PROSES PENGANGKUTAN PERSEKITARAN]

No of Credits: 3

Course Synopsis:

The objective of this course is to introduce Environmental Engineering student on natural transport processes in the environment. Basic concept on mass balance, physical, chemical and biological transport process will be covered. Chemical and biological Kinetics will be introduced by applying Gibbs free energy concept. Similarly, phase equilibrium and partitioning in the environment will be introduced. By the end of the course, the student is expected to be able to understand the related driving forces in the process of advection, diffusion, and the combination of the two phases in air, water, and soil media.

Course Outcomes:

CO1 - Ability to apply basic concept of transport phenomena toward in-depth understanding in environmental transport processes.
CO2 - Ability to predict, propose and evaluate models of physical, chemical and biological transport process in the environment.
CO3 - Ability to develop model of environmental transport process using modern tool.

EAT301 AIR POLLUTION ENGINEERING [KEJURUTERAAN PENCEMARAN UDARA]

No of Credits: 4

Course Synopsis:

This subject discuss in detail about air pollution control. As an introduction, students will be introduced to air pollution control philosophies and regulations which are relate to air pollution control in Malaysia. Meteorological aspects which control the transport of air pollutants are also discussed in this subject. Apart of that, this subject will explain and discuss the general idea on how to control air pollution, modelling the pollutant dispersion as well as designing air pollution control equipment.

Course Outcomes:
CO1 - Ability to identify and discuss the behaviour of meteorological condition and evaluate the air pollutant dispersion using the Gaussian Plume idea.
CO2 - Ability to analyze and design the operation of air pollution control system for a specific problem.
CO3 - Ability to demonstrate the air pollution control device experiments and measurements.

EAT303 WASTEWATER ENGINEERING [KEJURUTERAAN AIR SISA]

No of Credits: 4

Course Synopsis:
The aim of this course is to enable the students to have the comprehensive understanding on Wastewater treatment processes, including preliminary, primary, secondary and tertiary treatments. In the first part of the course, student will be introduced to the wastewater sources, flow rate, treatment standard, location and plant hydraulics. The second part will be dealing with unit processes in primary treatment such as bar rack, screen, grit removal and sedimentation basin. The following part of the course containing the biological and chemical treatment processes of wastewater. By the end of the course, the student is expected to be familiarizing with the design principles of unit processes in wastewater treatment plant, applying all the basic knowledge in wastewater treatment theory.

Course Outcomes:
CO1 - Able to analyse the suitable unit process in wastewater engineering.
CO2 - Able to solve calculation of the unit process applied in wastewater treatment.
CO3 - Able to design basic structure of wastewater treatment plant.
CO4 - Able to conduct experiment and adapt field trip observation associated with wastewater treatment process.

EAT314 GEOTECHNICAL ENGINEERING [KEJURUTERAAN GOETEKNIK]

No of Credits: 4

Course Synopsis:
This course provides further discussion and explanation related to soil engineering. The topics cover in this course includes site investigation, bearing capacity and design of shallow foundation and pile foundation, lateral earth pressure, and slope stability. At the end of the course, students should be able to apply theory and practical to solve problem related to geotechnical engineering.

Course Outcomes:
CO1 - Able to apply the knowledge of geotechnical engineering.
CO2 - Able to solve the calculation of geotechnical problems.
CO3 - Able to design elements in geotechnical engineering.
CO4 - Able to conduct the experiment associated with computer software.

EAT332 ENVIRONMENTAL IMPACT ASSESSMENTS [PENILAIAN KESAN ALAM SEKITAR]

No of Credits: 3

Course Synopsis:
The aim of the course is to introduce the components and structure of an Environmental Impact Assessment (EIA) in line with Malaysian statutory requirement. This course will provide students with skills and knowledge in hazard and impact identification, prediction and evaluation of impacts and mitigation to reduce the magnitude of impacts. The scope will focuses on environmental and societies impacts on the proposed project. In achieving the objectives of this course, students will be engage in lecturers, small working groups in conducting problem based learning and writing an environmental impact assessment statement.

Course Outcomes:

CO1 - Ability to explain and analyze the EIA process, and compare with legal requirements in Malaysia.
CO2 - Ability to outline the terms of reference in conducting Environmental Impact Assessment (EIA) and evaluate the potential impacts to the environment and society.
CO3 - Ability to assess the severity of adverse effects and suggest mitigation measures and monitoring plan.
CO4 - Ability to comprehend the reporting mechanisms, public participation and auditing process.

EAT341 SOLID & HAZARDOUS WASTE ENGINEERING [KEJURUTERAAN SISA PEPEJAL & BERBAHAYA]

No of Credits: 3

Course Synopsis:

Students will be introduced to elements of solid waste which is Municipal solid waste characterization, waste handling, generation rate, storage, collection and transport; waste treatment and disposal methods, including biological and chemical treatment, incineration, pyrolysis, landfill and site remediation, waste minimization. Student will also be enriched with characteristic of hazardous waste, handling, storage and collection, treatment and disposal methods, physicochemical and biological methods, stabilization & various ultimate disposal options such as solidification, incineration and secure landfilling. Finally, student will be able to design a landfill with complete understanding of the characteristic of a landfill.

Course Outcomes:

CO1 - Ability to define and differentiate sources, composition and properties of waste and hazardous waste.
CO2 - Ability to design a complete flow of waste management system.
CO3 - Ability to distinguish the hazard of hazardous waste and elaborate the concept of risk assessment for hazardous waste.
CO4 - Ability to decide the final disposal of waste and hazardous waste and to design an engineered final disposal facility.

EAT342 NOISE POLLUTION ENGINEERING [KEJURUTERAAN PENCEMARAN BUNYI]

No of Credits: 3

Course Synopsis:

This course presents the basic principle and concepts of the noise pollution engineering. It covers how to tackle noise pollution problems, solutions available for noise control, how to determine noise, and how noise generated and radiated, and how it can be reduced. From the course, students will also be exposed to laws and codes governing noise and its control – Environmental Quality Act 1974, OSHA, Factories and Machinery Act 1967.

Course Outcomes:

CO1 - Ability to differentiate between noise and sound, able to explain and discuss the sources and effects of noise pollution.
CO2 - Ability of defining the properties of sound, quantifying the noise levels and decibel as well as to characterize the noise.
CO3 - Ability to develop methodologies to control noise pollution and get familiar with the statutory limits related to both ambient noise levels and noise levels at a workspace environment.

EAT343 PUBLIC HEALTH & OCCUPATIONAL HYGIENE [KESIHATAN AWAM & HIGIN PEKERJAAN]

No of Credits: 3

Course Synopsis:

Public health and occupational hygiene are two interrelated studies. This course is divided into two sections that cover both public health and occupational hygiene. The first section is devoted to the fundamentals of health in the tropics, water supply and sanitation, diseases transmitted by microbes, vectors and other agents. This includes introduction to pollutants and other hazards in nature and indoors. The second section is on occupational hygiene and the topics covers in this section includes introduction

to safety and health of workers and public, Malaysian occupational Safety and Health Act, Environmental, quality, health and safety management.

Course Outcomes:

CO1 - Ability to discuss, apply and analyse concepts in public health and epidemiology for health promotion and disease prevention.
CO2 - Ability to discuss environmental health in the tropics and relate to water supply, sanitation and social practices.
CO3 - Ability to discuss occupational hazards, evaluate risk and apply hierarchy of risk control in mitigating the potential of work related diseases with respect to relevant OSH legislation and standards.
CO4 - Ability to appraise selected literature on public health in a group.

EAT344 ENVIRONMENTAL MANAGEMENT SYSTEM [SISTEM PENGURUSAN ALAM SEKITAR]

No of Credits: 3

Course Synopsis:

This course aims to develop an understanding of the role and implementation for ISO 14001 or Environmental Management System (EMS). The course focuses on the processes involved in ISO 14001/EMS, with a particular emphasis on technical requirements of the system, regulatory and community issues. Students will be able to interpret the requirements of ISO 14001/EMS and suggest the appropriate measures to reduce environmental degradation. Students will also be exposed to corporate environmental reporting which reflect the company commitment towards environmental conservation.

Course Outcomes:

CO1 - Ability to explain the environmental management and the requirements on ISO 14001 (environmental management system).
CO2 - Ability to distinguish and articulate the aspect and impact of a human work processes that may resulted to adverse effect.
CO3 - Ability to suggest mitigation measure and establish environmental policy in conserving the environment.
CO4 - Ability to carry out environmental reporting.

EAT347 MASS TRANSFER [PEMINDAHAN JISIM]

No of Credits: 4

Course Synopsis:

The study of mass transfer is of particular interest to environmental engineers which involves processes that move chemicals through the air, surface water, subsurface environment, or engineered systems. Transport processes move pollutants from the location at which they are generated, resulting in impacts that can be distant from the pollution source. In addition, environmental engineers make use of the contents of this course in the design of emission-control systems. In this course the lectures discuss some of the processes that transport pollutants in the environment and in engineered systems. The goals of this discussion are twofold: to provide and understanding of the processes that cause pollutant transport, and to present and apply the mathematical formulas used to calculate the resulting pollutant fluxes.

Course Outcomes:

CO1 - Ability to utilize the understanding of the principle of mass transfer concepts.
CO2 - Ability to utilize the understanding of mass transfer operation systems.
CO3 - Ability to utilize transport processes in the design of emission-control systems.
CO4 - Ability to utilize the understanding of the sources, fate and transport, and the impact of chemical substances.

EAT348 WATER SUPPLY ENGINEERING [KEJURUTERAAN SUMBER AIR]

No of Credits: 3

Course Synopsis:
This course introduces the student of Civil and Environmental Engineering on the application of basic science and engineering knowledge to solve water supply issues. The topics to be covered include water sources, quality and demand, water treatment plant design covering water intake, pre-treatment, primary treatment and advance water treatment processes, and water distribution system analysis.

Course Outcomes:
CO1 - Ability to identify water sources, water quality and consumption, and to forecast water demand.
CO2 - Ability to identify the technology of water treatment processes.
CO3 - Ability to design water treatment unit.
CO4 - Ability to describe and analyze water distribution system.

EAT353 STRUCTURAL ANALYSIS II [ANALISIS STRUKTUR II]

No of Credits: 3

Course Synopsis:
This course provides student with understanding of matrix analysis for statically indeterminate structures using flexibility and stiffness methods. Non prismatic members are also included in the analysis. Student also will be introduced with the structural modelling using finite element method. Structural modelling and analysis using commercial structural analysis software are emphasized.

Course Outcomes:
CO1 - Ability to analyse the statically indeterminate beam, trusses and frame by applying the force or flexibility method.
CO2 - Ability to analyse and solve indeterminate structural problems for prismatic and non- prismatic members.
CO3 - Ability to analyse the statically indeterminate beam, trusses and frame by using the stiffness method.
CO4 - Ability to derive the finite elements equation and apply in analysis of structures.

EAT356 WATER & WASTEWATER ENGINEERING [KEJURUTERAAN AIR & AIR SISA]

No of Credits: 4

Course Synopsis:
This course is an overview of engineering approaches to protecting water quality with an emphasis on fundamental principles. Theory and conceptual design of systems for treating municipal wastewater are discussed. Physical and biological processes are presented, including sedimentation, filtration, biological treatment and disinfection. Finally, there is discussion of engineered and natural processes for wastewater treatment.

Course Outcomes:
CO1 - Able to analyse the knowledge of wastewater engineering.
CO2 - Able to solve calculation of wastewater problem.
CO3 - Able to design sewage treatment plant using prescribed standard.
CO4 - Able to conduct the experiment associated with wastewater for physical and biological parameter.

EAT357 CONSTRUCTION MANAGEMENT [PENGURUSAN PEMBINAAN]
No of Credits: 3
Course Synopsis:
This course is designed to provide students with the knowledge of subject area; ability to apply tools in a project environment; demonstrate competence in learning and evidence generating to sustain competency. The syllabus comprises scope management including project authorization, scope definition, control and finalization. Cost management including project costing, resource planning, budgeting and controlling financial comple-

tion are also emphasized. In addition, this course will also expose students to the time management including activity sequencing, duration estimating, scheduling, progress control, monitoring and forecasting.

Course Outcomes:
CO1 - Able to describe general project management principles.
CO2 - Able to evaluate the project management planning.
CO3 - Able to demonstrate project monitoring and handling over.
CO4 - Able to communicate effectively in term of construction management process.

EAT360 HIGHWAY & TRANSPORTATION ENGINEERING [KEJURUTERAAN LEBUHRAYA & PENGANGKUTAN]

No of Credits: 4

Course Synopsis:
The goal of this course is to give knowledge, understanding and synthesis in highway engineering which covers topics on traffic, road and highway. The sub-topics discussed are characteristics of drivers, pedestrians, vehicles and road, fundamentals of traffic flow, including volume, speed and density, traffic engineering studies, geometric design of road, two and multi-lanes highway. Students will be taught briefly on materials related to asphalt, bitumen and concrete, flexible and rigid pavements.

Course Outcomes:
CO1 - Ability to understand traffic flow fundamentals and relationship between volume, speed and density.
CO2 - Ability to understand the transportation planning process, forecast travel demand and design highway drainage structures.
CO3 - Ability to understand soil bearing test, material used in pavement, and design flexible pavement.
CO4 - Ability to design rigid pavement.

EAT361 REINFORCED CONCRETE STRUCTURE DESIGN I [REKABENTUK STRUKTUR KONKRIT BERTETULANG I]

No of Credits: 3

Course Synopsis:
This course is designed to provide the student with a understanding of the limit state design concept and analysis of sections for bending; to provide a basic understanding of standard methods of analysis and design of reinforced concrete behaviour (including an understanding of capabilities and limitations); and to ability to analyse and design reinforces concrete structural elements. Among the topics discussed are objectives and methods of design, code of practice, analysis and design of sections for moment, design for shear, checking for deflection and cracking, durability and detailing requirements. Design of simply supported, continuous beams and cantilever beam, design of one way and two way restrained and simply supported slab and design a column. The syllabus is cover ultimate and serviceability limit state. Design resistance typical structural element and detailing.

Course Outcomes:
CO1 - Able to calculate moment and design the building structure.
CO2 - Able to analyse shear, deflection and cracking.
CO3 - Able to illustrate detailing of the structure using AutoCAD.

EAT362 REINFORCED CONCRETE STRUCTURE DESIGN II [REKABENTUK STRUKTUR KONKRIT BERTETULANG II]

No of Credits: 3

Course Synopsis:
This course is designed to provide the student with ability to analyse and design advanced reinforces concrete structural elements. Among the topics discussed are objectives and methods of design, code of practice, analysis and design of sections for moment, design for shear, checking for deflection and cracking, durability and detailing requirements. Calculation for design includes prestressed concrete, foundation, reinforced concrete

frame and retaining wall.

Course Outcomes:
CO1 - Able to calculate moment and design the structure elements.
CO2 - Able to analyse shear, deflection and cracking.
CO3 - Able to illustrate detailing of the structure using AutoCAD.

EAT363 HYDRALOGY & WATER RESOURCE ENGINEERING [KEJURUTERAAN SUMBER AIR & HIDROLOGI]

No of Credits: 3

Course Synopsis:
This course is designed to expose students to the engineering principles involved in analysing and managing the quantity of water in natural and developed systems. This course consists of the hydrological cycle, water resources management and planning, precipitation, infiltration, flood routing, surface water, ground water and stormwater management. The students also will be exposed to the Urban Stormwater Management Manual for Malaysia (MSMA).

Course Outcomes:
CO1 - Able to demonstrate the scenario of hydrology and water resources engineering.
CO2 - Able to solve the calculation of hydrology and water resources engineering problems.
CO3 - Able to design basic stormwater management using prescribed manual.

EAT367 STEEL STRUCTURE DESIGN [REKABENTUK STRUKTUR KELULI]

No of Credits: 3

Course Synopsis:
This course provides a basic understanding of behavior and design of steel members, connections and structures. At the end of this unit, students should be familiar with the behavior of steel structures; in particular the various forms of buckling and failure, particularly those associated with tension, bending, shear, compression, combined actions and connections; have a working knowledge of Eurocode, and be competent in designing a simple structure to Eurocode. The syllabus comprises the behavior of steel members and structures - properties of cross-sections, local buckling, elastic beams, plastic beams, tension members, compression members, effective lengths and elastic in-plane frame buckling, local lateral buckling of beams, in-plane bending of beam columns, lateral buckling of beam-columns, biaxial bending of beam-columns, bolted and welded connections.

Course Outcomes:
CO1 - Able to design axially loaded member without and/or with associate combination axial load and bending.
CO2 - Able to design flexural members.
CO3 - Able to design steel structures joints.

EAT412 ADVANCED REINFORCED CONCRETE STRUCTURE DESIGN [REKABENTUK STRUKTUR KONKRIT BERTETULANG LANJUTAN]

No of Credits: 3

Course Synopsis:
This course provides additional knowledge on the aspect of reinforced concrete structural elements. As a continuation to the Concrete Building Design 1 and 2, the topics discussed include analysis and design of ribbed, waffle and flat slabs, water retaining structures, walls, corbel and Nibs. Methods of deflection calculation, design of elements for torsion and

analysis and design of raft foundation are also covered.

Course Outcomes:
CO1 - Able to calculate moment and design the structure elements.
CO2 - Able to analyse shear, deflection and cracking.
CO3 - Able to illustrate detailing of the structure using AutoCAD.

EAT441 ENVIRONMENTAL REMEDIATION [REMEDIASI ALAM SEKITAR]

No of Credits: 3

Course Synopsis:
This course provides a general overview of the environmental remediation with emphasis on soil, groundwater and aquifer contaminants. The student will be taught about the source and behaviour of subsurface contaminants, contaminants tracer study and remediation planning. Student will also be enriched with bioremediation technologies to recover the contaminants.

Course Outcomes:
CO1 - Ability to illustrate the concepts of bioremediation in soil, groundwater and contaminated site treatment.
CO2 - Ability to describe and analyse the characteristics of contaminants.
CO3 - Ability to identify and construct appropriate strategies to remediate contaminated soil.
CO4 - Ability to identify and construct appropriate strategies to remediate contaminated water.

EAT443 BUILT ENVIRONMENT [PERSEKITARAN TERBINA]

No of Credits: 3

Course Synopsis:
The aim of this course is to enable the students developing an understanding, knowledge and skills in elements and principles of building design. At the beginning, students will be introduced to the environmental issues that pervade the built environment and therefore influence sustainable design. This then leads to the undertaking of a detailed and systematic exploration of the designs of energy efficient buildings, incorporating thermal control, thermal dynamics, green architecture, thermal insulation, ventilation, air-conditioning, lighting and acoustics. While mini projects are designed to help students develop a stronger emphasis in considering in more detail the holistic design of a building, its internal environment, and the system necessary to achieve a sustainable building.

Course Outcomes:
CO1 - Able to APPLY the elements and principles of building designs and planning.
CO2 - Able to INTEGRATE tools and best practices within building planning that address the needs of energy efficiency.
CO3 - Able to DEMONSTRATE the critical planning solutions to built environment that promote healthier communities.

EAT445 REMOTE SENSING [PENDERIAAN JAUH]

No of Credits: 3

Course Synopsis:
Remote sensing is the acquisition of information about an object or phenomenon, without making physical contact with the object. This course emphasizes the understanding of the remote sensing foundation and principle as well as the use of remote sensor data, image interpretation and processing techniques. Specifically, this includes introduction to electromagnetic energy, satellite and sensor also its applications. The characteristic of various system embrace passive and active remote sensing also discussed.

Course Outcomes:
CO1 - Ability to understand basic concept of remote sensing.
CO2 - Ability to convert and analyze environmental data by using digital image processing software.

CO3 - Ability to characterized and utilizes the various system of remote sensing.

EAT447 ENVIRONMENTAL INFORMATICS [INFORMATIK ALAM SEKITAR]

No of Credits: 3

Course Synopsis:
Environmental informatics plays an important role in environmental decision making. Environmental informatics investigates the development of effective techniques to deliver comprehensive and reliable information for environmental research, management and public awareness. This assimilates expertise and technologies and promotes interaction between fields such as environmental monitoring, environmental databases and information systems, geographical information systems, numerical simulation modelling, knowledge-based systems, internet exploitation, data visualisation, human-computer interaction, information theory and public understanding of science. Great potential now exists to adopt the holistic perspective offered by Environmental Informatics to address the pressing problems surrounding environmental information in the world today. From this course, students will be at the forefront of these developments.

Course Outcomes:
CO1 - Able to ASESS the element and principles of sampling techniques.
CO2 - Able to MANIPULATE environmental data into decision making information by using statistical analysis.
CO3 - Able to ADAPTH the understanding on design experiments and able to manipulate experimental data using statistical model.

EAT449 ENVIRONMENTAL PROCESS CONTROL & INSTRUMENTATION [KAWALAN PROSES ALAM SEKITAR & INSTRUMENTASI]

No of Credits: 3

Course Synopsis:
The aim of this course is to enable the students to gain the conceptual understanding on Process Control and Instrumentation applied in Environmental Engineering. In the first part of the course, student will be introducing to common control system and instrumentation related to Environmental Processes. The second part will be consisting of process dynamics modeling, transformation of model into mathematical equation and solving the model by Laplace transform. The following part of the course containing the Characteristics, Forms, Modes, performances and tuning of Proportional-Integral-Derivative (PID) Control. By the end of the course, the student is expected to be familiarizing with control system in Environmental Engineering field. The application of the control system in Environmental Engineering will be introduce to the student at the last part of the course.

Course Outcomes:
CO1 - Ability to understand the concept of process control and instrumentation.
CO2 - Ability to develop and solve dynamics model of chemical and biological processes related to environmental engineering.
CO3 - Ability to analyze and design the control system for chemical and biological processes related to environmental engineering.
CO4 - Ability to apply the process control strategies of typical chemical and biological process related to environmental engineering.

EAT453 ANVANCED STRUCTURE ANALYSIS [ANALISIS STRUKTUR LANJUTAN]

No of Credits: 3

Course Synopsis:
This course provides students with basic knowledge of the finite element

method (FEM) in structural analysis and response of the systems under dynamic excitation. For the finite element method this course explains the fundamental of the FEM and procedure to develop FEM equation. The fundamental of the FE will be utilized in the development of FEM equation for 2 dimensional solid models. The plasticity of the structural member also discussed and analysed in this course. Moreover, the students will be introduced and exposed to the structural dynamic. For that purpose two basic topics in structural dynamic (i.e. equation of motion and response of single degree of freedom system under free vibration) will be covered in this course.

Course Outcomes:

CO1 - Ability to derive finite element equation.
CO2 - Ability to analyse the 2 dimensional solid model using finite element method.
CO3 - Ability to analyse moment capacity for the structural member.
CO4 - Ability to derive the equation of motion for single degree of freedom system.

EAT455 INDUSTRIALISED BUILDING INFORMATION (IBS) [SISTEM BINAAN BERINDUSTRI (IBS)]

No of Credits: 3

Course Synopsis:

This course is designed to expose students to the concepts of IBS which includes the advantages and disadvantages using IBS in Construction, Roadmap of IBS and the usage of IBS. It also highlighted the concept of Score Calculation and submission, Principal of Modular Coordination in IBS and concepts of buildability. Joints and tolerances will also be discussed. Enhancement through mini project and hands-on will be done to further strengthen their knowledge on subject matter.

Course Outcomes:

CO1 - Able to classify the concept of IBS modern construction technology.
CO2 - Able to calculate the Principle of Score calculation and its submissions.
CO3 - Able to decide Concept of Modular Coordination in IBS.
CO4 - Able to present the concept of IBS according to Malaysian Standard.

EAT456 FOUNDATION ENGINEERING [KEJURUTERAAN ASAS]

No of Credits: 3

Course Synopsis:

This course provides further discussion and explanation related to foundation engineering. The topics cover in this course includes mat foundations, drilled-shaft foundations, retaining walls, foundations on difficult soils, and soil improvement. At the end of the course, students should be able to apply theory and practical to solve problem related to foundation engineering.

Course Outcomes:

CO1 - Able to calculate soil bearing capacity for mat and drilled shaft foundations.
CO2 - Able to design the stability of retaining walls.
CO3 - Able to formulate foundations on difficult soils for collapsible and expansive soils.
CO4 - Able to present on soil improvement method and stability of retaining walls.

EAT461 FINAL YEAR PROJECT I [PROJEK TAHUN AKHIR I]

No of Credits: 2

Course Synopsis:

This an individual research project in connection with a special engineering problem and under the guidance of an academic staff. The project undertaken may fall under one of the following areas: Mathematical analysis, experimental tests, computer simulation, hardware and / software development, to their field of interest. At the end of the project, each student

prepares an engineering report, presents and demonstrates findings and results of the project work.

Course Outcomes:

CO1 - Able to APPLY the knowledge and provide assumptions to identify evidence for a conclusion.
CO2 - Able to COLLECT relevant information in a literature review to provide background of the project.
CO3 - Able to CONSTRUCT experimental design to solve the research problems.
CO4 - Able to CONDUCT an investigation using various methods.
CO5 - Able to PERFORM research activities with high ethic expressions.
CO6 - Able to DEMONSTRATE engineering principles with a sense of responsibility.
CO7 - Able to ADAPT and function on multi-disciplinary teams.
CO8 - Able to DISPLAY effective communication skills on complex engineering activities with the engineering community and with society at large.
CO9 - Able to RELATE research activities to relevant information from various sources for application on continuous learning.
CO10 - Able to PRODUCE excellent project management.

EAT462 FINAL YEAR PROJECT II [PROJEK TAHUN AKHIR II]

No of Credits: 4

Course Synopsis:

This subject is the continuity of Final Year Project I. In this course students will conduct an experimental task which has been planned during the Final Year Project I. Students also will be completing their thesis report during this subject. In this course, students will be also exposed to journal writing.

Course Outcomes:

CO1 - Able to analyze the knowledge to identify evidence for a conclusion.
CO2 - Able to collect the relevant information in a literature review to provide background of the project.
CO3 - Able to construct the experimental design to solve the research problems.
CO4 - Able to conduct the investigation using the various methods.
CO5 - Able to manage the research activities with high ethic expressions.
CO6 - Able to develop engineering principles with a sense of responsibility.
CO7 - Able to adapt on the multi-displinary teams.
CO8 - Able to display the effective communication skills on complex engineering activities with the engineering community.
CO9 - Able to arrange research activities to the relevant information from the various source for the application on continuous learning
CO10 - Able to develop excellent project management.

EAT464 ENGINEERING MANAGEMENT [PENGURUSAN KEJURUTERAAN]

No of Credits: 4

Course Synopsis:

This course aims to teach students on how to apply the project management skills and economic techniques in evaluating the design and engineering alternatives. The role of engineering economics is to assess the appropriateness of a given project, estimate its value, and justify it from an engineering standpoint. At the end of the course, students will be able to identify and discuss issues and challenges faced by engineers relating to project management in the current economic scenarios.

Course Outcomes:

CO1 - Able to apply decision making process to engineering project management.
CO2 - Able to analyse economic scenarios.
CO3 - Able to evaluate the process of project management and finance principles.

EAT470 SUSTAINABLE ENERGY [TENAGA LESTARI]

No of Credits: 3

Course Synopsis:
This course assesses current and potential future energy systems, covering resources, extraction, conversion and end-use technologies, with emphasis on meeting regional and global energy needs in the 21st century in a sustainable manner. Various conventional and renewable energy production technologies, energy end-use practices and alternatives as well as consumption practices are also discussed. This includes the current usage of fossil fuels, solar and biomass energy. This course also assesses the current storage technology, which include fuel cells and batteries.

Course Outcomes:
CO1 - Ability to synthesize the function and conversion efficiency of a solar photovoltaic device and apply to a real-world project.
CO2 - Ability to describe the fundamental of biomass and assess the potential of biomass conversion as an alternative energy.
CO3 - Ability to define and assess the performance of the principal types of fuel cells and batteries.

EAT471 ENVIRONMENTAL RISK ASSESSMENT [PENILAIAN RISIKO ALAM SEKITAR]

No of Credits: 3

Course Synopsis:
This course aims to assist students in the development of understanding and skills required for carrying out risk assessments and management. Students will learn on how to identify potential environmental/workplace hazards and their potential adverse effect that may be harmful to humans and environment via qualitative and quantitative approach.

Course Outcomes:
CO1 - Understanding the principles and method of risk assessment.
CO2 - Ability to investigate and assess human activity that influencing the distribution of chemicals in the environment.
CO3 - Ability to assess and determine the magnitude of risk on humans associated with the exposure level.

EAT472 ADVANCED WASTEWATER TREATMENT [RAWATAN AIR SISA LANJUTAN]

No of Credits: 3

Course Synopsis:
This course focuses on the design aspect of secondary and tertiary treatment units in wastewater treatment plant. The student will be learned on the process analysis and reactor design for various suspended growth and attached growth biological treatment processes. In addition, the student will be exposed to the design of the advanced wastewater treatment unit such as membrane filter, adsorber, ion exchanger and advanced oxidation process unit. By the end of the course, the student is expected to be able to design in detail the specific unit processes of secondary and tertiary treatment units in wastewater treatment plant.

Course Outcomes:
CO1 - Ability to apply basic knowledge of process analysis and reactor design toward in-depth understanding in wastewater treatment plant design.
CO2 - Ability to evaluate and propose a decision on the design of biological reactor for the secondary treatment unit in wastewater treatment plant.
CO3 - Ability to evaluate and propose a decision on the design of tertiary treatment unit in wastewater treatment plant.

EAT475 CONSTRUCTION PROJECT & LAW [PROJEK PEMBINAAN & UNDANG-UNDANG]

No of Credits: 3

Course Synopsis:
This course introduces students to Malaysian laws, which will focus on the sources, and branches of law in Malaysia. The course will emphasize on private laws related to construction practice, torts, law of contract and construction contract administration. Students will be exposed to construction contract administration which covers the Standard Forms of Contract, disputes in construction and dispute resolutions. At the end of the course, students should possess a sound knowledge of the Malaysian legal framework and familiar with legislative and legal constraints applicable to the practise of construction. More importantly, the students should be able to use their knowledge to promote ethical and better image of the construction industry.

Course Outcomes:
CO1 - Able to apply legal ethic and legal standards in construction practice.
CO2 - Able to demonstrate problem-solving skill and integrate knowledge gained in other core subject to problem emerged.
CO3 - Able to deliver critical reasoning and informed judgement in addressing legal issues in construction sector.
CO4 - Able to select high ethical standards to adapt, live and respect to members of profession.

EAT476 URBAN STORMWATER MANAGEMENT [PENGURUSAN AIR RIBUT BANDAR]

No of Credits: 3

Course Synopsis:
The aim of this course to equip students with in-depth knowledge in urban stormwater design and management. This course highlights on the aspects of urban drainage management. The students are also exposed to environmental friendly drainage system, hydrological analysis, Best Management Practices (BMPs), and Quantity and Quality Controls. Upon completion of this course, the students should be able to analyse and determine viable project option, propose appropriate management strategies, and apply the appropriate techniques and strategies in urban stormwater planning and design.

Course Outcomes:
CO1 - Able to classify the aspects of urban drainage scheme which applies the concept of environmental friendly drainage in civil engineering.
CO2 - Able to analyse urban drainage design alternative solutions based on the practices of the relevant authorities.
CO3 - Able to design urban drainage systems with regard to sustainable development.
CO4 - Able to explain urban drainage management in a group work.

EAT477 ADVANCED STEEL DESIGN [REKABENTUK KELULI LANJUTAN]

No of Credits: 3

Course Synopsis:
This course is to equip civil engineering students with additional knowledge on the design aspect of steel structural elements using EUROCODE 3. This module is a continuation of steel building design by enhancing the fundamental approached in designing steel components. Students will acquire fundamental knowledge to perform steel design for plated structures, composite structures, portal frame and cold formed steel structures. The aim of this subject is to develop professional engineering skills with special emphasis on analysis, and reliability of design approaches.

Course Outcomes:
CO1 - Able to design plate and gantry girders.
CO2 - Able to design composite structures in building.

CO3 - Able to design the stability of portal frame.
CO4 - Able to design cold-formed steel structures.

EAT478 BUILDING INFORMATION MODELLING (BIM) [INFORMASI PERMODELAN BANGUNAN (BIM)]

No of Credits: 3

Course Synopsis:
Building Information Modelling (BIM) offers a novel approach to design, construction, and facility management in which a digital representation of the building process is used to facilitate the exchange and interoperability of information in digital format. BIM is beginning to change the way buildings look, the way they function, and the ways in which they are designed and built. This course provides an in-depth understanding of BIM technologies, the business and organizational issues associated with its implementation, and the profound advantages that effective use of BIM can provide to all members of a project team.

Course Outcomes:
CO1 - Able to describe contributions of BIM to civil engineering.
CO2 - Able to design complex database of architecture and structure models for modelling libraries in BIM.
CO3 - Able to present complex BIM model through integration of civil engineering database under some supervision.

EAT481 INTEGRATED ENVIRONMENTAL ENGINEERING DESIGN PROJECT I [REKABENTUK PROJEK KEJURUTERAAN ALAM SEKITAR BERSEPADU I]

No of Credits: 3

Course Synopsis:
This course will focus on the design of an integrated Environmental Engineering Project. The course will start off with the introduction of basic principle of Engineering design and selection of the design project related to Environmental Engineering. The students are expected to work on selected project to design the unit process and unit operation as well as the economic analysis under the guidance of project supervisor.

Course Outcomes:
CO1 - Ability to acquire and apply complex knowledge of mathematics, science, engineering and an in-depth technical competence in an environmental engineering discipline.
CO2 - Ability to identify, formulate and solve complex engineering problems.
CO3 - Design and evaluate the specific complex unit process and unit operation in Environmental Engineering field
CO4 - Ability to conduct investigation into complex problems as well as to analyze and interpret data.
CO5 - Using Design Software to assist the complex design work e.g. WASDA and EPANET.
CO6 - Adopt awareness of the need for academic honesty and professional integrity and ethical responsibilities in the practice of engineering practices.
CO7 - Understanding of professional and ethical responsibilities and commitment to the community.
CO8 - Ability to function on multi-disciplinary teams.
CO9 - Ability to communicate effectively on complex engineering activities with the engineering community and with society at large.
CO10 - Recognition of the need for, and an ability to engage in life-long learning.
CO11 - Execute economic evaluation of the selected project in Environmental Engineering field, which include cost estimations, capital investment, operating costs and rate of return on investment.

EAT482 INTEGRATED ENVIRONMENTAL ENGINEERING DESIGN PROJECT II [REKABENTUK PROJEK KEJURUTERAAN ALAM SEKITAR BERSEPADU II]

No of Credits: 3

Course Synopsis:
This course will focus on the design of an integrated Environmental Engineering Project. The course will start off with the introduction of basic principle of Engineering design and selection of the design project related to Environmental Engineering. The students are expected to work on selected project to design the unit process and unit operation as well as the economic analysis under the guidance of project supervisor.

Course Outcomes:
CO1 - Ability to acquire and apply complex knowledge of mathematics, science, engineering and an in-depth technical competence in an environmental engineering discipline.
CO2 - Ability to identify, formulate and solve complex engineering problems.
CO3 - Design and evaluate the specific complex unit process and unit operation in Environmental Engineering field
CO4 - Ability to conduct investigation into complex problems as well as to analyze and interpret data.
CO5 - Using Design Software to assist the complex design work e.g. WASDA and EPANET.
CO6 - Adopt awareness of the need for academic honesty and professional integrity and ethical responsibilities in the practice of engineering practices.
CO7 - Understanding of professional and ethical responsibilities and commitment to the community.
CO8 - Ability to function on multi-disciplinary teams.
CO9 - Ability to communicate effectively on complex engineering activities with the engineering community and with society at large.
CO10 - Recognition of the need for, and an ability to engage in life-long learning.
CO11 - Execute economic evaluation of the selected project in Environmental Engineering field, which include cost estimations, capital investment, operating costs and rate of return on investment.

EAT483 CONSTRUCTION CONTRACT, ESTIMATING & FINANCE [KONTRAK PEMBINAAN, ANGGARAN & KEWANGAN]

No of Credits: 3

Course Synopsis:
This course consists of three parts. The first part exposes student to the introduction to construction contract; preparation of tender document and strategy in tendering. The second part covers types of estimates; organization of cost estimates; quantity take-offs included manual and computer methods; cost of construction resources; design and construction cost estimating methods; contract cost estimates based on the Standard Method of Measurement (SMM) for building works and Civil Engineering Standard Method of Measurement (CESMM). Finally, the third part covers economic and financial, including cost adjustment; cash flow forecasting and budgetary control; project cost control; construction cost accounting; comparing alternative proposals; financing business units and projects; and financial performance analysis.

Course Outcomes:
CO1 - Able to apply the basic knowledge regarding construction tender and contract.
CO2 - Able to evaluate the cost of building elements and civil engineering works.
CO3 - Able to create critical reasoning and make informed judgment in addressing economic and financial issues in construction practice.
CO4 - Able to work in a team or individually to solve problems and produce written report.

EAT484 INTEGRATED DESIGN PROJECT I [REKABENTUK PROJEK BERSEPADU I]

No of Credits: 3

Course Synopsis:
The civil engineering capstone senior design course involves all seniors in their last semester before graduation and is titled “Integrated Design Project”. It is illustrate in the course as analysis, design and planning of a building engineering design project; an integrated and realistic group project involving as much as possible all major aspects of civil engineering profession. This course is the culminating activity in the civil engineering program.

Course Outcomes:
CO1 - Able to acquire and apply knowledge of mathematics, science, engineering and an in-depth technical competence in complex civil engineering discipline.
CO2 - Able to identify, formulate and solve complex civil engineering problems.
CO3 - Able to design complex sub-structure, structure and infra-structure to meet desired needs.
CO4 - Able to investigate and interpret complex raw data; borelog, topographic map, architectural drawing, etc.
CO5 - Able to use techniques, skills and modern engineering tools necessary for complex engineering practices.
CO6 - Able to demonstrate/understand the social, cultural, global and civil responsibilities of a professional engineer.
CO7 - Able to demonstrate/understand entrepreneurship, the process of innovation and the need for sustainable development of the environment.
CO8 - Able to understand the professional and ethical responsibilities and commitment to the society.
CO9 - Able to function on multi-disciplinary teams.
CO10 - Able to communicate effectively in complex civil engineering activities.
CO11 - Able to understand the need for, and engage in life-long learning.
CO12 - Demonstrate understanding of project management and finance principles.

EAT485 INTEGRATED DESIGN PROJECT II [REKABENTUK PROJEK BERSEPADU II]

No of Credits: 3

Course Synopsis:
The civil engineering capstone senior design course involves all seniors in their last semester before graduation and is titled “Integrated Design Project”. It is illustrate in the course as analysis, design and planning of a building engineering design project; an integrated and realistic group project involving as much as possible all major aspects of civil engineering profession. This course is the culminating activity in the civil engineering program.

Course Outcomes:
CO1 - Able to acquire and apply knowledge of mathematics, science, engineering and an in-depth technical competence in complex civil engineering discipline.
CO2 - Able to identify, formulate and solve complex civil engineering problems.
CO3 - Able to design complex sub-structure, structure and infra-structure to meet desired needs.
CO4 - Able to investigate and interpret complex raw data; borelog, topographic map, architectural drawing, etc.
CO5 - Able to use techniques, skills and modern engineering tools necessary for complex engineering practices.
CO6 - Able to demonstrate/understand the social, cultural, global and civil responsibilities of a professional engineer.
CO7 - Able to demonstrate/understand entrepreneurship, the process of innovation and the need for sustainable development of the environment.
CO8 - Able to understand the professional and ethical responsibilities

and commitment to the society.
CO9 - Able to function on multi-disciplinary teams.
CO10 - Able to communicate effectively in complex civil engineering activities.
CO11 - Able to understand the need for, and engage in life-long learning.
CO12 - Demonstrate understanding of project management and finance principles.

ECT112 KEMAHIRAN KEJURUTERAAN [ENGINEERING SKILLS]

No of Credits: 3

Course Synopsis:
This subjecf is 100% practical coursework and carried out 3 unils credit hours.This course contains six modules which are Basic Workshop, Machining, Wiring,Basic Electonics, Matlab, AutoCAD and technical Drawlng that specificaly planned for non-electronic based programs.

Course Outcomes:
CO1 - Ability to APPLY and CONSTRUCT a basic skill and standard practiced of mechanical machines and equipment.
CO2 - Ability to APPLY and CONSTRUCT the basic skills and standard practiced of domestic wiring.
CO3 - Ability to APPLY and CONSTRUCT a logic system using common controller tool (PLC).
CO4 - Ability to APPLY CONSTRUCT a standard practiced of manual technical drawing and able to design a product using common software (AutoCAD
CO5 - Ability to APPLY and CONSTRUCT the basic skills and standard practiced of PCB layout design and fabrication process.

ENGINEERING TECHNOLOGY COURSES
PAT101 ASAS MEKANIK KEJURUTERAAN [FUNDAMENTAL OF ENGINEERING MECHANICS]

No of Credits: 2

Course Synopsis:
The aim of this course is to enable the students to learn the Fundamentals of engineering mechanics. In engineering mechanics portion, students will be introduced to fundamentals and principles of static and dynamics mechanics. Resultant and equilibrium of coplanar force system as well as spatial force system will be covered in static portion while kinematics of particle in dynamics potion. In material engineering portion, the student will be also taught on structure of crystalline solids and strength of material.

Course Outcomes:
CO1 - Ability to ANALYZE problem related to force vector
CO2 - Ability to SKETCH free body diagram and ability to SOLVE problem related to equilibrium of a particle and rigid body.
CO3 - Ability to ANALYZE problems which relate to kinematics of a particle
CO4 - Ability to EVALUATE area moment of inertia and mass moment of inertia for various type cross section and composite bodies

PAT102 TEKNOLOGI FIZIK [PHYSIC TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This course equips students with basic concept on physics and its applications especially in construction field. At this end of this course students must be able to calculate and solve basic physics problems that related to heat, lighting, electricity, magnetism and acoustics. The students must also be able to demonstrate the theory and its applications

Course Outcomes:

CO1 - Ability to EXPLAIN the concept of magnetic field and electromagnetic force, Ohm's law and Kirchhoff's law,. The concept of magnetic field, electromagnetic force IEEE standard

CO2 - Ability to EVALUATE interference of sound waves, Doppler effect, and the heat transfer by conduction through the flat the slab/wall, hollow cylinder, solid and so on. basic mechanism of heat transfer and characteristic of sound as per statutory requirements

CO3 - Ability to CONDUCT the experiment according to the fundamental of electricity and thermal comfort in the modern building as per statutory requirements

PAT103 PENGENALAN KEPADA TEKNOLOGI KEJURUTERAAN AWAM [INTRODUCTION TO CIVIL ENGINEERING TECHNOLOGY]

No of Credits: 2

Course Synopsis:

Introduces basic skills and knowledge required for a career in civil engineering technology. This course is a cross section of topics in contemporary civil engineering with their routine works by providing neat sketches and illustrations with practical problems. The syllabus also introduces the requirement of authority liaison, construction business and value engineering for future challenge in construction industries.

Course Outcomes:

CO1 - Ability to ANALYZE role of civil engineering technology and DISCUSS on functions for each of civil engineering branches and constructions.

CO2 - Ability to JUSTIFY the construction work of substructures, superstructure and infrastructure including M&E services in the building. ARRANGE and RECOMMEND construction process and management based on various condition.

CO3 - Ability to CONSTRUCT a house model consists of structural elements and infrastructure based on drawing in a group activity

CO4 - Ability to orally DISCUSS sequence concept of construction work through presentation.

PAT104 LUKISAN TEKNIK [TECHNICAL DRAWING]

No of Credits: 2

Course Synopsis:

This subject aims to equip students with fundamental technical drawing skills namely geometry, projection, orthography, isomet-ric, oblique sketch and cross section. These skills are fundamental knowledge that required for Construction Drawing course that will be offered in semester 2 of year 1. Students will be taught to draw manually and by using AutoCAD software.

Course Outcomes:

CO1 - Ability to APPLY manual drafting skills in preparing geometry drawing.

CO2 - Ability to ILLUSTRATE orthographic projection, isometric and oblique drawing by using manual drafting.

CO3 - Ability to PRODUCE basic geometry and perform drawing projection by using AutoCAD software

PAT151 ASAS MEKANIK PEPEJAL [FUNDAMENTAL OF SOLID MECHANIC]

No of Credits: 3

Course Synopsis:

The aim of this course is to teach student to determine the stress, deformation and reaction of structural member under four basic external loads i.e. shear force, moment, torque and axial forces. This course only covers for prismatic cross section and homogeneous structural members in elastic condition. This knowledge is essential for civil engineering technology students before they can analyze more complex civil engineering structural system such as frames and truss that will be taught in structural theory and structural analysis.

Course Outcomes:

CO1 - Ability to EVALUATE the deformation, shear and bending moment,stress and strain reaction of structural member under axial load by using appropriate method.
CO2 - Ability to DEMONSTRATE experiment of Axial Forces in Truss, Euler's Strut, Torsion, Bending Moment in Beam, Flexural Behaviour of Beam and Support Reactions and Bending Moment in Frames by using Laboratory manual.
CO3 - Ability to COMMUNICATE verbally during laboratory interview session
CO4 - Ability to COOPERATE in group activities for laboratory session

PAT152 ASAS MEKANIK BENDALIR [FUNDAMENTAL OF FLUID MECHANIC]

No of Credits: 3

Course Synopsis:

This course provides student knowledge in the patterns of movement of fluid particles. By the end of this subject student will be expected to understand the basic characteristics of fluid mechanics and fluid statics, be able to analyze the hydrostatics and basic hydrodynamics in fluid. Student also will be able to analyze the fluid behaviour statically and dynamically. In this subject, student will be introduced to pressure-elevation relationship, Bernoulli's equation, Moody's diagram, energy losses in pipelines, minor losses and flow measurement of fluid.

Course Outcomes:

CO1 - Ability to ANALYSE and SOLVE various fluid propertie, static theories, mechanic theories and pipeline system of fluids under rest condition and the application of the law of force and motion.
CO2 - Ability to DEMONSTRATE lab work/experiment of Specific Gravity of Fluid, Viscosity, Center of Pressure, Bouyancy, Bernoulli's Theorem, Flow Over Weirs and Friction Loss in Pipes by using lab manual.
CO3 - Ability to COOPERATE in a group activity during lab session. Experiment involves are Specific Gravity of Fluid, Viscosity, Center of Pressure, Buoyancy, Bernoulli's Theorem, Flow Over Weirs and Friction Loss in Pipes.
CO4 - Ability to EXPLAIN to lecturer during presentation of mini project.

PAT153 GEOMATIK [GEOMATIC]

No of Credits: 3

Course Synopsis:

This course introduces basic concepts of surveying including the basic of surveying, leveling, distance measurement, angle and tra-verse survey. In keeping with the goal of providing an up-to-date presentation of surveying equipment and procedures, total stations are stressed as the instruments for making angle and distance ob-servation as well as the Electronic Distance Measurement (EDM). In addition, practical skills on the use and care of geomatic instru-ments are essential to experience the real working environmen

Course Outcomes:

CO1 - Ability to DISCUSS in written and verbal, fundamental con-cept of geomatic consist of vertical and horizontal control, an-gle measurement, traversing, tacheometry and cut and fill
CO2 - Ability to SOLVE in written, geomatic measurement problem by applying appropriate technique in geomat
CO3 - Ability to CONDUCT survey using appropriate geomatics in-strument according to professional practice

PAT154 LUKISAN PEMBINAAN [CONSTRUCTION DRAWING]

No of Credits: 2

Course Synopsis:

The course equips students with construction drawings skill either manual-

ly practice or computer-aid software. Students are exposed to the preparation of construction drawings which include architectural drawing, civil and structural (C&S) drawing and mechanical and electrical (M&E) drawing. In the end of the course, students enable to distinguish between these types of construction drawings and enable to prepare construction drawing by manually and computer-aid soft-ware.

Course Outcomes:

CO1 - Ability to PREPARE manual drafting of construction drawing for a building

CO2 - Ability to ADAPTS computer-aided drfating software in preparing construction drawing of a building

PAT201 TEORI STRUKTUR [STRUCTURAL THEORY]

No of Credits: 2

Course Synopsis:

This course provides students with a clear and through presentation of the theory and application of structural analysis as it applies to beams, trusses and frames. It introduces analysis of statically determinate structures for beams, trusses and frames. Besides that, it also introduces deformations analysis of statically determinate structures using virtual work method for trusses, beams, and frames.

Course Outcomes:

CO1 - Ability to ANALYSE internal member forces for determinate structural systems.

CO2 - Ability to EVALUATE the internal member forces and deformations for determinate structural systems based on external loading using virtual work method.

CO3 - Ability to CONSTRUCT the bridge model based on determinate structural system of trusses.

PAT202 HIDARULIK DAN HIDROLOGI [HYDRAULIC AND HYDROLOGY]

No of Credits: 3

Course Synopsis:

This course builds on the fundamentals given in Fluid Mechanics and reinforces students understanding of the behaviour of fluids, through the study of the flow of water in typical civil engineering applications. The course covers the study of steady compressible flow in pipelines and pipe networks. Uniform and non-uniform flow in open channels. This course also will be introduced the hydrology theory derived from the natural process of hydrological cycle. Hydrology introduces the application of hydrological theory to solve problem in water resource engineering. Planning, development, management and design of water resources project require knowledge in hydrology.

Course Outcomes:

CO1 - Ability to ANALYSE concept of hydrology based on MSMA 2 and water flow in open channels as well as closed conduit using fundamental concept of hydraulic.

CO2 - Ability to EVALUATE rainfall data using fundamental concept of hydrology based on MSMA 2 and uniform and non uniform flow in open channels using fundamental concept of hydraulic.

CO3 - Ability to CONDUCT the experiment on hidrology and hydraulic according to appropriate standard and codes.

PAT203 MEKANIK TANAH [SOIL MECHANIC]

No of Credits: 2

Course Synopsis:

The course introduces the students with the basic and background of the properties and behavior of soil deposits and the applications of soil mechanics theory. It includes brief introduction on geological and physical characteristics of soils. Also includes identification, classification and

description of rock and soil for engineering purposes. Application of mechanics on soil such as phase relation-ship, compaction, permeability and seepage, stresses and effective stresses, shear strength and consolidation are also covere

Course Outcomes:

CO1 - Ability to DISCUSS in written and verbal, fundamental con-cept consist in soil mechanics including soil characteristics, seepage, stress distribution, shear strength, compaction and consolidation.

CO2 - Ability to SOLVE engineering problems related to soil using appropriate method and principal of soil mechanics

CO3 - Ability to CONDUCT experiment related to soil testing ac-cording to BS1377.

PAT204 BAHAN BINAAN [CONSTRUCTION MATERIAL]

No of Credits: 3

Course Synopsis:

This course provides an introductory overview of the various materials used in construction. Common construction methods are introduced and building details are explored. Students have the opportunity to experience material capacity and behavior as well as construction methods in demonstrations and lab experiments. Furthermore, material applications and detailing in structural and non-structural building components are explored. Resulting from this course, students will gain a comparative knowledge of material properties and possible applications in construction and architecture.

Course Outcomes:

CO1 - Ability to EXPLAIN types of material used in construction and their manufacturing process or sources.

CO2 - Ability to EVALUATE the physical and mechanical properties of construction materials.

CO3 - Ability to PREPARE concrete mix based on Design of Experiment (DOE) according to British Standard (BS)

CO4 - Ability to CONDUCT laboratorial material testing based on British Standard (BS) and American Society for Testing and Materials (ASTM)

PAT205 KHIDMAT BANGUNAN 1 [BUILDING SERVICES 1]

No of Credits: 3

Course Synopsis:

An overview on overall building services system and understanding its functionalities in building operation is the main objectives in this course. Students must be able to explain the function of building services and how it's important to a building occupant safety and activities. Student also need to produce a simple mechanical and electrical design that always been expected from a Building Technologist.

Course Outcomes:

CO1 - Ability to EVALUATE mechanical & electrical (M&E) services i.e. fire protection system, building energy and equipment-induced vibration & noise in terms of operation and maintenance in modern building.

CO2 - Ability to DEVELOP building services systems i.e.; plumbing and sanitation system, building electrical system and building illumination in terms of operation and maintenance in modern building.

CO3 - Ability to construct and ALTERS the condition of building services system in term of operation and maintenance in relation to building facilities.

CO4 - Ability to perform assessment and JUSTIFY building energy management in terms of energy conservation method and application of latest energy saving equipment for the modern building

PAT251 ANALISIS STRUKTUR [STRUCTURAL ANALYSIS]

No of Credits: 2

Course Synopsis:
This course provides students with a clear and through presentation of the theory and application of structural analysis as it applies to beams, trusses and frames. It introduces analysis of statically inde-terminate structures for beams, trusses and frames. Two method are introduces in this analysis of statically indeterminate structures using method of consistent deforma-tions and moment distribution.

Course Outcomes:
CO1 - Ability to ILLUSTRATE internal member forces diagram for indeterminate structural systems by using Method of Consistent Deformations
CO2 - Ability to ASSESS the changes in internal member forces exerted for different types of structural system materials by using Moment Distribution Method
CO3 - Ability to ANALYZE indeterminate structural system by using software/computer approach based on stiffness method

PAT252 PENGURUSAN PROJEK PEMBINAAN [CONSTRUCTION PROJECT MANAGEMENT]

No of Credits: 3

Course Synopsis:
This course aims to teach students on how to apply the project manage-ment skills throughout overall project life cycle. The role of engineering management is to assess the appropriateness of a given project, estimate its value, and justify it from an engineering standpoint. At the end of the course, students will be able to identify and discuss issues and challenges faced by engineers relating to project management in project life cycle.

Course Outcomes:
CO1 - Ability to discuss the process of project management, work plans of the construction cycle, construction procurement and project cost estimation.
CO2 - Ability to demonstrate project management activities using appropriate tools (Microsoft Project)
CO3 - Ability to adapt Project Management Tools for coordinating all activities in site construction.

PAT254 ANGGARAN NILAI PEMBINAAN [CONSTRUCTION VALUE ESTIMATION]

No of Credits: 3

Course Synopsis:
This course will lead the students to be able to implement an appropriate technique to forecast the possible costs incurred for a building or con-struction project via systematic calculations employing various methods to control the construction project cost at the design stage before any drawings have embarked upon. The procedure is determined through an extensive analysis of data of a building that has an influence on its cost through understanding of construction methods, the general principle of measurement and pricing. At the end of the course, students will be able to determine and produce an accurate construction cost estimation before the construction take place.

Course Outcomes:
CO1 - Ability to DISCUSS the appropriate methods of estimating to predict the project cost and the general principles of measuring work and preparing the quantity take offs.
CO2 - Ability to MEASURE the quantity of the building elements based on the Standard Method of Measurement of Building Works – (S.M.M) and Malaysian Civil Engineering Standard Method of Measurement (My-CESMM).
CO3 - Ability to COOPERATE with the industry players in order to get the building elements' price rates based on the materials, labours,

machineries, profit and any related cost.

CO4 - Ability to UTILISE the procedure and the process by using the MS-Excel and Autodesk-Revit software or any relevant software available.

PAT255 KHIDMAT BANGUNAN 2 [BUILDING SERVICES 2]

No of Credits: 3

Course Synopsis:
To highlight the importance of information and all building facilities such communication systems, electrical distribution system, building automation systems and public addressing systems in modern buildings.
To summarize the understanding on mechanical services in building and ability to explains the operations and functionality of each service.
Both services need to understand in a manner that considering energy efficiency spirit throughout building life cycles

Course Outcomes:
CO1 - Ability to EVALUATE mechanical & electrical (M&E) services i.e. Air conditioning system, building ventilation, three phase electrical installation and building transportation in terms of operation and maintenance in modern building.
CO2 - Ability to DEVELOP building facilities systems i.e. BMS/BAS, security and alarm system, building transportation and electrical system in terms of operation and maintenance in modern building.
CO3 - Ability to construct, assess and COMMISSIONING building services system i.e. ACMV, three phase wiring installation and building transportation in term of operation and maintenance in relation to building facilities.
CO4 - Ability to IMPLEMENT and ADOPT mechanical and electrical services i.e. low voltage electrical installation systems and air conditioning system in modern buildings in terms of operation and maintenance.
CO5 - Ability to ADOPT emerging sustainable building technologies such as smart or green building, renewable energy, and internet of things (IoT) application in modern buildings in terms of operation and maintenance.

PAT256 PENGURUSAN KESELAMATAN DAN KESIHATAN PEKERJAAN [MANAGEMENT OF OCCUPATIONAL SAFETY AND HEALTH]

No of Credits: 3

Course Synopsis:
This course will focus on the aspect of establishing safety culture with regards to construction industry. Students will be exposed to OSH management system as well as OSH laws that govern the industries in Malaysia (e.g. OSHA 1994 and FMA 1967) and other relevant acts (e.g. BOMBA, UBBL, EQA 1974). They will learn to interpret the requirements stipulated under these documents and be able to apply to working environment. This course will also provide students the necessary information in identifying hazards, perform risk assessment to determine the degree of hazard that may be harmful to humans in the workplace and lastly, develop mitigation plan/action to control or preventing the hazards and risks.

Course Outcomes:
CO1 - Ability to EXPLAIN the legal requirement of occupational safety and health laws and regulations. And OUTLINE OSH management system in managing the hazards and risks in the workplace.
CO2 - Ability to STUDY the occupational hazards and evaluate associated risks at the workplace.
CO3 - Ability to INVESTIGATE effective remedial or mitigation measures to control the hazards and risks at the workplace.
CO4 - Ability to PRACTICE and PERFORM - OSH management system, OSH laws, HIRARC and site safety assessment(i.e. ergonomics, noise and chemical hazard assessment)in construction safety.

PAT257 GEOTEKNIK [GEOTECHNIC]

No of Credits: 3

Course Synopsis:
This course provides further discussion and explanation related to soil engineering. The topics covered in this course includes site investigation, bearing capacity and design of shallow foundation and pile foundation, lateral earth pressure, and slope stability. At the end of the course, students should be able to apply theory and practical to solve problem related to geotechnical engineering.

Course Outcomes:
CO1 - Ability to EXPLAIN main component in geotechnical engineering consist of site investigation, foundation, lateral earth pressure and slope stability.
CO2 - Ability to ANALYZE soil bearing capacity, active and passive earth pressure and slope stability.
CO3 - Ability to DESIGN foundation and earth retaining structure using principle of geotechnical engineering.
CO4 - Ability to CONDUCT geotechnical laboratory test using appropriate instrument according to BS1377.

PAT301 REKABENTUK STRUKTUR 1 [STRUCTURE DESIGN 1]

No of Credits: 3

Course Synopsis:
The course is designed to provide the student with a basic understanding of the principle and method of design of reinforced concrete (RC) members like beam, column, slab and foundation. This course utilizes Eurocode 2: Design of Concrete Structures (EN 1992:2004) in conjunction with Eurocode 0: Basis of Structural Design and Eurocode 1: Actions on Structures that covers loadings to design the RC elements.

Course Outcomes:
CO1 - Ability to manually DESIGN reinforced concrete structural member according to Eurocode 2.
CO2 - Ability to SIMULATE a reinforced concrete structural member according to detailed drawing using a finite element software.
CO3 - Ability to clearly PRESENT the simulation of the reinforced concrete structure.

PAT302 TEKNOLOGI PEMBINAAN 1 [CONSTRUCTION TECHNOLOGY 1]

No of Credits: 3

Course Synopsis:
Construction Technology 1 is a basic knowledge over the whole field of building activities, to enable the technologist to hold and understand in the scope of work of carpentry, substructure & superstructure, framed building, finishes, internal fixtures and fittings, insulation, roofing, services and plant & equipments. This course will give a good theoretical background to what is essentially a practical subject. As addition, Building Information Modeling (BIM) was introduced as a tool for coordinating & interfacing work in building construction.

Course Outcomes:
CO1 - Ability to DISCUSS carpentry, substructure & superstructure, framed building, finishes, internal fixtures and fittings, insulation, roofing services and plant & equipment practices and procedures
CO2 - Ability to PRESENT Building Information Modeling (BIM) using appropriate tool.
CO3 - Ability to OPERATE Building Information Modeling (BIM) tool for coordinating & interfacing work in construction.

PAT303 TEKNOLOGI LEBUHRAYA DAN TRAFIK [HIGHWAY AND TRAFFIC TECHNOLOGY]

No of Credits: 3

Course Synopsis:
The course introduces the students with the basic and background of the traffic road and highway technology. The sub-topics discussed are highway materials and evaluations, premix plants, construction techniques and plants, mix designs, quality controls and testing, pavement structural thickness design, highway drainage, pavement visual assessment, maintenance and rehabilitation. For traffic technology, major topics include driver behaviour and interactions, fundamental theory of speed-flow-density relationships and applications in road performance analysis, traffic studies, design of traffic signal control system and highway geometric design.

Course Outcomes:
CO1 - Ability to DISCUSS main component in highway and traffic engineering technology using fundamental concept of design and construction for highway and traffic analysis.
CO2 - Ability to DESIGN pavement structure and traffic signal-controlled system or road geometry using appropriate standard in Malaysia.
CO3 - Ability to CONDUCT the experiment on highway and traffic according to appropriate standard and codes.

PAT304 PENTADBIRAN KONTRAK DAN TAPAK [CONTRACT AND SITE ADMINISTRATION]

No of Credits: 2

Course Synopsis:
The administration of a project including award of the contract, progress claims, instructions, variations, rise and fall calculations, certificates, claims, cash flow and dispute resolution. Conditions of standard form of domestic and international building contract. Develop the company safety program and hazard communication program.

Course Outcomes:
CO1 - Ability to CLASSIFY the types of Standard Form of Contract commonly adopted in the construction industry.
CO2 - Ability to APPLY the application of various construction documents and the administrative process based on Standard Form of Contract.
CO3 - Ability to ORGANISE the construction documents and the administrative process involved in solving the issues based on the practice of value engineering & constructability.
CO4 - Ability to RECOMMEND the effective solutions in quality, safety and project management based on Construction Industry Transformational Plan (CITP).

PAT308 PENGURUSAN KEWANGAN DAN SUMBER MANUSIA [FINANCIAL AND HUMAN RESOURCES MANAGEMENT]

No of Credits: 3

Course Synopsis:
This course aim to provide the students knowledge on how to apply financial management skills and economic techniques in evaluating the cost for overall projects. The role of engineering economics is to access the appropriateness of a given project, estimate its value and justify it from a technologist standpoint.

Course Outcomes:
CO1 - Ability to DESCRIBE the general project financial
CO2 - Ability to DESCRIBE three major components in project management (planning, execution, and project evalutation)
CO3 - Ability to DEVELOP organisation planning in construction management
CO4 - Ability to ANALYSE the project cash flow requirement, project monitoring and control

PAT309 UKUR BANGUNAN [BUILDING SURVEY]

No of Credits: 3

Course Synopsis:
In this course, students will be taught to identify cause and effect of common defects in building structures, repairs which may be undertaken, methodology used for remedies based on the condition of the building. At the end of the semester, students shall be able to prepare a building survey report that includes investigations and recommendations to the existing building for future enhancement.

Course Outcomes:
CO1 - Ability to CLASSIFY the component in building surveying and EXPLAIN the method of measurement based on equipments and procedures
CO2 - Ability to ANALYSE the factors that will affect structural elements and IDENTIFY the diagnosis pattern of insect attack to timber elements.
CO3 - Ability to DETERMINE causes of failure based on defects on foundations and damp penetration. ASSESS condition of superstructures and building services system. EVALUATE methods of remedy and prevention.
CO4 - Ability to PRESENT the building surveying defects analysis that relates to particular phenomenon

PAT351 REKABENTUK STRUKTUR 2 [STRUCTURE DESIGN 2]

No of Credits: 3

Course Synopsis:
The aim of this course is to introduce students to the fundamental principles about the structural behaviour and design criteria of steel and timber structure design. This course delivers knowledge and understanding of the principles of steel structure, pertaining to both its analysis and design aspects. This course also introduces students to timber as structural member. Student will be able to design timber joint for flexural and compression member elements

Course Outcomes:
CO1 - Ability to manually ANALYSE steel and timber structural elements subjected to permanent and variable actions as recommended by Eurocode 1
CO2 - Ability to manually DESIGN steel and timber structural elements using Eurocode 3 and Eurocode 5
CO3 - Ability to PRODUCE detail drawing by using computerized assisted software for steel and timber structural elements based on design calculation

PAT352 TEKNOLOGI PEMBINAAN 2 [CONTRUCTION TECHNOLOGY 2]

No of Credits: 3

Course Synopsis:
Construction Technology 2 is an instructional program that prepares an individual for employment or continued education in the drainage systems, Bridge Construction Technology, Railway Construction Technology, Highway Construction Technology, Machineries to launch beam and gantry, water reticulation and sewerage systems, ground treatment and slope stabilization, underground construction technology, Instrumentation, Non-Destructive Tests and Destructive Tests. Construction Technology 2 is a continuation of Construction Technology 1.

Course Outcomes:
CO1 - Ability to DISTINGUISH Drainage, Water Reticulation and Sewerage System.
CO2 - Ability to EVALUATE Bridge, Railway and Highway Construction Technology; and Machineries used to launch beam and gantry, Ground Treatment and Slope Stabilization; and Underground Construction Technology.
CO3 - Ability to DEMONSTRATE about Instrumentation as well as Non-Destructive Tests (NDT) and Destructive Tests used in Repair and Rehabilitation Works.

PAT353 ASAS KEJURUTERAAN DAN PENGURUSAN ALAM SEKITAR [BASIC ENVIRONMENTAL ENGINEERING AND MANAGEMENT]

No of Credits: 3

Course Synopsis:
This course focuses on basic elements of environmental engiineering and management. Basic principles such as parameter and design consideration in environmental engineering for water and wastewater engineering, air and noise pollution engineering and solid waste management will be taught. Other important parts that will be taught are the are the basic requirement on Environmental Management Systems (EMS) and ISO 14000 and Environmental Impact Assessment (EIA) including Emvironmental Management Plan (EMP). Both portions deal with the utilization of a common resource that is environment, and complied with the regulations and guidelines of Department of Environment for the project activity. Students will be also introduced to the environmental parameters measurement & monitoring systems in laboratory and field works.

Course Outcomes:
CO1 - Ability to SOLVE the basic principle in water and wastewater engineering/ air & noise pollution engineering/ solid waste management process & methods in Malaysia using basic principle in in Environmental Engineering & Guidelines for Developers.
CO2 - Ability to CONDUCT lab work/ experiment by using lab manual
CO3 - Ability to DEMONSTRATE the requirements in implementing an ISO 14001, EMS costing and audits
CO4 - Ability to ANALYZE EIA and & EM process & methods in Malaysia based on Environmental Quality Act and Regulations

PAT355 PROJEK SARJANA MUDA 1 [BACHELOR DEGREE PROJECT 1]

No of Credits: 4

Course Synopsis:
The Undergraduate Project is an individual research project in connection with a special engineering problem. Students will be guided by academic staff. The project undertaken may fall under the following areas; experimental tests, computer simulation, hardware or software development, device fabrication and case/field study. In this subject, students will be given two semesters to work on the task that is related to their field of interest. At the end of the project, students are compulsory to prepare the report and present the findings of the project conducted.

Course Outcomes:
CO1 - Ability to CARRY OUT written research proposal and reports based on area of research specifications.
CO2 - Ability to INITIATE analytical and critical thinking in identifying and solving problem that relates to area of specifications through written research proposal and report.
CO3 - Ability to DESIGN suitable research method according to area of specification in the written research proposal and report.
CO4 - Ability to ADAPTS engineering tools in preparing standard requirements of research writing.
CO5 - Ability to DEFEND the research proposal and progress report.
CO6 - Ability to ARRANGE systematically and independently the research project with professional ethics and norms based on standard proceeding and protocols.

PAT358 TEKNOLOGI PEMBINAAN LEBUHRAYA DAN JAMBATAN [CONSTRUCTION TECHNOLOGY OF HIGHWAY AND BRIDGE]

No of Credits: 3

Course Synopsis:
This course introduces the advance knowledge of road system drainage, road furniture, maintenance and rehabilitation of pavement and also bituminous mix of pavement. Course also covered the fundamental of bridge technology including conceptual of bridge design, superstructure, substructure, construction and maintenances of bridge.

Course Outcomes:

CO1 - Ability to DIFFERENTIATE in detail current main components and established construction technique for highway and bridge.
CO2 - Ability to PROPOSE sustainable solution in highway and bridge construction system using proven technology.
CO3 - Ability to DISCUSS mini project assessment in highway and bridge construction technology

PAT359 PENGURUSAN RISIKO PEMBINAAN [CONSTRUCTION RISK MANAGEMENT]

No of Credits: 3

Course Synopsis:

This course introduces the concepts and principles of risk management in construction industry. Students will be exposed to the risks management and how to manage the risks during construction process. This course also covered risk in development projects, risk analysis and identification, risk assessment and risk reduction in construction.

Course Outcomes:

CO1 - Ability to UNDERSTAND and DESCRIBE the definition of risk management, objectives of risk management and risk management process.
CO2 - Ability to EXPLAIN and analyze risk in development projects including risk management, risk of damage to the project and risks to the people
CO3 - Ability to DISCUSS the risk assessment, risk analysis and risk identification.
CO4 - Ability to EXPLAIN the risk reduction in construction stage including strategic planning and risk transfer.

PAT401 TEKNOLOGI PEMBINAAN BANGUNAN BERINDUSTRI [INDUSTRIALISED BUILDING CONSTRUCTION TECHNOLOGY]

No of Credits: 3

Course Synopsis:

This course is designed to expose students to the concepts of IBS which includes the advantages and disadvantages using IBS in Construction, Roadmap of IBS and the usage of IBS. It also highlighted the concept of Score Calculation and submission, Principal of Modular Coordination in IBS and concepts of buildibility. Joints and tolerances will also be discussed. Enhancement through mini project and hands-on project will be done to further strengthen their knowledge on subject matter.

Course Outcomes:

CO1 - Ability to CLASSIFY the concept of IBS modern construction technology and several types of IBS structure
CO2 - Ability to EVALUATE the component and construction method of IBS, Principle of Score calculation and Modular Coordination in IBS
CO3 - Ability to IDENTIFY the impact of IBS concept related to sustainability development.

PAT402 TEKNOLOGI PEMBINAAN PROJEK BERSEPADU [CONSTRUCTION TECHNOLOGY INTEGRATED PROJECT]

No of Credits: 4

Course Synopsis:

In this course, student will work in group to solve a construction related project. This given project task is based on real construction project. All the knowledge and practical skill such as design, cost estimation and project management, that they have gain from previous courses in this programme will be applied in this course to accomplish the given project. At the end of the course, students, the project proposal will be evaluated by lecturers with different expertise ranging from engineering, project amangement and quantity surveyin. This will help students to understand

and experience the real construction project work in order to produce technologist having excellent knowledge and skills in construction industry.

Course Outcomes:

CO1 - Ability to DESIGN civil and structural component using engineering fundamentals and principles by referring to relevant code and standards

CO2 - Ability to SOLVE construction related problem that required specific needs with appropriate consideration for economic, safety, cultural, societal, environmental and sustainability concern with appropriate techniques.

CO3 - Ability to CONDUCT appropriate experiment related to the construction project according to relevant code and standards.

CO4 - Ability to DEMONSTRATE result of construction related problem using modern construction tools.

CO5 - Ability to DEVELOP responsibility as individual, team and leader to ensure project successfully accomplished.

PAT408 REKABENTUK STRUKTUR TERMAJU [ADVANCED STRUCTURE DESIGN]

No of Credits: 3

Course Synopsis:

Advanced Structure Design is an optional subject which provide additional knowledge to Structural Design 1 and Structural Design 2. In this subject, the structural design considering the wind and earthquake is taught. Steps and method of structural design for wind load will be discussed. Then, the engineering aspect in seismology will be discussed. Other than that, seismic reaction on structure, general consideration on structural earthquake resistant design and seismic behavior of the structural system will be taught. Lastly, some issues on special topics considering the wind and earthquake engineering will be discussed.

Course Outcomes:

CO1 - Ability to manually DESIGN building structures for dynamic effects based on UBC-97, IBC2000 and Eurocodes 8 (EC8).

CO2 - Ability to MASTER the simulation design of building structures for dynamic effects using software approach by finite element method.

CO3 - Ability to RELATE fundamental performance and behavior of buildings under dynamic theory.

PAT409 TEKNOLOGI PEMBINAAN BANGUNAN TINGGI [CONSTRUCTION TECHNOLOGY OF HIGHRISE BUILDING]

No of Credits: 3

Course Synopsis:

This course is an introduction to the construction technology used to build highrise building. Construction technology related to structural concepts are discussed in relation to steel and concrete buildings. Design of highrise building due to wind loading will also be explained in this course. Besides that, the course will also explore the current technology and equipment applied in construction of high-rise building

Course Outcomes:

CO1 - Ability to CATEGORISE the lateral system by considering wind and seismic loading applied on highrise building

CO2 - Ability to RECOMMEND the construction process technology towards sustainable development for high-rise building

CO3 - Ability to DEFEND the structural system/form through high-rise model in mini project assessment

PAT455 PROJEK SARJANA MUDA 2 [BACHELOR DEGREE PROJECT 2]

No of Credits: 6

Course Synopsis:

This course is the continuity Bachelor Degree Project 1. With the aid of guidance from the academic staff, the students will continue their research project which has been planned during the Bachelor Degree Project 1. At the end of the project, each student prepares an engineering report, pres-

ents and demonstrates findings and results of the project work as well as exposed to journal writing.

Course Outcomes:

CO1 - Ability to DEFEND the whole research components during presentation session.
CO2 - Ability to ADAPT the research project with disciplines, standard procedures and protocols.
CO3 - Ability to DEMONSTRATE an understanding of the impact of research project on sustainable development in terms of economic, social, technology and environment.
CO4 - Ability to OUTLINE the significance of research project in terms of commercialization value in the FYP Thesis and during presentation session.
CO5 - Ability to WRITE UP research project report and short article at the end of the course.

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2. Sarjana Muda Perniagaan (Kepujian) (Perniagaan Antarabangsa)
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UR6321001
Bachelor of New Media Communication (Hons)

Programme Educational Objectives (PEO)

PEO 1
To educate and produce the graduates who have the knowledge and skills of professionals in the field of communication and social interaction

PEO 2.
To educate and produce the graduates who have the knowledge and skills of professionals in the field of new media

PEO 3.
To educate and produce graduates who have the knowledge and skills of professionals in the field of entrepreneurial management.

PEO 4.
To train and produce skilled graduates in implementing and managing projects/research by integrating the latest information related to new media communication.

Programme Outcomes (PO)

PO 01
To demonstrate professional and research skills in communication and social interaction, new media, entrepreneurship and management;

PO 02
To apply the model and the theory of communication and social interaction, new media, and entrepreneurial management through an understanding of the impact of such changes on society;

PO 03
To interpret social issues, cultural, global, and environmental responsibility, and law and ethics to the practice fields of communication and social interaction, new media, and entrepreneurial management in their professional activities;

PO 04
To identify the link between professionalism and human values in the areas of communication and social interaction, new media, and entrepreneurial management through a variety of practical applications and theoretical framework, methods and research techniques;

PO 05
To communicate effectively, both individually and in group;

PO 06
To demonstrate the ability to use hardware and software related to digital media, journalism, advertising, broadcasting, public relations, graphic design, multimedia and photography;

PO 07
To analyze and interpret research data of communication and social interaction, new media, and entrepreneurial management, and propose a solution and justify the measures to be taken;

PO 08
To develop analytical and critical thinking skills that are appropriate in preparation for continuous learning;

PO 09
To demonstrate an understanding of the impact of changing media and communications technologies, policies and structures on the social, cultural, economic and political environments;

PO 10
To apply widely business activities in real-world perspective; and

PO 11
To demonstrate social and entrepreneurship skills and inculcate a spirit of innovation.

CURRICULUM STRUCTURE
BACHELOR OF NEW MEDIA COMMUNICATION (HONS)
ACADEMIC SESSION (2020/2021)

YEAR	FIRST		SECOND		THIRD	
SEMESTER	I	II	III	IV	V	VI
Discipline Core	KUT101/3 Introduction to Communication Theory	KUT 115/3 Visual Communication	KUT 211/3 Digital Photography	KUT 303/3 Digital Marketing	KUT 401/3 Public Relations and New Media	KUT 404/3 Event Management
	KUT 103/3 Public Speaking	KUT 202/3 Organizational Communication	KUT 212/3 Graphic Design for New Media	KUT 311/3 Digital Video Production	KUT 403/3 Ethics and Law in New Media Communication	KUT 407/3 New Media Issues & Challenges
	KUT 113/3 Introduction to New Media		KUT 213/3 New Media Analysis	KUT 312/3 Web Design and Development	KUT 412/3 Animation for Integrated Media	
	KUT 118/3 Script Writing &Digital Storyboard		KUT 335/3 Media Psychology	KUT 313/3 New Media Arts	KUT 413/3 Creative Advertising	
	KUT 119/3 New Media Literacy					
Common Core		KUT 121/3 Innovative and Creative Skills	KUT 221/3 New Era Management	KUT 332/3 Data Reasoning	KUT 322/3 Electronic Entrepreneurship	KUT 421/3 Skills in Organizational Strategy and Performance Management
		KUT 120/3 Introduction to Programming Languages	KUT 331/3 Research Method		KUT 432/2 Final Year Project 1	KUT 433/4 Final Year Project 2
						KIT 432/6 Industrial Training
Elective		KUT 116/3 Principles of Human Computer Interaction		KUT 314/3 3D Modelling for Beginners / KUT 315/3 Contemporary Photography	KUT 414/3 Audio Design	
		KUT 117/3 Sociology in New Media		KUT 334/3 Industrial Psychology	KUT 406/3 Crisis Communication in New Media	
University Required	*UVA101/2 - Preparatory English (Band 2 & below)	**UVW201/2 - English for General Communication (MUET Band 3 & below) / (UUW 12X/2- Opsyen University) (MUET Band 4 & above)	UVW313/2 English for Academic Purposes	UUW 12X/2- Opsyen University		
	UUW 410/2 Bahasa Melayu Universiti	UUW131/2 Appreciation of Ethics and Civilization.	UVW 1XX/2 Foreign Language	UUW 322/2 Thinking Skills		
	UUW130/2 Philosophy and Current Issues					
	UZW 1XX/1 KO-K	UZW 1XX/1 KO-K				
123	20	20	22	22	20	19
TOTAL UNITS FOR GRADUATION 123						

UR6340001
Bachelor of Business (Honours) (International Business)

Programme Educational Objective (PEO)

PEO 1
Graduates who are managers.

PEO 2
Graduates who are business leaders experienced in global and international business environment.

PEO 3
Graduates who pursue continuous educational opportunities.

PEO 4
Graduates who contribute to society.

PEO 5
Graduates who contribute through research and development.

Programme Outcomes (PO)

PO 1
Ability to apply the theories and concepts of international business management in the work environment.

PO 2
Ability to apply business operation practices and principles currently used in professional business environments.

PO 3
Ability to analyse problems and enhance their problem solving and decision making skills.

PO 4
Ability to communicate effectively in a multilingual business and work environment.

PO 5
Ability to collaborate professionally and ethically with multidisciplinary business teams.

PO 6
Ability to explain professionally and ethically the social, cultural and environmental responsibilities and issues from a global perspective.

PO 7
Ability to use appropriate ICT to engage in lifelong learning.

PO 8
Ability to demonstrate professional entrepreneurship skills and innovativeness required for sustainable development.

PO 9
Ability to demonstrate leadership skills and responsibility in international business environments.

CURRICULUM STRUCTURE
BACHELOR OF BUSINESS (HONOURS)(INTERNATIONAL BUSINESS)
ACADEMIC SESSION (2020/2021)

YEAR	FIRST		Semester Break	SECOND		Semester Break	THIRD	
SEMESTER	FIRST	SECOND		FIRST	SECOND		FIRST	SECOND
Business Program Core / Elective Courses	BFT101/3 Business Economics	BFT103/3 Business Law & Ethics		BFT107/3 Principles of Finance	BFT221/3 Operations Management	BIT292/4 INDUSTRIAL TRAINING (8 weeks)	BFT351/6 Final Year Project	
	BFT106/3 Principles of Accounting	BFT108/3 Principles of Marketing		BFT223/3 Human Resource Management	BFT222/3 Managerial Accounting		BFT204/3 International Finance	BFT338/3 Strategic Management
	BFT109/3 Principles of Management	BFT116/3 Management Information System		BFT202/3 International Business Management	BFT318/3 Research Methodology		BFT205/3 International Human Resource Management	BFT344/3 Export Import Management
	BFT115/3 Principles of Entrepreneurship	BFT110/3 Organizational Behavior		BFT224/3 Business Communication	BFT203/3 International Economics		BFT337/3 International Marketing	BFT314/3 Cross-Cultural Management
	BFT114/3 Business Quantitative Analysis	BFT212/3 Business Franchising and Licensing		BFT225/3 Digital Business	UVW2x4/2 Foreign Language (Level4) **(Elective 1)**		BFT316/3 Leadership in Organization	BFTXXX/3 Global Economics Issues
	UVW1x1/2 Foreign Language (Level 1) **(Elective 1)**	UVW1x2/2 Foreign Language (Level 2) **(Elective 1)**		UVW2x3/2 Foreign Language (Level 3) **(Elective 1)**	BFTXXX/3 Elective **(Elective 2)**		BFTXXX/3 Elective **(Elective 3)**	
University Required Courses and Foreign Language	UUW130/2 Philosophy and Current Issues	UUW322/2 Thinking Skill		MPU331/3 Time Management	UVW410/2 Malay Language or UVW110 Basic Malay		UVW313/2 English for Academic Purposes (MUET ALL BANDS)	UUW131/2 Appreciation of Ethics and Civilization
	UZW1xx/1 Co-Curriculum (Uniformed Body)	UZW2xx/1 Co-Curriculum (Uniformed Body)						
120 units	**20**	**20**		**20**	**19**	**4**	**20**	**17**

UR6340002
Bachelor of Business (Honours) (Engineering Entrepreneurship))

Programme Educational Objective (PEO)

PEO 1
Graduates who are entrepreneurs.

PEO 2
Graduates who are entrepreneurial leaders in the chosen field as demonstrated through career advancement

PEO 3
Graduates who pursue continuous educational opportunities.

PEO 4
Graduates who contribute to society.

PEO 5
Graduates who contribute through research and development

Programme Outcomes (PO)

PO 1
Ability to apply knowledge of entrepreneurship, business management and basic engineering.

PO 2
Ability to identify problems, create solutions and innovate to improve decision making and problem solving.

PO 3
Ability to apply business operation practices and principles used in the current business environment.

PO 4
Ability to communicate effectively

PO 5
Ability to demonstrate an in-depth understanding of entrepreneurship, the process of innovation and the need for sustainable development.

PO 6
Ability to understand professional and ethical responsibilities.

PO 7Ability to operate with multi-disciplinary teams.

PO 8Ability to recognize the need for, and engage in life-long learning.

PO 9
Ability to understand social, cultural and environmental responsibilities of an entrepreneur/ manager.

PO 10
Ability to recognize potential utilities of engineering applications as business opportunities.

CURRICULUM STRUCTURE
BACHELOR OF BUSINESS (HONOURS)(ENGINEERING ENTREPRENEURSHIP)
ACADEMIC SESSION (2020/2021)

YEAR	FIRST			SECOND		SEMESTER BREAK	THIRD	
SEMESTER	FIRST	SECOND		FIRST	SECOND		FIRST	SECOND
Business Program Core / Elective Courses	BFT101/3 Business Economics	BFT107/3 Principles of Finance	SEMESTER BREAK	BFT213/3 Business Venture Management	BFT225/3 Digital Business	BIT291/ 4 INCUBATOR PROGRAM (8 WEEKS)	BFT318/3 Research Methodology	BFT338/3 Strategic Management
	BFT106/3 Principles of Accounting	BFT108/3 Principles of Marketing		BFT211/3 Business Innovation	BFT219/3 Product Design & Development		BFT326/3 Project Management	BFT362/3 Business Plan for Engineering Entrepreneurship Project
	BFT109/3 Principles of Management	BFT110/3 Organisational Behaviour		BFT223/3 Human Resource Management	BFT220/3 Technology Entrepreneurship		BFT312/3 Business Analysis	BFT212/3 Business Franchising & Licensing
	BFT114/3 Business Quantitative Analysis	BFT113/3 Engineering Drawing		BFT218/3 Introduction to Manufacturing Technology	BFT221/3 Operation Management		BFTxxx/3 Elective 1	BFT340/3 Business Coaching
	BFT112/3 Introduction to Engineering	BFT224/3 Business Communication		BFT103/3 Business Law & Ethics	BFT222/3 Managerial Accounting		BFT339/3 Engineering System and Design	BFTxxx/3 Elective 3
				BFT226/3 Salesmanship	BFT215/3 Entrepreneurial Finance		BFTxxx/3 Elective 2	BFTxxx/3 Elective 4
University Required Courses and Foreign Language	UUW 130 Philosophy and Current Issues	BFW161/2 Contemporary Issues in Economics		UUW131 Appreciation of Ethics and Civilization	UVW313/2 English for Academic Purposes (MUET ALL BANDS)		UUW322 Thinking Skill	
	UZW1xx/ 1 Co-Curriculum (Uniformed Body)	UZW2xx/1 Co-Curriculum (Uniformed Body)						
	UVW410/2 Malay Language Or UVW110 Basic Malay							
120 Units	20	18		20	20	4	20	18

LIST OF COURSES:
BUSINESS COURSES

BFT101	EKONOMI PERNIAGAAN [BUSINESS ECONOMICS]
BFT103	ETIKA & UNDANG UNDANG PERNIAGAAN [BUSINESS LAW & ETHICS]
BFT106	PRINSIP PRINSIP PERAKAUNAN [PRINCIPLES OF ACCOUNTING]
BFT107	PRINSIP PRINSIP KEWANGAN [PRINCIPLES OF FINANCE]
BFT108	PRINSIP PRINSIP PEMASARAN [PRINCIPLES OF MARKETING]
BFT109	PRINSIP-PRINSIP PENGURUSAN [PRINCIPLES OF MANAGEMENT]
BFT110	GELAGAT ORGANISASI [ORGANIZATIONAL BEHAVIOUR]
BFT112	PENGENALAN KEPADA KEJURUTERAAN [INTRODUCTION TO ENGINEERING]
BFT113	LUKISAN KEJURUTERAAN [ENGINEERING DRAWING]
BFT114	ANALISIS KUANTITATIF PERNIAGAAN [BUSINESS QUANTITATIVE ANALYSIS]
BFT116	SISTEM PENGURUSAN MAKLUMAT [MANAGEMENT INFORMATION SYSTEM]
BFT201	PERAKAUNAN ANTARABANGSA [INTERNATIONAL ACCOUNTING]
BFT202	PENGURUSAN PERNIAGAAN ANTARABANGSA [INTERNATIONAL BUSINESS MANAGEMENT]
BFT203	EKONOMI ANTARABANGSA [INTERNATIONAL ECONOMICS]
BFT204	KEWANGAN ANTARABANGSA [INTERNATIONAL FINANCE]
BFT205	PENGURUSAN SUMBER MANUSIA ANTARABANGSA [INTERNATIONAL HUMAN RESOURCE MANAGEMENT]
BFT211	INOVASI PERNIAGAAN [BUSINESS INNOVATION]
BFT212	PERNIAGAAN FRANCAIS DAN PERLESENAN [BUSINESS FRANCHISING AND LICENSING]
BFT213	PENGURUSAN USAHA NIAGA [BUSINESS VENTURE MANAGEMENT]
BFT215	KEWANGAN KEUSAHAWANAN [ENTREPRENEURIAL FINANCE]
BFT215	KEWANGAN KEUSAHAWANAN [ENTREPRENEURIAL FINANCE]
BFT218	PENGENALAN TEKNOLOGI PEMBUATAN [INTRODUCTION TO MANUFACTURING TECHNOLOGY]

BFT219	REKA BENTUK & PEMBANGUNAN PRODUK [PRODUCT DESIGN & DEVELOPMENT]
BFT220	KEUSAHAWANAN TEKNOLOGI [TECHNOLOGY ENTREPRENEURSHIP]
BFT221	PENGURUSAN OPERASI [OPERATIONS MANAGEMENT]
BFT222	PERAKAUNAN PENGURUSAN [MANAGERIAL ACCOUNTING]
BFT223	PENGURUSAN SUMBER MANUSIA [HUMAN RESOURCE MANAGEMENT]
BFT224	KOMUNIKASI PERNIAGAAN [BUSINESS COMMUNICATION]
BFT225	PERNIAGAAN DIGITAL [DIGITAL BUSINESS]
BFT226	JUALAN PEORANGAN [SALESMANSHIP]
BFT314	PENGURUSAN SILANG BUDAYA [CROSS-CULTURAL MANAGEMENT]
BFT316	KEPIMPINAN DIDALAM ORGANISASI [LEADERSHIP IN ORGANIZATION]
BFT318	KAEDAH PENYELIDIKAN [RESEARCH METHODOLOGY]
BFT319	PENGURUSAN RISIKO [RISK MANAGEMENT]
BFT321	PEMASARAN PERKHIDMATAN [SERVICES MARKETING]
BFT322	PENGURUSAN RANTAIAN BEKALAN [SUPPLY CHAIN MANAGEMENT]
BFT325	PENGURUSAN LOGISTIK [LOGISTIC MANAGEMENT]
BFT326	PENGURUSAN PROJEK [PROJECT MANAGEMENT]
BFT328	URUSAN KEJURUTERAAN & TEKNOLOGI [MANAGING ENGINEERING & TECHNOLOGY]
BFT337	PEMASARAN ANTARABANGSA [INTERNATIONAL MARKETING]
BFT338	PENGURUSAN STRATEGIK [STRATEGIC MANAGEMENT]
BFT339	REKA BENTUK DAN PEMBANGUNAN SISTEM KEJURUTERAAN [ENGINEERING SYSTEM DESIGN AND DEVELOPMENT]
BFT344	PENGURUSAN EXPORT IMPORT [EXPORT IMPORT MANAGEMENT]
BFT347	ISU-ISU EKONOMI GLOBAL [GLOBAL ECONOMICS ISSUES]
BFT351	PROJEK TAHUN AKHIR [FINAL YEAR PROJECT]
BFT362	RANCANGAN PERNIAGAAN UNTUK PROJEK KEUSAHAWANAN KEJURUTERAAN [BUSINESS PLAN FOR ENGINEERING ENTREPRENEURSHIP PROJECT]
BIT291	PROGRAM INKUBASI [INCUBATION PROGRAM]

BIT292	LATIHAN INDUSTRI [INDUSTRIAL TRAINING]

NEW MEDIA COURSES

KUT101	PENGENALAN KEPADA TEORI KOMUNIKASI [INTRODUCTION TO COMMUNICATION THEORY]
KUT103	PERUCAPAN AWAM [PUBLIC SPEAKING]
KUT113	PENGENALAN KEPADA MEDIA BAHARU [INTRODUCTION TO NEW MEDIA]
KUT115	KOMUNIKASI VISUAL [VISUAL COMMUNICATION]
KUT116	PRINSIP-PRINSIP INTERAKSI MANUSIA-KOMPUTER [PRINCIPLES OF HUMAN-COMPUTER INTERACTION]
KUT117	SOSIOLOGI DALAM MEDIA BAHARU [SOCIOLOGY IN NEW MEDIA]
KUT118	PENULISAN SKRIP DAN PAPAN CERITA DIGITAL [SCRIPT WRITING AND DIGITAL STORYBOARD]
KUT119	LITERASI MEDIA BAHARU [NEW MEDIA LITERACY]
KUT120	PENGENALAN KEPADA BAHASA PENGATURCARAAN [INTRODUCTION TO PROGRAMMING LANGUAGES]
KUT121	KEMAHIRAN KREATIF DAN INOVATIF [INNOVATIVE AND CREATIVE SKILLS]
KUT202	KOMUNIKASI ORGANISASI [ORGANIZATIONAL COMMUNICATION]
KUT211	FOTOGRAFI DIGITAL [DIGITAL PHOTOGRAPHY]
KUT212	REKABENTUK GRAFIK UNTUK MEDIA BAHARU [GRAPHIC DESIGN FOR NEW MEDIA]
KUT213	ANALISIS MEDIA BAHARU [NEW MEDIA ANALYSIS]
KUT221	PENGURUSAN ERA BAHARU [NEW ERA MANAGEMENT]
KUT303	PEMASARAN DIGITAL [DIGITAL MARKETING]
KUT311	PENERBITAN VIDEO DIGITAL [DIGITAL VIDEO PRODUCTION]
KUT312	REKABENTUK & PEMBANGUNAN WEB [WEB DESIGN & DEVELOPMENT]
KUT313	SENI MEDIA BAHARU [NEW MEDIA ARTS]
KUT314	ASAS PEMODELAN 3D [3D MODELLING FOR BEGINNER]
KUT315	FOTOGRAFI KONTEMPORARI [CONTEMPORARY PHOTOGRAPHY]
KUT314	PSIKOLOGI INDUSTRI [INDUSTRIAL PSYCHOLOGY]
KUT335	PSIKOLOGI MEDIA [MEDIA PSYCHOLOGY]

KUT401	PERHUBUNGAN AWAM DAN MEDIA BAHARU [PUBLIC RELATIONS AND NEW MEDIA]
KUT403	UNDANG-UNDANG DAN ETIKA DALAM KOMUNIKASI MEDIA BAHARU [ETHICS AND LAW IN NEW MEDIA COMMUNICATION]
KUT404	PENGURUSAN ACARA [EVENT MANAGEMENT]
KUT406	KUT406 KOMUNIKASI KRISIS DALAM MEDIA BAHARU [CRISIS COMMUNICATION IN NEW MEDIA]
KUT407	ISU DAN CABARAN MEDIA BAHARU [NEW MEDIA ISSUES AND CHALLENGES]
KUT412	ANIMASI UNTUK MEDIA BERSEPADU [ANIMATION FOR INTEGRATED MEDIA]
KUT413	PENGIKLANANKREATIF DIGITAL [DIGITAL CREATIVE ADVERTISING]
KUT414	REKA BENTUK AUDIO [AUDIO DESIGN]
KUT421	KEMAHIRAN PENGURUSAN STRATEGI DAN PRESTASI ORGANISASI [SKILLS IN ORGANIZATIONAL STRATEGY AND PERFORMANCE MANAGEMENT]
KUT322	KEUSAHAWANAN ELEKTRONIK [ELECTRONIC ENTREPRENEURSHIP]
KUT331	KAEDAH PENYELIDIKAN [RESEARCH METHODS]
KUT332	PENAKULAN DATA [DATA REASONING]
KUT432	PROJEK TAHUN AKHIR 1 [FINAL YEAR PROJECT 1]
KUT433	PROJEK TAHUN AKHIR2 [FINAL YEAR PROJECT 2]
KIT432	INDUSTRIAL TRANING [LATIHAN INDUSTRI]
UUT122/ PUW122	KEMAHIRAN DAN TEKNOLOGI DALAM KOMUNIKASI [SKILLS AND TECHNOLOGY IN COMMUNICATION]
UUW130	FALSAFAH DAN ISU SEMASA [PHILOSOPHY AND CURRENT ISSUES]
UUW131	PENGHAYATAN ETIKA DAN PERADABAN [APPREACIATION ETHIC AND CIVILIZATION]
UUW224	KEUSAHAWANAN KEJURUTERAAN [ENGINEERING ENTEPRENUESHIP]
UUW322	KEMAHIRAN BERFIKIR [THINKING SKILL]
UUW125	KOMUNIKASI KORPORAT [CORPORATE COMMUNICATION]
UUW126	PSIKOLOGI INDUSTRI [INDUSTRIAL PSICOLOGY]
UUW127	KOMUNIKASI DAN PENGURUSAN KONFLIK [COMMUNICATION AND CONFLICT MANAGEMENT]
UUW128	PENGURUSAN SUMBER MANUSIA [HUMAN RESOURSE MANAGEMENT]

MATHEMATICS COURSES

DQT101	MATEMATIK I [MATHEMATICS I]
DQT102	MATEMATIK II [MATHEMATICS II]
DQT203	MATEMATIK III [MATHEMATICS III]
EQT101	MATEMATIK KEJURUTERAAN I [ENGINEERING MATHEMATICS I]
EQT102	MATEMATIK KEJURUTERAAN II [ENGINEERING MATHEMATICS II]
EQT203	MATEMATIK KEJURUTERAAN III [ENGINEERING MATHEMATICS III]
EQT221	MATEMATIK DISKRIT DAN ALJABAR LINEAR [DISCRETE MATHEMATICS & LINEAR ALGEBRA]
EQT271	STATISTIK KEJURUTERAAN [ENGINEERING STATISTICS]
EQT272	KEBARANGKALIAN DAN STATISTIK [PROBABILITY & STATISTICS]
PQT111	MATEMATIK UNTUK TEKNOLOGI KEJURUTERAAN I [MATHEMATICS FOR ENGINEERING TECHNOLOGY I]
PQT112	MATEMATIK UNTUK TEKNOLOGI KEJURUTERAAN II [MATHEMATICS FOR ENGINEERING TECHNOLOGY II]
PQT213	MATEMATIK UNTUK TEKNOLOGI KEJURUTERAAN III [MATHEMATICS FOR ENGINEERING TECHNOLOGY III]
PQT274	STATISTIK UNTUK TEKNOLOGI KEJURUTERAAN [STATISTICS FOR ENGINEERING TECHNOLOGY]

LANGUAGE COURSES

DVW101	BAHASA INGGERIS KOMUNIKASI 1 [COMMUNICATIVE ENGLISH 1]
DVW201	BAHASA INGGERIS KOMUNIKASI 2 [COMMUNICATIVE ENGLISH 2]
DVW301	BAHASA INGGERIS KOMUNIKASI 3 [COMMUNICATIVE ENGLISH 3]
DVW410	BAHASA MELAYU [MALAY LANGUAGE]
UVA101	BAHASA INGGERIS PERSEDIAAN [PREPARATORY ENGLISH]
UVW104	BAHASA MANDARIN PERMULAAN [MANDARIN FOR BEGINNER]
UVW105	BAHASA THAI PERMULAAN [THAI FOR BIGINNER]
UVW106	BAHASA ARAB PERMULAAN [ARABIC FOR BEGINNERS]
UVW107	BAHASA JEPUN ASAS [JAPANESE FOR BEGINNERS]
UVW108	BAHASA JERMAN PERMULAAN [GERMAN FOR BEGINNERS]

UVW109	BAHASA KOREA PERMULAAN [KOREAN FOR BEGINNER]
UVW110	BAHASA MELAYU ASAS [BASIC MALAY LANGUAGE]
UVW114	BAHASA MANDARIN I [MANDARIN 1]
UVW115	BAHASA THAI I [THAI I]
UVW116	BAHASA ARAB I [ARABIC I]
UVW117	BAHASA JEPUN I [JAPANESE I]
UVW118	BAHASA JERMAN I [GERMAN I]
UVW119	BAHASA KOREA I [KOREAN I]
UVW201	BAHASA INGGERIS UNTUK KOMUNIKASI UMUM [ENGLISH FOR GENERAL COMMUNICATION]
UVW214	BAHASA MANDARIN II [MANDARIN 11]
UVW215	BAHASA THAI II [THAI II]
UVW216	BAHASA ARAB II [ARABIC II]
UVW217	BAHASA JEPUN II [JAPANESE III]
UVW218	BAHASA JERMAN II [GERMAN II]
UVW219	BAHASA KOREA II [KOREAN II]
UVW312	BAHASA INGGERIS UNTUK KOMUNIKASI TEKNIKAL [ENGLISH FOR TECHNICAL COMMUNICATION]

UVW312	BAHASA ENGGERIS TEKNIKAL [ENGLISH FOR TECHNICAL COMMUNICATION]
UVW313	BAHASA INGGERIS AKADEMIK [ENGLISH FOR ACADEMIC PURPOSES]
UVW314	BAHASA MANDARIN III [MANDARIN III]
UVW315	BAHASA THAI III [THAI III]
UVW316	BAHASA ARAB III [ARABIC III]
UVW317	BAHASA JEPUN III [JAPANESE III]
UVW318	BAHASA JERMAN III [GERMAN III]
UVW319	BAHASA KOREA III [KOREAN III]
UVW410	BAHASA MELAYU UNIVERSITI [UNIVERSITY MALAY LANGUAGE]
UVW414	BAHASA MANDARIN IV [MANDARIN IV]
UVW415	BAHASA THAI IV [THAI IV]
UVW416	BAHASA ARAB IV [ARABIC IV]
UVW417	BAHASA JEPUN IV [JAPANESE IV]
UVW418	BAHASA JERMAN IV [GERMAN IV]
UVW419	BAHASA KOREA IV [KOREAN IV]

CO-CURRICULUM COURSES

UZW101	GOLF [GOLF]
UZW102	BESBOL [BASEBALL]
UZW103	WOODBALL [WOODBALL]
UZW104	BOLA SEPAK [FOOTBALL]
UZW105	BOLA JARING [NETBALL]
UZW106	TENIS [TENNIS]
UZW109	BOLA TAMPAR [VOLLEYBALL]
UZW110	SUKARELAWANAN SISWA/SISWI KOREKSIONAL JABATAN PENJARA MALAYSIA I (KOR SISKOR) [STUDENTS VOLUNTARY CORRECTIONAL MALAYSIAN PRISON DEPARTMENT I (KOR SISKOR I)]
UZW111	SUKARELAWANAN SISWA/SISWI KOREKSIONAL JABATAN PENJARA MALAYSIA II (KOR SISKOR) [STUDENTS VOLUNTARY CORRECTIONAL MALAYSIAN PRISON DEPARTMENT II (KOR SISKOR II)]
UZW112	KUMPULAN LATIHAN KELANASISWA MALAYSIA (UDARA) I [MALAYSIAN UNIVERSITY ROVER TRAINING GROUP I (AIR)]
UZW114	SUKARELAWAN BANTUAN PERUBATAN MALAYSIA (MERCY MUDA) I [STUDENT VOLUNTARY MALAYSIAN MEDICAL RELIEF SOCIETY (YOUNG MERCY) I]
UZW120	BRIGED BOMBA & PENYELAMAT I [FIRE AND RESCUE BRIGED I]
UZW122	PANDU PUTERI I [GIRL GUIDE I (PPS I)]
UZW124	ST. JOHN AMBULANS MALAYSIA I [MALAYSIAN ST. JOHN AMBULANCE I]
UZW125	ST. JOHN AMBULANS MALAYSIA I [MALAYSIAN ST. JOHN AMBULANCE II]
UZW126	KUMPULAN LATIHAN KELANASISWA MALAYSIA I [MALAYSIA UNIVERSITY ROVER TRAINING GROUP I]
UZW128	KUMPULAN LATIHAN KELANASISWA MALAYSIA (LAUT) I [MALAYSIA UNIVERSITY ROVER TRAINING GROUP I (SEA)]
UZW132	PENERBITAN VIDEO [VIDEO PUBLISHING]
UZW151	ASAS GAMELAN [FOUNDATIONS OF GAMELAN]
UZW152	KUMPULAN JAZZ I [JAZZ BAND I]
UZW153	[BRASS BAND I]
UZW154	ANGKLUNG [ANGKLUNG]
UZW155	SENI PERGERAKAN KREATIF [ART OF CREATIVE MOVEMENT]
UZW156	DRAMA, PEMENTASAN & SENI LAKON [DRAMA, PLAYWRIGHT AND ACTING]

UZW157	SENI TEATER BAHASA INGGERIS [ENGLISH THEATRE ARTS]
UZW160	PALAPES I [ROTU ARMY I]
UZW161	PALAPES II [ROTU ARMY II]
UZW162	KOR SISWA SISWI PERTAHANAN AWAM I [MALAYSIA CIVIL DEFENSE DEPARTMENT I (KOR SISPA I)]
UZW163	KOR SISWA SISWI PERTAHANAN AWAM II [MALAYSIA CIVIL DEFENSE DEPARTMENT II (KOR SISPA II)]
UZW164	KURSUS PERSIJILAN BULAN SABIT MERAH MALAYSIA [THE MALAYSIAN RED CRESCENT SOCIETIES CERTIFICATION COURSE I]
UZW166	KOR SUKARELAWAN POLIS SISWA/SISWA I [SVPC-1 @STUDENTS VOLUNTARY POLICE CORP]
UZW167	KOR SUKARELAWAN POLIS SISWA/SISWA II [SVPC-2 @STUDENTS VOLUNTARY POLICE CORP]
	UZW168 BRIGED RELA SISWA SISWI I [MALAYSIAN PEOPLE 'S VOLUNTEER CORP I]
UZW169	BRIGED RELA SISWA SISWI II [MALAYSIAN PEOPLE 'S VOLUNTEER CORP II]
UZW171	SENI SILAT CEKAK I [SENI SILAT CEKAK I]
UZW172	TAEKWON – DO GTF I [TAEKWON – DO GTF I]
UZW173	KARATE-DO I [KARATE-DO I]
UZW175	FUTSAL [FUTSAL]
UZW176	TAEKWON-DO WTF I [TAEKWON-DO WTF I]
UZW177	SILAT OLAHRAGA I [SPORT SILAT I]
UZW178	SILAT OLAHRAGA II [SPORT SILAT II]
UZW179	OLAHRAGA [ATHLETIC]
UZW181	BOWLING PADANG [LAWN BOWL]
UZW182	PETANQUE [PETANQUE]
UZW183	KAYAK [CANOE]
UZW184	BADMINTON [BADMINTON]
UZW185	HOKI [HOCKEY]
UZW186	SEPAK TAKRAW [SEPAK TAKRAW]
UZW187	RAGBI [RUGBY]
UZW188	OLAHRAGA [ATHLETIC]
UZW189	PING PONG [TABLE TENNIS]
UZW191	KHIDMAT MASYARAKAT [COMMUNITY SERVICE]
UZW192	DAYA USAHA & INOVASI [INITIATIVE & INNOVATION]
UZW193	TAJWID [TAJWID]

UZW195	RADIO KAMPUS [CAMPUS RADIO]
UZW196	STUDENT IN-FREE ENTERPRISE [STUDENT IN-FREE ENTERPRISE (SIFE)]
UZW197	PENGUCAPAN AWAM [SPEAKING ASSEMBLY]
UZW210	SUKARELAWANAN SISWA/SISWI KOREKSIONAL JA-BATAN PENJARA MALAYSIA III (KOR SISKOR) [STUDENTS VOLUNTARY CORRECTIONAL MALAYSIAN PRISON DEPARTMENT III (KOR SISKOR III)]
UZW211	SUKARELAWANAN SISWA/SISWI KOREKSIONAL JA-BATAN PENJARA MALAYSIA IV (KOR SISKOR) [STUDENTS VOLUNTARY CORRECTIONAL MALAYSIAN PRISON DEPARTMENT IV (KOR SISKOR IV)]
UZW253	[BRASS BAND II]
UZW260	PALAPES III [ROTU ARMY III]
UZW261	PALAPES IV [ROTU ARMY IV]
UZW262	KOR SISWA SISWI PERTAHANAN AWAM III [MALAYSIA CIVIL DEFENSE DEPARTMENT III (KOR SISPA III)]
UZW263	KOR SISWA SISWI PERTAHANAN AWAM IV [MALAYSIA CIVIL DEFENSE DEPARTMENT IV (KOR SISPA IV)]
UZW266	KOR SUKARELAWAN POLIS SISWA/SISWA III [SVPC-3 @STUDENTS VOLUNTARY POLICE CORP]
UZW267	KOR SUKARELAWAN POLIS SISWA/SISWA IV [SVPC-4 @STUDENTS VOLUNTARY POLICE CORP]
UZW268	BRIGED RELA SISWA SISWI III [MALAYSIAN PEOPLE 'S VOLUNTEER CORP III]
UZW269	BRIGED RELA SISWA SISWI IV [MALAYSIAN PEOPLE 'S VOLUNTEER CORP IV]
UZW271	SENI SILAT CEKAK II [SENI SILAT CEKAK II]
UZW272	TAEKWON – DO GTF II [TAEKWON – DO GTF II]
UZW273	KARATE-DO II [KARATE-DO II]
UZW276	TAEKWON-DO WTF II [TAEKWON-DO WTF II]
UZW360	PALAPES V [ROTU ARMY V]
UZW361	PALAES VI [ROTU ARMY VI]
UZW362	KOR SISWA SISWI PERTAHANAN AWAM V [MALAYSIA CIVIL DEFENSE DEPARTMENT V (KOR SISPA V)]
UZW366	KOR SUKARELAWAN POLIS SISWA/SISWA V [SVPC-5 @STUDENTS VOLUNTARY POLICE CORP]
UZW367	KOR SUKARELAWAN POLIS SISWA/SISWA VI [SVPC-6 @STUDENTS VOLUNTARY POLICE CORP]

COURSE SYLLABUS:

BUSINESS COURSES BFT101 EKONOMI PERNIAGAAN [BUSINESS ECONOMICS]
No of Credits: 3

Course Synopsis:
This course applies the tools of economic analysis to issue in business management, developing the student's abilities to problem solving using microeconomic and macroeconomic approaches. The module will focus on the operation of markets for goods and services demand and supply analysis, entrepreneurship, emergence and growth of firms, costs of production, different forms of competition and game theory, the macroeconomic environment and government policy.

Course Outcomes:
CO1 - Ability to demonstrate a detailed knowledge of economic analysis in business management areas.
CO2 - The ability to analyse business management issues and appropriate economic tools.
CO3 - The ability to evaluate economic analysis and the complexity of business management issues.

BFT103 ETIKA & UNDANG UNDANG PERNIAGAAN [BUSINESS LAW & ETHICS]
No of Credits: 3

Course Synopsis:
Law governs our daily activities. Similarly, there are certain rules that we have to follow in business transactions. The purpose of having these laws is to provide remedies for the aggrieved parties to take action in the occurrence of any breach of the laws. Business ethics deals with what is right and wrong in organizational decisions, behaviour and policies. Ethics provides the principles and guidelines to assist people in making choices to balance up economic interests and social responsibilities. The main objective of this course is to nurture students' abilities to discuss various laws and ethical issues which affect business operation. Ethical issues exposed include business operations and how business effectively operates.

Course Outcomes:
CO1 - Ability to explain the law of contract and essential elements of a valid contract and its effects on business transaction.
CO2 - Ability to analyse the importance of other types of business law in relation to business transactions.
CO3 - Ability to analyse business ethics and its importance in business decision making and avoid ethical dilemmas.

BFT106 PRINSIP PRINSIP PERAKAUNAN [PRINCIPLES OF ACCOUNTING]
No of Credits: 3

Course Synopsis:
This is an introductory course to business accounting, which introduces students to the environment of accounting. The course covers the nature of accounting and the accounting concepts that are relevant to the preparation and presentation of financial statements. This course also exposes the students the skills of analyzing and interpreting the financial statements.

Course Outcomes:
CO1 - Ability to describe the basic principles, concepts and techniques of financial accounting.
CO2 - Ability to prepared main financial statements required of a business organization.
CO3 - Ability to analyse the financial performance to satisfy the decision making requirements of the different stakeholder groups.

BFT107 PRINSIP PRINSIP KEWANGAN [PRINCIPLES OF FINANCE]
No of Credits: 3

Course Synopsis:
This subject will introduce students with an understanding and knowledge of financial management of a business. Students will be introduced to the problem solving techniques in finance in a cohesive and interrelated series

of topics so as to enable them fully appreciate what they have learn and apply them when the situation warranted.

Course Outcomes:

CO1 - Ability to analyze financial information to understand firm financial performance.
CO2 - Ability to examine the different financial valuation techniques and tools.
CO3 - Ability to apply business financial practices and principles for business activities.

BFT108 PRINSIP PRINSIP PEMASARAN [PRINCIPLES OF MARKETING]

No of Credits: 3

Course Synopsis:

This course presents a thorough and systematic coverage of marketing theory and practice. It focuses on the defining marketing and marketing process, understanding the marketplace and consumers, and designing a customer-driven strategy and marketing mix (Product, Price, Place and Promotion), with special attention to marketer's responsibility for effective and efficient achievement of goals.

Course Outcomes:

CO1 - Ability to explain the vital marketing concepts and environment.
CO2 - Ability to discuss the significant marketing strategies and techniques.
CO3 - Ability to criticise the issues and challenges of local and international marketing.

BFT109 PRINSIP-PRINSIP PENGURUSAN [PRINCIPLES OF MANAGEMENT]
No of Credits: 3

Course Synopsis:

This course presents a thorough and systematic coverage of management theory and practice. It focuses on the basic roles, skills and functions of management, with special attention to managerial responsibility for effective and efficient achievement of goals. Special attention is given to social responsibility, managerial ethics, and the importance of multi-national organizations.

Course Outcomes:

CO1 - Ability to discuss the fundamental concepts of principles management and management functions.
CO2 - Ability to explain the management historical development and managerial process.
CO3 - Ability to analyse the interactions between the environment, technology, human resources and organizations to achieve high performance.

BFT110 GELAGAT ORGANISASI [ORGANIZATIONAL BEHAVIOUR]
No of Credits: 3

Course Synopsis:

Organisational behaviour is the study of individual behaviour and group dynamics in organisational settings. Thus, this course is intends to provide students in gaining knowledge and understanding on the importance of organisational behaviour in various organizations.

Course Outcomes:

CO1 - Ability to explain the importance of organisational behaviour and individual differences in the workplace.
CO2 - Ability to discuss the theories and concepts of motivation and leadership.
CO3 - Ability to demonstrate the influence of workplace culture, work teams and groups, power, politic, conflict and negotiation, and change to organisational behaviour.

BFT112 PENGENALAN KEPADA KEJURUTERAAN [INTRODUCTION TO ENGINEERING]
No of Credits: 3

Course Synopsis:
This course introduces students to the basic engineering concepts/fields and how they can be applicable in manufacturing systems across industries. It also covers issues from engineering disciplines. These key engineering issues shall be translated into entrepreneurial opportunities. For example, how bioprocess engineering can be used in agriculture, food, perfume and pharmaceuticals. Or cause and effect of climate change to the environment. Or the usage of electrical and electronics engineering in power generation and broadcast transmission systems.

Course Outcomes:
CO1 - Ability to compose basic engineering concepts in general
CO2 - Ability to generate the fundamentals and characteristics of each field of engineering.
CO3 - Ability to assess engineering solutions into entrepreneurial opportunities.

BFT113 LUKISAN KEJURUTERAAN [ENGINEERING DRAWING]
No of Credits: 3

Course Synopsis:
This course provides exposure and skills to student in basic Engineering Drawing, Computer Aided Drafting (CAD) and its applications in product design. The course will cover the details of Engineering Drawing for beginners followed by projection systems, oblique and isometric sketches, before going on to Computer Aided Drafting software, which focuses on product design in 2D. Knowledge in dimensioning and geometrical tolerance (GDT) will enhance student's ability in interpreting and assessing information from basic raw data of an engineering drawing which can be used for business applications.

Course Outcomes:
CO1 - Ability to explain basic engineering drawing and design concopts.
CO2 - Ability to apply the fundamentals of drafting and sketching.
CO3 - Ability to analyse the information in engineering drawins.

BFT114 ANALISIS KUANTITATIF PERNIAGAAN [BUSINESS QUANTITATIVE ANALYSIS]
No of Credits: 3

Course Synopsis:
This course emphasise on an application-oriented study of statistical and mathematical concepts and techniques. It focuses on the student as a user of statistics who needs a minimal understanding of mathematical theory and formula derivation. Major topics of study are financial mathematics, application of calculus in business, exploration data analysis, sampling methods, constructing a hypothesis, regression analysis and correlation test, and time series and business forecasting. This course will utilize computer-based statistical software to perform statistical computation and interpreting the analysis output correctly.

Course Outcomes:
CO1 - Ability to apply the knowledge of basic mathematics, basic statistical concept and thinking in business model problems.
CO2 - Ability to identify the suitable statistics methods and structure to solve business problem.
CO3 - Ability to formulate solutions for business decision problems through statistical analysis.

BFT116 SISTEM PENGURUSAN MAKLUMAT [MANAGEMENT INFORMATION SYSTEM]
No of Credits: 3

Course Synopsis:
This course will expose students to the Management Information System (MIS) topics like organisations, management, infrastructures and applications for managing the information system.
Course Outcomes:

CO1 - Ability to explain principles and role of Management Information Systems (MIS) in business organizations.
CO2 - Ability to analyse tools and techniques of the information system hardware, software, database, and networking technologies.
CO3 - Ability to examine the core information system applications to improve operational excellence and decision making.

BFT201 PERAKAUNAN ANTARABANGSA [INTERNATIONAL ACCOUNTING]
No of Credits: 3

Course Synopsis:
This course is an extension of Principles of Accounting (BFT106) where students need to apply the knowledge that has been gained for the implementation of the accounting regulation and practices internationally. The main objective of this course is to enlarge the existing accounting knowledge of the students and improve it by including the international accounting issues uniquely confronted by companies involve in international business. The courses content will familiarize them with international accounting regulations, financial reporting, taxation and other accounting practices that exist across countries.

Course Outcomes:
CO1 - Ability to explain the international differences in financial accounting theory and practice, harmonization and convergence of accounting standard.
CO2 - Ability to analyse the foreign currency market and accounting for foreign currency transactions and translation.
CO3 - Ability to demonstrate the knowledge of international accounting issues related to additional financial reporting, international taxation and international transfer pricing.

BFT202 PENGURUSAN PERNIAGAAN ANTARABANGSA [INTERNATIONAL BUSINESS MANAGEMENT]
No of Credits: 3

Course Synopsis:
This course will expose student to globalization and internationalization issues, international trade theory, business culture, international political and ethical issues, international economic development, international trade organization, trade policy and other related areas.

Course Outcomes:
CO1 - Ability to discuss theories and practices in international business.
CO2 - Ability to explain issues and trends in international business.
CO3 - Ability to analyse opportunities and threats in international business.

BFT203 EKONOMI ANTARABANGSA [INTERNATIONAL ECONOMICS]
No of Credits: 3

Course Synopsis:
This course applies the issues on globalisations and basic concepts of international trade relations. This course also helps to develop the students' ability to analyse the problems on tariff, non-tariffs and exchange rate system. Understanding these parts will help the students to apply related policies in analysing international banking and monetary system.

Course Outcomes:
CO1 - Ability to explain the basic concept of international economics.
CO2 - Ability to analyse international trade theory.
CO3 - Ability to evaluate international monetary system and policies.

BFT204 KEWANGAN ANTARABANGSA [INTERNATIONAL FINANCE]
No of Credits: 3

Course Synopsis:
The subject matter of international finance consists of issues raised by

the special problems of economic interaction between sovereign states. This course will introduce the main concepts and theories of international finance and illustrates them with applications drawn from the real world. It will address a wide range of issues, including the balance of payments, exchange rate determination, international policy coordination, and the international capital market. International finance course will focus on the monetary side of international economy, and international financial transactions.

Course Outcomes:
CO1 - Ability to explain the multinational corporation's operations and the international financial environment.
CO2 - Ability to discuss the management of exchange rate risk for performance forecasting.
CO3 - Ability to analyze issues in management of short and long term assets and liabilities on multinational corporations.

BFT205 PENGURUSAN SUMBER MANUSIA ANTARABANGSA [INTERNATIONAL HUMAN RESOURCE MANAGEMENT]
No of Credits: 3

Course Synopsis:
This course provides the introduction to the critical issues facing organizations in simultaneously managing their human resources at home and abroad. It focuses on the connection between corporate strategies and the effective management or human resources, which at times, may require differing policies across countries. The course is based on the notion that competitive firms and economies require appropriate structures, policies and strategies for managing their employees at every level of the enterprise. This is particularly true of multinational enterprises (MNEs) and transactional corporations (TCs) intricately involved in a global environment.

Course Outcomes:
CO1 - Ability to discuss international HRM models and practices.
CO2 - Ability to recognize the roles of international HRM for the global market.
CO3 - Ability to analyse trends and future challenges in international HRM.

BFT211 INOVASI PERNIAGAAN [BUSINESS INNOVATION]
No of Credits: 3

Course Synopsis:
This course aims to provide students with a pedagogy that helps them to build their decision-making skills and to equip them with manipulative skills in dealing with accounting information to make decisions. Focuses on contemporary issues which include interpreting financial information as a basic function for top management to plan, control and making decision in the internal organization operations. Students also learn how to manage business units effectively.

Course Outcomes:
CO1 - Ability to construct the relationship between innovation and creativity in the context of business and consumer
CO2 - Ability to discuss creative tools in adapting to business environment
CO3 - Ability to analyze the innovation process.

BFT212 PERNIAGAAN FRANCAIS DAN PERLESENAN [BUSINESS FRANCHISING AND LICENSING]
No of Credits: 3

Course Synopsis:
This course introduce students to franchising and licensing business concept. The topics covered are franchising and licensing business environment, franchising and licensing industry in Malaysia, franchising and licensing opportunities, franchising and licensing business plan, selling and marketing concept in franchising and licensing; Operation in franchising and licensing business like accounting, financial and legal aspects in franchising and licensing industry.

Course Outcomes:
CO1 - Ability to explain the franchising and licensing business theories

and concepts.

CO2 - Ability to describe the business operation in franchising and licensing.

CO3 - Ability to analyse business opportunities in franchising and licensing business.

BFT213 PENGURUSAN USAHA NIAGA [BUSINESS VENTURE MANAGEMENT]
No of Credits: 3

Course Synopsis:
This course is indeed an extension subject of Introduction to Business (BFT 105). Students need to apply the knowledge that has been gained earlier for the implementation of the business venture and management process and strategies. The main objective of this course is to equip students with communication skills to make good business venture management decisions, and to formulate cost effective business strategies and programmes, if we want to attain business organizational objectives.
It requires students to integrate, in an optimal manner, the appropriate strategies associated with each element of the marketing mix (4Ps) to produce a comprehensive business venture management plan.

Course Outcomes:

CO1 - Ability to analyse the entrepreneurial process for new venture creation

CO2 - Ability to evaluate opportunity-driven business ideas using appropriate methodology.

CO3 - Ability to organize new business ventures.

BFT215 KEWANGAN KEUSAHAWANAN [ENTREPRENEURIAL FINANCE]
No of Credits: 3

Course Synopsis:
The subject covers a broad range of core financial aspects that are pertinent for entrepreneurs in starting a business and understanding the financial aspects of running a business may be an overwhelming experience. The course discusses sole proprietorships, partnerships, limited liability companies, and private corporations. Key financial topics, such as financial statements, break-even analysis, working capital management, and time value of money are also explained and examined. The class will also study important topics in finance and describes how mastering these topics can positively impact business success. Students are also expected to master the financial tools of Time-Value-of-Money and financial statement analysis - Discusses horizontal, vertical, and ratio analysis of financial statements in detail. Other topics of discussion include financial distress and mergers and acquisition, and also personal financial planning which is relevant for entrepreneurs.

Course Outcomes:

CO1 - Ability to describe and discuss the financial concepts and issues that are of particular significance to the entrepreneur.

CO2 - Ability to analyze and interpret financial information for the development of the firm's financial plan and strategies.

CO3 - Ability to analyze the financial requirements of firm and apply the various financial tools for to solve problem and make decision.

BFT218 PENGENALAN TEKNOLOGI PEMBUATAN [INTRODUCTION TO MANUFACTURING TECHNOLOGY]
No of Credits: 3

Course Synopsis:
This course introduces students to some fundamentals of manufacturing technology and its function in product development, production and business. Topics taught include introduction to manufacturing technology and its role in concurrent engineering, metallic and non-metallic material behaviours, casting, forming and shaping processes. Aspects of material removal, joining and surface technology are expose later. Finally, the engineering metrology and quality assurance, manufacturing system and automation, human factors and manufacturing costing.

This course introduces students to various design aspects in the application of product development. Design plays an importance role in transform-

ing product ideas into physical form which is vital to product development. The design function includes engineering design and industrial design. It is complemented by marketing and manufacturing.

Course Outcomes:

CO1 - Ability to define and discuss the relationship between manufacturing technology and new product development describe and identify the role of manufacturing technology in product design production and business

CO2 - Ability todefine the fundamentals of materials, describe and discuss the behavior and manufacturing properties, define forming and shaping process, and discuss and choose the related process and wquipments

CO3 - Ability to define material removal processes, discuss and choose the related process and equipment, define the joining processes and surface technology, discuss and justify the related process and equipments

BFT219 REKA BENTUK & PEMBANGUNAN PRODUK [PRODUCT DESIGN & DEVELOPMENT]
No of Credits: 3

Course Synopsis:
This course introduces students to various design aspects in the application of product development. Design plays an importance role in transforming product ideas into physical form which is vital to product development. The design function includes engineering design and industrial design. It is complemented by marketing and manufacturing.

Course Outcomes:

CO1 - Ability to identify and discuss the nature and role product design in relation to product development

CO2 - Ability to develop an appreciation for product design function throughout the product development process

CO3 - Ability to describe and apply product design and development techniques for different types of products

BFT220 KEUSAHAWANAN TEKNOLOGI [TECHNOLOGY ENTREPRENEURSHIP]
No of Credits: 3

Course Synopsis:
This course concentrates on the innovative transformation of knowledge into commercial products and services. Students shall access real technologies for commercial potential in terms of licensing and for venture development. The course begins by examining concepts associated with technology commercialization. Concepts are introduced to improve and accelerate the commercialization process, from decisions made by scientist at the research bench, through the development, patenting, and licensing of new technologies, to the formation of entrepreneurial enterprises. Intellectual property studies are to be included in this course.

Course Outcomes:

CO1 - Identify and explain the key concepts and options in technology entrepreneurship and commercialization.

CO2 - Identify and analyze related technologies for commercialization potential.

CO3 - Analyze and derive the steps that a technology goes through in the journey from the laboratory to the marketplace.

CO4 - Evaluate the roles that intellectual property protection and licensing play in the commercialization process.

BFT221 PENGURUSAN OPERASI [OPERATIONS MANAGEMENT]
No of Credits: 3

Course Synopsis:
This course will introduce the concepts and techniques for design, planning and control of manufacturing and service operations at local and international level. This course will provide basic definitions of all operational issues such as operation strategy, managing quality, process strategy, location strategies, layout strategies, aggregate planning, Capacity planning, work measurement and queuing analysis.

Course Outcomes:
CO1 - Ability to describe the impact of operations management decisions on business management.
CO2 - Ability to explain operations management theories and concepts in relation to a range of organisational problems.
CO3 - Ability to propose solutions based on theories and concepts in solving organisational problems.

BFT222 PERAKAUNAN PENGURUSAN [MANAGERIAL ACCOUNTING]
No of Credits: 3

Course Synopsis:
This course introduces students with the knowledge of managerial accounting information in planning, controlling and decision making by using costing, budgeting and decision making techniques for organization's internal users.

Course Outcomes:
CO1 - Ability to explain the role of managerial accounting and the concept of cost.
CO2 - Ability to analyse costing techniques in managing internal business decision for planning, control and decision making.
CO3 - Ability to evaluate cost-volume-profit analysis, profit planning, standard costing and short term decision making.

BFT223 PENGURUSAN SUMBER MANUSIA [HUMAN RESOURCE MANAGEMENT]
No of Credits: 3

Course Synopsis:
This course will introduce students to the elements of effective use of human capital in an organisation through the management of people-related activities. It will discuss the concepts and functions of human resource management, legal environment in human resource management, job analysis and design, staffing, human resource development, performance appraisal, compensation management, occupational safety and health, industrial relations, and employee rights and disciplines.

Course Outcomes:
CO1 - Ability to explain the definition of human resource management and its functions in the workplace.
CO2 - Ability to discuss the legal Acts in Malaysia which influence human resource management practices in Malaysia.
CO3 - Ability to demonstrate the effects of human resource management functions to the individual and organization.

BFT224 KOMUNIKASI PERNIAGAAN [BUSINESS COMMUNICATION]
No of Credits: 3

Course Synopsis:
This course applies the communication tools and analysis issues in business management. The module will focus on the patterns and principles of business communication, multicultural and global communication management, communication technology and its trends in business settings, organizational and managerial communication as well as preparation in the formal writing and oral presentation.

Course Outcomes:
CO1 - Ability to explain the concepts of communication in business environments.
CO2 - Ability to apply the skills of business communication in appropriate business situation.
CO3 - Ability to communicate effectively and efficiently in business contexts.

BFT225 PERNIAGAAN DIGITAL [DIGITAL BUSINESS]
No of Credits: 3

Course Synopsis:
This course is a comprehensive guide to on digital business. The course introduces key concepts in digital business and e-commerce, the infrastructure and applications of digital business.

Course Outcomes:
CO1 - Ability to apply theories and concept of digital business in the working environment.
CO2 - Ability to use appropriate digital business tools that will be able to help engage in lifelong learning.
CO3 - Ability to demonstrate professional technopreneurship skill that will able to increase competency for a sustainable development.

BFT226 JUALAN PEORANGAN [SALESMANSHIP]
No of Credits: 3

Course Synopsis:
This course emphasises on duties of professional salesperson on the way to develop the sales presentations. It also covers the entire selling process from prospecting to follow up. The importance of of the proper use and management of one's time and sales territory coverage. This course provide students with the ability to analise the sales opportunity based on business activities. It also expose students on the ability to evaluate the elements of sales application towards supplier and customer.

Course Outcomes:
CO1 - Ability to apply the sales concept based on business activities
CO2 - Aility to analise the sales opportinity using the personal selling strategies and techniques.
CO3 - Ability to evaluate the important elements of personal salling and the application towards customers.

BFT314 PENGURUSAN SILANG BUDAYA [CROSS-CULTURAL MANAGEMENT]
No of Credits: 3

Course Synopsis:
This course seeks to provide students with an understanding of an effective cross -cultural management and the challenges that are likely to be faced while working internationally. This course covers cultural aspect of leadership, corporate strategy, marketing, communication and its barriers across culture, negotiation and international teams and cultural conflicts. Cross- cultural competencies are exposed to the students in order to work effectively in their international assignments setting.

Course Outcomes:
CO1 - Ability to explain the cross cultural management theories and concepts in international business setting.
CO2 - Ability to apply cultural theories and concepts for international business opportunities.
CO3 - Ability to analyse situations based on cross cultural management theories and concept for solving international business problems.

BFT316 KEPIMPINAN DIDALAM ORGANISASI [LEADERSHIP IN ORGANIZATION]
No of Credits: 3

Course Synopsis:
This course is designed to enhance students' understanding and widening their perspective, knowledge and conceptions of leadership theories, styles, effectiveness and practical applications for their career in business, government and non-profit organizations. The main focus of this course is on managerial leadership effectiveness and what makes a person an effective leader. The syllabus covers leadership approaches, behavioural tendencies of leaders, teamwork, uses of power, participation, delegation, and empowerment, effective change, developing leaderships skills and cross-cultural leadership.

Course Outcomes:
CO1 - Ability to explain the leadership's concepts and theories practiced in organization.
CO2 - Ability to analyse the situational factors that affect the leadership styles and behaviours in organization.
CO3 - Ability to analyse the effective leadership skills to increase organization performance.

BFT318 KAEDAH PENYELIDIKAN [RESEARCH METHODOLOGY]
No of Credits: 3

Course Synopsis:
This course addresses the theoretical concepts of research methods in all area of business. It introduces students to the fundamental of preparing the research and presenting the written and oral professional reports. Amongst areas to be revealed to students include: (i) the basic step of research process, (ii) data collection techniques, (iii) research methodologies, (iv) findings, (v) data analysis, (vi) discussion, and (vii) report writing.

Course Outcomes:
CO1 - Ability to formulate research topic and methods in business.
CO2 - Ability to develop research design and all stages in the research process.
CO3 - Ability to present a quality research findings.

BFT319 PENGURUSAN RISIKO [RISK MANAGEMENT]
No of Credits: 3

Course Synopsis:
The subject covers a broad range of core aspects that are pertinent for entrepreneurs as starting a business and understanding the risk management of running a business. The course discusses fundamentals of risk management, risk management techniques and strategies. Key topics include, risk and its treatment, legal principles of insurance, financial risk management, enterprise risk management, and also personal insurance which is relevant for entrepreneurs.

Course Outcomes:
CO1 - Ability to describe te risk management process that can applied to a variety of risks.
CO2 - Ability to develop the understanding of what risk is, how it can be measured and transferred and the importance of risk management in the organization.
CO3 - Ability to apply risk management process to two major area of concern for corporations; liability risk and financial risk details.

BFT321 PEMASARAN PERKHIDMATAN [SERVICES MARKETING]
No of Credits: 3

Course Synopsis:
This course focused on a comprehensive reference of managing services in marketing elements in an organization. It divided into 4 parts: Understanding Service Products,Consumers,and Markets; Applying the 4 P's of Marketing to Services; Managing the Customer Interface and Implementing Profitable Service Strategies.

Course Outcomes:
CO1 - Ability to recall and discuss the service products, consumers and markets in the new marketing perspectives.
CO2 - Ability to explain and apply the 4Ps of marketing to services and identify the role of marketing communications.
CO3 - Ability to analyze the managing service processes and relate the service environment to evaluate the marketing decisions.

BFT322 PENGURUSAN RANTAIAN BEKALAN [SUPPLY CHAIN MANAGEMENT]
No of Credits: 3

Course Synopsis:
This subject focus on Supply chain management topics such as overview of supply chain management, purchasing issues in supply chain management, supplier relationship management, strategic sourcing, forecasting methods, ERP system, inventory management, total quality management, just in time, customer relationship management, service response logistic and process integration.

Course Outcomes:
CO1 - Ability to discuss the concepts and processes involve in supply chain management.
CO2 - Ability to explain effective supply chain in a business environment.
CO3 - Ability to analyse suitable supply chain model in business environment.

BFT325 PENGURUSAN LOGISTIK [LOGISTIC MANAGEMENT]
No of Credits: 3

Course Synopsis:
The course focuses on the fundamental principles of contemporary logistic management. It involves the roles and contributions of logistics management in ensuring successful supply chain management process (plan, implementation, control); the efficient, effective forward and reverse flow, storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers' requirements. It then focuses on the additional competitive reassures and reengineering possibilities generated by the rapid advances in Information and Communication Technology (ICT) and Intelligent Transportation Systems (ITS) technologies. The final part of the course covers transportation management which highlights the multi-modal transportation.

Course Outcomes:
CO1 - Ability to explain the role, importance and contribution of logistics management.
CO2 - Ability to identify problems and apply sound logistics solutions in business situation.
CO3 - Ability to analyse criteria to perform a better logistics management process.

BFT326 PENGURUSAN PROJEK [PROJECT MANAGEMENT]
No of Credits: 3

Course Synopsis:
In this course, students shall learn basic management concepts and models that could enhance successful management of projects in engineering and technology. Topics include, structured approach to project management, project life cycle, project selection and evaluation, organizational concepts in project management, project planning, conflict and negotiation, budgeting and cost estimation, scheduling, resource allocation, monitoring, information systems and project evaluation and control, project reviewing and project termination.

Course Outcomes:
CO1 - Define and discuss organizational issues and illustrate quantitative methods that are necessary for successful project management.
CO2 - Illustrate organizational concepts in project management, analyze project planning and identify conflict and negotiation.
CO3 - Evaluate and analyze budgeting and cost estimation, scheduling, resource allocation, monitoring, information system and project evaluation, control, project reviewing and project termination.

BFT328 URUSAN KEJURUTERAAN & TEKNOLOGI [MANAGING ENGINEERING & TECHNOLOGY]
No of Credits: 3

Course Synopsis:
This course introduces students to the management functions of planning, organizing, leading and controlling; analyzes the application of these functions in research, design, production, technical marketing and project management; and studies evolution of the engineering career and the transition to engineering management.

Course Outcomes:
CO1 - Ability to identify and discuss the nature and role of engineering and technology management and apply related tasks and functions of technology management
CO2 - Ability to develop an appreciation for the different technology management roles throughout the product life cycle and analyze some of the fundamentals of managing technology project
CO3 - Ability to describe, analyse and propose issues related to engineers including ethics, globalization and future challenges

BFT337 PEMASARAN ANTARABANGSA [INTERNATIONAL MARKETING]
No of Credits: 3

Course Synopsis:
This course is to expose the students to the issues in international marketing. The course will look at international environment in terms of politics, economics, social and cultural. The students should be able apply this knowledge to formulate the marketing mix strategies to penetrate foreign market.

Course Outcomes:
CO1 - Ability to explain the importance of international marketing theories and concepts.
CO2 - Ability to apply theories and models of international marketing in relation to a range of organizational problems and issues concerning the international marketing field.
CO3 - Ability to analyse the outputs from the application of models and tools in international marketing.

BFT338 PENGURUSAN STRATEGIK [STRATEGIC MANAGEMENT]
No of Credits: 3

Course Synopsis:
Strategic management is a multidisciplinary course that integrates the knowledge learned from other courses that were concerned with a specific functional area (for example production, marketing, finance, accounting, human resources), and/or well-defined and specialized body of knowledge (for example economics, statistics, business law, information systems).

Course Outcomes:
CO1 - Ability to analyse business strategies to achieve competitive advantage.
CO2 - Ability to evaluate business problems or issues for strategy formulation.
CO3 - Ability to assess the appropriateness of strategy implementation and control.

BFT339 REKA BENTUK DAN PEMBANGUNAN SISTEM KEJURUTERAAN [ENGINEERING SYSTEM DESIGN AND DEVELOPMENT]
No of Credits: 3

Course Synopsis:
This course intorduces the students on the system process from origin to finished product.

Course Outcomes:
CO1 - Ability to define the importance of system and design management theories and concepts
CO2 - Ability to analize the theories and models of system and design management
CO3 - Ability to analize the outputs from the applications/models

BFT344 PENGURUSAN EXPORT IMPORT [EXPORT IMPORT MANAGEMENT]
No of Credits: 3

Course Synopsis:
This course will expose students to the export-import introduction; strategies and practices; documentation and steps; procedures; methods of financing; instruments of payment and pricing; customs clearance of cargo; logistic and characteristic of mode of transportation; and containerization and leasing practices.

Course Outcomes:
CO1 - Ability to explain the application of various export-import basic documents and procedures in international business.
CO2 - Ability to analyse export and import opportunities for international market.
CO3 - Ability to plan modes of transportation, customs clearance, containerization and leasing practices for export and import activities.

BFT347 ISU-ISU EKONOMI GLOBAL [GLOBAL ECONOMICS ISSUES]
No of Credits: 3

Course Synopsis:
This course will focus on major global economic issues that characterize the state of our current world. The students will be emphasized on global economic issues, the world economy evolution, economic cooperation among the nations, demographics, geopolitics, the economic powers, industrial revolutions, world hunger and poverty, sustainable development and current issues evolved

Course Outcomes:
CO1 - Ability to apply the basic concepts of global economic issues
CO2 - Ability to analyse the importance of cooperation amongst nation demographics, geopolitics and powers
CO3 - Abi;ity to evaluate the impocts of global economic issues connected on current social, political, cultural and environmental responsibilities

BFT351 PROJEK TAHUN AKHIR [FINAL YEAR PROJECT]
No of Credits: 6

Course Synopsis:
An exposure to the students in business and management based research project

Course Outcomes:
CO1 - Ability to conduct business research independently.
CO2 - Ability to apply appropriate business research methods and business data analysis.
CO3 - Ability to evaluate data collection for business decision process.

BFT362 RANCANGAN PERNIAGAAN UNTUK PROJEK KEUSAHAWANAN KEJURUTERAAN [BUSINESS PLAN FOR ENGINEERING ENTREPRENEURSHIP PROJECT]
No of Credits: 3

Course Synopsis:
This course provides an exposure to the students to write a business plan proposal which combine business and basic engineering aspect. Students shall have an opportunity to put their learning into practice in a specific business plan format with specific product project. The product or project to be included in the proposal shall reflect from various sources such as the faculty, industry or student's project.

Course Outcomes:
CO1 - Ability to apply theory into practice
CO2 - Ability to undertake project planning, implementation and management
CO3 - Ability to strengthen capability in working independently

BIT291 PROGRAM INKUBASI [INCUBATION PROGRAM]
No of Credits: 4

Course Synopsis:
This course exposes students to the actual entrepreneurship and business world. Students will be stationed in business incubators, and have been assigned to one of the newly startup companies or enterprise. Students shall experience challenges which include start up a company / business the company procedures, banking activities, development of new product, business networking, management of the company and others. Exposure to business world shall trigger students into fostering an entrepreneurial network.

Course Outcomes:
CO1 - Ability to display good work performance during training period
CO2 - Ability to demonstrate good personality including communication skill leadership and work ethics during training period
CO3 - Ability to describe and demonstrate kkowledge regarding host company and industrial training activities

BIT292 LATIHAN INDUSTRI [INDUSTRIAL TRAINING]
No of Credits: 4

Course Synopsis:
Industrial Training is a practical-oriented course where students will go for attachment at industries or some related organizations for certain period of time. During industrial training, the students will be exposed to the real working environment where they will learn about the company operations, department functions, works and safety procedures, project management, technical skills, communication, administration, etc. The students are also required to submit their logbook and final report at the end of the Industrial Training period.

Course Outcomes:
CO1 - Ability to display good work performance and adapt to the working environment during training period
CO2 - Ability to demonstrate good communication skills, leadership and work ethics during training period
CO3 - Ability to perform the assigned task given by the host company

NEW MEDIA COURSES

KUT101 PENGENALAN KEPADA TEORI KOMUNIKASI [INTRODUCTION TO COMMUNICATION THEORY]
No of Credits: 3

Course Synopsis:
The course aims to expose the students to the basic concepts of human communications, theory and basic communication theories. Several definitions, the models, elements, functions and contexts of human communication will be explained. Description on several basic concepts, features and attributes of theory and the domain/families of theory will be the other focus of this course. Discussion on several basic theories of communication in its relevant contexts will be utilise to strengthen students understanding.

Course Outcomes:
CO1 - Explain concepts, model, elements, functions and contexts of communication
CO2 - Demonstrate the features, attributes and functions of theory in the context of new media communication
CO3 - Elaborate basic communication theories based on contexts

KUT103 PERUCAPAN AWAM [PUBLIC SPEAKING]
No of Credits: 3

Course Synopsis:
This course provides both theoretical basis and practical instruction to speaking effectively in public. Areas covered include; topic selection, audience analysis, speech preparation and organization, support of speeches with credible research, strategic and creative language use, effective listening and delivery skills, and common types of public speeches.At the end of this course, students should be able to demonstrate the speaking and to be effective communicators in academic settings, workplace and community.

Course Outcomes:
CO1 - Describe the vital ideas related to public speaking
CO2 - Apply knowledge in the process of preparing a speech
CO3 - Perform a public speech in front of the audience, according to the situation and event
CO4 - Analyse and verbally critique speeches and presentations

KUT113 PENGENALAN KEPADA MEDIA BAHARU [INTRODUCTION TO NEW MEDIA]
No of Credits: 3

Course Synopsis:
This course provides an insight of modern cyber culture, including various forms of human communication mediated by the creative application of computer technology, and the developments that have enabled this exploding phenomenon. This course studies the practice of new media in today's networked society; the implications of the technology; and the societal implications of the new connectedness. Second and third generation web-based media such as social networks, blogs, wikis, and web pages are also introduced to the students.

Course Outcomes:
CO1 - Explain the concepts of new media and computer technology.
CO2 - Distinguish computer hardware, software, communication media, its functions and characteristics.
CO3 - Elaborate and compare the new media tools used in producing/ publishing new media content.

KUT115 KOMUNIKASI VISUAL [VISUAL COMMUNICATION]
No of Credits: 3

Course Synopsis:
This course will guide the students understand the basic principles of visual communication and relationship with publishing products either in print or on the move. This course also explains the importance of visual communication in human life. This course will guide students to produce projects that are visually more meaningful. Students will be guided in understanding various concepts of visual perspective view, the history of visual communication and its development, its importance from the perspective of different cultures and their application in a publication. This course will help students to become more critical and sensitive in the use of color, layout, design and selection of tones in attracting attention and leave a meaning to the audience.

Course Outcomes:
CO1 - Explain the concepts and principles of visual communication with a suitable approach and process of issuing all forms of visual media.
CO2 - Summarize the elements of visual communication and analyze the appreciation meaning in the context of the creation of the product.
CO3 - Produce communication products that emphasize aspects of visual communication.

KUT116 PRINSIP-PRINSIP INTERAKSI MANUSIA-KOMPUTER [PRINCIPLES OF HUMAN-COMPUTER INTERACTION]
No of Credits: 3

Course Synopsis:
This course provides an overview of the principles of human computer interaction(HCI) that applicable to New Media Communication Programme. HCI is an interdisciplinary field that integrates theories and methodologies from computer science, cognitive psychology, design and many other areas. The course readings span current theory and practice in interface specification, design and evaluation in HCI. Students will work on the group report and group presentation to design, implement and evaluate computer interfaces. They should be able to explore the HCI in their projects, and analyze its relevant and usage for managerial usage and decision making.

Course Outcomes:
CO1 - Explain the principles of human computer interaction and analyze its relevant to managerial usage and decision making.
CO2 - Combine the principles of human computer interaction and relate its usage in today's activity.
CO3 - Modify various human computer interaction features and re-arrange them to retrieve the information.

KUT117 SOSIOLOGI DALAM MEDIA BAHARU [SOCIOLOGY IN NEW MEDIA]
No of Credits: 3

Course Synopsis:
This course provides an overview of the study of the relationship between humans and society. This paper will allow students to examine how economics, politics, religion, race, gender, family and the environment interact to shape people's lives. Students will learn to analyze social problems to discover their causes and possible solutions. This paper also prepares the students for employment in social service, recreation, teaching, and preparation for pre-professional studies.

Course Outcomes:
CO1 - Explain how social change factors, such as population, urbanization, or technology affect social structure and individuals.
CO2 - Discuss how the self develops sociologically and compare this to psychological, economic and other approaches.
CO3 - Justify how social structure varies across time and place and the effects of such variations.

KUT118 PENULISAN SKRIP DAN PAPAN CERITA DIGITAL [SCRIPT WRITING AND DIGITAL STORYBOARD]
No of Credits: 3

Course Synopsis:
The purpose of this cource is to expose students to the writing skills and its methods in the new media publication. Student will learn the interactive pattern of online writing as compared to the traditional writing. This course will help studnet to upgrade their understanding on the method of new media writing by appreciating the relevent concepts and will be able to apply them in the organisaional situation.

Course Outcomes:
CO1 - Explain the concepts that relate to the new media script writing & storyboard.
CO2 - Demonstrate the script writing and story board development skills in the new media.
CO3 - Justify creative ideas in new media writing and storyboard development.

KUT119 LITERASI MEDIA BAHARU [NEW MEDIA LITERACY]
No of Credits: 3

Course Synopsis:
This course examines the intersection of education and participatory culture, literacy and technology change, the knowledge gap, informal learning and knowledge communities, emerging social skills and cultural competencies across the lifespan.

Course Outcomes:
CO1 - Explain the concepts of New Media Literacy and the Internet of Things (IoT).
CO2 - Analyse the elements of New Media, IoT and Big Data in a variety of contexts.
CO3 - Elaborate on the issues related to New Media Literacy, IoT and Big Data.

KUT120 PENGENALAN KEPADA BAHASA PENGATURCARAAN [INTRODUCTION TO PROGRAMMING LANGUAGES]
No of Credits: 3

Course Synopsis:
This course is targeted to the students who have no or very little programming knowledge and experience. The goal of this course is to get students familiar with programming concepts and constucts at a relatively slow pace. This course also exposes the students about database for programming tasks in a business or technical environment.

Course Outcomes:
CO1 - Understand the concepts of related programming languages (program style/formatting and self- documenting code, and familiar with the debugging process).
CO2 - Able to prepare basic programming solutions in various contexts.
CO3 - Able to develop a simple application/product using related programming languages.

KUT121 KEMAHIRAN KREATIF DAN INOVATIF [INNOVATIVE AND CREATIVE SKILLS]
No of Credits: 3

Course Synopsis:
The course aims to enhance students' understanding and knowledge of the theories and processes related to creative thinking and innovative skills. This course focuses on processes which are relevant to solve the problems which will lead to the use of problem-solving tools.

Course Outcomes:
CO1 - Explain theories and concepts that are relevant to the creative and innovative thinking
CO2 - Demonstrate an effective approach to identify problems and looking for opportunities to solve the problem
CO3 - Reflecting the related stuff associated with creativity and innovation

KUT202 KOMUNIKASI ORGANISASI [ORGANIZATIONAL COMMUNICATION]
No of Credits: 3

Course Synopsis:
This course provides an introduction to contemporary theory and intellectual traditions applied to the study of organizations, including the role of organizations in society and cultural practices. Whatever your career goals, the knowledge you gain from participating in this course will help you make sense of how communication is integral to the organizational experience.

Course Outcomes:
CO1 - Use theories and concepts covered in the course to help them understand organizational processes and experiences.
CO2 - Analyze communication problems and potential solutions within organizations.
CO3 - Share knowledge with others about organizational communication through a team-based term project and presentation.
CO4 - Demonstrate knowledge of various theories of organizational communication by explaining related organizational practice.

KUT211 FOTOGRAFI DIGITAL [DIGITAL PHOTOGRAPHY]
No of Credits: 3

Course Synopsis:
In this course, students learn the basic principles of the photographic media, basic camera functions, become familiar with various settings and presets on camera, explore the photographic process from pre-visualization, taking images, digital storage media and transfer of images, to adjusting and manipulation of digital images, output to print and creating digital portfolio. Emphasis is placed on learning design principles, composition, and fundamental history and theory of photographic media. Through number of projects students approach various subjects to create images that are personal and expressive.

Course Outcomes:
CO1 - Describe the notion of digital photography as an art form.
CO2 - Apply camera techniques necessary for using digital photography as a creative tool.
CO3 - Adapt professional digital images editing using software
CO4 - Appraise the practice in the creation of images using their camera that they can visualize in their mind.

KUT212 REKABENTUK GRAFIK UNTUK MEDIA BAHARU [GRAPHIC DESIGN FOR NEW MEDIA]
No of Credits: 3

Course Synopsis:
This course is designed to build upon a basic level of skills in using Adobe Illustrator, and Adobe Photoshop, for those wishing to design a variety of graphics. This course also provides theoretical basis on graphic design such as Design Principle, Elements of arts, Stages of Design and types of graphic design. At the end of this course, students should be able to demonstrate the basic skill of Adobe software and basic knowledge about graphic design for both academic settings and industrial workplaces.

Course Outcomes:
CO1 - Interpreted key ideas related to the graphic design
CO2 - Build technical skills by using graphic software to produce creative projects
CO3 - Adapt the creative process in solving the design problem
CO4 - Explaining effectively about the project and by engaging audiences and enhancing communication with confident

KUT213 ANALISIS MEDIA BAHARU [NEW MEDIA ANALYSIS]
No of Credits: 3

Course Synopsis:
This course is designed to help students develop an informed, critical, and practical understanding of new communication media including analysis of digital media. This course enables students to demonstrate their understanding of the key concepts of media languages, representation, audience, production, skills and processes as well as express their creativity and originality.

Course Outcomes:
CO1 - Interpret the role of media in society to understand the impact of technological developments, and controls and constraints, on media production and use.
CO2 - Analyse skills, techniques, processes, conventions and technologies to create media work for audience, purpose and context.
CO3 - Create media communicate ideas in particular contexts and for different audiences and purposes.

KUT221 PENGURUSAN ERA BAHARU [NEW ERA MANAGEMENT]
No of Credits: 3

Course Synopsis:
This course aims to expose students to the basic concepts and skills to manage organizations in the new era. In general, this course focuses on the management of an organization such as planning, organizing, directing, and controlling; and monitoring the local and global organizations in a new era of management that is driven by the power of information technology.

Course Outcomes:
CO1 - Identify the concepts related to new era management
CO2 - Understanding the knowledge of new era management in an organization.
CO3 - Analyze new era management concepts with the real situation in\ the organization.
CO4 - Conclude the contemporary challenges facing management ethic and corporate social responsibility and international management.

KUT303 PEMASARAN DIGITAL [DIGITAL MARKETING]
No of Credits: 3

Course Synopsis:
Digital marketing is an exciting area of marketing practice. In this course, we will cover the what, why, and how of major current approaches, including online listening and monitoring, website traffic analytics, search engine optimization, search and display ads, affiliates, email marketing, and social media. Digital marketers approach their jobs with a curiosity about how new technologies will change business, with an insistence that strategy drive tactics, and with a measurement mindset. The course is designed to get the student to think like a digital marketing professional.

Course Outcomes:
CO1 - Apply the concepts used in Digital marketing
CO2 - Develop a Digital Marketing Planning Framework
CO3 - Evaluate Digital marketing concepts in online business

KUT311 PENERBITAN VIDEO DIGITAL [DIGITAL VIDEO PRODUCTION]
No of Credits: 3

Course Synopsis:
This course introduces students to the fundamentals of digital video production. Students will learn how to produce short videos, including story-boarding, directing, lighting and shooting, sound recording and will finish productions using current video- and sound-editing software.Particular attention is paid to the skills required to successfully bring a mediated story or message to an audience. Students will learn to analyse and respond critically to a variety of audio/visual productions.

Course Outcomes:
CO1 - Demonstrate various concepts in operating digital video production.
CO2 - Interpret audio/visual productions and respond critically.
CO3 - Evaluate the technical and aesthetic qualities of digital video productions in the context of contemporary video making trends.

KUT312 REKABENTUK & PEMBANGUNAN WEB [WEB DESIGN & DEVELOPMENT]
No of Credits: 3

Course Synopsis:
This course provides the knowledge and basic skills in creating, coding and posting basic HTML and CSS files to the Internet. Equipped with standard design guidelines to ensure strong website presentation, the students will have a foundational knowledge of website creation and apply it to the planning, design and development of heir own web page over the course of the semester. Critical thinking will be encouraged through class interactions, projects, and online postings.

Course Outcomes:
CO1 - Propose suitable HTML, CSS code and website designs.
CO2 - Demonstrate the skills of applying new media elements on websites.
CO3 - Develop a fully functioning website.

KUT313 SENI MEDIA BAHARU [NEW MEDIA ARTS]
No of Credits: 3

Course Synopsis:
This course offers an overview of and exposure to visual and media arts through a theoretical, aesthetic and practical framework. Students will be introduced to media concepts and techniques in creating a creative media artwork which they will create an interactive digital media, hologram, digital painting and projection mapping. As a result, students will be equipped to build their own creative media artwork. The practical component of the course will emphasize the creative process from conception of idea and writing through production and post production. Students will be given a series of assignments in which they will produce interactive digital media, hologram, digital painting and projection mapping projects in all genres discussed.

Course Outcomes:
CO1 - Apply the key concept and technical skill related to the new media technology.
CO2 - Apply the creative process in developing a creative new media project
CO3 - Design strategies for effectively engaging audiences and enhancing communication and creative artwork in all form of interactive media

KUT314 ASAS PEMODELAN 3D [3D MODELLING FOR BEGINNER]
No of Credits: 3

Course Synopsis:
This course aims to expose the students to the skills of practical in basic 3D modelling. This course will help to improve the students' ability to create basic 3d models for animation, game and film.

Course Outcomes:
CO1 - Design and develop simple 3D models and environments
CO2 - Apply and design materials for 3D models (Texturing)
CO3 - Able to compose effective rendering of 3D environments

KUT315 FOTOGRAFI KONTEMPORARI [CONTEMPORARY PHOTOGRAPHY]
No of Credits: 3

Course Synopsis:
The module will begin in a project directed framework but will develop towards independent research as it progresses. Students will develop a sound critical dialogue within the disciplines of photography, progressing into more independent practical solutions for a series of challenging projects. Students begin to construct a platform of individual study in discus-

sion with their personal tutor and informed by peer discussions.

Course Outcomes:
CO1 - Demonstrate descriptive and analytical skills with reference to advanced visual analysis of photographic images
CO2 - Demonstrate independent judgements with reference to the study of contemporary photography
CO3 - Develop a multi-tasking and multi-skilled approach to professional practices.

KUT314 PSIKOLOGI INDUSTRI [INDUSTRIAL PSYCHOLOGY]
No of Credits: 3

Course Synopsis:
This course focuses both on understanding the psychological bases of work behavior and on the organizational practices used to create a good fit between people's characteristics and work's demands. During this course, we will cover a number of topics including personnel selection, placement, training, work motivation, job satisfaction, leadership, teamwork, and work-family balance.

Course Outcomes:
CO1 - Elaborate how the science of human behavior is used to select, develop, and manage employees
CO2 - Conclude the major content areas and vital foundational components of Industrial Psychology
CO3 - Critically evaluate and apply solutions to the problems relevant to Industrial Psychology.

KUT335 PSIKOLOGI MEDIA [MEDIA PSYCHOLOGY]
No of Credits: 3

Course Synopsis:
Media psychology is concerned with the interaction between people and media technology on a cognitive, affective, and behavioral level. This course will help to improve the students' ability to comprehend the concepts related to media psychology that can be used to discuss issues related with human behaviour and media. The main concern in this course to help students to use their understanding of media psychology to recommend a solution to neutralize the possible impact of vast development in media technology to human.

Course Outcomes:
CO1 - Explain the concepts related to media psychology.
CO2 - Discuss issues related with interaction of human behavior and media technology
CO3 - Recommend a solution using psychology elements to solve problem in media basis.

KUT401 PERHUBUNGAN AWAM DAN MEDIA BAHARU [PUBLIC RELATIONS AND NEW MEDIA]
No of Credits: 3

Course Synopsis:
The course is designed to provide students with the theory and knowledge, understanding, skills and experience in applying new and emerging media technologies to public relations. Students will learn how new media technologies are used by PR professionals to develop online strategies.

Course Outcomes:
CO1 - Use knowledge and theoretical understanding of the way new and emerging media technologies are shaping and changing PR practices.
CO2 - Examine how social media and new media technologies are applied to PR activities
CO3 - Compare the relevance of various new media technologies for PR applications.
CO4 - Evaluate and recommend the solution to the PR issues in new media context

KUT403 UNDANG-UNDANG DAN ETIKA DALAM KOMUNIKASI MEDIA BAHARU [ETHICS AND LAW IN NEW MEDIA COMMUNICATION]
No of Credits: 3

Course Synopsis:
This course aims to enhance students' understanding and knowledge about policies, law and ethics related to communication and new media. Students will develop an understanding and appreciation of issues related to policies, law and ethics in new media. The case study approach will be used, with an emphasis on the principles and philosophy that underlie the various aspects of communications. At the end of this course, students should be able to analyze the important legal and ethical issues involved with the new media scenarios.

Course Outcomes:
CO1 - Explain the policies, laws and ethics that are relevant to the field of communications and new media
CO2 - Interpret and distinguish law and ethics related to communication and new media
CO3 - Evaluate the law and ethics related to communication and new media

KUT404 PENGURUSAN ACARA [EVENT MANAGEMENT]
No of Credits: 3

Course Synopsis:
This course is designed for students to explore the profession of event management. Students will learn concepts and professional skills of event management such as event planning, coordination, sponsorship, programming, marketing, communications, risk management, event research, and event evaluation.

Course Outcomes:
CO1 - Develop an enhanced understanding of professionalism in event management.
CO2 - Ability in analyzing and managing the risks of an event
CO3 - Identify and acquire a full range of resources to ensure successful event management.
CO4 - Apply event management concepts and skills to develop a comprehensive event project.

KUT406 KOMUNIKASI KRISIS DALAM MEDIA BAHARU [CRISIS COMMUNICATION IN NEW MEDIA]
No of Credits: 3

Course Synopsis:
Every day something happens in the world of business, economics, and/or in the lives of celebrities that involve crises.In this course the students will examine theories and concepts that lay at the intersections of communication, business, social psychology, and interpersonal relationships. This course will also address historic and contemporary examples of crises in order to give the students both atheoretical and hands-on approach to crisis communication and an understanding of how it relates to our daily world.

Course Outcomes:
CO1 - Critically analyze crisis communication in new media case studies
CO2 - Critically discuss crisis communication and management strategies and tactics for detection, prevention, preparation, containment, and recovery.
CO3 - Recommend the application of learned new media crisis communication and management skills to a real-world context

KUT407 ISU DAN CABARAN MEDIA BAHARU [NEW MEDIA ISSUES AND CHALLENGES]
No of Credits: 3

Course Synopsis:
This course provides a forum for students to discuss and generate ideas (prepare, practice and present) on issues related to a variety of applied new media communication project or research. Students will conduct a project or a study of research topic of their choice, discuss these issues with experts in the field of project/research selected, work in discussion groups, debate and problem solve on selected issues. The students will be

given an opportunity to integrate their knowledge, skills and practical experience gained in the program. This course seeks to improve their skills, confidence, and long-term success by focusing on critical thinking, writing, and speaking; on building community; and on engaging with institutional, intellectual, and social culture.

Course Outcomes:
CO1 - Determine the strategies to exploit information resources effectively, efficiently and ethically.
CO2 - Writing appropriate information related to current new media issues and challenges
CO3 - Perform a sharing session by communicating intelligently with audiences, and to collaborate effectively.

KUT412 ANIMASI UNTUK MEDIA BERSEPADU [ANIMATION FOR INTEGRATED MEDIA]
No of Credits: 3

Course Synopsis:
This course provides the students with the familiarization of the Adobe Flash and Adobe After Effects. It also will cover the fundamental programming concepts in addition the flash and after effects environment. The course also covers principles of interface design, measurement as it applies to embedded items, and requires the writing of an instructional design document. Students finishing this course will have at least one basic Animation and After Effects project for their portfolios demonstrating a strong knowledge of the software.

Course Outcomes:
CO1 - Apply the principles of animation in new media.
CO2 - Develop and animate vector graphic for new media
CO3 - Design vector animation and editing videos for new media.

KUT413 PENGIKLANANKREATIF DIGITAL [DIGITAL CREATIVE ADVERTISING]
No of Credits: 3

Course Synopsis:
This course focuses on creative thinking and exploration, creative strategy, realisation and experience which encourages students to become independent learners with the ability to synthesise and reflect.It covers specialised courses of study in creative advertising in copywriting, art direction and practical that develops students capability to articulate their learning to enter professional new media and advertising practice in creative industry.

Course Outcomes:
CO1 - Develop creative ideas and skills to communicate through media with audiences.
CO2 - Demonstrate an ability to select methods, manage and self direct projects in response to well defined problems, communicating effectively in a format appropriate to the discipline.
CO3 - Evaluate the capacity of producing work that follows the creative process from research through ideation to execution using a variety of media production technologies.

KUT414 REKA BENTUK AUDIO [AUDIO DESIGN]
No of Credits: 3

Course Synopsis:
Audio Design is an area that is closely related to the maintenance and handling of sound equipment and recording equipment. A comprehensive hands-on study of the post-production sound workflow in the video production process, with emphasis on sound editing, sound design and multitrack mixing. The course is project based.

Course Outcomes:
CO1 - Demonstrate proficiency of the skills basic to audio production, including recording, mixing and interconnecting various pieces of equipment.
CO2 - Create solutions, integrating technical knowledge and design

principles, for Audio products and the implementation of audio projects.
CO3 - Ability to revise digital audio projects through a three-step process of description, analysis and evaluation.

KUT421 KEMAHIRAN PENGURUSAN STRATEGI DAN PRESTASI ORGANISASI [SKILLS IN ORGANIZATIONAL STRATEGY AND PERFORMANCE MANAGEMENT]
No of Credits: 3
Course Synopsis:
This course is designed to explore the basic knowledge and skills to formulate a strategy and organizational performance. Students will learn the basic concepts of strategy and organizational performance and hone skills on how to formulate the strategy of an organization such as mission and vision, scanning the environment, set the theme and the success of strategic, strategic objectives, strategic map, performance measures, strategic initiatives, and implementation of strategies and performance automation.
Course Outcomes:
CO1 - Conduct critical analysis on the organizational strategy and /or performance management
CO2 - Formulate the organizational strategy and performance measures step by step.
CO3 - Produce organizational strategy and performance management plan documents concerning the current situation.

KUT322 KEUSAHAWANAN ELEKTRONIK [ELECTRONIC ENTREPRENEURSHIP]
No of Credits: 3
Course Synopsis:
The course aims to enhance students' understanding and knowledge of the theories and processes related to Electronic Entrepreneurship. This course focuses on processes which are relevant to the modern business practice by using internet as the platform for the business.
Course Outcomes:
CO1 - Determine the theories and concepts that are relevant to the entrepreneurship and preparation as electronic entrepreneurship.
CO2 - Demonstrate effective approach to identify and perform the business plan.
CO3 - Evaluate the process of e-entrepreneurship platform.

KUT331 KAEDAH PENYELIDIKAN [RESEARCH METHODS]
No of Credits: 3

Course Synopsis:
The course focuses on the processes involved in conducting research in the field of social sciences particularly in new media and communication. It aims at providing the experience for students to apply selected research designs to conduct research focuses in the field of new media and communication. In addition it develops research exposure in collecting, analyzing and interpreting research data. The course will enable students to apply research format to prepare a research proposal.

Course Outcomes:
CO1 - Integrate the five basic research processes conducting research in the field of new media and communication (social sciences).
CO2 - Identify research designs to conduct research in the field of new media and communication (social sciences).
CO3 - Justify the skills and understanding in collecting, analyzing and interpreting research data.
CO4 - Prepare a research proposal.

KUT332 PENAKULAN DATA [DATA REASONING]
No of Credits: 3

Course Synopsis:
The course provide to students the process of evaluating data using analytical and logical reasoning to examine each component of the data provided. Data from various sources is gathered, reviewed, and then analyzed using a variety of specific data analysis methods with the goal of discovering useful information, or supporting decision-making and learn to use data to make reasonable, useful conclusions and to write the results and reports in effective and convincing ways.

Course Outcomes:
CO1 - Identify the concepts related to the basics of statistical thinking with an interesting question and some data.
CO2 - Apply the correct statistical tool to answer question of interest about own data, using available statistical software/transcribing manually.
CO3 - Write clearly and concisely about own research topic so that the reader can easily understand the purpose and results of own research.
CO4 - Interpret findings and develop a meaningful conclusion.

KUT432 PROJEK TAHUN AKHIR 1 [FINAL YEAR PROJECT 1]
No of Credits: 2

Course Synopsis:
This course comprises the first phase of final year project, and provides the opportunity to apply knowledge and skills in planning and managing projects. At the end of the semester, the students will defend their project proposal prior to a full project execution in the next semester.

Course Outcomes:
CO1 - Formulate project planning, implementation and management of their selected project.
CO2 - Practice ethical and professional norms for the implementation of the projects.
CO3 - Ability to prepare project proposal, present and justify the projects.

KUT433 PROJEK TAHUN AKHIR2 [FINAL YEAR PROJECT 2]
No of Credits: 4

Course Synopsis:
This course comprises the second phase of final year project, and provides the opportunity to apply
knowledge and skills in managing and implementing projects. At the end of the semester, the students
will present their project report in a seminar.

Course Outcomes:
CO1 - Execute project and management of their selected project.
CO2 - Practice ethical and professional norms for the implementation of the projects.
CO3 - Ability to prepare project report, present and justify the projects.

KIT432 INDUSTRIAL TRANING [LATIHAN INDUSTRI]
No of Credits: 6

Course Synopsis:
The course will expose students to the technical and application aspects as well as other organizational aspects such as company organization structure, company operation, department function, work procedure, safety procedure, management, communication, technical skills, project management and presentation. The students are also required to submit their log book and report at the end of the Industrial Training. Overall, the course is a practical-based course.

Course Outcomes:
CO1 - Display good work performance and adapt to the working environment during training period.
CO2 - Demonstrate good communication skills, leadership and work ethics during training period.
CO3 - Perform assigned task given by Host Company

PUW122/UUT122 KEMAHIRAN DAN TEKNOLOGI DALAM KOMUNIKASI [SKILLS AND TECHNOLOGY IN COMMUNICATION]
No of Credits: 2

Course Synopsis:
This course introduces students to the basic aspects of human, Students are introduced to motivation, knowledge and skills as tools for competence communication. The first part of the course discusses the basic process in an effective communication such as perception, verbal and non-verbal communication, listening skills, basic communication models and the use of information technology in communication. The second part deals with competence communication in the contexts of interpersonal communica-

tion, organization communication, small group communication, basic skill for presentation and intercultural communication.

Course Outcomes:
CO1 - Ability to define the concepts of communication and technology in communication
CO2 - Ability to describe the elements of communication
CO3 - Ability to describe the communication skills in various context
CO4 - Ability to apply the basic technology in communication context

UUW130 FALSAFAH DAN ISU SEMASA [PHILOSOPHY AND CURRENT ISSUES]
No of Credits: 2

Course Synopsis:
Kursus ini merangkumi hubungan ilmu falsafah dengan Falsafah Pendidikan Kebangsaan dan Rukunegara. Penggunaan falsafah sebagai alat untuk memurnikan budaya pemikiran dalam kehidupan melalui seni dan kaedah berfikir serta konsep insan. Topik utama dalam falsafah iaitu epistemologi, metafizik dan etika dibincangkan dalam konteks isu semasa. Penekanan diberi kepada falsafah sebagai asas bagi menjalin dialog antara budaya serta memupuk nilai sepunya. Di hujung kursus ini pelajar akan mampu_ melihat disiplin-disiplin ilmu sebagai satu badan ilmu yang komprehensif dan terkait antara satu sama lain.

Course Outcomes:
CO1 - Menjelaskan isu semasa berlandaskan ilmu falsafah, Falsafah Pendidikan Kebangsaan dan Rukunegara.
CO2 - Menerangkan isu semasa berdasarkan aliran pemikiran utama dalam pelbagai aliran falsafah.
CO3 - Menghuraikan isu semasa melalui perspektif perbandingan falsafah sebagai asas bagi menjalinkan dialog antara budaya.

UUW131 PENGHAYATAN ETIKA DAN PERADABAN \[APPREACIATION ETHIC AND CIVILIZATION]
No of Credits: 2

Course Synopsis:
Kursus ini menerangkan tentang konsep etika daripada perspektif peradaban yang berbeza. Ia bertujuan bagi mengenal pasti sistem, tahap perkembangan, kemajuann dan kebudayaan sesuatu bangsa dalam mengukuhkan kesepaduan social. Selain itu, perbincangan berkaitan isu-isu kontemporari dalam aspek ekonomi, politik, social, budaya dan alam sekitar daripada perspektif etika dan peradaban dapat melahirkan pelajar yang bermoral dan professional. Penerapan amalan pendidikan berimpak tinggi (HEIPs) yang bersesuaian digunakan dalam penyampaian kursus ini. Di hujung kursus ini pelajar akan dapat menghubungkait etika dan kenegaraan berminda sivik.

Course Outcomes:
CO1 - Menjelaskan konsep etika dari peradaban yang berbeza
CO2 - Membandingkan sistem, tahap perkembangan, kemajuan sosial dan kebudayaan merentas bangsa.
CO3 - Membincangkan isu kontemporari berkaitan ekonomi, politik, sosial, budaya dan alam sekitar daripada perspektif etika dan peradaban.

UUW224 KEUSAHAWANAN KEJURUTERAAN [ENGINEERING ENTEPRENUESHIP]
No of Credits: 2

Course Synopsis:
The purpose of this course is designed to focus on training, education, and competency assessments, ensuring students are responsive to the dynamic economic environment and societal demands on a global level. Serving as a center of gravity, the course provides both knowledge and access to resources such as preparation, support, evaluation of opportunities, business planning, marketing,financial consultation, networking and e-commerce.

Course Outcomes:
CO1 - Ability to define the concepts of entrepreneurship and preparation as an entrepreneurship
CO2 - Ability to describe the elements of creativity an innovation and

evaluation of opportunities.
CO3 - Ability to produce business plan
CO4 - Ability to relate the issues in entrepreneurship with the current business situation

UUW322 KEMAHIRAN BERFIKIR [THINKING SKILL]
No of Credits: 2

Course Synopsis:
Kursus ini bertujuan membina kemahiran berfikir para pelajar dalam konteks penyelesaian masalah. Kemahiran menyelesaikan masalah pada umumnya menuntut dua bentuk pemikiran iaitu pemikiran kreatif dan pemikiran kritis. Melalui pelbagai bentuk prinsip dan kaedah pemikiran lahir, logik, luhur serta lateral pelajar diharapkan berkemampuan untuk berfikir secara lebih kreatif, inovatif dan kritis dalam menghadapi pelbagai masalah dalam kehidupan dan kerjaya mereka.

Course Outcomes:
CO1 - Ability to understand and explain the related thinking skills philosophies, theories and concepts theories and concepts
CO2 - Ability to apply and discuss the appropriate and suitable thinking skill theories and concepts in managing and resolving issues
CO3 - Ability to interpert case studies using thinking skills

UUW125 KOMUNIKASI KORPORAT [CORPORATE COMMUNICATION]
No of Credits: 2

Course Synopsis:
This course introduces the basic corporate communication strategies needed to address various communication requirements in order to build beneficial relationships between an organization and its stakeholders. Students will learn strategies and tactics within the corporate communication strategy framework to help an organization to achieve its planned objectives across the internal and external contexts. The skills gained through the subject will enable students to determine appropriate ways of dealing with primary corporate communication issues in 'real-life' settings.

Course Outcomes:
CO1 - Explain the principles of corporate communication concepts in organization
CO2 - Apply learned strategies to improve communication for different sub functions such as media relations, internal communications, investor Relations, and crisis communication.
CO3 - Analyze the role of corporate communication within cultural, political and social contexts

UUW126 PSIKOLOGI INDUSTRI [INDUSTRIAL PSICOLOGY]
No of Credits: 2

Course Synopsis:
This course focuses both on understanding the psychological bases of work behavior and on the organizational practices used to create a good fit between people's characteristics and work's demands. During this course, we will cover a number of topics including personnel selection, placement, training, work motivation, job satisfaction, leadership, teamwork, and work-family balance.

Course Outcomes:
CO1 - Elaborate how the science of human behavior is used to select, develop, and manage employees
CO2 - Conclude the major content areas and vital foundational components of Industrial Psychology
CO3 - Critically evaluate and apply solutions to the problems relevant to Industrial Psychology.

UUW127 KOMUNIKASI DAN PENGURUSAN KONFLIK [COMMUNICATION AND CONFLICT MANAGEMENT]
No of Credits: 2

Course Synopsis:
This first part of the course discuss about understanding of conflict such as definition and approaches to conflict and communication. The Second part, deals and manage conflict with competence communication in the contexts of interpersonal conflict, organizational conflict and intercultural conflict.

Course Outcomes:
CO1 - Ability to describe the concepts of communication and conflict
CO2 - Ability to describe the appropriate and suitable managing conflict in various contexts

UUW128 PENGURUSAN SUMBER MANUSIA
[HUMAN RESOURSE MANAGEMENT]
No of Credits: 2

Course Synopsis:
This course provides an introduction to the critical issue of human resourxe management.

Course Outcomes:
CO1 - Ability to differentiate the HRM elements and functions, and analyze the activities involved in HRM.
CO2 - Ability to differentiate the terms of HR development, analyze the process of performance management, compensation and rewards management.
CO3 - Ability to develop and manage Organizational Safety and Health and Industrial Relations issues.

MATHEMATICS COURSES
DQT101 MATEMATIK I [MATHEMATICS I]
No of Credits: 3

Course Synopsis:
This course will introduce the fundamental principles and concepts in algebra and trigonometry. The topics that will be discussed in this course are trigonometric, complex numbers, matrices and vectors. It will acquire ability to develop basic mathematical solving solution to well-defined the engineering problem.

Course Outcomes:
CO1 - Ability to express the concepts of trigonometric and solve the problems involving trigonometric functions.
CO2 - Ability to express the operations and solve the problems involving complex numbers.
CO3 - Ability to identify the properties and solve the operations involving matrices.
CO4 - Ability to identify and apply the concepts of vectors, solve and explain the problems involving vectors.

DQT102 MATEMATIK II [MATHEMATICS II]
No of Credits: 3

Course Synopsis:
This course will introduce the definition of limits and continuity. The topics also discuss the method of differentiations and integrations, and its applications. At the end, students will learn the concept of statistics and probability.

Course Outcomes:
CO1 - Ability to define the definition of limits and obtain the limits.
CO2 - Ability to express and demonstrate the concepts of differentiation, differentiate for any given function and solve its applications.
CO3 - Ability to express and demonstrate the concepts of integration, integrate for any given function and solve its applications.
CO4 - Ability to apply the concepts of probability, explanatory data analysis and understand the basic concept of statistics, solve and explain the results.

DQT203 MATEMATIK III [MATHEMATICS III]
No of Credits: 3

Course Synopsis:
This course introduces to ordinary differential equations (ODE). The topic begins with an introduction to the first order differential equations where the students will be able to solve using various techniques of ODE such as separable variables, homogeneous, linear and exact equations. Application to initial and boundary value problem are also included. While for the second order linear differential equations, topics on homogeneous linear equations and non-homogeneous linear equations are discussed. At the end, students will learn the basic concept of Laplace transform as a solu-

tion for solving the second order differential equations.

Course Outcomes:
CO1 - Ability to define and solve the first order differential equations using various methods.
CO2 - Ability to create and solve the application of the first order differential equations, and explain the results.
CO3 - Ability to define and solve the second order linear differential equations using various methods.
CO4 - Ability to express and demonstrate the basic concept and application of Laplace transforms and solve second order linear differential equations.

EQT101 MATEMATIK KEJURUTERAAN I [ENGINEERING MATHEMATICS I]
No of Credits: 3

Course Synopsis:
This course will introduce the fundamental principles and concepts in linear algebra and calculus. The topics that will be discussed in this course are complex numbers, matrices, vectors, and differentiation & integration and partial differential equations also topic of Partial Derivatives.

Course Outcomes:
CO1 - Ability to relate relevant concepts and methods in algebra.
CO2 - Ability to relate concepts and methods in calculus.
CO3 - Ability to evaluate solutions of engineering problems using relevant concepts and methods.

EQT102 MATEMATIK KEJURUTERAAN II [ENGINEERING MATHEMATICS II]
No of Credits: 3

Course Synopsis:
In this course, students will be exposed to differential equations. Firstly, number of analytical methods will be introduced to solve the first and second order ordinary differential equations and also partial differential equations. The theory of Laplace transforms and it applications to solve ordinary differential equation will be taught and then Fourier series of periodic function will be covered in the last chapter.

Course Outcomes:
CO1 - Ability to solve differential equations which covered first and second order ordinary differential equations and partial differential equations
CO2 - Ability to apply the Laplace transforms method and able to solve and analyze certain differential equations.
CO3 - Ability to apply the fundamental understanding of Fourier series and able to express Fourier series and Fourier series expansions of any given function.
CO4 - Ability to analyze certain physical problems and able to relate the problems with differential equations.

EQT203 MATEMATIK KEJURUTERAAN III [ENGINEERING MATHEMATICS III]
No of Credits: 3

Course Synopsis:
This course introduces the definition and concepts in vector calculus, the fundamental theorems of vector calculus and numerical methods. The topics discuss the concept of differentiation and integration in vector calculus, the line, surface and volume integrals as well as the Green's, divergence and Stokes's theorems. In numerical methods topic, several numerical techniques will be introduced to solve nonlinear equations, interpolation, curve fitting, differentiation, intergration and also differential equations. The introduction of finite element method also will be exposed in this course.

Course Outcomes:
CO1 - Ability to apply vector calculus concepts to solve single, double or triple integrals
CO2 - Ability to apply the concept of differentiation and integration in vector calculus to solve classical theorems in vector calculus.
CO3 - Ability to select appropriate numerical methods to solve the mathematical problems

EQT221 MATEMATIK DISKRIT DAN ALJABAR LINEAR [DISCRETE MATHEMATICS & LINEAR ALGEBRA]
No of Credits: 3

Course Synopsis:
This course introduces the definition and concepts in discrete mathematics and linear algebra which is an essential tools in almost all subareas of computer science and communication systems. The topics discuss includes sets and functions, logic, theory number and cryptography, matrices and linear transformation, vector spaces and inner product spaces.

Course Outcomes:
CO1 - Ability to identify and choose the suitable concepts of discrete mathematics in solving engineering problems.
CO2 - Ability to apply the concept of linear algebra in solving engineering problems.
CO3 - Ability to relate and solve engineering problems using discrete mathematics and linear algebra

EQT271 STATISTIK KEJURUTERAAN [ENGINEERING STATISTICS]
No of Credits: 3

Course Synopsis:
The goal of this course is to introduce students with the appropriate statistical methods for data collection, analysing and interpreting data. Moreover, in this course, the statistical concepts and methods are discussed within the context of statistics is a study about variation. The basic concepts of randomness, quantifying uncertainty through probability models and making inference about population are the essence of this course. The course begins with describing and exploring data. Various graphical tools and numerical measures used to describe data will be introduced. Some basic probability concepts, discrete and continuous probability distribution are among topics for modelling uncertainty. Making inference through estimation and hypothesis test based on parametric and non-parametric methods are being explored in the second part of this course. The last chapter discuss the topic of simple linear regression model.

Course Outcomes:
CO1 - Ability to describe basic statistical concepts, apply basic statistical skills and develop statistical reasoning skills.
CO2 - Ability to apply, analyze and evaluate the suitable methods of statistical inference for a given statistical problem and design an application of inferential method.
CO3 - Ability to interpret, apply and analyze the procedures of simple linear regression model and synthesize the regression model for making prediction.

EQT272 KEBARANGKALIAN DAN STATISTIK [PROBABILITY & STATISTICS]
No of Credits: 3

Course Synopsis:
This course provides an elementary introduction to probability and statistics with applications. Topics include probability theorem, random variables, probability distribution, statistical inference which is including estimation and hypothesis testing and finally the regression concept.

Course Outcomes:
CO1 - Ability to apply the theory of probability and solve discrete and continuous random variables.
CO2 - Ability to understand and apply the concepts of probability distribution.
CO3 - Ability to apply hypothesis testing and simple linear regression model to solve engineering problems.

PQT111 MATEMATIK UNTUK TEKNOLOGI KEJURUTERAAN I [MATHEMATICS FOR ENGINEERING TECHNOLOGY I]
No of Credits: 3

Course Synopsis:
This course will introduce the fundamental principles and concepts in algebra, calculus and statistics. The topics that will be discussed in this course are complex numbers, matrices, vectors, differentiation & integration and statistics.

Course Outcomes:
CO1 - Ability to solve mathematical problems using basic concepts of algebra (complex numbers, matrices and vectors).
CO2 - Ability to solve mathematical problems using basic concepts of calculus (differentiation and integration).
CO3 - Ability to solve statistical problems using data analysis.

PQT112 MATEMATIK UNTUK TEKNOLOGI KEJURUTERAAN II [MATHEMATICS FOR ENGINEERING TECHNOLOGY II]
No of Credits: 3

Course Synopsis:
This course will introduce the concepts of ordinary differential equations. The topics that will be discussed in this course are the methods in solving the differential equations including first and second order differential equations and its applications. Next, the course will introduce to the Laplace transform method to solve differential equations and at the end of topic, Fourier Series expansion of a function will be discussed to the students.

Course Outcomes:
CO1 - Able to solve differential equations involving the first and second order differential equation by selecting appropriate techniques and able to relate and analyze the certain physical problems to differential equations.
CO2 - Ability to apply the Laplace transforms method to solve and analyze certain differential equations problems.
CO3 - Ability to apply the fundamental understanding of Fourier series and able to express Fourier series and Fourier series expansions to any given function.

PQT213 MATEMATIK UNTUK TEKNOLOGI KEJURUTERAAN III [MATHEMATICS FOR ENGINEERING TECHNOLOGY III]
No of Credits: 3

Course Synopsis:
This course will introduce the definition and concepts of partial derivatives and vector calculus. An introduction to some theorems in vector calculus topic will be exposed for students. At the end of study, this course also discusses the topic of numerical methods that introduce several methods in solving mathematical problems.

Course Outcomes:
CO1 - Ability to apply the concepts of partial derivatives and able to evaluate solutions of mathematical problems using suitable methods
CO2 - Ability to apply vector calculus concepts and able to differentiate and solve single, double or triple integrals
CO3 - Ability to solve numerical problems by selecting suitable numerical methods

PQT274 STATISTIK UNTUK TEKNOLOGI KEJURUTERAAN [STATISTICS FOR ENGINEERING TECHNOLOGY]
No of Credits: 3

Course Synopsis:
The goal of this course is to introduce students with the appropriate statistical methods for data collection, analysing and interpreting data. Moreover, in this course, the statistical concepts and methods are discussed within the context of statistics is a study about variation. The basic concepts of randomness, quantifying uncertainty through probability models and making inference about population are the essence of this course. The course begins with describing and exploring data. Various graphical tools and numerical measures used to describe data will be introduced. Some basic probability concepts, discrete and continuous probability distribution are among topics for modelling uncertainty. Making inference through estimation and hypothesis test based on parametric and non-parametric methods are being explored in the second part of this course. The last chapter discuss the topic of simple linear regression model.

Course Outcomes:
CO1 - Ability to describe basic statistical concepts, apply basic statistical skills and develop statistical reasoning skills.
CO2 - Ability to apply, analyze and evaluate the suitable methods of

statistical inference for a given statistical problem.
CO3 - Ability to interpret, apply and analyse the procedures of simple linear regression model and making prediction.

LANGUAGE COURSES
DVW101 BAHASA INGGERIS KOMUNIKASI 1 [COMMUNICATIVE ENGLISH 1]
No of Credits: 2

Course Synopsis:
The course incorprates skill-based approach to assist the students to improve their proficiency level in the four skills of reading, writing, listening and speaking. The students are exposed to an English-rich learning environment that focuses on the use of both receptive and productive skills in daily life situations.

Course Outcomes:
CO1 - Understand simple day-to-day familiar reading text.
CO2 - Apply targeted grammatical items correctly.
CO3 - Comprehend simple conversation or audio texts.
CO4 - Identify main ideas and provide reasons regarding experiences and events.
CO5 - Write descriptive essay on topics which are familiar or of personal interest.

DVW201 BAHASA INGGERIS KOMUNIKASI 2 [COMMUNICATIVE ENGLISH 2]
No of Credits: 2

Course Synopsis:
The course uses skills-based approach for students in becoming a competent user of English. The course is designed so that the students can perform targeted skills in the English language. The activities require the students to participate actively in the classroom by providing relevant responses to the assigned tasks. This course engages students' receptive and productive skills by incorporating daily life situations.

Course Outcomes:
CO1 - Exhibit comprehension of straightforward texts from everyday material.
CO2 - apply targeted grammatical items correctly.
CO3 - listen to and analyse factual information in speech on familiar topics.
CO4 - create and compose short, detailed descriptions on a range of familiar subjects on topics of interest.
CO5 - argue and explain on a variety of familiar subjects, opinions and interests.

DVW301 BAHASA INGGERIS KOMUNIKASI 3 [COMMUNICATIVE ENGLISH 3]
No of Credits: 2

Course Synopsis:
This course which is designed to provide students with opportunities for the application of English Language skills. The course adopts a learner-centred approach in which students are engaged in various task-based activities to enhance their confidence to present and justify their ideas individually as well as in group discussion. Students will also learn how to comprehend various types of extensive reading text to strengthen students' listening and reading comprehension skills. Emphasis will also be given to ensure that students can write a good summary and expository essay through various types of writing exercises.

Course Outcomes:
CO1 - Read straightforward factual texts on subjects related to their field.
CO2 - Comprehend straightforward factual information about common everyday related topics
CO3 - Give opinions and participate in discussions covering familiar issues.
CO4 - Compose straightforward connected text on a range of familiar subjects within their field of interest, by linking a series of shorter discrete elements in a linear sequence.

DVW410 BAHASA MELAYU [MALAY LANGUAGE]
No of Credits: 2

Course Synopsis:
Kursus ini memberi pengetahuan kepada para pelajar tentang sejarah perkembangan bahasa Melayu dan memberi pendedahan kepada keempat-empat kemahiran berbahasa (mendegar, membaca, menulis dan bertutur) dengan memberi tumpuan kepada kemahiran bertutur dan menulis. Komponen menulis difokuskan kepada ketepatan penggunaan aspek tatabahasa, struktur dan semantik (makna) dan dikukuhkan dengan tajuk-tajuk penulisan esei yang akan memberi peluang kepada pelajar untuk mempelajari proses-proses tatabahasa seperti penggunaan kata, analisis kesalahan bahasa dan sintaksis. Aspek kemahiran bertutur akan membantu pelajar untuk berkomunikasi dengan menggunakan sistem bahasa yang berkesan seperti dalam aspek sebutan dan juga pembinaan ayat dalam bahasa Melayu.

Course Outcomes:
CO1 - Mengetahui sejarah dan perkembangan bahasa Melayu.
CO2 - Menganalisis bahasa yang betul dari aspek tatabahasa dan struktur ayat dalam pelbagai jenis laras tulisan.
CO3 - Mengarang esei dengan menggunakan tatabahasa yang betul dari aspek sintaksis dan makna.
CO4 - Menghuraikan idea secara lisan dengan berkesan.

UVA101 BAHASA INGGERIS PERSEDIAAN [PREPARATORY ENGLISH]
No of Credits: 2

Course Synopsis:
This course is designed to help students perform effectively and competently in social and academic contexts. The learning of language skills is integrated within communicative and plurilingualism approaches with an emphasis on speaking skills. It aims to raise the students' language proficiency to B1 CEFR level through the use of language in different contexts.

Course Outcomes:
CO1 - Exhibit comprehension of the main points of clear standard input on familiar matters regularly encountered in work, school, leisure, etc.
CO2 - Use targeted grammatical items correctly.
CO3 - Produce simple connected texts on topics which are familiar or of personal interest.
CO4 - Briefly give reasons and explanations for opinion and plans on experiences, events, dreams, hopes and ambitions.

UVW104 BAHASA MANDARIN PERMULAAN [MANDARIN FOR BEGINNER]
No of Credits: 2

Course Synopsis:
This course is designed for beginners with no prior knowledge of Mandarin, this course will focus on developing the learner's listening, speaking and reading skills. Students will acquire the correct Mandarin pronunciation using Mandarin Characters in Pinyin. They will be introduced to the basic Mandarin competence to interact in various everyday situations. Apart from that, students will be engaged to classroom interactions, practicing daily greetings, simple conversations such as self-introduction and introducing other people, describing objects/people and expressing everyday activities. Students will also be introduced to the basic elements of the Mandarin culture through the topics covered.

Course Outcomes:
CO1 - Students can identify sounds of Finals, Initials and tone. Demonstrate understanding of simple expressions and short dialogues.
CO2 - Students can pronounce simple vocabularies, simple phrases and simple sentences clearly and produce short conversation appropriately.
CO3 - Students can read and understand simple words (100-150 vocabularies) and sentences related to daily activities using Pinyin and acquire the elements of Mandarin culture through the texts learned.

UVW105 BAHASA THAI PERMULAAN [THAI FOR BIGINNER]
No of Credits: 2

Course Synopsis:
This course is designed for beginners with no prior knowledge of Thai language, This course focuses on developing the learner's listening, speaking and reading skills. Students will acquire the correct Thai language pronunciation using Thai phonetic transcription and are introduced to basic Thai language so that they are able to interact in various everyday situations. Apart from that, students will also be actively engaged in classroom interactions,daily greetings and simple conversations such as self introduction, introducing oneself to others,describing objects/people and expressing everyday activities. In addition, students will be exposed to basic elements of the Thai culture via the topics covered in the syllabus.

Course Outcomes:
CO1- Students can identify sounds of consonants, vowels and tone. Demonstrate understanding of simple expressions and short dialogues.
CO2 - Student can pronounce vocabularies, simple phrases and simple sentences clearly and produce short conversation appropriately.
CO3 - Student will be able to read and understand simple words (100-150 vocabularies) and sentences related to daily activities using Thai phonetic transcription and acquire the elements of Thai culture through the texts learnt.

UVW106 BAHASA ARAB PERMULAAN [ARABIC FOR BEGINNERS]
No of Credits: 2

Course Synopsis:
This course is designed for beginners with no prior knowledge of Arabic language, this course will focus on developing learner's listening, speaking and reading skills. Students will acquire the correct Arabic language pronunciation using transliteration provided. They will be introduced to the basic Arabic language competence to interact in various everyday situations. Apart from that, students will be engaged to classroom interactions, practicing daily greetings, simple conversations such as self introduction and introducing other people, describing objects/people and expressing everyday activities. Students will also be introduced to the basic elements of Arabic culture through the topics covered.

Course Outcomes:
CO1 - Students can identify sounds of consonants, vowels and tone. Demonstrate understanding of simple expressions and short dialogues.
CO2 - Student can pronounce simple vocabularies, simple phrases and simple sentences accurately and produce short conversation appropriately.
CO3 - Student can read and understand simple words (100-150 vocabularies) and sentences related to daily activities using transliteration and acquire the elements of Arabic culture through the texts learnt.

UVW107 BAHASA JEPUN ASAS [JAPANESE FOR BEGINNERS]
No of Credits: 2

Course Synopsis:
This course is designed for beginners with no prior knowledge of Japanese language. This course focuses on developing the learner's listening, speaking and reading skills. Students will acquire the correct Japanese language pronunciation using Japanese Kana in Romaji and are introduced to basic Japanese language competence so that they are able to interact in various everyday situations. Apart from that, students will also be actively engaged in classroom interactions, daily greetings and simple conversations such as self introduction, introducing one self to others, describing objects/people and expressing everyday activities. In addition, students will be exposed to the basic elements of Japanese culture via the topics covered in the syllabus.

Course Outcomes:
CO1 - Identify sounds of consonants, vowels and tone. Demonstrate understanding of simple expressions and short dialogues.
CO2 - Pronounce vocabularies, simple phrases and simple sentences

clearly and produce short conversation appropriately

CO3 - Read and understand simple words (100-150 vocabularies) and sentences related to daily activities using Romaji and acquire the elements of Japanese culture through the texts learnt.

UVW108 BAHASA JERMAN PERMULAAN [GERMAN FOR BEGINNERS]
No of Credits: 2

Course Synopsis:
This course is designed for beginners with no prior knowledge of German language. This course will focuses on developing the learner's listening, speaking and reading skills. Students will acquire the correct German language pronunciation and are introduced to basic German language competence so that they are able to interact in various everyday situations. Apart from that, students will also be actively engaged in classroom interactions, daily greetings and simple conversations such as self introduction, introducing oneself to others, describing objects/people and expressing everyday activities. In addition, students will be exposed to the basic elements of the German culture via the topics covered in the syllabus.

Course Outcomes:
CO1 - Students can identify sounds of consonants, vowels and tone. Demonstrate understanding of simple expressions and short dialogues.
CO2 - Student can pronounce simple vocabularies, simple phrases and simple sentences clearly and produce short conversation appropriately.
CO3 - Student can read and understand simple words (100-150 vocabularies) and sentences related to daily activities and acquire the elements of German culture through the texts learnt.

UVW109 BAHASA KOREA PERMULAAN [KOREAN FOR BEGINNER]
No of Credits: 2

Course Synopsis:
This course is designed for beginners with no prior knowledge of Mandarin, this course will focus on developing the learner's listening, speaking and reading skills. Students will acquire the correct Mandarin pronunciation using Mandarin Characters in Pinyin. They will be introduced to the basic Mandarin competence to interact in various everyday situations. Apart from that, students will be engaged to classroom interactions, practicing daily greetings, simple conversations such as self-introduction and introducing other people, describing objects/people and expressing everyday activities. Students will also be introduced to the basic elements of the Mandarin culture through the topics covered.

Course Outcomes:
CO1 - Students can identify sounds of Finals, Initials and tone. Demonstrate understanding of simple expressions and short dialogues.
CO2 - Students can pronounce simple vocabularies, simple phrases and simple sentences clearly and produce short conversation appropriately.
CO3 - Students can read and understand simple words (100-150 vocabularies) and sentences related to daily activities using Pinyin and acquire the elements of Mandarin culture through the texts learned.

UVW110 BAHASA MELAYU ASAS [BASIC MALAY LANGUAGE]
No of Credits: 2

Course Synopsis:
Kursus ini bertujuan memberi pendedahan kepada pelajar-pelajar antarabangsa di UniMAP dalam aspek kemahiran asas bahasa Melayu. Penekanan terhadapa kemahiran asas ini merangkumi empat aspek; mendengar, membaca bertutur dan menulis. Kemahiran mendengar dan bertutur digabungkan sebagai satu dan penekanannya tidak hanya terhad

kepada bentuk bahasa dan fungsinya, tetapi juga kepada peningkatan kefahaman dan ketepatan berbahasa. Aspek tatabahasa juga diajar secara langsung dalam proses pembelajaran.

Course Outcomes:
CO1 - Memahami struktur asas tatabahasa bahasa Melayu.
CO2 - Mengguna dan menjelaskan perkataan mudah dalam bahasa Melayu.
CO3 - Mengguna dan mengaplikasikan binaan ayat bahasa Melayu dalam perbualan mudah dan asas penulisan.+

UVW114 BAHASA MANDARIN I [MANDARIN 1]
No of Credits: 2

Course Synopsis:
UVW114 is designed to introduce students to Mandarin language. The course will cover listening, speaking, reading and writing in spoken and written Mandarin. The students will be introduced to Pin Yin which will help them to pronounce accurately. They will be able to read and understand short and simple sentences and able to write simple Chinese characters with the help of Pin Yin. Students will also learn short and simple common daily expressions.

Course Outcomes:
CO1 - Recognizing simple Chinese characters with the help of Pin Yin.
CO2 - Read and understand simple and short sentences with the help of Pin Yin.
CO3 - Respond to common daily conversation.
CO4 - Write simple Chinese characters with the help of Pin Yin.

UVW115 BAHASA THAI I [THAI I]
No of Credits: 2

Course Synopsis:
This course is designed for students who have no background in Thai. The course will cover listening, speaking, reading and writing in spoken and written Thai. The student will be introduced to Thai phonetic transcriptions which will help them to pronounce with the correct tone, read and understand short and simple sentences. Students will be able to write simple words and sentences in Thai script. They will also learn short and simple daily expressions.
Course Outcomes:
CO1 - Identify and pronounce the simple words and sentences with the correct tone.
CO2 - Respond to simple common daily expression and conversation.
CO3 - Read and understand simple word and sentences with help of phonetic transcription
CO4 - Write simple words and sentences with the help of phonetic transcription.

UVW116 BAHASA ARAB I [ARABIC I]
No of Credits: 2

Course Synopsis:
This course is designed for beginners with no prior knowledge of Arabic Language. The course covers listening, speaking, reading and writing skills. Students will be exposed to Arabic characters and correct pronunciation. Students will be able to read and understand short sentences and dialogues. They will learn basic grammar to enable them to write simple sentences in Arabic.

Course Outcomes:
CO 1- Pronounce simple words and sentences correctly.
CO 2- Respond to simple common daily expressions and conversations.
CO 3- Read and understand simple sentences and dialogues.
CO 4- Write simple words and sentences.

UVW117 BAHASA JEPUN I [JAPANESE I]
No of Credits: 2
Course Synopsis:
Designed for beginners with no prior knowledge of Japanese Language, this course covers listening, speaking, reading and writing skills. Students

will learn to write 2types of Japanese writing system, Hiragana and Katakana. Students will be engaged to classroom interactions, practising daily greetings and simple conversations. Students will be introduced to basic elements of the Japanese culture through the topics covered.

Course Outcomes:
CO1 - Identify and pronounce the different Japanese words with the correct tone.
CO2 - Understand and respond simple daily life greetings and expressions.
CO3 - Read and understand simple sentence with reference to the Hiragana and Katakana chart.
CO4 - Memorize and write basic and modified Japanese characters.

UVW118 BAHASA JERMAN I [GERMAN I]
No of Credits: 2

Course Synopsis:
The objective of this course is to expose students to German. Students will gain listening, speaking, reading and writing skills in standard spoken and written German language. Students will recognize the basic elements and structures of the language with an understanding of the culture in which the language is spoken. Students will be able to construct 4-5 word sentences for the purpose of communication. Students will also be able to read and comprehend short simple texts.

Course Outcomes:
CO1 - Recognize and pronounce simple words and sentences in German.
CO2 - Read and understand simple text.
CO3 - Constructed simple sentences in spoken and written German.

UVW119 BAHASA KOREA I [KOREAN I]
No of Credits: 2

Course Synopsis:
This course is designed for beginners with no prior knowledge of Korean. It introduces students to the Korean language and covers reading and writing of the Hangul script as well as pronunciation. Starting with greetings, the course proceeds to develop communication through basic grammar, vocabulary and reading skills for simple sentences. Students will develop the four skills of listening, speaking, reading and writing in an interactive and integrated manner through theme-based activities that relate to daily life.

Course Outcomes:
CO1 - Identify and pronounce the different Hangul words with the correct tone.
CO2 - Understand and respond to simple daily life greetings and expressions.
CO3 - Read and understand simple sentences
CO4 - Memorize and write simple Korean sentences with the correct suffixes.

UVW201 BAHASA INGGERIS UNTUK KOMUNIKASI UMUM [ENGLISH FOR GENERAL COMMUNICATION]
No of Credits: 2

Course Synopsis:
This course emphasizes on productive skills – writing and speaking by using authentic materials to help students to become competent users of English. Receptive skills are also given some coverage. It aims to consolidate students' English language proficiency and communicative ability. This learner centered course adopts language in context and skills-based approaches in order to raise the students' proficiency level to B2 CEFR level.

Course Outcomes:
CO1 - Exhibit comprehension of the main ideas of complex texts in both concrete and abstract topics.

UVW214 BAHASA MANDARIN II [MANDARIN 11]
No of Credits: 2

Course Synopsis:
At this level students of Mandarin II will be introduced to simple use of grammar. Students will able to read and understand longer sentences and conversations. They will learn to write longer sentences with the help of Pin Yin. Students will be introduced to different social contexts through the topics covered as well as introduced to shorts Mandarin songs.

Course Outcomes:
CO1 - Read and understand short dialogue of different social media contexts with the help of Pin Yin
CO2 - Write simple and short sentences with the help of Pin Yin.
CO3 - Engage in simple dialogues within different contexts.

UVW215 BAHASA THAI II [THAI II]
No of Credits: 2

Course Synopsis:
At this level students will be introduced to simple use of grammar. Students will learn to read and understand longer sentences and conversations about daily activities. They will learn to write longer sentences with the help of phonetic transcription. Throughout the course student will have more understanding about Thai culture and practices

Course Outcomes:
CO1 - Listen and respond to sentence and short dialogues in various topics regarding to daily activities.
CO2 - Express themselves and respond to conversations in different contexts given using the correct tone.
CO3 - Read using special feature in Thai word and longer sentences correctly with the help of phonetic transcription.
CO4 - Write longer grammatical sentences with correct spelling with the help of phonetic transcription.

UVW216 BAHASA ARAB II [ARABIC II]
No of Credits: 2

Course Synopsis:
At this level, students will learn basic vocabularies. Students will be exposed to more basic grammar and sentence structures. They will also learn to read and write longer sentences and conversations about daily activities. These will further develop students' listening, speaking, reading and writing skills.

Course Outcomes:
CO 1- Listen and respond to sentences and short dialogues in various topics relating to daily activities.
CO 2- Express themselves and respond to conversations in different contexts given.
CO 3- Read and understand longer sentences and dialogues.
CO 4- Write longer sentences with correct spelling.

UVW217 BAHASA JEPUN II [JAPANESE III]
No of Credits: 2

Course Synopsis:
Students will be exposed to new vocabulary and will begin to use simple sentences in spoken and written Japanese. They will be introduced to simple grammatical and sentences structures. Students will learn how to learn and write short sentences. Basic elements of the Japanese culture will be also taught in the topics covered throughout the course.

Course Outcomes:
CO1 - Listen and respond to daily life conversations.
CO2 - Read and understand short paragraphs and dialogues given.
CO3 - Produce simple Japanese sentences and dialogues with the correct pronunciations.
CO4 - Write simple sentences with reference to the Hiragana and Katakana Chart using approximately 120 Japanese words.

UVW218 BAHASA JERMAN II [GERMAN II]
No of Credits: 2

Course Synopsis:
The objective of this course is to extend students' knowledge of the German language which they started in German I. Students will continue and expand the basic elements, structures and constructions of the language as well as understand the culture of the people who speak the language. Students will be able to construct longer sentences in both written and spoken for the purpose of communication, express themselves using simple phrases and also to read and comprehend short simple texts.

Course Outcomes:
CO1 - Listen to and discuss on topics related to daily conversation.
CO2 - Illustrate understanding of short paragraphs and dialogues.
CO3 - Experiment using grammatical component in sentences in spoken German.
CO4 - Compose sentences in writing for daily situations.

UVW219 BAHASA KOREA II [KOREAN II]
No of Credits: 2

Course Synopsis:
In this course, students will become more familiar with the morphology of spoken and written Korean. Students will further develop their proficiency in the skills of listening, speaking, reading and writing. These skills will be taught in an interactive and integrated manner through theme-based activities related to everyday life. The course will also enable students to acquire more accurate pronunciation and articulation of Korean words and sentence patterns. By the end of the course, they will have a better understanding of Korean lifestyle and culture and they will be able to use Korean in a variety of social contexts.

Course Outcomes:
CO1 - Listen and respond to common daily life conversations.
CO2 - Read and understand short dialogues and passages of different social situations.
CO3 - Produce simple Korean sentences and dialogues with the correct pronunciations.
CO4 - Write sentences and a short paragraph with the correct use of suffixes and sentence structures.

UVW312 BAHASA INGGERIS UNTUK KOMUNIKASI TEKNIKAL [ENGLISH FOR TECHNICAL COMMUNICATION]
No of Credits: 2

Course Synopsis:
This course is designed to prepare engineering and other technical disciplinary students to achieve confidence in extracting, evaluating and synthesising information to write good technical documents. Various theories of technical communication will be introduced throughout this course. Students will learn how to prepare technical documents as well as on how to write clearly and concisely. Students will also be exposed to primary and secondary research, techniques of analysing and interpreting different information and applying functional organisation in report writing. At the end of the semester, students are required to formally present their research report orally.

Course Outcomes:
CO1 - Explain the basic theories and concepts discussed in the course.
CO2 - Analyse data of relevant information to be used in the report.
CO3 - Write a technical report with appropriate graphics and formats.
CO4 - Present written assignment.

UVW312 BAHASA ENGGERIS TEKNIKAL [ENGLISH FOR TECHNICAL COMMUNICATION]
No of Credits: 2

Course Synopsis:
This course is designed to provide students the opportunity to be exposed in many Technical Documents necessary in relation to the field they are into. It ,at the same time, provides some important theories so as how and why it is important for them to b e taught aand be trained how to create or write a communication technically. It also requires them how to make pro-

posal reports in orderfor them to be familiar with it. Students in this course are evaluated, graded and tested in such that before they finish the course, they are fully equipped with the necessary skills in writing.Exercise are given to hone their writing skills as well.

Course Outcomes:
CO1 - Explain the basic theories and concepts discussed in the course,
CO2 - Analyze data of relevant information to be used in the report.
CO3 - Write a technical report with appropriate graphics and formats.
CO4 - Present written assignment.

UVW313 BAHASA INGGERIS AKADEMIK [ENGLISH FOR ACADEMIC PURPOSES]
No of Credits: 2

Course Synopsis:
Using a learner-centred approach, this course is aimed at preparing business students to improve their general academic writing skills by familiarising them with the fundamentals of academic writing. By the end of the semester, students are required to produce an argumentative essay individually, with topics that are related to their respective disciplines. Students are required to conduct library research; both printed and online material such as books, journals, periodicals etc. Apart from that, students are also required to apply the correct form of APA citation style in their essays. Although the primary focus of the course is on writing, this course also provides substantial activities on reading and speaking. Students are required to present their topics orally by the end of the semester.

Course Outcomes:
CO1 - Conduct library research on topic selected.
CO2 - Read and respond to academic texts critically.
CO3 - Plan and write an argumentative essay.
CO4 - Present their chosen academic topic verbally.

UVW314 BAHASA MANDARIN III [MANDARIN III]
No of Credits: 2

Course Synopsis:
At this level, students of Mandarin III will be introduced to basic business Mandarin language used in business. Students will be able to read short paragraphs with the help of Pin Yin and able to respond to questions from short paragraphs. Students will also able to write longer sentences with the appropriate Chinese stroke order.

Course Outcomes:
CO1 - Engage in the conversation of different social and business contexts.
CO2 - Read and understand short texts of different social and business contexts with the help of Pin Yin.
CO3 - Construct short dialogue with the appropriate Chinese stroke order with the help of Pin Yin.

UVW315 BAHASA THAI III [THAI III]
No of Credits: 2

Course Synopsis:
This course will expand the use of vocabulary relating to social contexts and introduce its use in business context .student will be able to read longer dialogues and paragraphs relating to social and simple business contexts. Students will learn to write complex sentences to produce dialogues relating to topics learned. At this level the phonetic transcription will be used when only necessary only.

Course Outcomes:
CO1 - Engage in conversations in different social and business contexts.
CO2 - Read and demonstrate understanding in short texts of different social and business context.
CO3 - Construct complex sentences with correct use of grammar items to form dialogues relating to different social and business context.
CO4 - Write longer grammatical sentences with correct spelling with the

help of phonetic transcription.

UVW316 BAHASA ARAB III [ARABIC III]
No of Credits: 2

Course Synopsis:
At this level, students will learn the advanced essential components in developing Arabic writing skill. Students will be exposed to more advanced grammar topics such as types of verbs, active voice and passive voice Arabic connectors and other related components needed in helping them constructing Arabic sentence including the knowledge of verbs and nouns in details. They will also learn to read and write longer sentences and conversations about daily activities. These will further develop students' listening, speaking, reading and writing skills.

Course Outcomes:
CO 1- Listen and respond to sentences and short dialogues in various topics relating to daily activities.
CO 2- Express themselves and respond to conversations in different contexts given.
CO 3- Read and understand longer and advanced sentences and dialogues.
CO 4- Write longer and advanced sentences with correct spelling.

UVW317 BAHASA JEPUN III [JAPANESE III]
No of Credits: 2

Course Synopsis:
Students will be exposed to expanded vocabulary and higher level grammar, particles and sentence structure. Students will learn reading, writing and speaking longer sentences and dialogues. Throughout the course, students will also learnthe elements of Japanese culture in the topics covered.

Course Outcomes:
CO1 - Able to acquire basic listening skill at basic level 3.
CO2 - Able to speak longer dialogues in various topics for different proposes at basic level 3.
CO3 - Able to read and comprehend simple texts independently, at basic level 3.
CO4 - Able to write Japanese sentence texts and compose a dialogue at basic level 3.

UVW318 BAHASA JERMAN III [GERMAN III]
No of Credits: 2

Course Synopsis:
The objective of this course is the introduction to, and use of vocabulary related to social contexts and its use in business contexts. Students will be able to read longer dialogues and paragraphs related to social and simple business contexts. Students will learn to construct longer sentences to produce dialogues related to topics learned.

Course Outcomes:
CO1 - Listen and respond to sentences and short dialogues of various topics relating to daily activities.
CO2 - Demonstrate understanding of short paragraphs and texts of different social and business contexts.
CO3 - Engage in conversations in different social and business contexts.
CO4 - Construct longer sentences and phrases with correct use of grammar.

UVW319 BAHASA KOREA III [KOREAN III]
No of Credits: 2

Course Synopsis:
This course aims to expand students' language skills by introducing more complex sentence structures, colloquial expressions in different cultural contexts. Classroom tasks in this course naturally demand a higher level of participation and hence incorporate learning through the use of audio-visual materials and class discussion. This course will introduce students to basic business Korean use and culture behavior in dealing business with people from Korea.

Course Outcomes:
CO1 - Engage in conversations of different social and business contexts.
CO2 - Demonstrate understanding of longer texts of the different social and business contexts
CO3 - Construct longer sentences and paragraphs with the correct us e of suffix and sentence structures.

UVW410 BAHASA MELAYU UNIVERSITI [UNIVERSITY MALAY LANGUAGE]
No of Credits: 2

Course Synopsis:
Kursus ini menekankan empat elemen dalam berbahasa, iaitu mendengar, bertutur, membaca dan menulis. Pelajar akan didedahkan tentang konsep pemilihan kata, santun berbahasa, pengunaan gaya bahasa dan bahasa sapaan. Topik perancangan bahasa yang menyentuh sistem ejaan, pembentukan kata dan peristilahan akan membantu pelajar untuk menggunakan bahasa dan tatabahasa yang betul. Justeru pelajar akan dapat menggunakan bahasa yang tepat mengikut konteks. Tajuk-tajuk penulisan karangan (esei) akan memberikan peluang kepada pelajar mempelajari proses-proses analisis, sintaksis dan penghuraian idea.

Course Outcomes:
CO1 - Mengaplikasi aspek-aspek kemahiran berbahasa dalam lisan dan tulisan.
CO2 - Menganalisis penggunaan bahasa dan tatabahasa mengikut konteks.
CO3 - Berhujah dengan menggunakan bahasa yang kritis dan analitis.

UVW414 BAHASA MANDARIN IV [MANDARIN IV]
No of Credits: 2

Course Synopsis:
At this level, students of Mandarin IV are expected to gain more vocabulary from what they have learned from Mandarin III. The topics covered will expose students to practice Mandarin language in business context. Students will be able to read and write longer sentences with appropriate grammar and Chinese stroke order without the help of Pin Yin. Students should also be able to hold a conversation in Mandarin especially for business purposes.

Course Outcomes:
CO1 - Engage in the longer conversation of business contexts.
CO2 - Read and understand business contexts given without the help of Pin Yin.
CO3 - Construct longer dialogues with the correct use of grammar without the help of Pin Yin.

UVW415 BAHASA THAI IV [THAI IV]
No of Credits: 2

Course Synopsis:
At this level, students are exposed to vocabulary closely related to business contexts. The topics covered will provide students with practice using Thai language in business contexts. Students will be able to read and write longer dialogues and short paragraphs with the correct use of grammar without the help of phonetic transcription. Students should be able to hold a conversation in Thai especially for business purposes.

Course Outcomes:
CO1 - Read and understand business contexts given without the help of phonetic transcription.
CO2 - Engage in conversation in different business context.
CO3 - Construct longer dialogues and short paragraphs relating to the business contexts using the correct Thai of grammar.

UVW416 BAHASA ARAB IV [ARABIC IV]
No of Credits: 2

Course Synopsis:
At this level, students will learn the essential components in developing Arabic writing skill and grammatical elements used in sentences including genitive construction, adjectives and adverbs. Students will also be

exposed to advanced grammar topics such as types of verbs, numbers, comparative & superlatives nouns apart from learning two new types of sentence which are affirmative sentence as well as denial sentence and other related components needed in helping them constructing Arabic sentence including the knowledge of verbs and nouns in details. Besides, this level aims at aiding students to enhance their knowledge on other complementary elements used to make longer sentences and writing practice which cover on wide range of topics.

Course Outcomes:

CO1 - Listen and respond to sentences and short dialogues in various topics relating to daily activities.
CO2 - Express themselves and respond to conversations in different contexts given.
CO3 - Read and understand longer and advanced sentences and dialogues.
CO4 - Write longer and advanced sentences with correct spelling.

UVW417 BAHASA JEPUN IV [JAPANESE IV]
No of Credits: 2

Course Synopsis:

This is the fourth of a four part program for Japanese Language Course. As in the third course, this course also emphasizes on listening, speaking, reading and writing. Students will be exposed to vocabulary expansion, speaking using dialogues for different purposes and different contexts. Students will be introduced to the advanced communicative compentence. Students will also be exposed to reading, writing longer sentences and passages and to compose a dialogue. The syllabus ranges from the basic Japanese structures to basic Japanese cultural elements.

Course Outcomes:

CO1 - Read and respond to longer paragraphs and dialogues on various topics
CO2 - Engage in conversations in different social contexts independently
CO3 - Construct longer sentences and paragraphs using the correct grammar and order of particles in spoken and written text

UVW418 BAHASA JERMAN IV [GERMAN IV]
No of Credits: 2

Course Synopsis:

The objective of this course is to expose and teach the students complex grammatical forms and sentence structure as compared to level 1, 2 and 3. Classroom tasks demand a higher level of participation and allow students to express themselves using the language. Students are exposed to different authentic situations that they would encounter in their future workplace. Students will also learn how to write essays.

Course Outcomes:

CO1 - Listen and respond to sentences and longer dialogues of various topics relating to work in social and Business field.
CO2 - Demonstrate understanding of longer paragraphs and texts of specific business contexts.
CO3 - Engage in conversations in specific business contexts.
CO4 - Write essays with correct use of grammar.

UVW419 BAHASA KOREA IV [KOREAN IV]
No of Credits: 2

Course Synopsis:

At this level, students are introduced to more complex grammatical forms and sentence structures as compared to the previous level. Classroom tasks in this course would demand a higher level of participation and allow students opportunities to express themselves using the language. Students are exposed to use the language in different authentic contexts that they would encounter in their future workplace.

Course Outcomes:

CO1 - Engage in conversations of different social and business contexts.
CO2 - Demonstrate understanding of longer texts of the different social and business contexts
CO3 - Construct longer sentences and paragraphs with the correct use of suffix and sentence structures.

CO-CURRICULUM COURSES
UZW101 GOLF [GOLF]
No of Credits:

Course Synopsis:
The Golf Co-Curriculum course aims to expose the students to the science of the game of golf in both theoretical and technical skills. The theoretical aspect of the course covers the history, background, terminology, self-management and other related aspects of golf, while the technical portion focuses on the practical training i.e. skills in playing golf

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW102 BESBOL [BASEBALL]
No of Credits:

Course Synopsis:
The Baseball Co-Curriculum course aims to expose the students to both the theoretical and technical aspects of the baseball game. The theoretical aspect of the course covers the history, background, terminology, self-management and other related aspects of baseball, while the technical portion focuses on the practical training i.e. skills in playing baseball.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW103 WOODBALL [WOODBALL]
No of Credits:

Course Synopsis:
The Woodball Co-Curriculum course aims to expose the students to both the theoretical and technical aspects of the woodball game. The theoretical aspect of the course covers the history, background, terminology, self-management and other related aspects of woodball, while the technical portion focuses on the practical training i.e. skills in playing woodball.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW104 BOLA SEPAK [FOOTBALL]
No of Credits:

Course Synopsis:
The Soccer/Football Co-Curriculum course aims to expose the students to both the theoretical and technical aspects of the soccer/football game. The theoretical aspect of the course covers the history, background, terminology, self-management and other related aspects of soccer/football, while the technical portion focuses on the practical training i.e. skills in playing soccer.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW105 BOLA JARING [NETBALL]
No of Credits:

Course Synopsis:
The Netball Co-Curriculum course aims to expose the students to both the theoretical and technical aspects of the netball game. The theoretical aspect of the course covers the history, background, terminology, self-management and other related aspects of netball, while the technical portion focuses on the practical training i.e. skills in playing netball.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW106 TENIS [TENNIS]
No of Credits:

Course Synopsis:
The Tennis Co-Curriculum course aims to expose the students to both the theoretical and technical aspects of the tennis game. The theoretical aspect of the course covers the history, background, terminology, self-management and other related aspects of tennis, while the technical portion focuses on the practical training i.e. skills in playing tennis.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW109 BOLA TAMPAR [VOLLEYBALL]
No of Credits:

Course Synopsis:
Make curricular sports activities of Volleyball as an activity participated by all students through the activities planned in order to master the basic skills of volleyball, the organization of the game, and the rules of the game.
In addition to member interaction opportunities, fun and occupy their free time with useful things as well as fostering a sense of sportsmanship and cooperation, responsible and contribute to the university.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW110 SUKARELAWANAN SISWA/SISWI KOREKSIONAL JABATAN PENJARA MALAYSIA I (KOR SISKOR) [STUDENTS VOLUNTARY CORRECTIONAL MALAYSIAN PRISON DEPARTMENT I (KOR SISKOR I)]
No of Credits:

Course Synopsis:
This course is a preliminary course in the series Prison Teachers Training courses. Through this course, students will be introduced to the prison organization, its history and its importance in the development of the State. At the initial stage, the students will be exposed to activities, training and education syllabus assignment of the role of the Prison Department of Malaysia, as well as providing the relevant disclosure as volunteer basis, the Prison Act 1995 as amended in 2008, REGULATIONS Prison In 2000, United Nations Standard Minimum Rules (UNSMR) and marching exercises.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in

order to make effective decisions, while enriching understanding of our diverse world.

UZW111 SUKARELAWANAN SISWA/SISWI KOREKSIONAL JABATAN PENJARA MALAYSIA II (KOR SISKOR) [STUDENTS VOLUNTARY CORRECTIONAL MALAYSIAN PRISON DEPARTMENT II (KOR SISKOR II)]
No of Credits:

Course Synopsis:
Undergraduate students Correctional II (SISKOR II) is an extension of SISKOR II where he emphasized the safety of the placement , the placement of detention, the placement service and the placement of recovery (PPI) at the Prisons Department . This Course also emphasizes interpersonal skills and character building of students. Students will be exposed to skills training drills, snap and handling of firearms. In addition, students are given an overview of the compulsory attendance (FGM), involving the community program.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW112 KUMPULAN LATIHAN KELANASISWA MALAYSIA (UDARA) I [MALAYSIAN UNIVERSITY ROVER TRAINING GROUP I (AIR)]
No of Credits:

Course Synopsis:
Co-curricular courses uniformed bodies Kelana Student Training Group I with another name Air Scout Unit, which is a newly established unit within the Group Kelana Students in Malaysia. This university is a pioneer in the establishment of the Air Scout. Malaysia is the only university that has the Air Scout. Air Scout Training Scheme will be exposed to the new Air Scout and Leadership courses scouter. Air Scout is comprised of adolescents aged from 17 years up to 25 years old offering a range of activities and skills training in developing human capital of individuals directly or indirectly. Concentration is also given to the development of self-awareness that emphasizes self-responsibility, obedience to the leader, organization, community and volunteerism State and providing services to the public, in line with the Scout motto of “Serving”

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW114 SUKARELAWAN BANTUAN PERUBATAN MALAYSIA (MERCY MUDA) I [STUDENT VOLUNTARY MALAYSIAN MEDICAL RELIEF SOCIETY (YOUNG MERCY) I]
No of Credits:

Course Synopsis:
The MERCY I programme is one of the co-curricular uniform bodies in Universiti Malaysia Perlis where early exposure to volunteerism is instilled. The basic knowledge of humanitarian relief aspect blended with practical exercise is integrated in this MERCY I programme. The students will undergo a Basic Volunteer and Mission Training before getting involved in the planning and implementing a humanitarian project.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW120 BRIGED BOMBA & PENYELAMAT I [FIRE AND RESCUE BRIGED I]
No of Credits:

Course Synopsis:
The main purpose of this course is expected to

1. Foster the spirit of loyalty to the organization (UniMAP & Fire Brigade) and the National, independent mark, discipline and willing to provide volunteer services at any time and from anywhere in need.
2. Foster and enhance the "soft skills" among students UniMAP
3. Fire is a threat that there is no war, then this course hopes to promote and provide greater awareness to students and staff about the dangers of fire UniMAP.
4. Provide knowledge, training, skills to students UniMAP as a precaution and prevention.
5. Enhance the spirit of community among the students served the UniMAP especially when there is a fire threat

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW122 PANDU PUTERI I [GIRL GUIDE I (PPSI)]
No of Credits:

Course Synopsis:
Course curriculum uniformed bodies 1 Girl Guides Association was implemented in two semesters (semester 1 and 2) aims to produce graduates with soft skills through Girl Guides Association program especially in terms of basic knowledge and skills Guides Princess based on teamwork that can be applied in your career or life.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW124 ST. JOHN AMBULANS MALAYSIA I [MALAYSIAN ST. JOHN AMBULANCE I]
No of Credits:

Course Synopsis:
This course introduces the basic principles and goals of first aid. Students will explore how to provide assistance in an emergency. They will learn methods of wrapping and pembebatan, as well as how to handle external bleeding and shock conditions. Students will recognize bone fracture, sprain, dislocation, and how to provide emergency treatment for such cases.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW125 ST. JOHN AMBULANS MALAYSIA I [MALAYSIAN ST. JOHN AMBULANCE II]
No of Credits:

Course Synopsis:
This course introduces the basic principles and goals of first aid. Students will explore how to provide assistance in an emergency. They will learn methods of wrapping and pembebatan, as well as how to handle external bleeding and shock conditions. Students will recognize bone fracture, sprain, dislocation, and how to provide emergency treatment for such cases.
Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW126 KUMPULAN LATIHAN KELANASISWA MALAYSIA I [MALAYSIA UNIVERSITY ROVER TRAINING GROUP I]
No of Credits:

Course Synopsis:
KLKM is an international characteristic uniformed body that teaches about the science of life and survival skills. The students will be exposed to the ethical life settings, cooperation, respect, love fellow human beings and the environment through the appreciation of the Treaty and Scout Law.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW128 KUMPULAN LATIHAN KELANASISWA MALAYSIA (LAUT) I [MALAYSIA UNIVERSITY ROVER TRAINING GROUP I (SEA)]
No of Credits:

Course Synopsis:
This course is also known by other names as Sea Rover Scouts Unit, which is part of the 4th of training in the Organization of Scouting Movement Sea Rover. It is a part of Scout Adults make space for youth in enriching their knowledge. Sea Rover Scouts devoted to follow Rover Wood Badge Leadership Course aims to produce Sea Rover Scout Leaders who are skilled, knowledgeable and qualified in the move The Sea Rover Scouts. This section consists of teens aged 17 to 25 years, offering a variety of activities and skills training in developing human capital individuals directly or indirectly. Convergence is also given to the development of self-awareness which emphasizes self-responsibility, obedience to leaders, organizations, communities and the country as well as providing volunteer services to the community, in accordance with Sea Rover Scout motto of “SERVICE”

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW132 PENERBITAN VIDEO [VIDEO PUBLISHING]
No of Credits:

Course Synopsis:
Course is about the process of publishing Video. Kursus will begin pre-production phase which touches on the work of the management before undergoing the process of filming or production phase of learning .The process will run until the end of Phase Post - Production for the completion of the work of editing

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW151 ASAS GAMELAN [FOUNDATIONS OF GAMELAN]
No of Credits:

Course Synopsis:
The Basic Gamelan Co-Curriculum course aims to expose the students to both the theoretical and technical aspects of the traditional art of gamelan. The theoretical aspect of the course covers the history, background, terminology, self-management and other related aspects of traditional art of gamelan, while the technical portion focuses on the practical training i.e. the skills in playing gamelan

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW152 KUMPULAN JAZZ I [JAZZ BAND I]
No of Credits:

Course Synopsis:
The Jazz Group Co-Curriculum course aims to expose the students to both the theoretical and technical aspects of the jazz music. The theoretical aspect of the course covers the history, background, terminology, self-management and other related aspects of jazz music, while the technical portion focuses on the practical training i.e. skills in playing the jazz music.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW153 [BRASS BAND I]
No of Credits:

Course Synopsis:
The Brass Band Co-Curriculum course aims to expose the students to both the theoretical and technical aspects of brass musical instruments. The theoretical aspect of the course covers the history, background, terminology, self-management and other related features of brass band, while the technical portion focuses on practical training of playing the brass musical instruments in group.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW154 ANGKLUNG [ANGKLUNG]
No of Credits:

Course Synopsis:
Angklung Co-Curriculum course seeks to expose the students to both the theoretical and traditional aspects of the traditional art of angklung music. The theoretical aspect of the course covers on the history, background, terminology, self-management and other related to angklung, while the technical portion focuses on practical training (practical) of skills in playing the angklung musical instruments

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW155 SENI PERGERAKAN KREATIF [ART OF CREATIVE MOVEMENT]
No of Credits:

Course Synopsis:
Creative movement Co-Curriculum course aims to expose the students to the knowledge of arts creative movement in terms of theoretical skills and technical. In terms of theory, this course is more focused on the history, background, terminology, self-management and other related arts creative movement, while technically, this course is more focused practical training (practical) of skills in the art of creative movement.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW156 DRAMA, PEMENTASAN & SENI LAKON [DRAMA, PLAYWRIGHT AND ACTING]
No of Credits:

Course Synopsis:
The drama, playwright and acting co-curriculum course aims to expose the students to the knowledge of drama, theatre in terms of theoretical and technical skills. In terms of theory, this course is more focused on the history, background, terminology, self-management and other related aspects of drama, theatre and arts. The technical terms, this course is more focused on the practical training (practical) skills in drama, theatre and playwright

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW157 SENI TEATER BAHASA INGGERIS [ENGLISH THEATRE ARTS]
No of Credits:

Course Synopsis:
The course is an introduction of English Language drama for students to gain skills and confidence in spoken English through the teaching of dramatic performance arts which would involve basic acting, annunciation and pronunciation, situational awareness, emotional display, role-playing, improvisation and exercises to enhance spoken English. The goal is to imbue students with better spoken communicative abilities to help them in their personal and professional lives

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW160 PALAPES I [ROTU ARMY I]
No of Credits:

Course Synopsis:
Candidates must fulfil the conditions that have been set by ATM Selection Board. Training will start after the candidates have succeeded in the selection test by PALAPES Base and Reserve Team Section. Level I and II aims are to expose students to Basic Military Training (Theory and Practical) and life in camp.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW161 PALAPES II [ROTU ARMY II]
No of Credits:

Course Synopsis:
Candidates must fulfil the conditions that have been set by ATM Selection Board. Training will start after the candidates have succeeded in the selection test by PALAPES Base and Reserve Team Section. Level I and II aim are to expose students to the Basic Military Training (Theory and Practical) and life in camp.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW162 KOR SISWA SISWI PERTAHANAN AWAM I [MALAYSIA CIVIL DEFENSE DEPARTMENT I (KOR SISPA I)]
No of Credits:

Course Synopsis:
This course offers basic knowledge and skills of marching, first aid essentials, human blood circulation, fire burns treatment, treatment for bone injuries, joint and muscle pain, treatment of insect bites and poisonous animals, Cardiopulmonary resuscitation, and extrication techniques. The students will learn the theoretical and practical rescue, and also first aid during accidents to enhance the understanding, mentally and physically ready to face any emergency issues

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW163 KOR SISWA SISWI PERTAHANAN AWAM II [MALAYSIA CIVIL DEFENSE DEPARTMENT II (KOR SISPA II)]
No of Credits:

Course Synopsis:
This course offers basic knowledge and skills of marching, extrication techniques, rope knots, chainsaw safety operation manual, fire science and firefighting equipment, map and compass reading techniques, first aid management and also security during natural disasters. The students will learn the theoretical and practical rescue and first aid during an accident to enhance the understanding and the mental and physical readiness to face any emergency issues.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW164 KURSUS PERSIJILAN BULAN SABIT MERAH MALAYSIA [THE MALAYSIAN RED CRESCENT SOCIETIES CERTIFICATION COURSE I]
No of Credits:

Course Synopsis:
Certified Red Crescent Co-Curriculum course aims to expose the students to both the theoretical and traditional aspects of Certified Red Crescent. The theoretical aspect of the course covers on historical background, terminology, self-management and other related features of Certification by the Red Crescent, while the technical aspects focuses on practical training in terms of skills for the Certification of the Red Crescent.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW166 KOR SUKARELAWAN POLIS SISWA/SISWA I [SVPC-1 @STUDENTS VOLUNTARY POLICE CORP]
No of Credits:

Course Synopsis:
The Co-Curriculum course is to form personality and student development that is knowledgeable, disciplined and patriotic, and also possesses good level of police knowledge. The training programme and SVPC Corp activities are by following the training programme and activity that was provided and approved by PDRM. A total of 672 hours needed to comply with the training needs and SVPC Corp activity for commission purposes. Thus, a total of 112 hours of training are needed to fulfil the training requirement in the aspect of Administration/Management, outdoor activity and academic.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in

order to make effective decisions, while enriching understanding of our diverse world.

UZW167 KOR SUKARELAWAN POLIS SISWA/SISWA II [SVPC-2 @ STUDENTS VOLUNTARY POLICE CORP]
No of Credits:

Course Synopsis:
This is the addition from the programme that has been implemented in semester one that intends to shape student personality and development that is knowledgeable, discipline and patriotic, and also possess good police knowledge level. The training programme and SVPC Corp activity is followed by the training programme and activity that has been provided and approved by PDRM. Thus, a total of 112 hours of training are needed to fulfil the training requirement in the aspect of Administration/Management, outdoor activity and academic.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW168 BRIGED RELA SISWA SISWI I [MALAYSIAN PEOPLE 'S VOLUNTEER CORP I]
No of Credits:

Course Synopsis:
This course exposes students to the introduction of the People's Volunteer Corps (RELA), REAL legislation, union people, the concept of voluntary, external training and marching.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW169 BRIGED RELA SISWA SISWI II [MALAYSIAN PEOPLE 'S VOLUNTEER CORP II]
No of Credits:

Course Synopsis:
This course exposes students to the introduction of the People's Volunteer Corps (RELA), REAL legislation, union people, the concept of voluntary, external training and marching.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW171 SENI SILAT CEKAK I [SENI SILAT CEKAK I]
No of Credits:

Course Synopsis:
Martial Arts Fight Co-Curriculum course aims to expose students to the knowledge of martial arts self-defence fight in terms of theoretical skills and technical. In terms of theory, this course is more focused on the history, background back, terminology, self-management and other related to Martial arts. While technically, this course focused on practical training (practical) skills in terms of hands and feet that are being practice from time to time.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW172 TAEKWON – DO GTF I [TAEKWON – DO GTF I]
No of Credits:

Course Synopsis:
Taekwon-Do I (GTF) Co-Curriculum course aims to expose the students to the knowledge of martial arts that is Taekwon-Do (GTF) in terms of theoretical and technical skills. In terms of theory, this course is focused on historical background, terminology, self-management and other related with Taekwon-Do. While technical, this course is more focused on practical training (practical) skills in terms of hands and feet that are being practice from time to time.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW173 KARATE-DO I [KARATE-DO I]
No of Credits:

Course Synopsis:
The karate-do co-curriculum course exposes the students to the knowledge of martial arts karate-do in terms of theoretical and technical skills. In terms of theory, this course is more focused on the history, background, terminology, management of oneself and other associated with the art of karate-do. While technically, this course is focused on practical training (practical) skills in the art of karate-do.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW175 FUTSAL [FUTSAL]
No of Credits:

Course Synopsis:
Make curricular sports activities of Futsal as an activity participated by all students through the activities planned in order to master the basic skills of futsal, organization of games and game laws. In addition to the opportunity of interaction, fun and occupy their free time with useful things as well as fostering a sense of difficulty and collaborative, responsible and contribute to the the university.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW176 TAEKWON-DO WTF I [TAEKWON-DO WTF I]
No of Credits:

Course Synopsis:
Taekwon-Do I (WTF) Co-Curriculum course aims to expose the students to the knowledge of martial arts that is Taekwon-Do (WTF) in terms of theoretical and technical skills. In terms of theory, this course is focused on historical background, terminology, self-management and other related with Taekwon-Do. While technical, this course is more focused on practical training (practical) skills in terms of hands and feet that are being practice from time to time.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW177 SILAT OLAHRAGA I [SPORT SILAT I]
No of Credits:

Course Synopsis:
Sports Silat course introduces and exposes the students with the martial art in terms of theory and practice. Students will learn the background, concepts, equipment and regulations in martial arts and martial arts sports. Students will also be emphasized in terms of self-discipline. In addition, students will learn the basics of martial arts movement, combination of technical and fundamental movements in martial art.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW178 SILAT OLAHRAGA II [SPORT SILAT II]
No of Credits:

Course Synopsis:
Silat course of this exercise is continued from the course exercise Silat I. This course will explore Silat sport again in theory, ternikal and practical. Students will learn about the art of tying headdress, art sampin bond and basic movement and sports games silat martial art. Students will also be emphasized in terms of self-discipline. In addition, students will learn the basics of coaching workshops sports and martial arts martial arts.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW179 OLAHRAGA [ATHLETIC]
No of Credits:

Course Synopsis:
Course aims to expose students to the science of Athletics that is the foundation of all sports. In Sports Sports there are many types of events such as running, jumping, and throwing a stone. This course covers the planning, implementation and evaluation of the work, leadership and the right skills. In addition, students can learn about management in a competition advocate the Athletics

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW181 BOWLING PADANG [LAWN BOWL]
No of Credits:

Course Synopsis:
The lawn bowl co-curriculum courses aims to expose the students to the knowledge of lawn sports in the theory and technical skills. In terms of theory, this course is more focused on the history, background, terminology, and management of oneself and other related aspects of lawn sports. While technically, this course is more focused on the practical training (practical) skills in lawn bowls.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW182 PETANQUE [PETANQUE]
No of Credits:

Course Synopsis:
The petanque co-curriculum courses aims to expose the students to the knowledge of petanque sports in theory and technical skills. In terms of theory, this course is more focused on the history, background, terminology, management of oneself and other aspects associated with petanque sports. While technically, this course is more focused on practical training (practical) skills in petanque.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW183 KAYAK [CANOE]
No of Credits:

Course Synopsis:
The canoeing co-curriculum course aims to expose the students to the sports science of canoeing theory and technical skills. In terms of theory, this course is more focused on the history, background, terminology, management of oneself and other related aspects associated with canoeing. While technically, this course is more focused on the practical training (practical) skills in canoeing.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW184 BADMINTON [BADMINTON]
No of Credits:

Course Synopsis:
The badminton co-curriculum course aims to expose the students to the knowledge of badminton in terms of theoretical and technical skills. In terms of theory, this course is more focused on the history, background, terminology, management of oneself and other related aspects associated with badminton. While technically, this course is more focused on the practical training (practical) skills in playing badminton.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW185 HOKI [HOCKEY]
No of Credits:

Course Synopsis:
The hockey ho-curriculum course aims to expose the students to the sport science of hockey in terms of theoretical and technical skills. In terms of theory, this course is more focused on the history, background, terminology, management of oneself and other related aspects associated with hockey. While technically, this course is more focused on the practical training (practical) in terms of skills in playing hockey.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW186 SEPAK TAKRAW [SEPAK TAKRAW]
No of Credits:

Course Synopsis:
The sepak takraw co-curriculum course aims to expose the students to the science of sepak takraw sports, theoretically and technically. In terms of theory, this course is more focused on the history, background, terminology, management of oneself and other related aspects associated with sepak takraw. While technically, this course is more focused on the practical training (practical) in terms of skills in playing sepak takraw.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW187 RAGBI [RUGBY]
No of Credits:

Course Synopsis:
The rugby co-curriculum course aims to expose the students to the knowledge of rugby in terms of theory and technical skills. In terms of theory, this course is more focused on the history, background, terminology, management of oneself and other aspects associated with rugby. While technically, this course is more focused on the practical training (practical) skills in playing rugby

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW188 OLAHRAGA [ATHLETIC]
No of Credits:

Course Synopsis:
The archery co-curriculum course aims to expose the students to archery, shooting sports science in terms of theoretical and technical skills. In terms of theory, this course is more focused on the history, background, terminology, management of oneself and other related aspects concerning shooting. While technically, this course is more focused on the practical training (practical) skills in archery

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW189 PING PONG [TABLE TENNIS]
No of Credits:

Course Synopsis:
The table tennis co-curriculum course aims to expose the students to the knowledge of ping pong sports in terms of theoretical and technical skills. In terms of theory, this course is more focused on the history, background, terminology, management of oneself and other related aspects associated with ping-pong. While technically, this course is more focused on the practical training (practical) skills in playing ping-pong.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW191 KHIDMAT MASYARAKAT [COMMUNITY SERVICE]
No of Credits:

Course Synopsis:
The community service co-curriculum course fosters community spirit of volunteerism among the students. In addition, the course will also help the process of forming communication network and self-stimulate the intellectual of the community.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW192 DAYA USAHA & INOVASI [INITIATIVE & INNOVATION]
No of Credits:

Course Synopsis:
This course intends to train the students to master the basic skill of design and engineering. Additionally, it gives an exposure to students to know ways of using recycling materials, mechanisms that can be used and techniques of designing. This course gives the opportunity to students to spill out ideas that are constructive and apply it in a form of a product, high level of cooperativeness, be responsible and ability to develop student personality that is excellent

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW193 TAJWID [TAJWID]
No of Credits:

Course Synopsis:
This course covers an introduction to the basics of Tajweed knowledge, basic knowledge of the laws of the holy Qur'an is right, and so Talaqqi and practice reading the Quran in mujawwad. Students learn the basic rules and laws fluently, held talks in a feedback session, complete Quran recitation, Tajweed and subsequently apply the knowledge Talaqqi Musyafahah and undergo testing for evaluation.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW195 RADIO KAMPUS [CAMPUS RADIO]
No of Credits:

Course Synopsis:
Radio is one of the most effective medium or disseminator of information and also more extensive compared to TV. Campus Radio curriculum will expose students to the ethics of broadcasting, editing management, recording, and live events. Campus Radio will help students to communicate better and have better ethical in delivering information to the public.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW196 STUDENT IN-FREE ENTERPRISE [STUDENT IN-FREE ENTERPRISE (SIFE)]
No of Credits:

Course Synopsis:
SIFE co-curriculum course is to inculcate entrepreneurial culture and foster a sense of community among students. In addition, this course also has 3 elements that are taken to contribute to the entrepreneurial community, education and the environment. It is implemented so that the students can help the community to improve the standard of living for those in need.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW197 PENGUCAPAN AWAM [SPEAKING ASSEMBLY]
No of Credits:

Course Synopsis:
The course is an introduction to speech communication which emphasizes the practical skill of public speaking, including techniques to lessen speaker anxiety, and the use of visual aids to enhance speaker presentations. Its goal is to provide a platform to prepare students for success in typical public speaking situations and also to provide them with the basic principles of organization. Master of the skills used in public speaking will greatly improve the student's confidence and also chances of being understood. An effective presentation includes good content, organization, delivery, audience, and analysis. These are the tools that the students will be exposed to while attending the course.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW210 SUKARELAWANAN SISWA/SISWI KOREKSIONAL JABATAN PENJARA MALAYSIA III (KOR SISKOR) [STUDENTS VOLUNTARY CORRECTIONAL MALAYSIAN PRISON DEPARTMENT III (KOR SISKOR III)]
No of Credits:

Course Synopsis:
Undergraduate students Correctional III (SISKOR III) is an advanced course SISKOR III which emphasizes the understanding of the Prison Policy, Promoting Prisons Rehabilitation and Housing Intermediate (RP). School Students are also given skills training and marching outside.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW211 SUKARELAWANAN SISWA/SISWI KOREKSIONAL JABATAN PENJARA MALAYSIA IV (KOR SISKOR) [STUDENTS VOLUNTARY CORRECTIONAL MALAYSIAN PRISON DEPARTMENT IV (KOR SISKOR IV)]
No of Credits
:

Course Synopsis:
Undergraduate students Correctional IV (SISKOR IV) is an advanced course SISKOR III which emphasizes the Teachers Training Program Occupational Safety and Parole and Community Services in Prison Institutions that become core business in correctional services. Students will be exposed to the knowledge base prison rehabilitation program, theoretical training and practical firearms. Rehabilitation Program, and Internal Security Unit. In addition, students are required to undertake university and community ties.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in

order to make effective decisions, while enriching understanding of our diverse world.

UZW253 [BRASS BAND II]
No of Credits:

Course Synopsis:
Brass Band II Co-Curriculum course aims to expose the students to both the theoretical and technical aspects of brass musical instruments. The theoretical aspect of the course covers the history, background, terminology, self-management and other related features of brass band, while the technical portion focuses on practical training of playing the brass musical instruments in group

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW260 PALAPES III [ROTU ARMY III]
No of Credits:

Course Synopsis:
This training is the addition from Level I, II and III. Emphasis made towards the administration leadership principle, planning and grouped training.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW261 PALAPES IV [ROTU ARMY IV]
No of Credits:

Course Synopsis:
This training is the addition from Level I, II and III. Emphasis made towards the administration leadership principle, planning and grouped training.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW262 KOR SISWA SISWI PERTAHANAN AWAM III [MALAYSIA CIVIL DEFENSE DEPARTMENT III (KOR SISPA III)]
No of Credits:

Course Synopsis:
This course offers basic knowledge and skills of marching, National Integrity Plan (NIP), the use of power cutter and hydraulic equipment, tools and techniques of ascending and descending, rescue techniques from high places, the introduction of basic fire-fighting equipment, tools & Basic Trauma Life Support (BTLS) and the introduction of ambulance equipment. The students will learn the theoretical and practical rescue and first aid during an accident to enhance the understanding and the mental and physical readiness to face any emergency issues.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW263 KOR SISWA SISWI PERTAHANAN AWAM IV
[MALAYSIA CIVIL DEFENSE DEPARTMENT IV (KOR SISPA IV)]
No of Credits:

Course Synopsis:
This course offers basic knowledge and skills of marching, 999 Emergency services, disaster and crisis management, training management, team management, leadership courses in the organization (PTB), and etiquette and protocol courses. Students will learn the theory and practice of rescue operations and administration of the Civil Defense Department (JPA) to enhance students' understanding of the organizational structure of JPA.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW266 KOR SUKARELAWAN POLIS SISWA/SISWA III
[SVPC-3 @STUDENTS VOLUNTARY POLICE CORP]
No of Credits:

Course Synopsis:
This is the addition from the programme that has been implemented in semester two that intends to shape student personality and development that is knowledgeable, discipline and patriotic, and also possess good police knowledge level. The training programme and SVPC Corp activity is followed by the training programme and activity that has been provided and approved by PDRM. Thus, a total of 112 hours of training are needed to fulfil the training requirement in the aspect of Administration/Management, outdoor activity and academic.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW267 KOR SUKARELAWAN POLIS SISWA/SISWA IV
[SVPC-4 @STUDENTS VOLUNTARY POLICE CORP]
No of Credits:

Course Synopsis:
This is the addition from the programme that has been implemented in semester three that intends to shape student personality and development that is knowledgeable, discipline and patriotic, and also possess good police knowledge level. The training programme and SVPC Corp activity is followed by the training programme and activity that has been provided and approved by PDRM. Thus, a total of 112 hours of training are needed to fulfil the training requirement in the aspect of Administration/Management, outdoor activity and academic.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW268 BRIGED RELA SISWA SISWI III [MALAYSIAN PEOPLE 'S VOLUNTEER CORP III]

Course Synopsis:
This course exposes students to the introduction of the People's Volunteer Corps (RELA), REAL legislation, union people, the concept of voluntary, external training and marching.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW269 BRIGED RELA SISWA SISWI IV [MALAYSIAN PEOPLE 'S VOLUNTEER CORP IV]
No of Credits:

Course Synopsis:
This course exposes students to the introduction of the People's Volunteer Corps (RELA), REAL legislation, union people, the concept of voluntary, external training and marching.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW271 SENI SILAT CEKAK II [SENI SILAT CEKAK II]
No of Credits:

Course Synopsis:
Martial Arts Fight II Co-Curriculum course aims to expose the students the knowledge of martial arts self-defence fight in terms of theoretical skills and technical. In terms of theory, this course is more focused on the history, background back, terminology, self-management and other related to Martial arts. While technically, this course focused on practical training (practical) skills in terms of hands and feet that are being practice from time to time.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW272 TAEKWON – DO GTF II [TAEKWON – DO GTF II]
No of Credits:

Course Synopsis:
Course Co-Curriculum II Taekwon-Do (GTF) is an extension of Taekwon-Do I (GTF). Through this course, emphasis is given to the technical aspects related to each stage of belts. Among the aspects to be covered include the philosophy, theory, and etc. In addition, the students are exposed to the theory of how to manage a tournament or competition.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW273 KARATE-DO II [KARATE-DO II]
No of Credits:

Course Synopsis:
The karate-do co-curriculum course exposes the students to the knowledge of martial arts karate-do in terms of theoretical and technical skills. In terms of theory, this course is more focused on the history, background, terminology, management of oneself and other associated with the art of karate-do. While technically, this course is focused on practical training (practical) skills in the art of karate-do.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW276 TAEKWON-DO WTF II [TAEKWON-DO WTF II]
No of Credits:

Course Synopsis:
Taekwon-Do II (WTF) Co-Curriculum course aims to expose the students to the knowledge of martial arts that is Taekwon-Do (WTF) in terms of theoretical and technical skills. In terms of theory, this course is focused on historical background, terminology, self-management and other related with Taekwon-Do. While technical, this course is more focused on practical training (practical) skills in terms of hands and feet that are being practice from time to time.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW360 PALAPES V [ROTU ARMY V]
No of Credits:

Course Synopsis:
This course is the continuity from Level III and IV. In this level, student is trained to become a head, lead the team in all related to training, administration and social. Student will be evaluated and given the support to be accredited in the Commissioning Ceremony and Certificate Awarding by DYMM SPB Yang Dipertuan Agong.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW361 PALAES VI [ROTU ARMY VI]
No of Credits:

Course Synopsis:
This course is the continuity from Level III, IV and V. In this level, student is trained to become a head, lead the team in all related to training, administration and social. Student will be evaluated and given the support to be accredited in the Commissioning Ceremony and Certificate Awarding by DYMM SPB Yang Dipertuan Agong.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW362 KOR SISWA SISWI PERTAHANAN AWAM V [MALAYSIA CIVIL DEFENSE DEPARTMENT V (KOR SISPA V)]
No of Credits:

Course Synopsis:
This course offers basic knowledge and skills of marching, management of meetings, characteristics, ethics, leadership, etiquette and protocol, endurance training coaching skills courses and courses to be officers. The students will learn in theory and practice regarding the management and administration of the Malaysian Civil Defence Department (JPA) team to further enhance the preparedness of the students with the possibility in the future

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW366 KOR SUKARELAWAN POLIS SISWA/SISWA V
[SVPC-5 @STUDENTS VOLUNTARY POLICE CORP]
No of Credits:

Course Synopsis:
This is the addition from the programme that has been implemented in semester four that intends to shape student personality and development that is knowledgeable, discipline and patriotic, and also possess good police knowledge level. The training programme and SVPC Corp activity is followed by the training programme and activity that has been provided and approved by PDRM. Thus, a total of 112 hours of training are needed to fulfil the training requirement in the aspect of Administration/Management, outdoor activity and academic.

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

UZW367 KOR SUKARELAWAN POLIS SISWA/SISWA VI
[SVPC-6 @STUDENTS VOLUNTARY POLICE CORP]
No of Credits:

Course Synopsis:
This is the addition from the programme that has been implemented in semester five that intends to shape student personality and development that is knowledgeable, discipline and patriotic, and also possess good police knowledge level. The training programme and SVPC Corp activity is followed by the training programme and activity that has been provided and approved by PDRM. Thus, a total of 112 hours of training are needed to fulfil the training requirement in the aspect of Administration/Management, outdoor activity and academic

Course Outcomes:
CO1 - Ability to communicate, lead and work effectively in a team.
CO2 - Ability to learn, realize potential, think and access information in order to make effective decisions, while enriching understanding of our diverse world.

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DIPLOMA & BACHELOR DEGREE PROGRAMME

AKADEMIK

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ACADEMIC SESSION