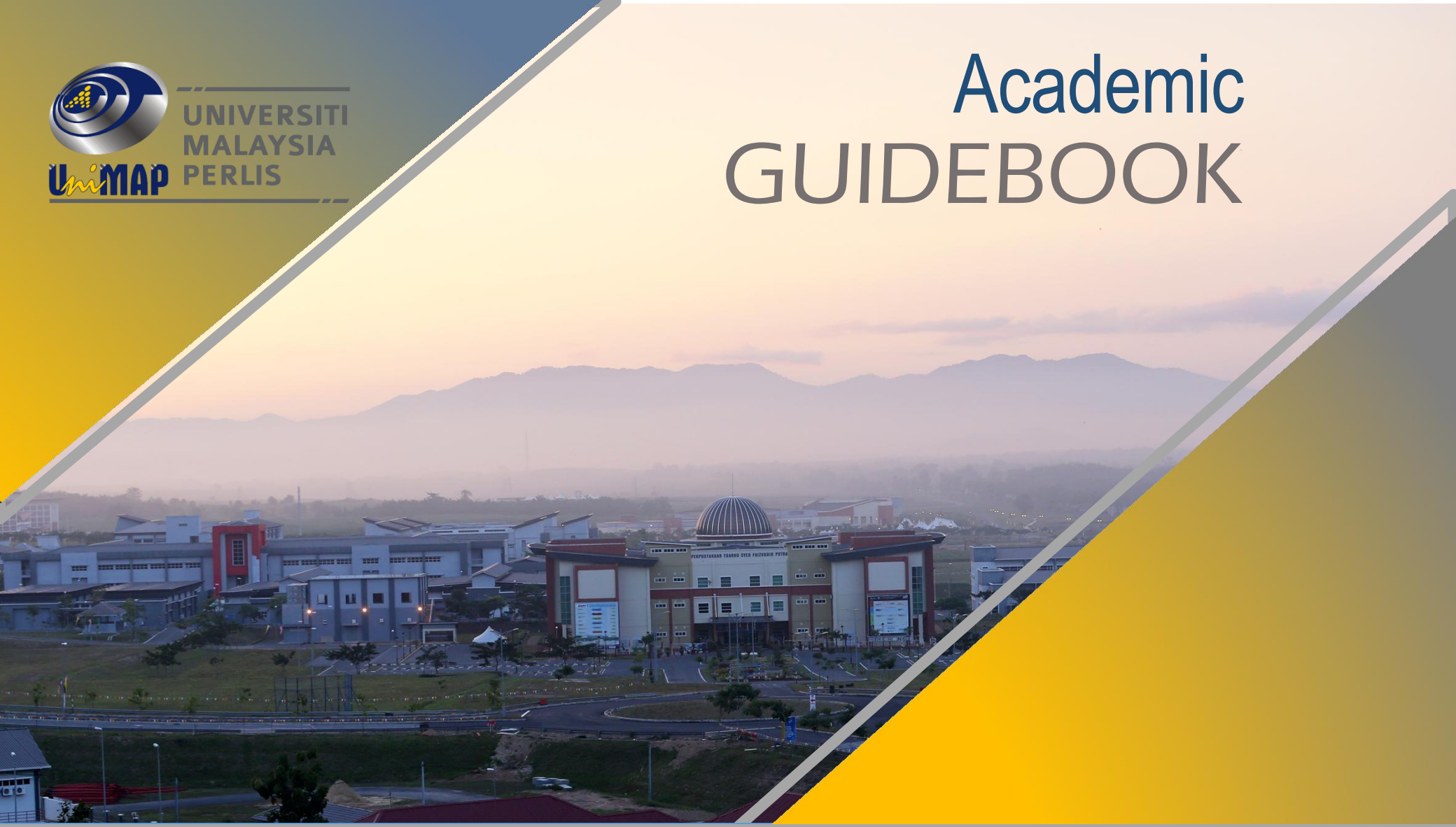
UNIVERSITI MALAYSIA PERLIS

UniMAP

Academic GUIDEBOOK



DEGREE PROGRAMME

ACADEMIC SESSION 2021/2022

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En. Rusdi Puteh dan Pn. Mazmin Mat Akhir.

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 Pusat Pengurusan Akademik (AMC), Universiti Malaysia Perlis.
all the staff at Academic Management Centre (AMC), Universiti Malaysia Perlis.

ISI KANDUNGAN / CONTENTS

PENGENALAN

Buku Panduan Program 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.

Senarai Fakulti:

1. Fakulti Teknologi Kejuruteraan Elektrik
2. Fakulti Teknologi Kejuruteraan Elektronik
3. Fakulti Teknologi Kejuruteraan Mekanikal
4. Fakulti Teknologi Kejuruteraan Kimia
5. Fakulti Teknologi Kejuruteraan
6. Fakulti Sains Gunaan dan Kemanusiaan

INTRODUCTION

The Academic Guidebook for Diploma 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.

List of Faculties:

1. *Faculty of Electrical Engineering Technology*
2. *Faculty of Electronic Engineering Technology*
3. *Faculty of Mechanical Engineering Technology*
4. *Faculty of Chemical Engineering Techonolgy*
5. *Faculty of Civil Engineering Techonolgy*
6. *Faculty of Applied and Human Sciences*

Senarai Program Pengajian / *List of Programmes:*

1. Sarjana 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) 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 Engineering 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*

Senarai Program Pengajian / *List of Programmes:*

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

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

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

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

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

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Naib Canselor/ *Vice Chancellor*

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Acting
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Deputy Vice Chancellor (Academic & International)

Prof. Ir. Dr. Rizalafande Che Ismail
Timbalan Naib Canselor (Penyelidikan & Inovasi) /
Deputy Vice Chancellor (Research & Innovation)

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Deputy Vice Chancellor (Students Affairs & Alumni)

Tuan Haji Mohd Saad Din
Pendaftar / *Registrar*

En. Rusdi Puteh
Bendahari / Bursar

Pn. Mazmin Mat Akhir
Ketua Pustakawan / *Chief Librarian*

KALENDAR AKADEMIK SARJANA MUDA / *BACHELOR DEGREE ACADEMIC CALENDAR*
SIDANG AKADEMIK / *ACADEMIC SESSION* 2021/2022

AKTIVITI / *ACTIVITIES*	**SEMESTER PERTAMA / *FIRST SEMESTER*** 18 Oktober – 27 Februari 2022 (19 minggu/*weeks*)		
	JANGKA MASA / *DATE*	**TEMPOH / *DURATION***	**CATATAN / *NOTES***
Pendaftaran Pelajar Baharu & Minggu Suai Kenal / *New Intake Registration & Orientation Week*	9 – 17 Oktober 2021	1 minggu / *week*	-
Kuliah / *Lectures*	18 Oktober – 5 Disember 2021	7 minggu / *weeks*	**Maulidur Rasul / *Prophet Muhammad's Birthday*** 19.10.2021 [Selasa / Tuesday] **Hari Deepavali / *Deepavali*** 14.11.2021 [Selasa / Tuesday]
Cuti Pertengahan Semester / *Mid Semester Break*	6 – 12 Disember 2021	1 minggu / *week*	
Kuliah / *Lectures*	12 Disember 2021– 30 Januari 2022	7 minggu / *weeks*	**Hari Krismas / *Christmas*** 25.12.2021 [Sabtu / *Saturday*]
Minggu Ulangkaji / *Revision Week*	31 Januari – 6 Februari 2022	1 minggu / *week*	**Tahun Baru Cina / *Chinese New Year*** 1 & 2.02.2022 [Selasa & Rabu / *Tuesday & Wednesday*]
Peperiksaan / *Examination*	7– 27 Februari 2022	3 minggu / *weeks*	-
Cuti Antara Semester / *Semester Break*	28 Februari – 27 Mac 2022	3 minggu / *weeks*	**Israk Mikraj** 1.03.2022 [Selasa / Tuesday]

KALENDAR AKADEMIK SARJANA MUDA / *BACHELOR DEGREE ACADEMIC CALENDAR*
SIDANG AKADEMIK / *ACADEMIC SESSION* 2021/2022

AKTIVITI / *ACTIVITIES*	**SEMESTER KEDUA / SECOND SEMESTER** 28 Mac – 16 Oktober 2022 (19 minggu / weeks)		
	JANGKA MASA / *DATE*	**TEMPOH / *DURATION***	**CATATAN / *NOTES***
Kuliah / *Lectures*	28 Mac – 1 Mei 2022	5 minggu / *weeks*	**Nuzul Al-Quran** 19.04.2022 [Selasa / Tuesday] **Hari Pekerja / Labour Day** 01.05.2022 [Ahad / *Sunday*]
Cuti Pertengahan Semester / *Mid. Semester Break*	2 – 8 Mei 2022	1 minggu / *week*	**Hari Raya Aidilfitri / Eid-ul Fitr** 2 & 5.05.2022 [Isnin & Selasa / *Monday & Tuesday]*
Kuliah / *Lectures*	9 Mei – 10 Julai 2022	9 minggu / *weeks*	**Hari Wesak / *Wesak Day*** 15.05.2022 [Ahad / *Sunday*] **Hari Keputeraan Agong** / *Agong Birthday* 06.06.2022 [Isnin / *Monday*] **Hari Raya Aidiladha / *Eid-ul Adha*** 9 & 10 Julai 2022 [Sabtu & Ahad / *Saturday & Sunday*]
Minggu Ulangkaji / *Revision Week*	11 – 17 Julai 2022	1 minggu / *week*	**Hari Keputeraan Raja Perlis / *Birthday of Raja Perlis*** 17.07.2022 [Ahad / *Sunday*]
Peperiksaan / *Examination*	18 Julai - 7 Ogos 2022	3 minggu / *weeks*	**Awal Muharam** 30.07.2022 [Sabtu / *Saturday*]
Cuti Panjang / *Long Break*	8 Ogos - 16 Oktober 2022	10 minggu / *weeks*	**Hari Kebangsaan / *National Day*** 31.08.2022 [Rabu / *Wednesday*] **Hari Malaysia / *Malaysia Day*** 16.09.2022 [Jumaat / Friday] **Maulidur Rasul** 08.10.2022 [Sabtu/ Saturday]

SISTEM AKADEMIK

Tahun Akademik Universiti dibahagikan kepada dua semester biasa iaitu Semester I dan Semester II. Setiap semester ini mengandungi 14 minggu pembelajaran. Universiti juga menawarkan semester khas iaitu Semester Tambahan dan Semester Pendek pada cuti akhir sidang akademik. 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 berijazah.

STRUKTUR PROGRAM SARJANA MUDA

Struktur program Sarjana Muda Kejuruteraan, Sarjana Muda Teknologi Kejuruteraan, Sarjana Muda Teknologi, Sarjana Muda Perniagaan dan Sarjana Muda Komunikasi Media Baharu dikelompokkan seperti yang ditunjukkan dalam Jadual 1, Jadual 2, Jadual 3, Jadual 4, Jadual 5 dan Jadual 6.

ACADEMIC SYSTEM

The University Academic Year is divided into two regular semesters, namely Semester I and Semester II. Each semester contains 14 learning weeks. The University also offers special semesters consists Additional Semester and Short Semester on the end of the academic year break. 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.

DEGREE 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, Table 2, Table 3, Table 4, Table 5 and Table 6.

Jadual 1: Struktur Program Ijazah Sarjana Muda Kejuruteraan
Table 1 : Programme Structure for the Bachelor of Engineering Programme

KURSUS / *COURSES*	**Kemasukan 2021 / *Intake 2021*** **Kredit / *Credits***
KURSUS TERAS KEJURUTERAAN / *ENGINEERING CORE COURSES*	**120**
KURSUS WAJIB UNIVERSITI / *UNIVERSITY REQUIREMENT COURSES*	**16**
a) Keusahawanan Kejuruteraan / *Engineering Entrepreneurship*	2
b) Kemahiran Berfikir / *Thinking Skill*	2
c) Bahasa Melayu Universiti / *University Malay Language*	2
d) Bahasa Inggeris Persediaan / *Preparatory English*	2*
e) Bahasa Inggeris Komunikasi Umum / *English for General Communication*	2**
f) Bahasa Inggeris Untuk Komunikasi Teknikal / *English for Technical Communication*	2
g) Falsafah dan Isu Semasa / *Philosophy & Current Issues*	2
h) Penghayatan Etika dan Peradaban / *Appreciation Ethnic and Civilization*	2
i) Ko-Kurikulum / *Co-Curriculum*	2
k) Opsyen / *Optional Course*	2
JUMLAH / *TOTAL*	**136**

Jadual 2 : Struktur Program Ijazah Sarjana Muda Teknologi Kejuruteraan
Table 2 : Programme Structure for the Bachelor of Engineering Technology Programme

KURSUS / *COURSES*	**Kemasukan 2021 / *Intake 2021*** **Kredit / *Credits***
KURSUS TERAS TEKNOLOGI KEJURUTERAAN / *ENGINEERING TECHNOLOGY CORE COURSES*	**123**
KURSUS WAJIB UNIVERSITI / *UNIVERSITY REQUIREMENT COURSES*	**18**
a) Keusahawanan Kejuruteraan / *Engineering Entrepreneurship*	2
b) Kemahiran Berfikir / *Thinking Skill*	2
c) Bahasa Melayu Universiti / *University Malay Language*	2
d) Bahasa Inggeris Persediaan / *Preparatory English*	2*
e) Bahasa Inggeris Komunikasi Umum / *English for General Communication*	2**
f) Bahasa Inggeris Untuk Komunikasi Teknikal / *English for Technical ommunication*	2
g) Falsafah dan Isu Semasa / *Philosophy & Current Issues*	2
h) Penghayatan Etika dan Peradaban / *Appreciation Ethnic and Civilization*	2
i) Kemahiran & Teknologi Dalam Komunikasi / *Skills and Technology in Communication*	2
j) Ko-Kurikulum / *Co-Curriculum*	2
k) Opsyen / *Optional Course*	2
JUMLAH / *TOTAL*	**141**

Jadual 3 : Struktur Program Ijazah Sarjana Muda Teknologi
Table 3 : Programme Structure for the Bachelor of Technology Degree Programme

KURSUS / *COURSES*	**Kemasukan 2021 / *Intake 2021*** **Kredit / *Credits***
KURSUS TERAS / *CORE COURSES*	**106**
KURSUS WAJIB UNIVERSITI / *UNIVERSITY REQUIREMENT COURSES*	**18**
a) Keusahawanan Kejuruteraan / *Engineering Entrepreneurship*	2
b) Kemahiran Berfikir / *Thinking Skill*	2
c) Bahasa Melayu Universiti / *University Malay Language*	2
d) Bahasa Inggeris Persediaan / *Preparatory English*	2*
e) Bahasa Inggeris Komunikasi Umum / *English for General Communication*	2**
f) Bahasa Inggeris Untuk Komunikasi Teknikal / *English for Technical Communication*	2
g) Falsafah dan Isu Semasa / *Philosophy & Current Issues*	2
h) Penghayatan Etika dan Peradaban / *Appreciation Ethnic and Civilization*	2
i) Ko-Kurikulum / *Co-Curriculum*	2
j) Bahasa Ketiga / *Foreign Language*	2
JUMLAH / *TOTAL*	**124**

Jadual 4 : Struktur Program Ijazah Sarjana Muda Perniagaan (Perniagaan Antarabangsa)
Table 4 : Programme Structure for the Bachelor of Business (International Business) Programme

KURSUS / *COURSES*	**Kemasukan 2021 / *Intake 2021*** **Kredit / *Credits***
KURSUS TERAS PERNIAGAAN / *BUSINESS CORE COURSES*	**91**
KURSUS TERAS ELEKTIF / *ELECTIVE CORE COURSES*	**14**
KURSUS WAJIB UNIVERSITI / *UNIVERSITY REQUIREMENT COURSES*	**15**
a) Kemahiran Berfikir / *Thinking Skills*	2
b) Bahasa Melayu Universiti / *University Malay Language*	2
c) Bahasa Inggeris Persediaan / *Preparatory English*	2*
d) Bahasa Inggeris Komunikasi Umum / *English for General Communication*	2**
e) Bahasa Inggeris Akademik / *English for Academic Purposes*	2
f) Falsafah dan Isu Semasa / *Philosophy & Current Issues*	2
g) Penghayatan Etika dan Peradaban / *Appreciation Ethnic and Civilization*	2
h) Pengurusan Masa / *Time Management*	3
i) Ko-Kurikulum / *Co-Curriculum*	2
JUMLAH / *TOTAL*	**120**

Jadual 5 : Struktur Program Ijazah Sarjana Muda Perniagaan (Keusahawanan Kejuruteraan)
Table 5 : Programme Structure for the Bachelor of Business (Engineering Entrepreneurship) Programme

KURSUS / *COURSES*	**Kemasukan 2021 / *Intake 2021*** **Kredit / *Credits***
KURSUS TERAS PERNIAGAAN / *BUSINESS CORE COURSES*	**94**
KURSUS TERAS ELEKTIF / *ELECTIVE CORE COURSES*	**12**
KURSUS WAJIB UNIVERSITI / *UNIVERSITY REQUIREMENT COURSES*	**14**
a) Keusahawanan Kejuruteraan / *Engineering Entrepreneurship*	2
b) Kemahiran Berfikir / Thinking Skills	2
c) Bahasa Melayu Universiti / *University Malay Language*	2
d) Bahasa Inggeris Persediaan / *Preparatory English*	2*
e) Bahasa Inggeris Komunikasi Umum / *English for General Communication*	2**
f) Bahasa Inggeris Akademik / *English for Academic Purposes*	2
g) Falsafah dan Isu Semasa / *Philosophy & Current Issues*	2
h) Penghayatan Etika dan Peradaban / *Appreciation Ethnic and Civilization*	2
i) Ko-Kurikulum / *Co-Curriculum*	2
JUMLAH / *TOTAL*	**120**

Jadual 6 : Struktur Program Ijazah Sarjana Muda Komunikasi Media Baharu
Table 6 : Programme Structure for Bachelor of New Media Communication Programme

KURSUS / *COURSES*	**Kemasukan 2021 / *Intake 2021*** **Kredit / *Credits***
KURSUS TERAS MEDIA BAHARU / *NEW MEDIA COMMUNICATION CORE COURSES*	**96**
KURSUS ELEKTIF / *ELECTIVE COURSES*	**9**
KURSUS KEPERLUAN UNIVERSITI / *UNIVERSITY REQUIREMENT COURSES*	**18**
a) Kemahiran Berfikir / *Engineering Entrepreneurship*	2
b) Bahasa Melayu Universiti / *University Malay Language*	2
c) Bahasa Inggeris Persediaan / *Preparatory English*	2*
d) Bahasa Inggeris Komunikasi Umum / *English for General Communication*	2**
e) Bahasa Inggeris Akademik / *English for Academic Purposes English for Academic Purposes*	2
f) Falsafah dan Isu Semasa / *Philosophy & Current Issues*	2
g) Penghayatan Etika dan Peradaban / *Appreciation Ethnic and Civilization*	2
h) Bahasa Asing / *Foreign Language*	2
i) Ko-Kurikulum / *Co-Curriculum*	2
j) Kursus Opsyen /*Optional courses*	2
JUMLAH / *TOTAL*	**123**

Penerangan / *Descriptions*:

1. **Kursus ini wajib kepada pelajar yang mendapat Band 1 atau 2 dalam MUET*
   This course is compulsory for student who obtained Band 1 or Band 2 in MUET

2. ***Kursus ini wajib kepada pelajar yang mendapat Band 3 dalam MUET*
   This course is compulsory for student who obtained Band 3 in MUET

3. *Merupakan kursus audit*
   Audit course

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**.

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****.*

- Sekiranya berlaku perubahan pada pendaftaran kursus sama ada pelajar menambah kursus, menggugurkan kursus 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 memperoleh kelulusan daripada Dekan Fakulti.

- Manakala pelajar yang baru mendaftar bagi satu-satu sidang akademik baru akan mendaftar secara online pada tarikh yang dinyatakan pada Minggu Suai Kenal mengikut Fakulti masing-masing. Pelajar akan diberi taklimat tentang kursus, dalam Minggu Suai Kenal 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).

- *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 school. Students will be briefed by their school 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.*

- 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.

i. Pendaftaran Kursus Pelajar Berstatus Aktif

- Pelajar berstatus Aktif boleh mendaftar kursus secara atas talian tidak melebihi 20 kredit dan tidak kurang daripada 10 kredit kecuali pelajar yang mengikuti Latihan Industri dan pelajar Semester Akhir yang akan menamatkan pengajian. Pelajar yang ingin mendaftar melebihi 20 kredit perlu mendapatkan kebenaran daripada RPS dengan kelulusan daripada Dekan Fakulti.

- Keterangan mengenai Pendaftaran Kursus pelajar berstatus Aktif diringkaskan seperti **Jadual 7**. Pelajar yang tidak mengambil kursus LI atau FYP boleh mengambil kursus melebihi 20 kredit dengan kelulusan Dekan Fakulti terlebih dahulu.

- *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.*

i. Active Student Course Registration

- *Students who do not take FYP or LI can take more than 20 credits but with the approval from the Dean. All Active students are allowed to register for not more than 20 credits and not less than 10 credits except for those who are involved in Industrial Training and the Final Year Project. Student who wish to register for more than 20 credits, need to obtain approval from their RPS and verification by the Dean.*

- ***Table 7** summarises the credits that students can register for each semester based on their status. The students who are not registering LI or FYP can register courses more than 20 credits with the approval by the Dean.*

Jadual 7: Ringkasan Pendaftaran Kursus Pelajar Berstatus Aktif
Table 7 : Summary of Credits for Active Student

Status Pelajar / *Student Status*	**Kredit Minimum / *Minimum Credits***	**Kredit Maksimum / *Maximum Credits***
Pelajar Aktif / *Active Student*	10	20

ii. Pendaftaran Kursus Pelajar Percubaan [P] / Probation Student Course Registration [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 8 berikut:

i. Pendaftaran Kursus Pelajar Percubaan [P] / 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 credits allowed is as in Table 8 below:*

Jadual 8 : Ringkasan Pendaftaran Kursus Pelajar Percubaan [P]
Table 8 : Summary of Credits for Probation Student

Status Pelajar / *Student Status*	**Kredit Minimum/ *Minimum Credits***	**Kredit Maksimum/ *Maximum Credits***
Percubaan/ *Probation* (P1)	10	12
Percubaan/ *Probation* (P2)	8	10
Percubaan/ *Probation* (P2*)	8	10

PENAMBAHAN, PENGGUGURAN ATAU TARIK DIRI KURSUS

1. Tambah Kursus

- Tempoh yang dibenarkan untuk penambahan kursus adalah sehingga minggu ke-2 minggu pembelajaran. Pelajar yang lewat mendaftar perlu mengisi Borang HEA(B)-02[b] (Borang Pendaftaran Kursus Lewat) dan menyerahkannya kepada Penolong Pendaftar Fakulti untuk dikemas kini dalam sistem. Permohonan untuk tambah kursus adalah tertakluk kepada kelulusan dan kekosongan kuota.

2. Gugur Kursus

- Tempoh yang dibenarkan untuk menggugurkan kursus adalah sehingga minggu ke-7 minggu pembelajaran. 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 dikemas kini dalam sistem.

3. Tarik Diri Kursus

- 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).

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

- 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.

ADD COURSES, DROP COURSES OR COURSE WITHDRAWAL

1. Adding Courses

- *The time period allowed for the adding of courses is up to the second week of study). The 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

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

- *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.*

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

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

JENIS-JENIS KURSUS

1. KURSUS WAJIB 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) Kemahiran Dan Teknologi Dalam Komunikasi (SMU12202)/ Kemahiran Komunikasi dan Teknologi (SMU12202) - (2 kredit)
Semua pelajar program kejuruteraan wajib mengambil kursus ini. Kursus ini ditawarkan kepada pelajar tempatan dan antarabangsa dengan mengikut kepada struktur kursus dalam penawaran kurikulum program masing-masing.

b) Falsafah & Isu Semasa (SMU13002) – (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.

c) Penghayatan Etika & Peradaban (SMU13102) - (2 kredit)
Semua pelajar wajib mengambil kursus SMU13102 Penghayatan Etika Dan Peradaban. Kursus ini ditawarkan kepada pelajar tempatan dan antarabangsa dengan mengikut kepada struktur kursus dalam penawaran kurikulum program masing-masing.

d) Keusahawanan Kejuruteraan (SMU22402) - (2 kredit)
Semua pelajar wajib mengambil kursus SMU22402 Keusahawanan Kejuruteraan. Kursus ini ditawarkan kepada pelajar tempatan dan antarabangsa dengan mengikut kepada struktur kursus dalam penawaran kurikulum program masing-masing

TYPES OF COURSES

1. UNIVERSITY REQUIREMENTCOURSES

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) Skills and Technology in Communication (SMU12202)/ Communication Skills And Technology (SMU12202) - (2 credits)
All students are required to enrol in this course. This course is offered to local and international students.

b) Philosophy & Current Issues (SMU13002) – (2 credits)
All students are required to take SDU12902 Philosophy & Current Issues. This course is offered to local and international students.

c) Appreciation Ethnic and Civilization (SMU13102) - (2 credits) *All students are required to enrol in this course. This course is offered to local and international students.*

d) Engineering Entrepreneurship (SMU22402) - (2 credits)
All students are required to take SMU22402 Engineering Entrepreneurship. This course is offered to local and international students.

e) Kemahiran Berfikir (SMU32202) - (2 kredit)
Semua pelajar wajib mengambil kursus SMU32202 Kemahiran Berfikir. Kursus ini ditawarkan kepada pelajar tempatan dan antarabangsa dengan mengikut kepada struktur kursus dalam penawaran kurikulum program masing-masing.

f) Ko-Kurikulum (SDZXXXXX)- (2 kredit)
Semua pelajar diwajibkan untuk mengumpul dua (2) unit kursus kokurikulum sepanjang pengajian di UniMAP. Satu (1) unit badan beruniform perlu diambil pada semester 1 tahun pertama pengajian. Manakala, satu (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.

g) Bahasa Melayu Universiti (SMB41002) - (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).

h) Bahasa Inggeris Persediaan (SMB10102) – (2 kredit)
Pelajar dengan salah SATU kriteria berikut perlu mendaftar kursus ini,
- Memperolehi keputusan MUET Band 1 atau 2.
-Memperolehi keputusan MUET dibawah Band 3 / IELTS 5.0 ke bawah bagi Program EPPP (pelajar antarabangsa sahaja)
-Memperolehi keputusan TOEFL 42 ke bawah / IELTS 5.0 ke bawah (pelajar pascasiswazah sahaja)

e) Thinking Skill (SMU32202) - (2 credits)
All students are required to take SMU32202 Thinking Skill. This course is offered to local and international students.

f) Co-Curriculum (SDZXXXXX)- (2 credits)
All students are required to collect two (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 one (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.

g) University Malay Language (SMB41002) – (2 credits)
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.

h) Preparatory English (SMB10102) – (2 credits)
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)*
- *Scored below Band 3 for Malaysian University English Test (MUET)/ scored below 5.0 for IELTS for the English and Pre-University Preparatory Programme (EPPP) (**applicable to international students only)*
- *Scored below 42 for TOEFL/ scored below 5.0 for IELTS (*optional and applicable to postgraduate students ONLY)*

i) Bahasa Inggeris untuk Komunikasi Umum (SMB20102) – (2 kredit)

Pelajar dengan salah SATU kriteria berikut perlu mendaftar kursus ini,

- Memperolehi keputusan MUET Band 3.
- Lulus Bahasa Inggeris Persediaan (SMB10102) dengan minimum gred C

j) Bahasa Inggeris Untuk Komunikasi Teknikal (SMB31202) /Bahasa Inggeris Akademik (SMB31302) - (2 kredit)

- Semua pelajar wajib mengambil kursus Bahasa Inggeris untuk Komunikasi Teknikal (bagi program Sarjana Muda Kejuruteraan , Sarjana Muda Teknologi Kejuruteraan dan Sarjana Muda Teknologi) 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 9.

- Pelajar yang memperolehi Band 1 atau 2 dalam MUET diwajibkan terlebih dahulu mengambil Bahasa Inggeris Asas (Foundation English) iaitu kursus 2 kredit tidak berkredit (audit) dan perlu mendapat kelulusan minimum Gred C sebelum dibenarkan mengambil kursus Bahasa Inggeris Umum (English for General Purposes) sebanyak 2 kredit dan kursus Bahasa Inggeris untuk Komunikasi Teknikal (English for Technical Communication) atau Bahasa Inggeris Akademik (English for Academic Purposes) sebanyak 2 kredit. Gred Lulus minimum bagi semua kursus Bahasa Inggeris ialah gred C.

i) English for General Communication (SMB20102) – (2 credits)

Students with ONE of the following criteria must register for this course;

- *Obtained Band 3 in Malaysian University English Test (MUET)*
- *Passed SMB10102 Preparatory English with minimum of grade C*

j) English for Technical Communication (SMB31202) / English for Academic Purposes (SMB31302) – (2 credits)

- All students are required to take English for Technical Communication (for Bachelor of Engineering, Bachelor of Engineering Technology and Bachelor of Technology) or English for Academic Purposes (for Bachelor of Business and Bachelor of Communication New Media) courses. However, depending on their MUET results, students are required to attend and pass other English language courses first before they are allowed to take English for Technical Communication or English for Academic Purposes, as shown in Table 9.

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

- Bagi pelajar yang memperolehi Band 3 dalam MUET diwajibkan mengambil mengambil kursus Bahasa Inggeris Umum (English for General Communication) iaitu kursus 2 kredit 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 Persediaan (Preparatory 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 Persediaan (Preparatory English) atau kursus Bahasa Inggeris Umum (English for General Communication).

- Bagi pelajar yang mendapat Band 1, 2 dan 3, dua (2) kredit yang diperolehi melalui kursus Bahasa Inggeris Umum (English for General Communication) 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.

- Students who obtained Band 3 in MUET are required to take and pass 2 credits 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 courses.

- For students who obtained Band 1, 2 and 3, the two (2) credits 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 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.

Jadual 9 : Kursus Wajib Bahasa Inggeris
Table 9 : English Compulsory Courses

MUET Band	ENGLISH COMPULSORY COURSES			
	SMB10102 Preparatory English (Non-accredited)	SMB20102 English for General Communication	SMB31202 English for Technical Communication / SMB31302 English for Academic Purposes	Optional Courses (Foreign Languages)
BAND 1 & 2	/	/	/	Registration is open to students
BAND 3		/	/	
BAND 4			/	/

Note:
SMB10102 - Preparatory English is a new course offered for Cohort 2018/2019 and later.
SMB20102 - English for General Communication is a new course offered for Cohort 2018/2019 and later.
SMB31202 - English for Technical Communication (offered for Bachelor of Engineering & Bachelor of Engineering Technology students)
SMB31302 - English for Academic Purposes (offered for the Bachelor of Business & Bachelor of Communication New Media students)

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.

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.

PENDEKATAN PEMBELAJARAN DAN PENGAJARAN DI UniMAP

- Kebanyakan Kursus Teras yang ditawarkan merangkumi komponen teori dan komponen praktikal dengan nilaian jam.

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

i. 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.

ii. 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.

iii. 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.

iv. 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.

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.*

- *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.*

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.

INDUSTRIAL TRAINING

- *Industrial Training is one of the University compulsory courses for student of University Malaysia Perlis (UniMAP) before graduating. The Industrial Training 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:-*

i. Instil professionalism in students
ii. Raise students' awareness on the importance and connection between industrial and lab-intensive training, and engineering theories.
iii. 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

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

- *UniMAP's Industrial Training Courses are divided into the following fields of study:*

Bidang Pengajian / *Field of Study*	**Kredit / *Credits***	**Tempoh Latihan Industri / *Industrial Training Period***
Sarjana Muda Kejuruteraan/ *Bachelor of Engineering*	5	10 Minggu / *weeks*
Sarjana Muda Teknologi Kejuruteraan/ *Bachelor of Engineering Technology*	12	24 Minggu / *weeks*
Sarjana Muda Teknologi/ *Bachelor of Technology*	12	24 Minggu / *weeks*
Sarjana Muda Perniagaan (Perniagaan Antarabangsa)/ *Bachelor of Business (International Business)*	4	8 Minggu / *weeks*
Sarjana Muda Perniagaan (Keusahawan Kejuruteraan)/ *Bachelor of Business (Engineering Entreprenuership)*	4	10 Minggu / *weeks*
Sarjana Muda Komunikasi Media Baharu/ *Bachelor of New Media Communication*	6	12 Minggu / *weeks*
Diploma Kejuruteraan/ *Diploma in Engineering*	8	16 Minggu / *weeks*

- 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).

- *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).*

- 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.

- *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.*

TEMPOH PENGAJIAN MINIMUM DAN MAKSIMUM

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).

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).

Jadual 10 : Tempoh Minimum atau Maksimum pengajian pelajar
Table 10 : The minimum and maximum period of study

Program Pengajian / *Programme*	**Minimum (Semester) / *Minimum (Semester)***	**Maksimum (Semester) / *Maximum (Semester)***
Sarjana Muda Kejuruteraan / *Bachelor of Engineering*	8	14
Sarjana Muda Teknologi Kejuruteraan / *Bachelor of Engineering Technology*	8	14
Sarjana Muda Teknologi / *Bachelor of Technology*	7	12
Sarjana Muda Perniagaan / *Bachelor of Business*	6	10
Sarjana Muda Komunikasi Media Baharu / *Bachelor of New Media Communication*	6	10
Diploma Kejuruteraan / *Diploma in Engineering*	6	10

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 adalah tidak digalakkan. Walau bagaimanapun, permohonan pertukaran program pengajian boleh dipertimbangkan dengan alasan-alasan yang kukuh dan tertakluk kepada garis panduan 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 Borang 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.

TRANSFER OF STUDY 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.*

- *A transfer between programmes is not recommended. However, the application for transfer will be considered if the student has strong reasons and adheres to the following guidelines:*

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 Programme of Study Application Form.*

2. *Students who are under sponsorship and funding must inform and get approval from their respective sponsors before applying.*

3. Borang permohonan mestilah disertakan dengan lampiran:

a) Salinan keputusan peperiksaan peringkat SPM.
b) Salinan keputusan STPM/ Matrikulasi/ Diploma/setaraf;
c) Salinan keputusan MUET
d) Slip keputusan peperiksaan semester sebelumnya (dikecualikan bagi permohonan pada semester pertama).
e) Surat kebenaran daripada penaja (sekiranya berkaitan).

- Pertukaran program pengajian adalah tidak dibenarkan kepada pemohon yang statusnya telah kembali aktif setelah berjaya dalam permohonan rayuan kemasukan semula.

- Permohonan pertukaran program hanya dibenarkan sekali sahaja sepanjang tempoh pengajian.

- 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).

3. The following documents must be attached with the application form:

a) A copy of SPM level examination results.
b) A copy of STPM / Matriculation / Diploma / equivalent results;
c) A copy of MUET results
d) The previous semester examination results slip (excluded for first semester applications).
e) A letter of permission from the sponsor (if applicable).

- *The programme transfer is not allowed for students whose Active status has been restored upon a successful Re-admission appeal.*

- *The programme transfer is only allowed once during the student's entire study period.*

- *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).*

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)/ *Approved by the Vice Chancellor / Deputy Vice Chancellor (Academic and International)*

POSTPONEMENT OF STUDY

- *Postponement of studies is an authorization for students to postpone their studies for a semester for specific 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 Deferment of Study Application Form which can be obtained from the Registrar or their Faculty. Application must be:*

1. *Recommended by the Rakan Pendamping Siswa (RPS),*
2. *Recommended by the Dean of Faculty,*
3. *Recommended by the Director of Academic Management, dan/and*
4. *Approved by the Vice Chancellor / Deputy Vice Chancellor (Academic and International)*

- 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 akan diberikan peringatan 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 dua (2) semester berturut- turut boleh ditamatkan pengajian dan disahkan berhenti daripada Universiti.

- *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.*

- *Students who postpone their studies due to health or other permissible reasons, the semester will not be taken into account in the calculation for graduation (without penalty). In the case of Without Penalty, courses registered for the semester will be dropped, and examination results confirmed by University Examination Council will also be cancelled.*

- *Students will be given a written reminder by the Faculty if they are found to be unregistered during a semester without any application for study postponement. Students who do not respond within a period of up to two (2) consecutive semesters will be terminated from their studies and confirmed as dropouts from the University.*

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:

1. 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.

2. 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%.

CREDIT TRANSFER

- *Credit transfer is defined as the recognition of the amount of credit that has been obtained by a student from UniMAP or from any other higher education institution.*

1. Vertical Credit Transfer or 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:*

i. Passing 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).
ii. 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.
iii. The content of the course must have at least 80% similarities to the course for which credit transfer is applied for.

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 kredit per semester dan terhad kepada 16 kredit 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.

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 credits per semester and be limited to 16 credits 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:

    a. Student who obtained a grade D and below for Core Courses;
    OR
    b. Student who obtained grade C- and below for University Requirement Courses;
    AND
    c. Obtain a passing mark for continuous assessment with a score of 40% for relevant courses.

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.

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

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:

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:*

Jadual 11 : Tempoh Peperiksaan
Table 11 : Examination Duration

Nilai Kursus / *Course Value*	**Tempoh Peperiksaan / *Examination Duration***
1 Kredit / *credit*	2 jam / *hours*
2 – 4 kredit / *credit*	3 jam / *hours*

- 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:

- *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:*

Jadual 12 : Gred Abjad dan Mata Penilaian
Table 12 : Letter grades and points

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.

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

i. For University Requirement 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 requirement No.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 that get D+ or C- to ensure a CGPA reaches at least 2.00

Jadual 13 : Pengiraan PNG dan PNGK:
Table 13 : Calculation of GPA and CGPA

KURSUS/ *COURSE*	**KREDIT/ *CREDIT***	**NILAI GRED/ *GRADE VALUE* [NG]**	**GRED/ *GRADE* [G]**	**JUMLAH/ *TOTAL* NG**
SDQ10002	2	3.75	A-	7.50
EDJ16002	2	2.50	C+	5.00
EDJ17303	3	3.50	B+	10.50
SDU12302	2	4.00	A	8.00
SDB10102	2	1.75	C-	3.50
EDJ17703	3	2.75	B-	8.25
EDJ28003	3	3.00	B	9.00
	17			51.75
PNG [*GPA*] = 51.75/17 = 3.04				
SDQ20303	3	3.50	B+	10.50
EDJ29403	3	2.00	C	6.00
EDJ28503	3	4.00	A	12.00
SDB30102	2	3.50	B+	7.00
SDU12902	2	3.75	A-	7.50
EDJ29703	3	2.50	C+	7.50
	16			50.50
PNG [*GPA*] = 50.50/16 = 3.16				
PNGK [CGPA]	= Jumlah NG Terkumpul [*Total Accumulated Grade Value*] / Jumlah Bil. Unit Terkumpul [*Total Accumulated Credits*] = 51.75 + 50.50 / 17 + 16 = 3.09			

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.

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 14 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.*

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.

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.*

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.

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.*

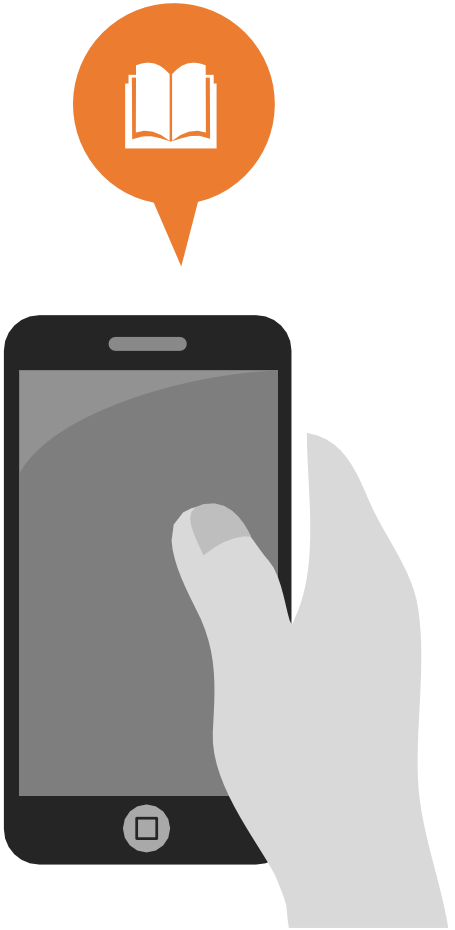
- *In the system, an academic staff supervises a small group of students for the whole duration of the students' study period at UniMAP. 'Supervision' here entails frequent meetings under informal settings, where students are able to discuss about academic and social issues with their lecturers who act 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'.*

UniMAP Academic Guide

QR CODE

Online Student Information

QR CODE



DIREKTORI / *DIRECTORY*

Pejabat Timb. Naib Canselor (Akademik & Antarabangsa) / *Deputy Vice Chancellor (Academic & International) Office*	04-941 4159
Pusat Pengurusan Akademik (AMC) / *Academic Management Centre*	04-941 4158
Bahagian Pemantapan Akademik (AED) / *Academic Enhancement Division*	04-941 4157

Bahagian Pengurusan Akademik (AMD) / *Academic Management Division*

▪ Unit Kemasukan dan Rekod Pelajar / *Student Admissions & Records Unit*	04-941 4056/4065
▪ Unit Peperiksaan dan Pengijazahan / *Examination & Convocation Unit*	04-941 4057/4058
▪ Unit SENAT / *SENAT Unit*	04-941 4060
Jabatan Bendahari / *Bursary Department*	04-941 4020/4021/4022
Jabatan Pendaftar / *Registrar Department*	04-941 4081
Pusat Pembangunan and Perkhidmatan Pelajar (P3P) / *Centre for Student Development and Services*	04-941 4434
Perpustakaan Tuanku Syed Faizuddin Putra (PTSFP) / *Tuanku Syed Faizuddin Putra Library*	04-988 5422/5410

FACULTY OF ELECTRICAL ENGINEERING TECHNOLOGY (FTKE)

Programmes Offered:

1. Bachelor of Electrical Engineering with Honours
2. Bachelor of Mechatronic Engineering with Honours
3. Bachelor of Electrical Engineering Technology (Industrial Power) with Honours
4. Bachelor of Electrical Engineering Technology (Robotic And Automation Technology) with Honours
5. Bachelor of Bachelor of Technology in Electrical Maintenance System with Honours
6. Diploma in Electrical Engineering
7. Diploma in Mechatronic Engineering

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ENGINEERING PROGRAMME

PROGRAMME OBJECTIVES (PEO)

The Programme Objectives for the entire ***Engineering Programme*** at Universiti Malaysia Perlis (UniMAP) is as follows:

PEO 1
Graduates who have demonstrated career advancement in the field of Electrical 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

*At the end of the **Engineering Programme**, the students are expected to attain the following attributes:*

PO 1
Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization respectively 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 consideration.

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 problem.

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 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
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.

PO12
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.

CURRICULUM STRUCTURE
UR6522001 BACHELOR OF ELECTRICAL ENGINEERING WITH HONOURS
INTAKE 2021/2022

	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	I	II	III	IV	V	VI		VII	VIII
Discipline Core (102 Units) (33 Courses)	EMJ12002 Engineering Science	EMJ13003 Electronic Devices	EMJ22003 Instrumentation and Measurements	EMJ23204 Microcontroller Systems Design	EMJ32004 Power System Engineering	EMJ33003 Communication System Engineering	EMJ30105 IndustrialTraining	EMJ42003 High Voltage Engineering	EMJ43003 Electrical Drives
	EMJ12103 Electric Circuit I	EMJ10003 Computer Programming	EMJ22204 Analog Electronics	EMJ23003 Electrical Power Technology	EMJ32103 ElectromagneticTheory	***EMJ33103 Power System Analysis		EMJ44X03 Elective I	EMJ44X03 Elective III
	EMJ12202 Introduction toElectrical Engineering	*** EMJ13103 Electric CircuitII	EMJ22304 Digital Electronics	EMJ23103 Control Systems Engineering	EMJ32204 Electrical Machine	EET33303 Electrical Energy Utilization		EMJ44X03 Elective II	EMJ44X03 Elective IV
		EMJ13203 Electrical Engineering Practices	EMJ22403 Signals and Systems		EMJ32304 Power Electronics I	EMJ33404 Electrical Installation Design I		EMJ40002 Final Year Project I	***EMJ40004 Final Year Project II
								EMJ41003 Management for Engineers	EMJ41102 Professional Engineers
								***EMJ42202 Electrical Installation Design II	
Common Core (14 Units) (5 Courses)	SMQ10103 Engineering Mathematics I	SMQ10203 Engineering Mathematics II	SMQ20303 Engineering MathematicsIII	SMQ27103 Engineering Statistics					
				SMU12202 Skill and Technology In Communication					
	SMB10102 Prepatory English	* SMB20102 English for General Communication		*SMB31202 English for Technical Communication	*SMB1XX02 Option				
	** SMB11002 University Malay Language								
	SMU13002 Philosophy andCurrent Issues								
	SMU13102 Appreciation of Ethics & Civilizations				SMU32202 Thinking Skills	SMU22402 Engineering Entrepreneurship			
	SMZXXX01 Co-curriculum	SMZXXX01 Co-curriculum							
137	17	18	17	17	16	16	5	16	15
Total Units for Graduation 137									

*Compulsory and optional courses according to MUET Results

MUET	SMB10102 (Uncredited)	SMB20102	SMB31202	SMB1XX02
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 139 Credits.

** Course specific for local or international student

Local	International
SMB 41002 University Malay Language	SMB11002 Basic Malay Language

***Courses with prerequisite

Course	Prerequisite
EMJ13103	EMJ12103
EMJ42202	EMJ33404
EMJ40004	EMJ40002
EMJ33104	EMJ32003

List of Elective Courses

Area	Course Code	Course Name	Semester Offered
Electrical Power	EMJ44103	Power System Operation & Control	7
	EMJ44203	Electrical Machine Design	
	EMJ44603	Substation Design	8
	EMJ44803	Power System Protection	
Renewable Energy and Control	EMJ44303	Power Electronics II	7
	EMJ44403	Electrical Energy System	
	EMJ44503	Industrial Electronic Control	8
	EMJ44703	Renewable Energy System	

CURRICULUM STRUCTURE
UR6523003 BACHELOR OF MECHATRONIC ENGINEERING WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	I	II	III	IV	V	VI		VII	VIII
ENGINEERING CORE COURSES (102)	EMJ16103 Electric Circuit Theory	EMJ17104 Analog Electronics	EMJ26103 Signals & Linear Systems	EMJ27103 Electromagnetic Field Theory	EMJ36103 Control Engineering I	EMJ37103 Control Engineering II	EMJ30105 Industrial Training	EMJ40002 Final Year Project I	EMJ40004 Final Year Project II
	EMJ16203 Engineering Statics	EMJ17203 Engineering Dynamics	EMJ26203 Digital Logic Circuit	EMJ27204 Embedded System and Interfacing	EMJ36203 Machine Vision	EMJ37203 Mechatronic Systems Design I		EMJ47204 Mechatronic Systems Design II	EMJ47002 Production & Quality Control
	EMJ16302 Principle of Engineering Materials	EMJ17303 Computer Aided Drawing	EMJ26303 Instrumentation & Measurements	EMJ27303 Power Electronics	EMJ36303 Fluid Power Systems	EMJ37303 Robotic Systems		EMJ47104 Automation	
	EMJ16403 Mechatronic Engineering Practices	EMJ10003 Computer Programming	EMJ26402 Principle of Engineering Thermofluids	EMJ27403 Network & Communication System	EMJ36404 Electrical Machines & Power Systems	EMJ37403 Artificial Intelligence for Mechatronic Engineering		Elective I	Elective II
			EMJ26703 Design of Machinery						
COMMON COURSES (19)	SMQ10103 Engineering Mathematics I	SMQ10203 Engineering Mathematics II	SMQ20303 Engineering Mathematics III	SMQ27103 Engineering Statistics	SMU12202 Skills and Technology in Communication			EMJ41003 Management for Engineers	EMJ41102 Professional Engineers
UNIVERSITY REQUIREMENT (16)	SMU13002 Philosophy and Current Issues	SMU13102 Appreciation of Ethics & Civilization				SMU32202 Thinking Skills			
	SMZ1XX01 Co-Curriculum I		SMZ2XX01 Co-Curriculum II			SMU22402 Engineering Entrepreneurship			
	*SMB10102 Preparatory English			Option or ** SMB20102 English for General Communication	SMB31202 English for Technical Communication	SMB41002 University Malay Language or ***SMB11002 Basic Malay Language			
	17	18	18	18	17	18	5	16	11
Total Units for Graduation 138									

*Compulsory and optional courses according to MUET Results

MUET	SMB10102 (Uncredited)	SMB20102	SMB31202	Option
Band 2	Compulsory	Compulsory	Compulsory	Optional
Band 3		Compulsory	Compulsory	Optional
Band 4,5 and 6			Compulsory	Compulsory

Electives:

Area	Elective I	Elective II
Control and System Integration	EMJ47503 Advanced Control Engineering	EMJ48503 System Identification & Parameter Estimation
Robotics and Automation	EMJ47603 Autonomous Mobile Robots	EMJ48603 Advanced PLC Systems
Artificial Intelligence and Machine Learning	EMJ47703 IoT & Data Analytics	EMJ48703 Smart System Design

ENGINEERING TECHNOLOGY PROGRAMME

PROGRAMME OBJECTIVES (PEO)

The Programme Objectives for the entire ***Engineering Technology Programme*** at Universiti Malaysia Perlis (UniMAP) is as follows:

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

*At the end of the **Engineering Technology Programme**, the students are expected to attain the following attributes:*

PO 1
Knowledge: Apply knowledge of mathematics, science, engineering fundamentals and engineering specialisation principles 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 specialization.

PO 3
Design/development of solutions: 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.

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 the effective reports and design documentation, make effective presentations, 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 and leader in a team and to manage projects in multidisciplinary environments.

PO12
Life-Long Learning: Recognize the need for and have the ability to engage in independent and lifelong learning in specialist technologies.

CURRICULUM STRUCTURE
UR6522002 BACHELOR OF ELECTRICAL ENGINEERING TECHNOLOGY (INDUSTRIAL POWER) WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEMESTER	I	II	III	IV	V	VI	VII	VIII
ENGINEERING CORE	EMK11003 Computer Programming	EMK11203 Electric Circuit Theory I	EMK21203 Electric Circuit Theory II	EMK21403 Electrical Machines Technology I	EMK32003 Electrical Machines Technology II	EMK30004 Final Year Project I	EMK40006 Final Year Project II	EMK40112 INDUSTRIAL TRAINING
	EMK10002 Computer Aided Drawing	EMK11403 Digital Electronics	EMK21103 Measurement & Instrumentation	EMK21503 Microcontroller System	EMK32103 Electrical Installation	EMK32303 Renewable Energy System	EMK42003 Power System Protection & Switchgear	
	EMK10103 Engineering Skills I	EMK11303 Electronics I	EMK21303 Electronics II	EMK21603 Power Electronics	EMK31003 Drives and Actuators	EMK31203 Programmable Logic Controller	EMK41003 Technologist in Society	
	EMK11103 Engineering Science	EMK10203 Engineering Skills II	EMK21003 Electromagnetic Field Theory	EMK21703 Communication System	EMK32203 Electrical Power System	EMK31303 Engineering Technology Management	Elective II/3	
				EMK21803 Signal & Systems	EMK31103 Control System Technology	Elective I/3	Elective III/3	
					EMK30103 Design Project			
COMMON CORE	SMQ11103 Mathematics for Engineering Technology I	SMQ11203 Mathematics for Engineering Technology II	SMQ21303 Mathematics for Engineering Technology III					
UNIVERSITY REQUIREMENT	SMU32202 Thinking Skills	*SMB10102 Preparatory English	**SMB20102 English for General Communication	SMU22402 Engineering Entrepreneurship		SMU12202 Skills & Technology in Communication		
	SMU13002 Philosophy and Current Issues	SMB41002 University Malay Language	SMB1XX02 Option Subject (Foreign Language)	SMB31202 English for Technical Communication	SMU13102 Appreciation of Ethics and Civilization			
	SMZXXX01 Co-Curricular Activity	SMZXXX01 Co-Curricular Activity						
M: 2- 3	19	18+2	17+2	19	20	18	18	12
M: 4- 6	19	18	17+2	19	20	18	18	12
Total Units for Graduation = 141								

Elective I	Elective II	Elective III
A1. EMK32403 Power Quality	B1. EMK42103 Power Electronics & Drives	C1. EMK42303 Energy Efficiency & Management
A2. EMK32503 Substation Engineering	B2. EMK42203 Industrial Automation	C2. EMK42403 High Voltage Technology

CURRICULUM STRUCTURE
UR6523006 BACHELOR OF ELECTRICAL ENGINEERING TECHNOLOGY (ROBOTIC AND AUTOMATION TECHNOLOGY) WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEM	I	II	III	IV	V	VI	VII	VIII
ENGINEERING CORE	EMK11003 Computer Programming	EMK11203 Electric Circuit Theory I	EMK21203 Electric Circuit Theory II	EMK21503 MicrocontrollerSystem	EMK31003 Drives and Actuators	EMK30004 Final Year Project I	EMK40006 Final Year Project II	EMK40112 INDUSTRIAL TRAINING
	EMK10002 Computer Aided Drawing	EMK11403 Digital Electronics	EMK21103 Measurement and Instrumentation	EMK21603 Power Electronic	EMK31103 Control System Technology	EMK31203 Programmable Logic Controller	Elective II/3	
	EMK10103 Engineering Skills I	EMK11303 Electronics I	EMK21303 Electronics II	EMK21703 Communication System	EMK36103 Mechanics and Machine Design	EMK36403 Modern Control	Elective III/3	
	EMK11103 Engineering Science	EMK10203 Engineering Skills II	EMK21003 Electromagnetic Field Theory	EMK21803 Signal and Systems	EMK30103 Design Project	EMK36203 Industrial Automation	EMK41003 Technologist in Society	
				EMK21403 Electrical Machines Technology I	EMK36003 Industrial Networking	EMK36303 Industrial Robotics		
					EMK31303 Engineering Technology Management	Elective I/3		
COMMON CORE	SMQ11103 Mathematics for Engineering Technology I	SMQ11203 Mathematics for Engineering Technology II	SMQ21303 Mathematics for Engineering Technology III					
UNIVERSITY REQUIRED	SMU13102 Appreciation Of Ethics and Civilization							
	SMU32202 Thinking Skills	**SMB20102 English for General Communication	SMB41002 University Malay Language	SDU22402 Engineering Entrepreneurship	SMU12202 Skills and Technology in Communication		SMB1XX02 Option Subject (Foreign Language)	
	*SMB10102 Preparatory English	SMU13002 Philosophy and Current Issues	***SMB11002 Basic Malay Language	SMB31202 English for Technical Communication				
	SMZXXX01 Co-Curricular Activity	SMZXXX01 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								

Compulsory and optional Language Courses according to MUET Results:

MUET	SMB10102 (Uncredited)	SMB20102	SMB31202	OPTION
Band 2	Compulsory	Compulsory	Compulsory	Optional
Band 3		Compulsory	Compulsory	Optional
Band 4,5 and 6			Compulsory	Compulsory

Electives:

Elective I	Elective II	Elective III
EMK36703 Artificial Intelligence	EMK46003 Material Handling and Identification	EMK46203 Mechatronic Systems
EMK36503 Robotics Control	EMK46103 Automated Guided Vehicle	EMK46303 Vision Systems

* Uncredited. Compulsory to students with MUET Band 1 and 2 only. This course is a prerequisite to SMB20102 English for General Communication.
**Compulsory to students with MUET Band 3 or less. This course is a prerequisite to SMB31202 English for Technical Communication.
***For international students only.

TECHNOLOGY PROGRAMME

PROGRAMME OBJECTIVES (PEO)

The Programme Objectives for the entire ***Technology Programme*** at Universiti Malaysia Perlis (UniMAP) is as follows:

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

*At the end of the **Technology Programme**, the students are expected to attain the followingattributes:*

PO 1
Knowledge: Apply knowledge of technology fundamentals to broadly-defined procedures processes, systems and methodologies in Electrical System Maintenance.

PO 2
Practical Skills and High Technology: Able to suggest and apply latest tools and techniques to solve broadly-defined problems.

PO 3
Analytical, Critical Thinking and Scientific Approach: Demonstrate strong analytical and critical thinking skills to solve broadly-defined problems in Electrical System Maintenance.

PO 4
Communication Skills : Able to communicate and articulate effectively in both verbal and written among technologist communities and society at large.

PO 5
Social Responsibility in Society and Technologist Community: Demonstrate understanding of the societal related issues and the consequent responsibilities relevant to broadly-defined technology practices.

PO 6
Lifelong Learning and Information Management : Recognize the needs for professional development and to engage independent lifelong learning in specialist technologists.

PO 7
Technopreneurship and Management Skills: Demonstrate an awareness of management and technopreneurship practices in real perspective.

PO 8
Ethics and Professionalism: Demonstrate professionalism and social and ethical consideration.

PO 9
Teamwork and Leadership: Demonstrate leadership quality, mentoring and work effectively in diverse teams.

CURRICULUM STRUCTURE
UR6522003 BACHELOR OF TECHNOLOGY IN ELECTRICAL SYSTEM MAINTENANCE WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST			SECOND			THIRD			FOURTH
SEMESTER	I	II	III	IV	V	VI	VII	VIII	VII	VIII
COMMON CORE	EMT10104 Electrical System Drafting and Simulation	EMT10405 Solar PV installation and Maintenance		EMT20105 Building Electrical System Maintenance	EMT20405 Electrical Machine & Drive System Integration		EMT30105 Industrial Machinery Control System Design	EMT30504 Maintenance Management System (MMS)	EMT30806 FYP 2	EMT40112 Industrial Training
	EMT10204 Technical Reporting	EMT10505 Switchboard Maintenance and Calibration		EMT20205 Renewable Energy System Maintenance	EMT20505 Energy Efficiency Optimization		EMT30205 Monitoring system Integration	EMT30604 Project Planning and Execution		
	EMT10305 Electrical System Measurement & Testing	EMT10603 Professional Practices		EMT20305 Generator System Maintenance	EMT20603 Collegiality Interaction and Management		EMT30304 Industrial Data Analysis	EMT30704 FYP 1		
					EMT20704 Technopreneur Project 1		EMT30404 Technopreneur Project 2			
	13	13		15	17		18	12	6	12
UNIVERSITY CORE	SMZXXX01 Co-Curriculum 1	SMZXXX01 Co-Curriculum 2		**SMB1XX02 Third Language	SMU22402 Engineering Entrepreneurship		SMU13102 Appreciation of Ethics and Civilizations			
	SMB41002 University Malay Language	SMU32202 Thinking skills		SMB31202 English for Technical Communication						
	SMU13002 Philosophy and Current Issues	SMB20102 English for General Communication								
	*SMB10102 Preparatory English									
	5	5		4	2		2			
TOTAL CREDIT PER SEMESTER	18	18		19	19		20	12	6	12
TOTAL CREDIT FOR GRADUATION						124				

LIST OF COURSES:

COURSE CODE	COURSE NAME
EMJ10003	Computer Programming [Pengaturcaraan Komputer]
EMJ12002	Engineering Science [Sains Kejuruteraan]
EMJ12103	Electric Circuit I [Litar Elektrik I]
EMJ12202	Introduction To Electrical Engineering [Pengenalan Kepada Kejuruteraan Elektrik]
EMJ13003	Electronics Devices [Peranti Elektronik]
EMJ13103	Electric Circuit II [Litar Elektrik II]
EMJ13203	Electrical Engineering Practices [Amalan-amalan Kejuruteraan Elektrik]
EMJ16103	Electric Circuit Theory [Teori Litar Elektrik]
EMJ16203	Engineering Statics [Statik Kejuruteraan]
EMJ16302	Principle Of Engineering Materials [Prinsip-Prinsip Bahan Kejuruteraan]
EMJ16403	Mechatronic Engineering Practices [Amalan-Amalan Kejuruteraan Mekatronik]
EMJ17104	Analog Electronics [Elektronik Analog]
EMJ17203	Engineering Dynamics [Dinamik Kejuruteraan]
EMJ17303	Computer Aided Drawing [Lukisan Terbantu Komputer]
EMJ22003	Instrumentation and Measurements [Instrumentasi dan Pengukuran]
EMJ22204	Analog Electronics [Elektronik Analog]
EMJ22304	Digital Electronics [Elektronik Digit]
EMJ22403	Signals and Systems [Isyarat dan Sistem]
EMJ23204	Microcontroller Systems Design [Rekabentuk Sistem Mikropengawal]
EMJ23003	Electrical Power Technology [Teknologi Kuasa Elektrik]
EMJ23103	Control Systems Engineering [Kejuruteraan Sistem Kawalan]
EMJ26103	Signals And Linear Systems [Isyarat Dan Sistem Lelurus]
EMJ26203	Digital Logic Circuit [Litar Logik Digit]
EMJ26303	Instrumentation And Measurements [Instrumentasi Dan Pengukuran]
EMJ26402	Principle Of Engineering Thermofluids [Prinsip-Prinsip Kejuruteraan Termobendalir]

LIST OF COURSES:

COURSE CODE	COURSE NAME
EMJ26703	Design Of Machinery [Rekabentuk Jentera]
EMJ27103	Electromagnetic Field Theory [Teori Medan Elektromagnetik]
EMJ27204	Embedded System And Interfacing [Sistem Terbenam Dan Pengantaramuka]
EMJ27303	Power Electronics [Elektronik Kuasa]
EMJ27403	Network And Communication System [Sistem Komunikasi Dan Rangkaian]
EMJ30105	Industrial Training [Latihan Industri]
EMJ32004	Power System Engineering [Kejuruteraan Sistem Kuasa]
EMJ32103	Electromagnetic Theory [Teori Elektromagnetik]
EMJ32204	Electrical Machine [Mesin Elektrik]
EMJ32304	Power Electronics I [Elektronik Kuasa I]
EMJ33003	Communication System Engineering [Kejuruteraan Sistem Perhubungan]
EMJ33103	Power System Analysis [Analisa Sistem Kuasa]
EMJ33303	Electrical Energy Utilization [Penggunaan Tenaga Elektrik]
EMJ33404	Electrical Installation Design [Reka Bentuk Pemasangan Elektrik]
EMJ36103	Control Engineering I [Kejuruteraan Kawalan I]
EMJ36203	Machine Vision [Penglihatan Mesin]
EMJ36303	Fluid Power Systems [Sistem Kuasa Bendalir]
EMJ36404	Electrical Machines & Power Systems [Jentera Elektrik Dan Sistem Kuasa]
EMJ37103	Control Engineering II [Kejuruteraan Kawalan II]
EMJ37203	Mechatronic Systems Design I [Rekabentuk Sistem Mekatronik I]
EMJ37303	Robotic Systems [Sistem Robotik]
EMJ37403	Artificial Intelligence For Mechatronic Engineering [Kecerdikan Buatan Untuk Kejuruteraan Mekatronik
EMJ40002	Final Year Project I [Projek Tahun Akhir I]
EMJ40004	Final Year Project II [Projek Tahun Akhir II]
EMJ41003	Management for Engineers [Pengurusan Untuk Jurutera]

LIST OF COURSES:

COURSE CODE	COURSE NAME
EMJ41102	Professional Engineers [Jurutera Professional]
EMJ42003	High Voltage Engineering [Kejuruteraan Voltan Tinggi]
EMJ42202	Electrical Installation Design II [Reka Bentuk Pemasangan Elektrik II]
EMJ43003	Electrical Drives [Pemacu Elektrik]
EMJ44103	Power System Operation and Control [Operasi Sistem Kuasa dan Kawalan]
EMJ44203	Electrical Machine Design [Rekabentuk Mesin Elektrik]
EMJ44303	Power Electronics II [Elektronik Kuasa II]
EMJ44403	Electrical Energy System [Sistem Tenaga Elektrik]
EMJ44503	Industrial Electronic Control [Kawalan Elektronik Industri]
EMJ44603	Substation Design [Rekabentuk Pencawang]
EMJ44703	Renewable Energy System [Sistem Tenaga Boleh Baharu]
EMJ44803	Power System Protection [Perlindungan Sistem Kuasa]
EMJ47002	Production and Quality Control [Pengeluaran dan Kawalan Kualiti]
EMJ47104	Automation [Automasi]
EMJ47204	Mechatronic Systems Design II [Rekabentuk Sistem Mekatronik II]
EMJ47503	Advanced Control Engineering [Kejuruteraan Kawalan Lanjutan]
EMJ47603	Autonomous Mobile Robots [Robot Tergerak Automatik]
EMJ47703	IoT & Data Analytics [IoT dan Analitik Data]
EMJ48503	System Identification & Parameter Estimation [Sistem Identifikasi dan Anggaran Parameter]
EMJ48603	Advanced PLC Systems [Sistem PLC Lanjutan]
EMJ48703	Smart System Design [Rekabentuk Sistem Pintar]
EMK10002	Computer Aided Drawing [Lukisan Terbantu Komputer]
EMK10103	Engineering Skills I [Kemahiran Kejuruteraan I]
EMK10203	Engineering Skills II [Kemahiran Kejuruteraan II]
EMK11003	Computer Programming [Pengaturcaraan Komputer]

LIST OF COURSES:

COURSE CODE	COURSE NAME
EMK11103	Engineering Science [Sains Kejuruteraan]
EMK11203	Electric Circuit Theory I [Teori Litar Elektrik I]
EMK11303	Electronics I [Elektronik I]
EMK11403	Digital Electronics [Elektronik Digit]
EMK21003	Electromagnetic Field Theory [Teori Medan Elektromagnet]
EMK21103	Measurement & Instrumentation [Pengukuran & Peralatan]
EMK21203	Electric Circuit Theory II [Teori Litar Elektrik II]
EMK21303	Electronics II [Elektronik II]
EMK21403	Electrical Machines Technology I [Teknologi Mesin Elektrik I]
EMK21503	Microcontroller System [Sistem Mikropengawal]
EMK21603	Power Electronics [Elektronik Kuasa]
EMK21703	Communication System [Sistem Komunikasi]
EMK21803	Signal & Systems [Isyarat dan Sistem]
EMK30004	Final Year Project I [Projek Tahun Akhir I]
EMK30103	Design Project [Projek Rekabentuk]
EMK31003	Drives And Actuators [Pemacu & Penggerak]
EMK31103	Control System Technology [Teknologi Sistem Kawalan]
EMK31203	Programmable Logic Controller [Pengawal Logik Bolehaturcara]
EMK31303	Engineering Technology Management [Pengurusan Teknologi Kejuruteraan]
EMK32003	Electrical Machines Technology II [Teknologi Mesin Elektrik II]
EMK32103	Electrical Installation [Pemasangan Elektrik]
EMK32203	Electrical Power System [Sistem Kuasa Elektrik]
EMK32303	Renewable Energy System [Sistem Boleh Baharu]
EMK32403	Power Quality (Elective) [Kuali Kuasa]
EMK32503	Substation Engineering (Elective) [Kejuruteraan Pencawang]

LIST OF COURSES:

COURSE CODE	COURSE NAME
EMK36003	Industrial Networking [Rangkaian Perindustrian]
EMK36103	Mechanics and Machine Design [Rekabentuk Mekanik dan Mesin]
EMK36203	Industrial Automation [Automasi Industri]
EMK36303	Industrial Robotics [Robotik Industri]
EMK36403	Modern Control [Kawalan Moden]
EMK36503	Robotics Control (Elective) [Kawalan Robotik]
EMK36703	Artificial Intelligence (Elective) [Kecerdikan Buatan]
EMK40006	Final Year Project II [Projek Tahun Akhir II]
EMK40112	Industrial Training [Latihan Industri]
EMK41003	Technologist In Society [Juruteknologi dalam Masyarakat]
EMK42003	Power System Protection and Switchgear [Perlindungan & Peralatan suis Sistem Kuasa]
EMK42103	Power Electronics and Drives (Elective) [Elektronik Kuasa dan Pemacu]
EMK42203	Industrial Automation (Elective) [Automasi Industri]
EMK42303	Energy Efficiency and Management (Elective) [Kecekapan dan Pengurusan Tenaga]
EMK42403	High Voltage Technology (Elective) [Teknologi Voltan Tinggi]
EMK46003	Material Handling and Identification (Elective) [Pengendalian dan Pengenalpastian Bahan]
EMK46103	Automated Guided Vehicle (Elective) [Kenderaan Berpandu Automatik]
EMK46203	Mechatronic Systems (Elective) [Sistem Mekatronik]
EMK46303	Vision Systems (Elective) [Sistem Penglihatan]
EMT10204	Laporan Teknikal [Technical Reporting]
EMT10305	Pengukuran Dan Pengujian Sistem Elektrik [Electrical System Measurement And Testing]
EMT10405	Pemasangan Dan Penyelenggaraan PV Solar [Solar PV Installation And Maintenance]
EMT10505	Penyelenggaraan Dan Penentukuran Papan Suis [Switchboard Maintenance And Calibration]
EMT10603	Amalan Profesional [Professional Practice]
EMT20105	Penyelenggaraan Sistem Elektrik Bangunan [Building Electrical System Maintenance]

LIST OF COURSES:

COURSE CODE	COURSE NAME
EMT20205	Penyelenggaraan Sistem Tenaga Boleh Diperbaharui [Renewable Energy System Maintenance]
EMT20305	Penyelenggaraan Sistem Penjana [Generator System Maintenance]
EMT20405	Integrasi Mesin Elektrik Dan Sistem Pemacu [Electrical Machine And Drive System Integration]
EMT20505	Pengoptimuman Kecekapan Tenaga [Energy Efficiency Optimization]
EMT20603	Interaksi Dan Pengurusan 'Collegiality' [Collegiality Interaction And Management]
EMT20704	Projek Keusahawanan Teknologi 1 [Technopreneur Project 1]
EMT30105	Rekabentuk Sistem Kawalan Jentera Industri [Industrial Machinery Control System Design]
EMT30205	Integrasi Sistem Pemantauan [Monitoring System Integration]
EMT30304	Analisis Data Perindustrian [Industrial Data Analysis]
EMT30404	Projek Keusahawanan Teknologi 2 [Technopreneur Project 2]
EMT30504	Sistem Pengurusan Penyelenggaraan (MMS) [Maintenance Management System (MMS)]
EMT30604	Perancangan Dan Pelaksanaan Projek [Project Planning And Execution]
EMT30704	Projek Tahun Akhir 1 [Final Year Project 1]
EMT30806	Projek Tahun Akhir 2 [Final Year Project 2]
EMT30105	Rekabentuk Sistem Kawalan Jentera Industri [Industrial Machinery Control System Design]
EMT40112	Latihan Industri [Industrial Training]

EMJ10003 COMPUTER PROGRAMMING

No of Credits: 3

Course Synopsis:
This course is designed to introduce the fundamentals of Computer Programming using high level language, C Language. It provides an introduction to the principles of procedural programming, data types, control structures, data structures and functions, data representation on the machine level. 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 applied to engineering problem.

Course Outcomes:
1. Ability to design solutions for complex engineering related problems and systems by using computer programming techniques.
2. Ability to apply GNU/Linux for compiling, debugging and executing computer program.

EMJ12002 ENGINEERING SCIENCE

No of Credits: 2

Course Synopsis:
This course introduces the knowledge of material selection and properties changes in the real engineering applications/problems. Engineering science is a broad discipline, allowing students to merge multidisciplinary resources to propose and develop innovative, enduring solutions and transform the latest scientific discoveries into enabling new technologies in future.

Course Outcomes:
1. Ability to apply knowledge of the concept and principle of materials science and thermodynamics to the solution of complex engineering problem.
2. Ability to identify and solve the fundamental materials science and thermodynamics problems using first principles of natural sciences and thermodynamics concept.
3. Ability to engage in independent and life-long learning on the theory and practical knowledge of the materials science for engineering applications.

EMJ12103 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:
1. Ability to apply knowledge of charge, current, voltage, power in DC circuits.
2. Ability to apply knowledge of circuits using basic laws, methods of analysis, and circuit theorems
3. Ability to apply appropriate simulation techniques for linear circuits.

EMJ12202 INTRODUCTION TO ELECTRICAL ENGINEERING

No of Credits: 2

Course Synopsis:
This course serves as a general introduction to electrical engineering programs offered by the Faculty of Electrical Engineering Technology. 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 analyse critically contemporary issues affecting mankind and his environment.

Course Outcomes:
1. Ability to apply knowledge related to engineering education including fundamental knowledge in accordance with the scope and career of an electrical engineer
2. Ability to assess any societal, health, safety, legal and cultural issues that relevant to the solution of engineering problem
3. Ability to assemble and construct electrical circuit on PCB based on schematic diagram
4. Ability to communicate effectively through effective presentation and academic report writing

EMJ13003 ELECTRONICS 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:
1. Ability to apply knowledge of fundamental concepts of electronic devices.
2. Ability to identify and solve the fundamental operations of electronic devices
3. Ability to analyze and differentiate basic biasing circuits.

EMJ13103 ELECTRIC CIRCUIT II

No of Credits: 3

Course Synopsis:
This course offers an introduction to AC circuits which consist concepts of first and second order responses of RLC circuits in time domain, sinusoidal steady state and phasor analysis using frequency domain, power calculation and frequency response using previous analytical techniques. The last chapter covers two-port circuits.

Course Outcomes:
1. Ability to apply knowledge of AC circuits analysis and power calculation using complex impedance.
2. Ability to apply knowledge of first and second-order concepts on RL, RC and RLC circuits.
3. Ability to analyze the concepts of frequency response and two-port network for AC circuits.

EMJ13203 ELECTRICAL ENGINEERING PRACTICES

No of Credits: 3

Course Synopsis:
This subject is 100% practical coursework and carries 3 units of credit hours. This course contains 6 modules namely Electrical Wiring, AutoCAD, Matlab Programming, Arduino Programming, Programmable Logic Controller (PLC), and OrCAD. Students will be given basic exposure to all the modules available in this subject. With this exposure, students are expected to develop their skills in the future.

Course Outcomes:
1. Ability to construct the basic skills and standard practiced of domestic wiring.
2. Ability to apply a logic system using a common controller tool (PLC).
3. Ability to apply a standard practiced of technical drawing and able to UNDERSTAND a standard practiced of PCB layout design and fabrication process.
4. Ability to apply programming to solve basic mathematical related to electrical engineering (Matlab).
5. Ability to apply programming in creating interactive objects or environments by using a microcontroller (ARDUINO).

EMJ22003 INSTRUMENTATION AND MEASUREMENTS

No of Credits: 3

Course Synopsis:
The course is aimed at providing an overview of modern instrumentation and measurement techniques. It is divided into several topics namely the fundamentals of electronic instrumentation and measurement systems; error in measurement and concept of analog instruments; principles and application of signal conditioning; principles of interfacing techniques and data conversion; and finally the working principles and applications of sensors and transducers.

Course Outcomes:
1. Ability to identify and analyze the fundamental concept of electronic instrumentation and measurement system.
2. Ability to select and apply appropriate tools for instrumentation and measurements related problems.
3. Ability to conduct investigation and evaluate electronic instrumentation and measurement system on their performances through theoretical or simulation.

EMJ22204 ANALOG ELECTRONICS

No of Credits: 4

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. Students will learn in depth about active filters and voltage regulators.

Course Outcomes:
1. Ability to analyse the basic amplifier circuits (BJT, and operational amplifier).
2. Ability to analyse and evaluate various types of filters.
3. Ability to analyse and evaluate basic types of voltage regulators.
4. Ability to communicate effectively on the basic amplifier circuits (BJT, and operational amplifier) through technical report and presentation.

EMJ22304 DIGITAL ELECTRONICS

No of Credits: 4

Course Synopsis:
This course introduces the fundamental principles of digital systems. From the importance of numbering systems and codes, it then proceeds to logic gates, their relationship to Boolean algebra, and gates' integration to form complex circuits. The course emphasizes combinational and sequential logic techniques to design, analyse, and implement simple digital systems using logic gates. The simulation software is introduced to facilitate the learning process.

Course Outcomes:
1. Ability to apply knowledge of the basic principles of the numbering systems and algebraic switching in digital systems.
2. Ability to design solutions for digital engineering problems using combinational or sequential logic design techniques.
3. Ability to evaluate and design the digital system project through valid approach with data validation

EMJ22403 SIGNALS & SYSTEMS

No of Credits: 3

Course Synopsis:
This course aims to introduce the students to basic knowledge of signals and systems. The students will learn how certain inputs to the system will produce the required outputs. The students will be exposed to the signals spectrum concept and various methods such as Fourier Series, Fourier Transform, Laplace Transform, and Z Transform to analyze the signal and its relations. The students will also learn the skills of analyzing the linear electric circuits using those methods.

Course Outcomes:
1. Ability to apply knowledge of the characteristics and properties of signals and process of the systems.
2. Ability to engage in independent and life-long learning on the theory of signals and systems based on the characteristics and process of the systems.
3. Ability to analyze and evaluate the periodic and non-periodic signals and the system responses using Fourier Series and Fourier Transform
4. Ability to analyze and evaluate the continuous- and discrete-time signals and the system responses using Laplace Transform and Z-transform.

EMJ23204 MICROCONTROLLER SYSTEMS DESIGN

No of Credits: 4

Course Synopsis:
This course introduce the knowledge of microcontroller architecture, its programming language and basic interfacing with input and output devices. From the importance of input and output modules, it then proceed to more advance modules like Timer module, Analog to Digital Converter (ADC) module and Serial module and how these modules being integrated and manipulated. The course emphasize on understanding the basic principle of input and output interfacing as well as build-in modules, and applied them to design a simple microcontroller based system.

Course Outcomes:
1. Ability to analyse and execute the microcontroller programming code in C language
2. Ability to design system using microcontroller to solve engineering problems
3. Abilit
4. y to investigate and design a microcontroller based system application through simulation with valid approach.

EMJ23003 ELECTRICAL POWER TECHNOLOGY

No of Credits: 3

Course Synopsis:
This course covers the importance of the three-phase system, the electromagnetism, the magnetic circuit, as well as the single and three-phase transformers. The operation of the three-phase generator as well as the magnitude and the phase relationship connecting the three-phase voltages/currents are introduced. The significant of voltages, currents, and phase sequences for the three-phase Y- and/or delta-connected generator with Y- and/or delta-connected load are included. The real, the reactive, and the apparent power of all the elements for the Y- and/or delta-connected load are explained. This course also comprises the concept of the ferromagnetic materials, the application of Faraday's law on inducing force on a wire and/or voltage across a wire, the magnetic circuits, as well as the inductances and its energy. Additionally, the theories of single and three-phase transformers are elaborated. The voltage, the current, and the impedance relationships across the windings of an ideal transformer is introduced, which are expanded to approximate the real transformer. The copper losses, the leakage flux, as well as the hysteresis and eddy currents that are modeled in transformer equivalent circuits, which are then used to compute the voltage and the current transformations. The losses, the voltage regulation, and the efficiency of the transformer is demonstrated. The per-unit system of measurements is elucidated. The autotransformer is encompasses. The three-phase transformer connections,
standard terminal markings, nameplates, and load division are also included. Finally, several laboratories are conducted in this course by using the software for better understanding.

Course Outcomes:
1. Ability to identify and analyze the parameters of the three-phase system as well as the electromagnetism problem and its application in magnetic circuit.
2. Ability to design solutions the performance of single and three-phase transformers.
3. Ability to apply the ethical principles in investigating the three-phase system.
4. Ability to analyze and evaluate the three-phase system, electromagnetism, as well as single and three-phase transformers to provide valid conclusions.

EMJ23103 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 and electro-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:
1. Ability to produce mathematical model from physical systems (electrical/mechanical/block diagram) by employingsuitable techniques such as Mason's law, Laplace transform and etc..
2. Ability to design solutions for complex engineering problems/ design systems / components or processes to solve control system problems.
3. Ability to select and apply appropriate simulation tools to solve control system problems.

EMJ32004 POWER SYSTEM ENGINEERING

No of Credits: 4

Course Synopsis:
This course covers four significant disciplines in power system analysis. The first section introduces the power system, problems in power system, single line diagram representation of a power system and the use of the per-unit system on power system's component calculation. The second section includes the calculation of bus admittance to solve power flow problems using the Gauss-Seidel method, Newton-Raphson method and Fast-Decoupled method. The third section incorporates the construction of the bus impedance matrix to solve the symmetrical and asymmetrical fault. The last section is designed to expose the student to solving engineering problems related to power system stability.

Course Outcomes:
1. Ability to analyze and differentiate load flow analysis in power system.
2. Ability to identify and analyze the symmetrical and unsymmetrical fault in the power system network.
3. Ability to design a solution in solving power system stability.

EMJ32103 ELECTROMAGNETIC THEORY

No of Credits: 3

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

Course Outcomes:
1. Ability to apply knowledge of mathematics to solve vector analysis related to electromagnetic theory.
2. Ability to analyze necessary knowledge in electrostatic and magnetostatic fields to the solution of engineering problems.
3. Ability to analyze and evaluate problems related to electromagnetic theory in transmission line.

EMJ32204 ELECTRICAL MACHINE

No of Credits: 4

Course Synopsis:
This course aims to equip students with the knowledge on a DC and AC electrical machines on their characteristic, behavior and responses. This course would enable students' consciousness on the different theoretical and performance expectation on various kind of machines which commonly used by consumers, commercial, industries and etc. Primarily this course can be divided into three parts. Part 1, begins by reviewing the basic concept of electromechanical conversions. 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:
1. Ability to analyze the characteristic of DC Machines using standard equivalent circuit model.
2. Ability to evaluate the characteristic of AC Machines using standard equivalent circuit model.
3. Ability to investigate and analyze the characteristic of electrical machines.
4. Ability to apply appropriate simulation tools for electrical machine analysis.

EMJ32304 POWER ELECTRONICS I

No of Credits: 4

Course Synopsis:
This course introduces Power Electronics as a multidisciplinary application orientated technology emphasising on the main criterion of power electronic concept and devices. Power electronic devices which include circuit topologies, semiconductor switches and protection circuits are introduced to grasp the understanding of this course. Following, topologies of AC-DC, DC-DC and DC-AC converters, including operational features, waveform analysis and performances along with protection circuits are developed from theoretical followed by laboratory works.

Course Outcomes:
1. Ability to analyze power electronic converter topologies and operation.
2. Ability to analyze and evaluate the protection circuits for power converters.
3. Ability to design power electronic converter system.
4. Ability to analyze and design power electronic converter topologies and performances through theoretical and simulation.

EMJ33003 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, noise, amplitude modulation, angle modulations and digital modulations, as well as transmission channels and medium. In addition, introduction to signal propagation and calculations of signal to noise ratio are also introduced to relate the students with real applications.

Course Outcomes:
1. Ability to identify and analyze the principles of communication systems.
2. Ability to analyse and evaluate signal gain, attenuation and the effect of noise in communication systems.
3. Ability to analyse and evaluate analog modulation,digital modulation techniques and transmission protocols.
4. Ability to function effectively in a group / team to identify and analyze the principles of communication systems.

EMJ33103 POWER SYSTEM ANALYSIS

No of Credits: 3

Course Synopsis:
This course covers four significant disciplines in power system analysis. The first section introduces the power system, problems in power system, single line diagram representation of a power system and the use of the per-unit system on power system's component calculation. The second section includes the calculation of bus admittance to solve power flow problems using the Gauss-Seidel method, Newton-Raphson method and Fast-Decoupled method. The third section incorporates the construction of the bus impedance matrix to solve the symmetrical and asymmetrical fault. The last section is designed to expose the student to solving engineering problems related to power system stability.

Course Outcomes:
1. Ability to analyze and differentiate load flow analysis in power system.
2. Ability to identify and analyze the symmetrical and unsymmetrical fault in the power system network.
3. Ability to design a solution in solving power system stability.

EMJ33303 ELECTRICAL ENERGY UTILIZATION

No of Credits: 3

Course Synopsis:
This course intends to give students fair knowledge of the electrical tariffs, electrical energy calculation, energy audit and energy management. This course also introduces students to the energy efficiency and conservation in order to reduce energy costs and promote economic and environmental sustainability. At the end of the course, the students are expected to be able to solve engineering problems related to electrical energy utilization.

Course Outcomes:
1. Ability to analyze and formulate solutions related to efficient electrical energy utilization and energy management.
2. Ability to function effectively in a group to design energy saving solutions based on electrical energy audits.
3. Ability to communicate effectively on energy saving design solution based on electrical energy audit through technical report and presentation.

EMJ33404 ELECTRICAL INSTALLATION DESIGN

No of Credits: 4

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 real project to demonstrate and reinforce the principles. A project plan with milestones shall be made, and the student shall continuously report progress/assignment and results. The project/assignments are based on actual installations and projects.

Course Outcomes:
1. Ability to apply electrical knowledge and conduct thorough evaluation in providing solution to the electrical installation system.
2. Ability to design solution to the electrical installation system that comply with the standard.
3. Ability to function constructively in a group and demonstrate effective communication through writing and oral assessments.

EMJ30005 INDUSTRIAL TRAINING

No of Credits: 5

Course Synopsis:
This course exposes students to a company's technical functions, organizational structure and operation such as departmental function, work procedure, safety procedure, communication, technical skills and project management. The students will be able to apply knowledge learned in the university, gain working experience and improve related skills for their future profession.

Course Outcomes:
1. Ability to demonstrate technical knowledge and practical skills.
2. Ability to adapt to health, safety, legal, cultural and sustainability requirements in working environment.
3. Ability to execute tasks with professional ethics and responsibilities.
4. Ability to work independently, interact with co-workers and work in a team.
5. Ability to communicate effectively on the complex engineering activities performed in training.

EMJ42003 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 also generation and measurement of high DC, AC and impulse voltages and currents, overvoltage phenomena, insulation coordination, high voltage testing techniques and testing of apparatus and equipment.

Course Outcomes:
1. Ability to analyze the various breakdown mechanism and applications of gas, liquid and solid dielectrics
2. Ability to design generation and measurement technique of high voltage AC, DC and impulse generator.
3. Ability to analyze and evaluate the over-voltage phenomena and insulation coordination in power system, types of high voltage testing for electrical apparatus and non-destructive testing of materials.

EMJ40002 FINAL YEAR PROJECT I

No of Credits: 2

Course Synopsis:
This course is designed to introduce an investigative for a small-scale research-based project to solve engineering problems. Students must identify the problems, develop techniques for information gathering, conduct a literature review and select proper methodology. In addition, students must deliver individual analysis and judgement and utilise appropriate modern technology/tools to conduct the research and be assessed independently. Students will have to prepare a written progress report and oral presentations using computers and multimedia technology at the end of the semester.

Course Outcomes:
1. Ability to conduct research literature on the relevant engineering principles and theories via independent lifelong learning to solve the engineering problems.
2. Ability to design the appropriate research methodology to solve the engineering problems.
3. Ability to conduct investigation, analyse and interpret data to solve the engineering problems.
4. Ability to communicate effectively on engineering problem solution through the technical report (progress report/ dissertation) and presentation.

EMJ40103 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:
1. Ability to apply principles of engineering management to engineering project.
2. Ability to apply economic decision - making principles to engineering project and business venture.
3. Ability to communicate effectively on project management and engineering economics tools in solving engineering problems through technical report and presentation.
4. Ability to apply professional ethics related to engineering management and economic decisions.

EMJ42202 ELECTRICAL INSTALLATION DESIGN II

No of Credits: 2

Course Synopsis:
This course is designed to provide electrical engineers with the application skills needed in modern electrical engineering practice. This course is continuing from subject Electrical Installation Design 1 (EMJ33404) where the combination of theory and real project to demonstrate and reinforce the principles. A project plan with milestones shall be made, and the student shall continuously report progress/assignment and results. The project/assignments are based on actual installations and projects.
The course topics include:
1. Energy Management
2. Project Management
3. Project Financial and Supervision
4. Business Presentation
5. Technical Report Writing
6. Sustainability in engineering design solution
7. Engineering impact on society, legal, health and safety

Course Outcomes:
1. Ability to apply knowledge of engineering fundamental and perform analysis to complete an engineering project.
2. Ability to assess any societal, health, safety, legal ,cultural and sustainability issues that relevant to the solution of electrical installation system thru energy management.
3. Ability to function constructively in a group and demonstrate effective communication through writing and oral assessments.
4. Ability to demonstrate knowledge and understanding of engineering management principles and economic decision-making in the solution to electrical installation systems.

EMJ43003 ELECTRICAL DRIVES

No of Credits: 3

Course Synopsis:
This course purposes 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 electrical braking and dynamics of the drive systems will also be introduced.

Course Outcomes:
1. Ability to evaluate suitable drive solution for DC motor
2. Ability to design suitable drive solution for AC motor.
3. Ability to analyse suitable electrical braking strategy and dynamic model for DC and AC electrical drive systems.

EMJ40004 FINAL YEAR PROJECT II

No of Credits: 4

Course Synopsis:
This course is designed to introduce an investigative research-based project to solve engineering problems. Students must identify problems, develop techniques for information gathering, conduct literature review and select proper methodology. In addition, students must deliver individual analysis and judgement and utilise appropriate modern technology/tools to conduct the research and be assessed independently. Students will prepare and have written and oral presentations using computers and multimedia technology at the end of the semester.

Course Outcomes:
1. Ability to conduct research literature on the relevant principles and theories via independent learning to solve engineering problems.
2. Ability to design the appropriate research methodology to solve engineering problems.
3. Ability to conduct investigation, analyse and interpret data to solve engineering problems.
4. Ability to select and apply appropriate modern tools in researching to solve engineering problems.
5. Ability to communicate effectively on engineering problem solving through technical report (progress report/dissertation) and presentation.

EMJ40202 PROFESSIONAL ENGINEER

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 the basics 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 the engineers relating to engineering ethics, engineering sustainability, risk management and to understand the legal requirements related to the engineering field.

Course Outcomes:
1. Ability to identify and evaluate the issues and challenges of engineering ethics.
2. Ability to understand and evaluate the engineering sustainability impact in societal and environmental context and propose solutions to the sustainable development issues.
3. Ability to apply and propose assessment on hazards, risk management, occupational safety & health (OSHA) and procedures of legal on engineering issues.

EMJ44103 POWER SYSTEM OPERATION AND 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:
1. Ability to analyze and evaluate the fundamental and operation of energy generation, power system behavior, economics of generating costs and optimal dispatch of power generation with and without transmission losses.
2. Ability to analyze and evaluate the unit commitment in thermal power plant and to evaluate power system control of power system network.
3. Ability to communicate effectively on communication in Power Systems through technical report and presentation.
4. Ability to design the interconnection and operation of generators in parallel with large power system and tie-line interchange between interconnected utilities.

EMJ44203 ELECTRICAL MACHINE DESIGN

No of Credits: 3

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

Course Outcomes:
1. Ability to analyse magnetic materials and magnetic circuits for electrical machine.
2. Ability to design the transformer with cooling system and electrical machine as well as evaluate its performance.
3. Ability to analyse and design the electrical machines and its performances to provide valid conclusions.
4. Ability to communicate effectively the design principle of electrical machine in the form of presentation.

EMJ44303 POWER ELECTRONICS II

No of Credits: 3

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

Course Outcomes:
1. Ability to analyze and evaluate the modulation techniques, waveforms, and effects of related parameters on switch-mode power supplies.
2. Ability to design solutions for complex engineering problems in switch mode power supplies.
3. Ability to design thermal management solutions for switch mode power supplies.

EMJ44403 ELECTRICAL ENERGY SYSTEM

No of Credits: 3

Course Synopsis:
This course introduces energy sources technology and develops an understanding of several types of energy sources whose outputs are suitable for conversion into electrical power generation, emphasising renewable energy resources. The class will then analyse and evaluate the economic, social and environmental impact of renewable energy implementation. The new technology of power system transmission and distribution and the interconnection of renewable energy sources to the grid also will be investigated. Worldwide future steps towards the sustainability electric supply system, policy and constraint in renewable energy implementation also will be discussed and exposed to the students.

Course Outcomes:
1. Ability to analyze and evaluate the energy conversion of the conventional energy system and renewable energy resources.
2. Ability to understand and evaluate the conversion of conventional energy system and renewable energy resources with consideration of societal and environmental impact.
3. Ability to analyze the transmission and distribution technology in power systems and renewable energy systems.
4. Ability to design the conversion of the conventional energy systems and renewable energy resources.

EMJ44503 INDUSTRIAL ELECTRONIC CONTROL

No of Credits: 3

Course Synopsis:
This course will have a wide explore of industrial electronics control for the students. The course will be covered the components, circuits, instruments, equipment, and control technique used in industrial automatic systems. This course is divided into three parts. The first part will be discussed about the basic principle of industrial electronics control and interfacing devices such as operational amplifiers, signal processors, opto-electronic interface devices, transducers, detection sensors, actuators, digital-to-analog converter, and analog-to-digital converter. The next part of this course will be discussed the design of the controller such as proportional, proportional-integral, proportional-integral-derivative, pressure, and temperature controllers, and servo and stepper motor control design. The last part will be exposed to a programmable logic controller (PLC), PLC components, PLC programming, and operational procedure.

Course Outcomes:
1. Ability to analyze the principle of industrial electronics control and interfacing devices
2. Ability to evaluate the type of controller for industrial electronic control applications.
3. Ability to design solutions using PLC programming for industrial electronic control applications.

EMJ44603 SUBSTATION DESIGN

No of Credits: 3

Course Synopsis:
This course aims to introduce the student to the fundamentals of substation design which include the classifications, important equipment and their sizing. This course also covers the design of protection system of a substation that follows the IEEE standard which encompasses the grounding grid system, protection relay as well as the lightning and insulation coordination. Towards the end of the course, student will also learn about substation auxiliary power supply, substation setting and equipment sizing as well as equipment testing and commissioning.

Course Outcomes:
1. Ability to analyse and evaluate the fundamentals of substation design.
2. Ability to design the substation busbar, grounding grid and protection system of substation.
3. Ability to investigate the components of substation and the substation protection system.

EMJ44703 RENEWABLE ENERGY SYSTEM

No of Credits: 3

Course Synopsis:
This course introduces basic system design for renewable energy integration into electrical grid and calculates the potential energy generation for different renewable energy technologies. This course also exposes students with relevant energy conversion, energy storage, network interfacing and economic assessment techniques for renewable energy systems.

Course Outcomes:
1. Ability to design the conversion of solar photovoltaic, energy from wind, hydro, biomass, biogas and fuel cell to electrical power.
2. Ability to design the energy system of Solar Photovoltaic, energy from wind, hydro, biomass, biogas and fuel cell for economic analysis.
3. Ability to analyze and evaluate the conversion of Solar Photovoltaic, energy from wind, hydro, biomass, biogas, and fuel cell for system performance.

EMJ44803 POWER SYSTEM PROTECTION

No of Credits: 3

Course Synopsis:
This course provides an advanced understanding of knowledge on purposes of power system protection, protection techniques, protection scheme, relays and fault diagnostic. It covers the introduction of power system protection, the protection device and control, the protection concepts, transmission protection and apparatus protection. The design of renewable power generation protection and the system aspect of protection will also be covered in this course. Besides lectures, this course is supported by series of laboratory where related computer simulations are executed. Together, these two courses will provide the students a comprehensive treatment of the theory and application of the power system protection.

Course Outcomes:
1. Ability to evaluate knowledge of the protective devices and protective controls.
2. Ability to evaluate and design the protection concepts.
3. Ability to analyse and design the transmission protection and the apparatus protection.

EMJ16103 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) to analyze and design the DC and AC circuits to meet the requirements of given applications.

Course Outcomes:
1. Ability to apply knowledge of mathematics equations to solve problems in electric circuits.
2. Ability to solve DC and AC problems using analytical method and circuit theorem.
3. Ability to design and evaluate basic circuits to meet specifications.

EMJ16203 ENGINEERING STATICS

No of Credits: 3

Course Synopsis:
The objective of the course is to investigate 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 are introduced in this course.

Course Outcomes:
1. Ability to apply fundamental static theory in engineering problems.
2. Ability to evaluate static problems using the principles of equilibrium.

EMJ16302 PRINCIPLE OF ENGINEERING MATERIALS

No of Credits: 2

Course Synopsis:
This course introduces students to the principles of engineering materials which treat the atomic bonding, crystal structures, imperfections, mechanical properties, strengthening mechanism in metallic materials and their alloys. Besides, the course also explore the structural properties of metal alloys, ceramics, polymers, composites, electrical, magnetic and optical properties. At the end of this course, the student will be able to analyze the structural and physical characteristic of the engineering materials as well as evaluate the properties and mechanism that affects the behavior of materials for various engineering applications.

Course Outcomes:
1. Ability to compare and categorize types of materials, bonding and crystal structure.
2. Ability to evaluate the properties and mechanism of engineering materials that affecting the behaviour of materials and its microstructure.
3. Ability to analyze the structural characteristic in metal alloys, ceramics, polymers, composites and properties behaviour of electrical and magnetic materials.

EMJ16403 MECHATRONIC ENGINEERING PRACTICES

No of Credits: 3

Course Synopsis:
The purpose of this course is to provide the 1st year student with basic skill and practice in multi discipline for the used of tools, machine and instrumentations. Students will be exposed to the basic skills of electrical wiring and assembly of electronic components, use of measuring equipment and instrumentation. In addition, mechanical workshops provide exposure to machining and welding processes. The basics of microcontroller and PLC applications will prepare students for courses related to embedded systems and automation.

Course Outcomes:
1. Ability to understand and comprehends the basic skills and standard practiced of electrical wiring installation and electronic circuit assembly.
2. Ability to understand and comprehends the basic programming techniques for microcontroller & PLC and simulation software
3. Ability to understand and comprehends the basic skills and standard practiced of mechanical machine and equipment.
4. Ability to understand and practice the safety procedure in operating the electrical measurement equipment and mechanical machine.

EMJ17104 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:
1. Ability to demonstrate characteristics of semiconductor devices.
2. Ability to analyze analogue circuits by using semiconductor devices.
3. Ability to evaluate analogue circuits for specific applications.

EMJ17203 ENGINEERING DYNAMICS

No of Credits: 3

Course Synopsis:
This course introduces the basic laws of motion involving kinematics and kinetics of a particle and rigid body. The concepts of force, energy, momentum, and impulse are reviewed for both particle and rigid body where several techniques are introduced to assist in the analysis of a mechanical system. At the end of the course, the students are expected to be able to solve engineering problems related to mechanisms and motions.

Course Outcomes:
1. Ability to apply basic principles of motion analysis related to law of motions and concept of mechanics
2. Ability to analyse basic principles of kinematics and kinetics of a particle involving force, work and impulse.
3. Ability to analyse and solve motion problems of planar kinematics and kinetics of a rigid body, involving force, work and impulse.

EMJ17303 COMPUTER AIDED DRAWING

No of Credits: 3

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 schematic drawings, designing PCB and testing the circuit in simulation. The use of Computer Aided Design software would enhance the students' understanding on the design process as well as allowing them to practice the knowledge for the forthcoming projects

Course Outcomes:
1. Ability to design 2D and 3D drawing using computer aided design software and perform structural analysis to models
2. Ability to design schematic diagram and printed circuit board for an electronic circuit using computer aided design software
3. Ability to construct the mechanical and electronic drawing prototype.

EMJ26103 SIGNALS & LINEAR SYSTEMS

No of Credits: 3

Course Synopsis:
This course provides the fundamentals of signals and their transformation techniques. The signal transformation methods are based on two domains (time and frequency), including the convolution integral, Laplace transform, Fourier series, Fourier transform, and Z-transform. In addition, the students are also exposed to the linear system and its characteristics. Then, the students will analyse and formulate the signal and linear systems and evaluate their performance. In the end, an introduction to digital signal processing is included to extend the student's knowledge of the signal and linear system applications.

Course Outcomes:
1. Ability to apply knowledge of signal, linear systems, and the concept of digital signal processing to solve engineering problems.
2. Ability to analyse and evaluate the performance of the signal and linear systems using time and frequency domain techniques.
3. Ability to formulate complex engineering problems using both time-domain and frequency-domain techniques.

EMJ26203 DIGITAL LOGIC CIRCUIT

No of Credits: 3

Course Synopsis:
This course provides the fundamental theory of digital logic circuits. It introduces the basic principle of digital electronics which covers the numbering systems, codes, logic gates, Boolean Algebra and logic simplification. The course also introduces logic design, particularly in combinational logic functions, bistable memory devices, sequential circuits design, programmable logic and memory units.

Course Outcomes:
1. Ability to describe and apply knowledge of the digital electronic components
2. Ability to analyse and evaluate digital logic circuits
3. Ability to design digital logic circuits to solve specific task

EMJ26303 INSTRUMENTATION & MEASUREMENTS

No of Credits: 3

Course Synopsis:
This course introduces the knowledge of measurement and instrumentation with various transducers and sensors. This includes an overview of a general measurement system, errors and signal characteristics, various type of sensors and respective interfacing, with their application in measuring electronic signal, temperature, humidity, strain, displacement, velocity, acceleration, force, fluid flow, fluid velocity and fluid level.

Course Outcomes:
1. Ability to analyse error and statistical theory in a measurement.
2. Ability to analyse and evaluate interfacing concept between sensor, signal and computer obtained in a measurement.
3. Ability to apply suitable software for measurement related problems.

EMJ26402 PRINCIPLE OF ENGINEERING THERMOFLUIDS

No of Credits: 2

Course Synopsis:
This course covers the fundamental of thermodynamics, fluid mechanics, and also their applications in the engineering field. In thermodynamics, fundamental principles and laws of thermodynamics and its general analysis will be covered. For fluid mechanics, attention will be given to the fundamental principles of fluid mechanics, fluid statics and fluid dynamics together with their analysis.

Course Outcomes:
1. Ability to apply basic law and principles of thermodynamics and fluid mechanics.
2. Ability to analyse theoretical concepts of thermodynamics and fluid mechanics in specific applications.

EMJ26703 DESIGN OF MACHINERY

No of Credits: 3

Course Synopsis:
This course enables students to comprehend the design theories as well as machine elements that are necessary for the machine design processes. The course introduces the basic principles of design concept and design phases. It focuses mainly on the machine kinematics and dynamics which include the machine mechanism, velocity and acceleration analysis. The components of the machine design such as shafts, bearings, gear systems, power screws, belts, chains and cams are also discussed.

Course Outcomes:
1. Ability to apply the concepts of various machine elements and mechanisms for specific applications.
2. Ability to analyse position, velocity and acceleration of point in a linkage.
3. Ability to combine various machine elements for specific design of mechanism.

EMJ27103 ELECTROMAGNETIC FIELD THEORY

No of Credits: 3

Course Synopsis:
This course enables students to comprehend the design theories as well as machine elements that are necessary for the machine design processes. The course introduces the basic principles of design concept and design phases. It focuses mainly on the machine kinematics and dynamics which include the machine mechanism, velocity and acceleration analysis. The components of the machine design such as shafts, bearings, gear systems, power screws, belts, chains and cams are also discussed.

Course Outcomes:
1. Ability to apply the concepts of various machine elements and mechanisms for specific applications.
2. Ability to analyse position, velocity and acceleration of point in a linkage.
3. Ability to combine various machine elements for specific design of mechanism.

EMJ27204 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, programming techniques and developing an embedded system application.

Course Outcomes:
1. Ability to analyze and prepare a structured programming language for embedded system application.
2. Ability to construct and apply input output devices to embedded system for interfacing.
3. Ability to evaluate and develop a self-contained embedded system application.

EMJ27303 POWER ELECTRONICS

No of Credits: 3

Course Synopsis:
This course 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. This course also will 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:
1. Ability to describe power electronic systems operation, applications area and need for efficiency design
2. Ability to analyze different types of power semiconductor device
3. Ability to analyze and design different type of converter

EMJ27403 NETWORK & COMMUNICATION SYSTEM

No of Credits: 3

Course Synopsis:
This course is designed to introduce the principles of network and communication system and its applications in communication and other modern equipments. At the end of the course, the students are expected to provide clear understanding in fundamental 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 Real-Time Transmission, copper cable, Fiber Optics cable, Industrial Ethernet and Wireless Ethernet.

Course Outcomes:
1. Ability to plan, prepare, create and design the principle of communication systems.
2. Ability to perform analysis and evaluate principle of various types of network and communication systems.
3. Ability to design and evaluate equipments for the industrial network and communication technology.

EMJ30105 INDUSTRIAL TRAINING

No of Credits: 5

Course Synopsis:
This course exposes students to a company's technical functions, organizational structure and operation such as departmental function, work procedure, safety procedure, communication, technical skills and project management. The students will be able to apply knowledge learned in the university, gain working experience and improve related skills for their future profession.

Course Outcomes:
1. Ability to demonstrate technical knowledge and practical skills.
2. Ability to adapt to health, safety, legal, cultural and sustainability requirements in working environment.
3. Ability to execute tasks with professional ethics and responsibilities.
4. Ability to work independently, interact with co-workers and work in a team.
5. Ability to communicate effectively on the complex engineering activities performed in training.

EMJ36103 CONTROL ENGINEERING I

No of Credits: 3

Course Synopsis:
This course introduces the fundamental aspects of control engineering. It covers topic of mathematical modelling of dynamical systems (electrical, mechanical and electromechanical systems), transfer function, analysis of first-order and second-order systems, transient response, steady-state errors, stability, root locus, frequency response analysis, Bode plot, PID and Lead/Lag compensators design.

Course Outcomes:
1. Ability to apply laws of physics for mathematical modeling of control systems.
2. Ability to analyse the performance of control systems in time and frequency domains.
3. Ability to design appropriate PID controller or lead/lag compensators for system performance improvement

EMJ36203 MACHINE VISION

No of Credits: 3

Synopsis:
This course is designed to introduce the concepts of machine vision and it's application in the industries. It provides crucial knowledge on image acquisition, image and video interfacing, color processing and the cutting-edge methods in image processing such as image noise filtering, image segmentation and edge detection, morphological image processing, feature extraction and also the introduction to classification algorithms. The course also requires the students to comprehend the components of machine vision, which will lead to the ability to develop the design of machine vision systems for industrial application and related research topics.

Course Outcomes:
1. Ability to analyze and formulate the machine vision system to solve complex engineering problems
2. Ability to design a machine vision system for a specific engineering application.
3. Ability to apply appropriate image processing techniques to develop solutions for machine vision system.

EMJ36303 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:
1. Ability to analyze and formulate the machine vision system to solve complex engineering problems
2. Ability to analyse and evaluate pneumatic, hydraulic, electro-pneumatic and electro-hydraulic systems for various applications.
3. Ability to select and apply appropriate simulation tools to develop pneumatic, hydraulic, electro-pneumatic and electro-hydraulic circuits.

EMJ36404 ELECTRICAL MACHINES & POWER SYSTEMS

No of Credits: 4

Course Synopsis:
This course is intended to introduce to the Mechatronic students both 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 high voltage power system in electrical management systems, safety and utilization.

Course Outcomes:
1. Ability to apply knowledge of the concept and operating principle of particular electrical machines and power systems.
2. Ability to investigate and solve the system integration of electrical machines and power systems.
3. Ability to analyse and interpret data related to characteristic of electrical machines

EMJ37103 CONTROL ENGINEERING II

No of Credits: 4

Course Synopsis:
This course introduces the state-space in control engineering to the students. The chapter includes system modelling and analysis for dynamic systems such as RLC circuit, spring-mass-damper and inverted pendulum in state-space. Furthermore, state-space are also converting to different forms while focusing on the controller design: the pole-placement and observer design controller. Finally, the state-space modelling is also expanding to the digital systems with the introduction to sample-data and controller design with output's performance analysis.

Course Outcomes:
1. Ability to apply knowledge of the dynamic physical systems for continuous-time and digital into state-space form.
2. Ability to analyse and evaluate the system's response for a continuous-time and digital control system.
3. Ability to design appropriate controllers via state-space to meet the desired performance specifications for the continuous-time and digital system.
4. Ability to select and apply appropriate techniques to produce engineering solutions.

EMJ37203 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. This course will require students to work in a group to design a mechatronic system solving a problem based on a predefined theme Students need to identify needs, develop design specifications, generate possible concept design. The conceptual design of the design project will be continued in EMJ47204 Mechatronic System Design II.

Course Outcomes:
1. Ability to design solution for mechatronic system by using suitable engineering instruments with consideration of public health safety/ cultural/ societal and environmental.
2. Ability to conduct investigation and evaluate solution that meets customer needs.
3. Ability to function in a team for the successful delivery of design project

EMJ37303 ROBOTIC SYSTEMS

No of Credits: 3

Course Synopsis:
This course is designed to introduce various aspects of Robotics such as the Types of robots, Capabilities, Characteristics, Robot Control Systems and Software, Kinematic Analysis, Principles of Inverse kinematics, Robot Sensors and Drive mechanisms, Robot Work Cell design and various industrial applications.

Course Outcomes:
1. Ability to choose suitable robots, analyse robot object manipulations and schedule a robot work cell for maximum productivity in industrial applications.
2. Ability to choose and analyse suitable robot sensor for integration into a robot control system.
3. Ability to practice robotic systems using hardware and software applications.
4. Ability to communicate effectively on robotic programming solution through technical report and demonstration.

EMJ37403 ARTIFICIAL INTELLIGENCE FOR MECHATRONIC ENGINEERING

No of Credits: 3

Course Synopsis:
This course is designed to introduce the fundamentals of Artificial Intelligence (AI). It provides on introduction to definitions of human and artificial intelligence. The students will be introduced to Fuzzy systems, Evolutionary Computation and Artificial Neural Networks. The latter will be used as a fundamental to Deep Learning. At the end of this course students should comprehend the major techniques in AI and ability to build simple intelligent systems in Mechatronic Engineering applications.

Course Outcomes:
1. The knowledge of different AI techniques for engineering applications.
2. The ability to implement analyse different AI techniques.
3. The ability to develop AI application in Mechatronic engineering

EMJ47002 PRODUCTION AND QUALITY CONTROL

No of Credits: 2

Course Synopsis:
This course introduces the concepts and practices of managing production and quality in contemporary organizations. It is designed to highlight the practical and applied techniques which can improve the organization's production and quality performances. Topics which will be covered in this course include production strategies, Just in Time production, continuous quality improvement, linear programming, statistical process control and Six Sigma concept.

Course Outcomes:
1. Ability to apply knowledge of production and quality control in operational management.
2. Ability to recommend and justify appropriate techniques for production and quality improvement.

EMJ47104 AUTOMATION

No of Credits: 4

Course Synopsis:

The purpose of this course is to provide the student with useful knowledge in identifying the concepts of automated machines and equipment and describe the terms and phrases associated with industrial automation. It combines the automation technology principles and their 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, engineering analysis, planning, tooling and manufacturing

Course Outcomes:
1. Ability to analyzes on automation technology principles and their relationship with manufacturing process.
2. Ability to apply suitable element of sensor, actuator and drive technology as an input/output component in automation technology.
3. Ability to design and apply the suitable controller functions and support system for optimum performance in various automation applications.

EMJ47204 MECHATRONIC SYSTEMS DESIGN II

No of Credits: 4

Course Synopsis:
This course focuses on the design of on 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:
1. Ability to design solution for mechatronic system by using suitable engineering instruments with consideration of public health safety/ cultural/ societal and environmental.
2. Ability to conduct investigation and evaluate solution that meets customer and financial needs.
3. Ability to apply ethical principles and evaluate issues and challenges related to engineering ethics.
4. Ability to communicate effectively via oral presentation and demonstration of the design solution.
5. Ability to function in a team for the successful delivery of design project

EMJ47503 ADVANCED CONTROL ENGINEERING

No of Credits: 3

Course Synopsis:
The aim of this course is to introduce advanced controllers that can be used not only for linear but also nonlinear systems. Parameter estimation and an adaptive mechanism is used in self-tuning regulation and model reference adaptive control. The concept of choosing the most appropriate setting of the feedback controller is discussed in optimal control. Robustness issues in understanding control system operating conditions are also presented. At the end of the course, the students are expected to be able to solve engineering problems by using an adaptive, optimal, or robust control system.

Course Outcomes:
1. Ability to apply knowledge of nonlinear system, adaptive control systems and optimal control
2. Ability to identify and evaluate the suitability in choosing adaptive control systems and optimal control.
3. Ability to apply appropriate simulation tools for control engineering related problems.

EMJ47603 AUTONOMOUS MOBILE ROBOTS

No of Credits: 3

Course Synopsis:
This course introduces the basic concepts of autonomous mobile robots which include the fundamentals of mobile robotics such as mechanical design, kinematics, perception, localization and planning. The course emphasizes wheeled mobile robotics and presents the recent technology on autonomous mobile robots and Automated Guided Vehicles (AGVs). At the end of the course, the students are expected to be able to construct and operate a basic autonomous mobile robot.

Course Outcomes:
1. Ability to apply basic concepts of mobile robotics such as locomotion, drive mechanisms and perception techniques.
2. Ability to solve kinematics and propose appropriate specifications for autonomous mobile robots.
3. Ability to construct and manipulate autonomous mobile robots.

EMJ47703 IOT & DATA ANALYTICS

No of Credits: 3

Course Synopsis:
This course will teach introductory programming concepts that allow connection to, and implementation of some functionality on, IoT devices, using the Python programming language. In addition, students will learn how to use Python to process text log files, such as those generated automatically by IoT sensors and other network-connected systems. Learners do not need prior programming experience to undertake this course and will not learn a specific programming language - however Python will be used for demonstrations. This course will focus on learning by working through realistic examples.

Course Outcomes:
1. Ability to comprehend the concepts of Internet-of-Things in data science particularly in Mechatronic engineering application.
2. Ability to apprehend the theory of big data analytics in analyzing the data.
3. Ability to evaluate the IoT and data analytic particularly for Mechatronic engineering application.

EMJ48503 SYSTEM IDENTIFICATION & PARAMETER ESTIMATION

No of Credits: 3

Course Synopsis:
This course is an introduction to the alternative modelling using system identification and parameter estimation approach. It covers an introduction to system identification technique, acquiring and pre-processing data, on parametric model estimation methods, parametric model estimation methods, partially known estimation methods, model estimation methods in closed loop systems, recursive model estimation methods, analyzing, validating, and converting models and system identification case study. This requires an in-depth understanding of control system engineering, modern control system and digital control system. The emphasis will be on the theoretical basis as well as practical implementations. Key components studied in details are time response analysis, frequency response analysis, correlation analysis, power spectrum density analysis, model structure, parametric model, parameter estimation method, test signals and model validation methods.

Course Outcomes:
1. Ability to explain the fundamental basic of system identification
2. Ability to comprehend the fundamental basic of parameter estimation
3. Ability to apply both fundamental above in real case study.

EMJ48603 ADVANCED PLC SYSTEMS

No of Credits: 3

Course Synopsis:
Programmable logic controllers (PLC) are the brains of complex automated production lines and process
automation systems and must be properly programmed to ensure safe and reliable operation. This requires a strong familiarity with the specifics of the programming environment and languages. Controlled Development System or CoDeSys is a complete development environment for new generation of PLC. CoDeSys puts a simple approach to the powerful IEC language at the disposal of the PLC programmer. Through programming of PLC industrial application examples, students learn how to use of the editors and debugging functions based upon the proven development program environments of advanced programming languages. The student will be able establish communication between devices, program PLC routines in various languages, and transfer projects to a high-end PLC, HMI and motion control.

Course Outcomes:
1. Ability to interpret PLCs control algorithms using CoDesys programing software.
2. Ability to apply technologies related to PLCs, such as Human Machine Interface, motion control and Field Bus Communication.
3. Ability to apply advanced PLC methods in engineering problems.

EMJ48703 SMART SYSTEM DESIGN

No of Credits: 3

Course Synopsis:
Smart Systems Design presents state-of-the-art technologies and available systems in the domains of smart systems and AI. The solutions from an augmented intelligence perspective show that these technologies can be used to benefit, instead of replacing humans by augmenting the information and
actions of their daily lives. This course aims to introduce all smart systems which combining sensing, activation, and control functions to visualize and analyze situations and make decisions based on predictively or adaptively available data.

Course Outcomes:
1. Ability to comprehend the concepts of smart system design particularly in Mechatronic engineering application.
2. Ability to apprehend the system integration between smart devices and instrumentations.
3. Ability to design a smart system framework particularly for Mechatronic engineering application

EMK10002 COMPUTER AIDED DRAWING

No of Credits: 2

Course Synopsis:
The main objective of this course is to expose the Bachelor Engineering Technology student with the skills of Computer Aided Drafting and its application. This course is and an extension from manual hand drawing into the usage of AutoCAD software which 100% coursework focused on product design in 2D, 3D and Electrical wiring drawing.

Course Outcomes:
1. Ability to apply appropriate techniques of Computer Aided Drafting in product design and electrical drawing
2. Ability to analyze and solve the fundamental engineering drawing by using the proper techniques.
3. Ability to design the product in Computer Aided Drafting to solve broadly-defined engineering technology problem

EMK10103 ENGINEERING SKILLS I

No of Credits: 3

Course Synopsis:
This subject is 100% practical coursework and carried out 3 units credit hours. This course contains 6 modules which are Basic Electronics, PCB Design, Arduino/Python Programming, Solidworks Drawing, Matlab Programming,
Machining Process that specially planned based on electrical engineering technology program.

Course Outcomes:
1. Ability to investigate and analyze the basic electronic component, use electronic instruments and reproduce schematic and layout design using common software.
2. Ability to apply programming and interfacing techniques to engineering (Arduino/Phyton)
3. Ability to apply a product/block diagram using common software (Solidworks)
4. Ability to apply programming and interfacing techniques to engineering (Matlab).
5. Ability to apply the basic skills and standard practiced of mechanical machine and equipment

EMK11003 COMPUTER PROGRAMMING

No of Credits: 3

Course Synopsis:
The 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:
1. Ability to apply knowledge of programming techniques and principles.
2. Ability to design solutions for broadly-defined engineering technology related problems and design systems using computer programming techniques.
3. Ability to apply programming software for coding compiling, executing and debugging computer programs.
4. Ability to solve engineering technology related problem in a group project.

EMK11103 ENGINEERING SCIENCE

No of Credits: 3

Course Synopsis:
This course introduces the knowledge of material selection and properties changes in the engineering applications/real problems. Engineering science is a broad discipline, allowing students to merge multidisciplinary resources to propose and develop innovative, enduring solutions and transform the latest scientific discoveries into enabling new technologies in future.

Course Outcomes:
1. Ability to apply knowledge of the concept and principle of materials science to distinguish the types of material families, structure, properties and performance
2. Ability to identify and analyze the performance of materials using first principles of natural sciences.
3. Ability to communicate effectively on the principle of materials science in engineering applications through technical report and presentation.

EMK10203 ENGINEERING SKILLS II

No of Credits: 3

Course Synopsis:
This course is divided into three parts which are electrical domestic wiring, printed circuit board (PCB) and computer. In electrical domestic wiring students will be exposed to the single-phase and three-phase wiring including the introduction to all equipment's of wiring. In PCB part, students will be exposed to the skill of preparing a PCB from scratch until it complete. In computer part, student will learn the process of assembling, formatting and networking. At the end of the course, students are expected to be able to solve simple engineering problems which is require the engineering skills.

Course Outcomes:
1. Ability to apply knowledge of basic skills and standard practiced in electrical wiring, PCB and computer assembling, formatting and networking.
2. Ability to create and assemble the domestic wiring based on standards practice.
3. Ability to apply appropriate techniques and calibration skills to construct a complete PCB and computer assembling, formatting and networking.

EMK11203 ELECTRIC CIRCUIT THEORY I

No of Credits: 3

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

Course Outcomes:
1. Ability to apply knowledge of basic laws and methods of circuit analysis to solve the problems in DC and AC circuits.
2. Ability to analyse and solve the first and second-order circuits containing passive elements, DC sources, and switches using differential equations.
3. Ability to apply appropriate techniques to solve the problems in DC and AC circuits.
4. Ability to design a solution of circuit parameter containing sinusoidal steady-state sources using complex impedances and phasor representations

EMK11303 ELECTRONICS I

No of Credits: 3

Course Synopsis:
This subject will expose the students with basic electronics devices. It provides a depth study on the concept of PN junction, operation and characteristics of the diode. The students will be emphasized to half wave rectifier, full wave rectifier, power supply filters and regulators, clipper and clamper diode circuit and voltage multipliers. The students also learn about the special-purpose of Zener diode in terms of its characteristics and applications. Bipolar junction transistors (BJTs) and various types of Field -effect Transistor (MOSFET) will be introduced in this course as well. Basic theories, principles and practical are stressed in this course.

Course Outcomes:
1. Ability to investigate and analyze the fundamental operating principle and output characteristics concepts of electronic devices.
2. Ability to apply knowledge of basic operations and performance electronic circuits through their applications in different areas to the solution of the engineering fundamental.
3. Ability to apply appropriate techniques to develop the basic concept of different construction, operation and characteristics biasing circuits and troubleshooting.

EMK11403 DIGITAL ELECTRONICS

No of Credits: 3

Course Synopsis:
The aim of this course is to introduce students to basic knowledge in digital electronics. This course focuses on 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:
1. Ability to apply knowledge the basic principles of digital electronics.
2. Ability to evaluate digital system applications using combinational and sequential logic techniques.
3. Ability to apply appropriate techniques for digital electronics engineering technology-related problems.

EMK21003 ELECTROMAGNETIC FIELD THEORY

No of Credits: 3

Course Synopsis:
The purpose of this subject is to learn and understand basic theory of electromagnetism. It provides basic concepts and understanding of fundamentals laws of electrostatics and magnetostatics. Student should be able to understand the basic concept applications of these laws for differences field configurations are also introduced. This course also introduces transmission line theory and use of transmission lines as circuit elements. Student should be understand the theory and application of transmission line such as VSWR, reflection coefficient and impedance matching using smith chart is also introduced in this course.

Course Outcomes:
1. Ability to understand and evaluate the different concept of electromagnetic field theory for solving the problems with consideration of public health and safety, cultural, societal and environmental.
2. Ability to communicate effectively concepts on the fundamental laws governing electromagnetic fields and evaluate the physical quantities of electromagnetic fields in different media using the fundamental laws-based cases through technical report and presentation.
3. Ability to engage in independent and life-long learning on the theory and practical knowledge concept to solve problems in electromagnetic field theory based on characteristics of materials and their interactions with electric and magnetic fields.
4. Ability to analyze and solve the concept of propagation of electromagnetic waves in different media in lossless and other environments, their sources & effects and theory of electromagnetic waves in practical problems.

EMK21103 MEASUREMENT & INSTRUMENTATION

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:
1. Ability to apply knowledge of electronic instrumentation and measurement techniques.
2. Ability to analyze the standardization and quality system knowledge in measuring electronic circuits using electrical measurement techniques.
3. Ability to apply the appropriate techniques for various sensors and signal conditioning/processing in instrumentation and measurements.

EMK21203 ELECTRIC CIRCUIT THEORY II

No of Credits: 3

Course Synopsis:
This course introduces the basic concepts and engineering methods of AC circuit analysis. The contents include the concepts of mutual inductance, frequency response in AC circuit and two port networks. The student also will expose to the mathematical modelling in the electrical circuit.

Course Outcomes:
1. Ability to apply knowledge of standard parameters and elements for AC circuits in circuit theory analysis.
2. Ability to analyse techniques of mathematical modelling with respect to certain parameters in electric system.
3. Ability to design solutions to electrical circuits using mathematical modelling in circuit theorem.
4. Ability to apply appropriate tools for software and hardware to validate the electric circuit theory.

EMK21303 ELECTRONICS II

No of Credits: 3

Course Synopsis:
This course offers fundamental knowledge in analogue circuits, especially in operational principles and applications. It covers small-signal models and frequency response of amplifier circuits including Operational Amplifier, Active Filters and Voltage Regulator.

Course Outcomes:
1. Ability to apply and analyse the theoretical principles related to the operation of electronic circuits.
2. Ability to design the electronic circuits using discrete components.
3. Ability to evaluate operational principles in electronic circuits for real applications.
4. Ability to apply appropriate techniques with the suitability of electronic circuitry according to the associated applications.

EMK21403 ELECTRICAL MACHINES TECHNOLOGY I

No of Credits: 3

Course Synopsis:
This course offers the students with knowledge about magnetic circuits, electromagnetic, electromechanical, transformer and DC machines. The practical and laboratory work are designed to give the students a practical perspective of electromagnetic, transformer and DC machines. They are given the opportunity to fully utilize the latest available facilities to realize the knowledge of practical electromagnetic, transformer, and DC machine.

Course Outcomes:
1. Ability to apply knowledge of the basic concept of electromagnetism, transformer, DC motor and DC generator into the electrical machine.
2. Ability to analyze and solve the performance of transformer, DC motor and DC generator.
3. Ability to apply appropriate techniques to evaluate the performance of transformer, DC motor and DC generator.
4. Ability to investigate and evaluate the performance of DC Motor and DC generators.

EMK21503 MIICROCONTROLLER SYSTEM

No of Credits: 3

Course Synopsis:
The aims of this course is to study the PIC microcontroller architecture. The programming languages using C and basic interfacing with input and output devices.
These knowledges are implemented to design a simple microcontroller based system.

Course Outcomes:
1. Ability to apply knowledge of a microcontroller programming language in C program
2. Ability to design an input and output devices with Timers, PWM and ADC using microcontroller programming language in C program
3. Ability to apply and design appropriate techniques related to the input and output devices with Timers, PWM and ADC in microcontroller
4. Ability to communicate effectively with justification of simple applications in microcontroller-based system.

EMK21603 POWER ELECTRONICS

No of Credits: 3

Course Synopsis:
This course introduces power electronics as a multidisciplinary and interdisciplinary application-oriented technology emphasizing the main criterion of electrical energy conversion: AC-DC, AC-AC, DC-DC, and DC-AC converters performance via waveform analysis. It also covers electronic devices such as diodes and transistors, but the emphasis is on circuit topology and function rather than on devices.
The primary background required is the understanding of the voltage-current relationships for linear devices as well as the concept of the Fourier Series.

Course Outcomes:
1. Ability to apply knowledge of power electronics devices and topologies to the solution of the engineering technology fundamental.
2. Ability to investigate and evaluate converter topologies and their performances through theoretical and simulation.
3. Ability to analyze and differentiate the various types of converter topologies.
4. Ability to apply appropriate techniques for power electronics-related problems.

EMK21703 COMMUNICATION SYSTEM

No of Credits: 3

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

Course Outcomes:
1. Ability to apply knowledge of the basic requirement of communication systems to solve the engineering fundamental.
2. Ability to select and apply appropriate types of modulation in communication systems.
3. Ability to design the appropriate research methodology to solve communication system technology.

EMK21803 SIGNAL & SYSTEMS

No of Credits: 3

Course Synopsis:
The course aims are to introduce students to the signals and systems in engineering technology. The concept of signals, linear time-invariant (LTI) systems characterization, and analysis through the Fourier Transform method for continuous-time signals (CTS) and discrete-time signals (DTS) are reviewed in this course. At the end of the course, the students are expected to be able to solve engineering problems related to signals and systems.

Course Outcomes:
1. Ability to analyze and differentiate the characteristic, process, and analysis method in signals and systems.
2. Ability to select and apply appropriate simulation tools for signals and systems.
3. Ability to engage in independent and life-long learning on the theory and practical knowledge in signals and systems.

EMK30103 DESIGN PROJECT

No of Credits: 3

Course Synopsis:
This course introduces the project that inclined towards engineering designs that is necessary for each Electrical Engineering Technology students during 3rd Year of study. The student will be given an engineering problem (or to identify the problem on their own) and gain experience by problem solving, investigation, research writing and effective presentation in the form of report and presentation. It is expected the students can be presented this project during exhibition or even poster presentation.

Course Outcomes:
1. Ability to design solutions for allocated engineering technology related problems and case study throughout stage of product development.
2. Ability to apply ethical principles and demonstrate responsibility in completing an integrated design project.
3. Ability to function effectively as an individual, and as a member or leader in diverse teams in developing an integrated design prototype.
4. Ability to understand and evaluate design project with consideration of public health and safety, cultural, societal and environment.
5. Ability to communicate effectively on engineering technology problem through technical report and presentation.

EMK31003 DRIVES AND ACTUATORS

No of Credits: 3

Course Synopsis:
This course provides the student an exposure application of power electronic drives, electrical, mechanical, pneumatic and hydraulic electrical actuator. The speed control of AC motor includes frequency control, stator voltage control and electrical actuator. The speed control of AC motor includes frequency control, stator voltage control and voltage frequency (v/f) control will be discussed as well as the aspects of dynamic braking of AC motors and dynamic load characteristic of electrical drives. In the second part of this subject, the definition, symbols, system, circuits, operation and component of the electro-pneumatic, electro-hydraulic and mechanical actuator will be discussed.

Course Outcomes:
1. Ability to apply knowledge of AC motor drives and electro pnuematic/hydrautic system to the solution of complex engineering problem.
2. Ability to investigate and analyze the functionality of AC drives motor.
3. Ability to design the compress air fundamental, hydraulic power unit and the relationship between pressure, force and speed for Pneumatic and hydraulic cylinder.
4. Ability to apply appropriate techniques of electro-pneumatics and hydraulic systems using electrical devices control fluid.

EMK31103 CONTROL SYSTEM TECHNOLOGY

No of Credits: 3

Course Synopsis:
This course introduces to control system for engineering technology students. Students will be exposed to mathematical modeling in time and frequency domain. This course also cover system compensation design using PID and lead-lag controllers.

Course Outcomes:
1. Ability to apply knowledge of mathematical models to the solution of the control system.
2. Ability to design solutions for broadly-defined engineering technology problems and design systems using feedback control.
3. Ability to select and apply appropriate controllers for system analysis.
4. Ability to function effectively in a group/team to design feedback control systems based on different types of controllers.

EMK32003 ELECTRICAL MACHINES TECHNOLOGY II

No of Credits: 3

Course Synopsis:
This course intends to give students fair knowledge of 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 motors, star-delta starter and testing the AC motor.

Course Outcomes:
1. Ability to apply knowledge of the concepts, related testing, and maintenances in understanding the principle of electrical machines.
2. Ability to analyze the classification of motor starter method for AC Machines.
3. Ability to design solutions for broadly defined engineering technology-related problems in synchronous generator and synchronous motor for electrical machines applications.
4. Ability to select and apply appropriate techniques for the three-phase induction motor and single phase induction motor and its application to electrical machines

EMK32103 ELECTRICAL INSTALLATION

No of Credits: 3

Course Synopsis:
This course is designed to educated next electrical engineers with the application skills needed in modern electrical engineering practice. This course uses a combination of theory and practical based on real case project to demonstrate and reinforce the principles and skills. Students in this course are expected to work through the project based. The project are require student design complete electrical system in new building.

Course Outcomes:
1. Ability to identify and analyze the design of electrical installation to the solution of engineeing technology problems.
2. Ability to select and apply appropriate modern engineering and IT tools for electrical installation design.
3. Ability to communicate effectively on electrical installation design through technical report and presentation.
4. Ability to design the solution of electrical installation with consideration of public health and safety, cultural, societal and environmental.

EMK32203 ELECTRICAL POWER SYSTEM

No of Credits: 3

Course Synopsis:
This course offers a basic principle in electrical power system engineering which covers the topic 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:
1. Ability to analyze and solve the type and operation of power system generation.
2. Ability to select and apply appropriate engineering tools for generation, transmission and distribution systems.
3. Ability to investigate and evaluate the load characteristics and distribution system components in power systems.
4. Ability to communicate effectively on type and operation of power system generation through technical report and presentation.

EMK30004 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:
1. Ability to design the appropriate research methodology to solve broadly defined engineering technology problems.
2. Ability to communicate effectively on engineering technology problem through technical report and presentation.
3. Ability to apply ethical principles and demonstrate responsibility in completing a technical project.
4. Ability to have the preparation on the theory and practical knowledge with organized arrangements.

EMK31203 PROGRAMMABLE LOGIC CONTROLLER

No of Credits: 3

Course Synopsis:
The course covers basic concept of PLC, PLC input and output components, PLC programming languages and PLC special programming techniques. Knowledge on theory acquired in lecture is also enhanced with a practical work conducted in laboratory. In the end of this course, the students are able to develop a PLC programming sequence operation system typically found in industrial or manufacturing environment.

Course Outcomes:
1. Ability to apply and analyze knowledge of PLC I/O components, operation and communications to the solution of the engineering specialization.
2. Ability to design solutions for broadly-defined engineering technology related problems and design systems using PLC programming languages.
3. Ability to apply PLC programming language and create programming sequence using a special programming techniques.

EMK31303 ENGINEERING TECHNOLOGY MANAGEMENT

No of Credits: 3

Course Synopsis:
This course exposes the management skills and economic techniques of project development to engineering technology students. 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.

Course Outcomes:
1. Ability to apply knowledge of project management and economic techniques to engineering technology project.
2. Ability to identify and evaluate the process of project management, work plans and cost estimation project.
3. Ability to apply and analyse the principles of engineering technology management to engineering technology project.
4. Ability to evaluate economic scenarios and apply decision making process in engineering technology project consideration of public health and safety, cultural, societal, and environmental.

EMK32303 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 off-grid and grid-connected power generation.

Course Outcomes:
1. Ability to identify and analyze the principles renewable energy.
2. Ability to design the conversion of renewable energy technology.
3. Ability to apply appropriate techniques to develop for renewable energy technology related problems.

EMK32403 POWER QUALITY (ELECTIVE)

No of Credits: 3

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

Course Outcomes:
1. Ability to apply and analyse knowledge of power quality disturbances in electrical power systems.
2. Ability to design solutions for electrical power quality disturbances that related to power quality problems.
3. Ability to select and apply appropriate techniques for typical problems associated with electrical power systems.
4. Ability to communicate effectively on electrical power quality disturbance design solutions in electrical power systems problem through report and presentation.

EMK32503 SUBSTATION ENGINEERING (ELECTIVE)

No of Credits: 3

Course Synopsis:
Substation Engineering is one of the specializations of the Industrial Power courses. Knowledge in this course covers the substation equipment in generation, transmission and distribution that is useful for students to understand electrical industrial power.

Course Outcomes:
1. Ability to apply and analyze the basic principles of substation equipment operation, maintenance and testing
2. Ability to identify and evaluate the substation principles and operations
3. Ability to investigate and analyze the operational parameters for busbar, circuit breaker, power transformer and grounding system.

EMK40006 FINAL YEAR PROJECT II

No of Credits: 6

Course Synopsis:
This course consists of lectures and independent study on the techniques of conducting laboratory and field experiments. The students are guided on the techniques and implementation of research and monitored based on research plan, data analysis, interpretation and conclusion. In addition, students are required to write, submit and defend their final year project report to the examiners, as well as presenting the report in technical form.

Course Outcomes:
1. Ability to design a solution for a project in technical and scientific knowledge with consideration of public health and safety, cultural, societal, and environmental.
2. Ability to communicate effectively on engineering technology problem through technical report and presentation.
3. Ability to apply ethical principles and demonstrate responsibility in completing a technical project.
4. Ability to have the preparation on the theory and practical knowledge with organized arrangements.
5. Ability to demonstrate knowledge and understand of engineering management principles and economic decision-making to manage projects in electrical engineering technology.

EMK41003 TECHNOLOGIST IN SOCIETY

No of Credits: 3

Course Synopsis:
This course introduces 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. The course presents the introductory nature to enable technologists to appreciate factors that have to be taken into account in decision-making. At the end of the course, students are expected to be able to examine and assess issues and challenges faced by technologists relating to engineering and technology ethics, risk management and to understand the legal requirements related to engineering and technology field.

Course Outcomes:
1. Ability to apply ethical principles and evaluate the aspects and procedures of legal on engineering and technology issues.
2. Ability to apply and assess hazards, risk management, occupational safety and health (OSHA) and procedures of legal related to professional engineering technology practice.
3. Ability to apply principles of engineering management to engineering project.
4. Ability to engage in independent and life-long learning on the theory and practical knowledge of the necessities and development of sustainable energy.

EMK42003 POWER SYSTEM PROTECTION AND SWITCHGEAR

No of Credits: 3
Course Synopsis:
This course introduces varieties of circuit breakers, isolators, earthing switches, bus-bar and relays for protection of generators, motors, transformers from short circuits, over-voltage and other hazards caused by internal and external faults.
This course also describes various neutral grounding of the equipment related to the protection systems.

Course Outcomes:
1. Ability to analyze the restriking phenomenon, operation and selection of switchgear equipment.
2. Ability to design neutral grounding concepts and performances.
3. Ability to apply appropriate techniques to investigate the abnormal condition on equipment, application, choice of protective relay correctly.
4. Ability to engage in independent and life-long learning on causes of overvoltage, evaluate the application of arrester to equipment protection the related insulation coordination problems and necessity of earthing neutral.

EMK42103 POWER ELECTRONICS AND DRIVES (ELECTIVE)

No of Credits: 3

Course Synopsis:
This course provides the student an exposure application of Power Electronics for electric motor drives. It emphasizes fundamental concepts of power electronics & drives, electrical machines types, and related applications. The aspects of load characteristics and matching drive to load are also discussed.

Course Outcomes:
1. Ability to identify and analyze the suitable converter's parameters for power electronics & drives.
2. Ability to select and apply appropriate techniques for different types of motor loads and drive requirements.
3. Ability to engage in independent and life-long learning on the theory and practical knowledge of the power electronics & drives in electrical machines application.

EMK42203 INDUSTRIAL AUTOMATION (ELECTIVE)

No of Credits: 3

Course Synopsis:
This course exposes the student the advance automation concept in the industries. The subject exposes the implementation of automation technology such as sensor, actuator and drives in manufacturing process. It also covers the hardware and software control techniques in industrial application.

Course Outcomes:
1. Ability to apply knowledge of automation technology in manufacturing process.
2. Ability to select and apply appropriate tools for pneumatic and PLC applications.
3. Ability to understand and evaluate the automation concepts with consideration of public health and safety, cultural, societal and environmental.

EMK42303 ENERGY EFFICIENCY AND MANAGEMENT (ELECTIVE)

No of Credits: 3

Course Synopsis:
This course exposes the students to national and worlds economic perspectives on energy in terms of economics, problems and the current status of energy. Through plans and operations for energy management and energy-efficient equipment, students will learn 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:
1. Ability to apply and analyze the electricity tariff and energy management calculation in Malaysia.
2. Ability to select and apply appropriate simulation tools for energy management related problems.
3. Ability to understand and evaluate the problem-related demand-side management and evaluate an energy-saving solutions based on electrical energy audits with consideration of public health and safety, cultural, societal and environmental.
4. Ability to recognize the need for energy efficiency based on theory and practical knowledge of electrical systems and their conservation potentials.

EMK42403 HIGH VOLTAGE TECHNOLOGY (ELECTIVE)

No of Credits: 3

Course Synopsis:
This course exposes the students about insulating materials and their applications, breakdown phenomena in insulating material such as solids, liquids and gases. The course also covers generation and measurement of high DC, AC and impulse voltages and currents, high voltage testing techniques and testing of apparatus and equipment.

Course Outcomes:
1. Ability to apply and analyse knowledge of high voltage technology in engineering technology practice.
2. Ability to identify and evaluate the breakdown mechanism, generations and measurements of high voltage.
3. Ability to select and apply appropriate tools to validate the voltage and current in high voltage technology.
4. Ability to communicate effectively on design solutions in high voltage technology problem through report and presentation.

EMK40112 INDUSTRIAL TRAINING

No of Credits: 12

Course Synopsis:
This practical-based course exposes students to a company technical functions and organizational structure and operation such as departmental function, work procedure, safety procedure, communication, technical skills and project management. During this course, the students will apply knowledge learned in the university and increased the related skills required in their future profession

Course Outcomes:
1. Ability to demonstrate technical knowledge and practical skills.
2. Ability to practice the health, safety, legal and cultural issues in working environment.
3. Ability to apply societal environmental and sustainable development in engineering problems.
4. Ability to demonstrate good work performance, work ethics during training period.
5. Ability to perform as individual, a member or leader in diverse technical teams.
6. Ability to communicate and operate assigned task given by host company.
7. Ability to engage in independent and life-long learning in sp

EMK36003 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:
1. Ability to identify and analyze the principle of network and communication system.
2. Ability to investigate and evaluate the principle of various types of network and communication systems
3. Ability to select and apply appropriate equipment for the industrial network and communication technology.

EMK36103 MECHANICS AND MACHINE DESIGN

No of Credits: 3

Course Synopsis:
This course exposes the students in mechanics and mechanical fields. The objective of the course is to provide students with concepts and principles of mechanics in term of mathematical and 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 such as kinematics, machine mechanism, velocity and acceleration analysis will be covered. 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:
1. Ability to apply and analyse knowledge of mechanics concept and machine design.
2. Ability to analyze the force and equilibrium of rigid body for the structures.
3. Ability to investigate and evaluate machine elements to develop a mechanism.
4. Ability to select and apply appropriate tools to analyze the Stress, Deformation Analysis and general case of combine stress

EMK36203 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 & system, sensor, actuator and drives technology. It also covers an industrial application in hardware and software control techniques, design, engineering analysis, planning, tooling and manufacturing.

Course Outcomes:
1. Ability to apply and assess the automation technology principles and its relationship with assembly process and material handling system in relation of public health and safety, cultural, societal and environmental.
2. Ability to apply knowledge of automation components such as sensor, actuator and drive/motion system.
3. Ability to select and apply appropriate tools using PLC, sensor, actuator and drive/motion in automation system.
4. Ability to understand and evaluate the principles of SCADA systems and the concept of CAD, CAM and CIM with consideration of public health and safety, cultural, societal and environmental.

EMK36303 INDUSTRIAL ROBOTICS

No of Credits: 3

Course Synopsis:
The objective of the course is to provide students with concepts and principles of robot system that is required in design of robot. Emphasis is given to the application of industrial robot design and task selection within robot system design. The basic element of robot system will understand such as the types of robots, capabilities, characteristics, robot control systems and software, kinematics analysis, principles of inverse kinematics, robot, robot work dell design, various industrial applications, sensors and drive mechanism.

Course Outcomes:
1. Ability to apply the robot system for specific design
2. Ability to design the robot system for specific task
3. Ability to conduct appropriate tools for industrial robot task related problems.

EMK36403 MODERN CONTROLS

No of Credits: 3

Course Synopsis:
This course in introduces the state-space in control technology to the students. This includes system modelling in state-space, state space representation in various form and more importantly controller design.

Course Outcomes:
1. Ability to apply the concept of state-space modelling technique
2. Ability to investigate and analyze the state- space representation model of a system
3. Ability to design controllers based on state-space model

EMK36503 ROBOTICS CONTROL (ELECTIVE)

No of Credits: 3

Course Synopsis:
In this course, 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:
1. Ability to apply knowledge of the fundamental concepts in robotics and applications.
2. Ability to analyze and design the operation of sensors, robots control and robotic programming.
3. Ability to investigate and analyze operational parameters for robots control in software or hardware development.
4. Ability to apply appropriate technique of object manipulations by robots for an intelligent system in industrial manufacturing.

EMK36703 ARTIFICIAL INTELLIGENCE (ELECTIVE)

No of Credits: 3

Course Synopsis:
This course provides the knowledge of artificial intelligence (AI) and application of AI in robotic industries. The course covers conceptual framework in search techniques and implementation of machine learning in AI. In addition to these topics, specific domains such as speech and image recognitions

Course Outcomes:
1. Ability to identify and analyze the right artificial intelligence techniques for robotic applications.
2. Ability to apply appropriate techniques using computer programming for artificial intelligence operation
3. Ability to investigate and evaluate different type of artificial intelligence techniques.

EMK46003 MATERIAL HANDLING AND IDENTIFICATION (ELECTIVE)

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. A significant improvement in the efficiency of operations and to maximize overall productivity of the plant or warehouse.

Course Outcomes:
1. Ability to apply and analyze knowledge of material handling principles and its relationship with assembly process.
2. Ability to investigate and evaluate the material handling equipment to meet desired industry needs.
3. Ability to apply appropriate techniques in material handling operating systems.

EMK46103 AUTOMATED GUIDED VEHICLE (ELECTIVE)

No of Credits: 3

Course Synopsis:
This course introduces the students to 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:
1. Ability to apply knowledge of the moving mechanisms for mobile robots such as wheeled, walking, swimming, flying, and climbing robots
2. Ability to analyse the force-torque requirements of mobile robots and deciding the servo and stepper motor specifications.

3. Ability to select and apply the requirements of sensors, motor specifications and control systems for wheeled robot mechanisms
4. Ability to analyse the operation of mobile robots with consideration of professional engineering technology practice.

EMK46203 MECHATRONIC SYSTEMS (ELECTIVE)

No of Credits: 3

Course Synopsis:
This course aims to provide knowledge of mechatronics system. The effectiveness of measurement and actuation system in mechatronic systems will be explained. The theoretical aspects are validated with laboratory works.

Course Outcomes:
1. Ability to apply knowledge of a systems using sensors/transducers and relevant conditioning circuits
2. Ability to design the actuation systems, programmable logic controllers (PLC) and microprocessors & microcontrollers
3. Ability to apply appropriate techniques for Electro pneumatic and electro hydraulic system, input/output systems using programmable logic controllers (PLC) and microprocessors & microcontrollers.

EMK46303 VISION SYSTEMS (ELECTIVE)

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:
1. Ability to apply knowledge of components of machine vision systems, image acquisition and sampling techniques to the solution of specialist knowledge
2. Ability to investigate and analyze the image processing techniques
3. Ability to design the machine vision system by utilizing image processing concepts
4. Ability to apply appropriate techniques to develop machine vision system

EMT10104 RANGKAAN 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. An introduction to OrCAD software also given.

Course Outcomes:
1. Ability to demonstrate general characteristic of electrical installation into the concepts of Computer Aided Drafting.
2. Ability to build electrical installation apparatus drawing for low voltage application.
3. Ability to demonstrate actual working drawings of electrical project.

EMT10204 LAPORAN TEKNIKAL [TECHNICAL REPORTING]

No of Credits: 4

Course Synopsis:
The objective of this course is to expose students to knowledge and skill in technical reporting using Excel, Word, and PowerPoint applications. In this course, students will be exposed to techniques and tips on producing a good formal report. Overall, it emphasizes the precise use of language and graphics to communicate technical and procedural information safely, legally, and ethically.

Course Outcomes:
1. Ability to apply knowledge of problem solving process to the effective reporting technique
2. Ability to show significant thinking abilities in analysing technical and professional documentation.
3. Ability to propose appropriate techniques to convey technical information in a clear and easily accessible format
4. Ability to manage information related to various technical information in order to produce good proposal reports

EMT10305 PENGUKURAN DAN PENGUJIAN SISTEM ELEKTRIK [ELECTRICAL SYSTEM MEASUREMENT AND TESTING]

No of Credits: 5

Course Synopsis:
To provide student with the concept, knowledge and skill in Electrical System Measurement And Testing especially in developing themselves as good technologist upon graduation.

Course Outcomes:
1. Ability to apply the relevant parameter to the measurement.
2. Ability to perform the tests and measurements using the proper tools and technique.
3. Ability to comply proper safety procedures in handling tools during measurement works.

EMT10405 PEMASANGAN DAN PENYELENGGARAAN PV SOLAR [SOLAR PV INSTALLATION AND MAINTENANCE]

No of Credits: 5

Course Synopsis:
This course is the first gateway for students to understand the photovoltaic system technology. This course will introduce students with terminologies used in solar photovoltaic (PV) system technology. It will enables student to assess, install and maintain solar PV system configuration for stand-alone and grid-connected power generation based on standard requirement by the agencies involved.

Course Outcomes:
1. Ability to apply appropriate knowledge to solve or interpret the fundamentals, main characteristics and components of PV system
2. Ability to apply suitable tools or techniques for specific purposes related to PV system.
3. Ability to demonstrate the awareness of standards or policies related to PV system in Malaysia.

EMT10505 PENYELENGGARAAN DAN PENENTUKURAN PAPAN SUIS [SWITCHBOARD MAINTENANCE AND CALIBRATION]

No of Credits: 5

Course Synopsis:
This course covers the acquiring of knowledge on the maintenance and calibration aspects of switchboard. All the associated components of switchboard including circuit breaker, relays and others will be looked into, to establish good knowledge on their functions, operations and others. In general, it emphasizes on the principles and safe practice in accordance to operations of switchboard.

Course Outcomes:
1. Ability to analyze basic principle of operation, construction and connections of a switchboard components and related equipment
2. Ability to demonstrate the calibration procedures on switchboard equipment using specific parameters
3. Ability to demonstrate proper safety procedures in maintenance work of switchboard equipment.

EMT10603 AMALAN PROFESIONAL [PROFESSIONAL PRACTICE]

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:
1. Ability to apply knowledge of the aspects and procedures of legal on engineering and technology issues.
2. Ability to show significant thinking abilities in analyzing hazards, the function of risk management and occupational safety and health (OSHA).
3. Ability to apply ethical principles on issues and challenges related to technology ethics.

EMT20105 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:
1. Ability to perform safe practice of common maintenance tasks electrical systems used in buildings
2. Ability to demonstrate basic preventive and reactive maintenance procedures for residential homes, apartments, and appliances.
3. Ability to demonstrate an ethical awareness on safety and health while doing maintenance tasks.

EMT20205 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. Students will be taught about the principal of operation and maintenance of renewable energy systems where necessary. In addition, exposure to HOMER software will be conducted through this course to equip students with knowledge of techno-economic analysis. Complementary to the syllabus, there will be mini projects designed to enhance students' understanding about the control mechanism in renewable energy systems.

Course Outcomes:
1. Ability to apply appropriate knowledge to solve or interpret the fundamentals, main characteristics and components of different renewable energy sources and systems.
2. Ability to apply suitable tools or techniques in maintenance activities of renewable energy systems
3. Ability to perform simple techno-economical assessments and compare environmental impact of renewable energy systems.

EMT20305 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 systems. The DC and AC generator and its function in the electrical system are introduced. The principle of the 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 systems according to standard, which includes preventive maintenance. Also, this course encompasses the servicing method for DC and AC generator that related to fault diagnosis.

Course Outcomes:
1. Ability to apply knowledge of the concepts and principles of diesel generator operation to the solution of load balance and protection system.
2. Ability to demonstrate a deep investigative ability to solve problems related to 3 Phase AC and DC generator systems and load characteristics.
3. Ability to apply operational procedures, preventive maintenance strategy, and problem-solving for diesel generator systems according to standard.
4. Ability to demonstrate understanding of generator system and safety issues related to diesel generator to follow IEEE Standard Criteria for Diesel Generator.

EMT20405 INTEGRASI MESIN ELEKTRIK DAN SISTEM PEMACU [ELECTRICAL MACHINE AND DRIVE SYSTEM INTEGRATION]

No of Credits: 5

Course Synopsis:
This course is designed to introduce the student the principles of DC and AC motors drive control. This includes studying the concept of control modes for motor drives, connections and applications. The integration practices among PLC, microcontroller, motors, software, drives, computers, and other industrial equipment will be provided. Lectures and labs will place emphasis on the above items will allow the student to build a working integrated motor drive system throughout the semester.

Course Outcomes:
1. Ability to apply the concepts and techniques used in electrical machines drive system.
2. Ability to propose and employ control algorithm of Programmable Logic Controller (PLC), microcontroller and Variable Frequency Drive (VFD)
3. Ability to comply safety regulation in handling electrical machine and drive integration equipment.

EMT20505 PENGOPTIMUMAN KECEKAPAN TENAGA [ENERGY EFFICIENCY OPTIMIZATION]

No of Credits: 5

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.In addition, safety aspect of electrical equipments will also be exposed to the student to create awareness and safe working practice. Through plans and operation for energy management and energy efficient equipments, student will learn on how efficient energy utilization 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 identify a solution for energy saving programs.

Course Outcomes:
1. Ability to understand energy management, standards, and safety aspect of efficient electrical energy utilization.
2. Ability to demonstrate the instrument and measurement tools of efficient electrical energy utilization.
3. Ability to demonstrate compliance to the energy policies and legislation, Electrical Hazards and Safety while performing energy management-related works.

EMT20603 INTERAKSI DAN PENGURUSAN 'COLLEGIALITY' [COLLEGIALITY INTERACTION AND MANAGEMENT]

No of Credits: 3

Course Synopsis:
The course provides a skill on how to develop and use the knowledge and skills needed for effective professional collaboration, including team meetings, parent conferences, co-teaching, and problem solving with colleagues.

Course Outcomes:
1. Ability to apply knowledge of pedagogical aids and organization behaviour.
2. Ability to function effectively in a group team of managerial practice and application exercise.
3. Ability to discuss the role of systematic planning in solving problems related to organization management to follow the organizational behavior theory.

EMT20704 PROJEK KEUSAHAWANAN TEKNOLOGI 1 [TECHNOPRENEUR PROJECT 1]

No of Credits: 4

Course Synopsis:
Technopreneur Project 1 course exposes students to the various financial aspects of new ventures. These include approaches to securing start-up capital and venture financing. Students learn about basic accounting, essential financial indicators, the types of funds available, the different categories of investors, and the importance of intellectual property in securing finance. The financial details to be included in a business plan are required for investment purposes, valuation of the company, and the art of negotiation with investors.

Course Outcomes:
1. Ability to apply knowledge of various financial indicators & tools to prepare for financial information for a new business venture.
2. Ability to show significant thinking abilities in analysing financial statements.
3. Ability to communicate effectively on the art of negotiation.
4. Ability to demonstrate management and technopreneurship skills in completing mini project related to business models and revenue models.

EMT30105 REKABENTUK SISTEM KAWALAN JENTERA INDUSTRI [INDUSTRIAL MACHINERY CONTROL SYSTEM DESIGN]

No of Credits: 5

Course Synopsis:
One of the aspects of a good technologies is to have the capability of integrating the hardware and the software, thus an electrical technologies should be competence in programming. This course introduces basic programming using high level language (C language) includes study of PIC microcontroller architecture, its programming using C language and interfacing with input and output devices. These knowledge are gathered and applied to design microcontroller based system. Applying and analyse control system problems by utilizing controller system such as P, PI, PID and Ziegler-nichols into water level & flow, temperature and servo motor. The course also to understanding of the PLC central processing unit, input-output system, programming and peripheral devices, and programming languages and will developed skills in programming PLC (omron and siemens) and applying in industrial PLC.

Course Outcomes:
1. Ability to apply knowledge of the concept in PLCs central processing unit, input-output system, programming and peripheral devices.
2. Ability to employ appropriate tools and techniques for control system problems by utilizing controller system: such as P, PI, PID and Ziegler-Nichols into broadly defined industrial problem e.g. water level & flow, temperature and servo motor.
3. Ability to communicate effectively in evaluating the appropriate input and output devices for selected control system and programmable logic controller through technical report and presentation.

EMT30205 INTEGRASI SISTEM PEMANTAUAN [MONITORING SYSTEM INTEGRATION]

No of Credits: 5

Course Synopsis:
The course provides an introduction to the fundamentals of Supervisory Control And Data Acquisition (SCADA), the architecture, the componets, Human Machine Interface (HMI) and the applications of SCADA. Students also introduced to the concept of Internet of Things (IoT), network communications and the applications. Lectures and labs will place emphasis on the above items will allow the student to operate the monitoring system and make data analysis throughout the semester.

Course Outcomes:
1. Ability to apply the concept used in SCADA system development.
2. Ability to construct Human Machine Interface (HMI) in SCADA system and their the network communication.
3. Ability to demonstrate teamwork and leadership skills while doing group task.

EMT30304 ANALISIS DATA PERINDUSTRIAN [INDUSTRIAL DATA ANALYSIS]

No of Credits: 4

Course Synopsis:
This course introduces students to several exploratory data analyses that are useful in collecting, organizing, analysing and interpreting data based on numerical and graphical data presentation. Probability concepts and several probability distributions that are useful in dealing with different types of random variables are also covered. For the preparation of making decisions and performing statistical inferences, point and interval estimations will be introduced. Then, few techniques to perform statistical inferences using hypothesis testing and statistical modelling techniques to data using simple linear regression will be taught. The statistical knowledge and data analysis skills taught in this course are explored using suitable statistical software.

Course Outcomes:
1. Ability to apply knowledge of exploratory data analysis, probability concepts and inferential statistics.
2. Ability to apply statistical data analysis using suitable software.
3. Ability to employ data analysis in industrial practice.

EMT30404 PROJEK KEUSAHAWANAN TEKNOLOGI 2 [TECHNOPRENEUR PROJECT 2]

No of Credits: 4

Course Synopsis:
The start-up and growth of an enterprise invariably involves both human and financial capital. To manage the increasing pool of human resources and to convince venture capitalists to invest become two main issues especially for growing venture. This course consists of two parts: in the first part, organization and human resource management are introduced; in the second part, the focus is on writing a convincing business plan to attract venture capital investment. When enterprise starts to take shape and grow, more people will be hired, proper organization, team building and human resource management will become important issues. In this course, students will be exposed to the various organizational aspects relevant to new ventures and established companies. These include the pros and cons of the different organization structures, conflicts that may arise among employees, and approaches to building strong teams. Human resourse management techniques will also be introduced and discussed. In the second part of the course, the business model canvas will be described listing the connections among the different components of a business. The value of a business plan and the techniques of writing a business plan will be introduced.

Course Outcomes:
1. Ability to apply knowledge of the business model canvas incorporating human and financial elements.
2. Ability to show significant thinking abilities in evaluating convincing business plan.
3. Ability to function effectively in a group to motivate all stakeholders and build a cohesive venture team.
4. Ability to display technopreneurship routine to complete a design project and business venture.

FACULTY OF ELECTRONIC ENGINEERING TECHNOLOGY (FTKEN)

Programmes Offered:

1. Bachelor of Microelectronic Engineering with Honours
2. Bachelor of Computer Engineering with Honours
3. Bachelor of Biomedical Electronic Engineering with Honours
4. Bachelor of Electronic Engineering with Honours
5. Bachelor of Electronic Engineering Technology (Electronic Systems) with Honours
6. Bachelor of Electronic Engineering Technology (Electronic Telecommunication Design) with Honours
7. Bachelor of Electronic Engineering Technology (Electronic Network Design) with Honours
8. Bachelor of Technology in Industrial Electronic Automation with Honours
9. Diploma in Computer Engineering
10. Diploma in Electronic Engineering

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Kampus Alam UniMAP Pauh Putra
02600 Arau Perlis
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ENGINEERING PROGRAMME

PROGRAMME OBJECTIVES (PEO)

The Programme Objectives for the entire ***Engineering Programme*** at Universiti Malaysia Perlis (UniMAP) is as follows:

PEO 1
Graduates who have demonstrated career advancement in the field of Electrical 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

*At the end of the **Engineering Programme**, the students are expected to attain the following attributes:*

PO 1
Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization respectively 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 consideration.

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 problem.

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 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
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.

PO12
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.

CURRICULUM STRUCTURE
UR6523001 BACHELOR OF MICROELECTRONIC ENGINEERING WITH HONOURS
INTAKE 2021/2022

YEAR	YEAR 1		YEAR 2		YEAR 3			YEAR 4	
SEMESTER	I	II	III	IV	V	VI		VII	VIII
Engineering Core (101)	NMJ11303 Circuit Theory	NMJ11203 Electrical Power System	***NMJ20303 Analog Electronic II	NMJ21603 Integrated Circuit Design	NMJ32303 Digital Integrated Circuit Design	NMJ32603 Computer Architecture	NMJ30904 Industrial Training	NMJ41802 Final Year Project I	NMJ41904 Final Year Project II
	NMJ10603 Electronic Engineering Skills	NMJ10303 Digital Electronic I	***NMJ20503 Digital Electronic II	NMJ21203 Microprocessor	NMJ30203 Microelectronic Fabrication I	NMJ30303 Microelectronic Fabrication II		NMJ41103 Semiconductor Packaging	NMJ40303 Reliability and Failure Analysis
	NMJ10403 Physics for Electronic	NMJ10903 Computer Programming	NMJ20603 Semiconductor Physics	***NMJ21803 Electromagnetic Theory	NMJ32903 Communication Systems	NMJ31403 Digital Signal Processing		****Elective 1	****Elective 4
	NMJ11103 Electronic Devices	NMJ10203 Analog Electronic I	NMJ20703 Signal and Systems	NMJ32703 Control Systems	NMJ30403 Instrumentation	NMJ32004 Integrated Design Project		****Elective 2	
								****Elective 3	
Non-Eng. (19)	SMQ10103 Engineering Mathematics I	SMQ10203 Engineering Mathematics II	SMQ20303 Engineering Mathematics III	SMQ27103 Engineering Statistics	NMJ31603 Management for Engineers	NMJ30602 Professional Engineers			
		SMU32202 Thinking Skills							
University Required (16)	**SMB41002 University Malay Language	*SMB10102 Preparatory English	*SMB20102 English for General Communication	*SMB31202 English for Technical Communication		SMU22402 Engineering Entrepreneurship		SMU13102 Appreciation of Ethics and Civilization	SMU13002 Philosophy and Current Issues
	SMZXXXX1 Co-Curiculum	SMZXXXX1 Co-Curiculum			SMU12202 Skill and Technology in Communication				
136	18	18	17	17	17	17	4	16	**12**
*Total Units for Graduation **136***									

*Compulsory and optional courses according to MUET Results

MUET	SMB10102 (Uncredited)	SMB20102	SMB31202	Option
Band 2	Compulsory	Compulsory	Compulsory	Optional
Band 3		Compulsory	Compulsory	Optional
Band 4,5 and 6			Compulsory	Compulsory

Local	International
SMB41002 University Malay Language	SMB11002 Basic Malay Language

**Course specific to local or international student

***Courses with prerequisite

Course	Prerequisite
NMJ20503	NMJ10303
NMJ20303	NMJ10203
NMJ21803	SMQ10103

****Elective courses

Elective courses
NMJ30803 Reliability and Testability in Integrated Circuit Design
NMJ31703 Advanced Devices
NMJ40403 Nanoelectronic Engineering
NMJ42403 Optoelectronic System
NMJ40703 Micro-Electro-Mechanical Systems
NMJ40203 Data Analytics
NMJ40903 Optical Communication

CURRICULUM STRUCTURE
UR6523002 BACHELOR OF COMPUTER ENGINEERING WITH HONOURS
INTAKE 2021/2022

	FIRST		SECOND		THIRD			FOURTH	
SEM	**I**	**II**	**III**	**IV**	**V**	**VI**		**VII**	**VIII**
Engineering Core (97)	NMJ11404 Electric Circuit Theory	NMJ10803 Electric Circuit II	NMJ20904 Analog Electronic Circuits II	NMJ21803 Electromagnetic Theory	NMJ30504 Electronic Instrumentation and Measurement	NMJ32404 Embedded System Design	NMJ30904 Industrial Training	NMJ41802 Final Year Project I	NMJ41904 Final Year Project II
	NMJ11004 Computer Programming	NMJ10704 Analog Electronic Circuits I	NMJ20404 Digital Electronics II	NMJ20703 Signals and Systems	NMJ32903 Communication Systems	NMJ32703 Control Systems		NMJ42503 Modern Operating System	NMJ42304 Real Time System
	NMJ11103 Electronic Devices	NMJ10303 Digital Electronics I	NMJ20003 Algorithm and Data Structures	NMJ21704 Microprocessor Systems	NMJ32203 Computer Networks	NMJ31903 Group Design Project		Program Elective I /3	Open Elective /3
		NMJ10503 Electrical Engineering		NMJ21403 Object-oriented Programming	NMJ31403 Digital Signal Processing	NMJ31804 Principle of Computer Architecture		Program Elective II /3	
Non Engineering (19)	SMQ10103 Engineering Mathematics I	SMQ10203 Engineering Mathematics II	SMQ22103 Discrete Mathematics and Linear Algebra	SMQ27203 Probability and Statistic	NMJ31602 Management for Engineers	NMJ30602 Professional Engineers			SMU12202 Skills and Technology in Communication
	SMZXXX01 Co-Curriculum	SMZXXX01 Co-curriculum	SMB10102 English for General Communication		SMB31202 English for Technical Communication	SMB41002* University Malay Language		SMU32202 Thinking Skills	SMU22402 Engineering Entrepreneurship
University Required (16)	SMU13002 Philosophy and Current Issues		SMBXXX02 Option Subjects			SMB11002** Basic Malay Language		SMU13102 Appreciation of Ethics and Civilization	
132	17	17	16	16	18	18	4	15	15
Total Units for Graduation 136									

Elective I & II (select any 2 courses): NMJ41203 Image Processing, NMJ40503 Software Engineering, NMJ40803 Internet of Things, NMJ40603 Artificial Intelligence.
Open Elective (select 1 course): NMJ41403 Network Programming, NMJ40203 Data Analytics

Notes: *Applicable for Local Students ** Applicable for Foreign Students
SMB10102 Preparatory English: Pre-requisite for SMB20102 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.
SMB20102 English for General Communication: Applicable for MUET Band 3, IEC Level "Intermediate and above", SMB10102 Preparatory English Grade "C and above"
SMBXXX02 Option Subjects: Applicable for MUET Band 4 and above, TOEFL "525 and above", IELTS "5.5 and above"

CURRICULUM STRUCTURE
UR6523004 BACHELOR OF BIOMEDICAL ELECTRONIC ENGINEERING WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	I	II	III	IV	V	VI		VII	VIII
Engineering Core (94)	NMJ11303 Circuit Theory	NMJ10903 Computer Programming	NMJ21103 Engineering Mechanics	NMJ20103 Biomaterials	NMJ31003 Mechanics of Materials	NMJ32903 Communication Systems	NMJ30904 Industrial Training	NMJ41802 Final Year Project I	NMJ41904 Final Year Project II
	NMJ10603 Electronic Engineering Skills	NMJ11503 Analog Electronic	NMJ20303 Analog Electronic II	NMJ21803 Electromagnetic Theory	NMJ32804 Linear Control Systems	NMJ31103 Electrical Machines & Drives		NMJXXX03 Elective I	NMJXXX03 Elective II
		NMJ10303 Digital Electronic I	NMJ20703 Signals & Systems	NMJ20203 Biomechanics	NMJ30703 Safety Standard and Ethics in Biomedical Engineering	NMJ32102 Design Project I		NMJ40003 Bioinstrumentation II	NMJ41003 Artificial Organs
			NMJ21002 Engineering Drawing and Computer Aided Design	NMJ21304 Microcontrollers & Interfaces	NMJ31303 Digital Signal Processing & Applications	NMJ30003 Bioinstrumentation I		NMJ41503 Medical Imaging	
					NMJ33003 Thermofluids			NMJ41703 Design Project II	
Non Engineering Core (26)	SMQ10103 Engineering Mathematics I	SMQ10203 Engineering Mathematics II	SMQ20303 Engineering Mathematics III			SMQ27103 Engineering Statistics		NMJ30602 Professional Engineers	NMJ31602 Management for Engineers
	NMJ10004 Anatomy & Physiology	NMJ10103 Biochemistry							
	SDU12302 Skills and Technology in Communication								
University Requirement (16)	*SMB10102 Preparatory English	SMBXXX02 Option or **SMB20102 English for General Communication	SMU13102 Appreciation Of Ethics And Civilization	SMB31202 English for Technical Communication		SMB41002 University Malay Language ***SMB11002 Basic Malay Language			
			SMU22402 Engineering Entrepreneurship	SMU32202 Thinking Skills					
	SMZXXX01 Co-Curriculum	SMZXXX01 Co-Curriculum							
	SDU12902 Falsafah dan Isu Semasa								
	18	18	18	17	16	16	4	16	13

Total Units for Graduation 136

Elective I (Medical Computing) : NMJ41303 Medical Image Processing, NMJ40603 Artificial Intelligence
Elective II (Medical Instrumentation) : NMJ41603 Medical Robotics, NMJ40103 Biosensors & BioMEMS
*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

CURRICULUM STRUCTURE
UR6523005 BACHELOR OF ELECTRONIC ENGINEERING WITH HONOURS
INTAKE 2021/2022

YEAR	YEAR 1		YEAR 2		YEAR 3			YEAR 4	
SEMESTER	I	II	III	IV	V	VI		VII	VIII
Engineering Core (104)	NMJ11303 Circuit Theory	NMJ10503 Electrical Engineering	NMJ20803 Engineering Materials	NMJ21603 Integrated Circuit Design	NMJ32303 Digital Integrated Circuit Design	NMJ32703 Control Systems	NMJ30904 Industrial Training	NMJ41802 Final Year Project I	NMJ41904 Final Year Project II
	NMJ10603 Electronic Engineering Skills	NMJ10303 Digital Electronic I	***NMJ20503 Digital Electronic II	NMJ21203 Microprocessor	NMJ31203 Microcontroller	NMJ32503 VLSI Design		NMJ42003 MEMS Design And Fabrication	NMJ42203 System on Chip
	NMJ10403 Physics for Electronic	NMJ10903 Computer Programming	NMJ20603 Semiconductor Physics	***NMJ21803 Electromagnetic Theory	NMJ32903 Communication Systems	NMJ30103 Power Electronic		NMJ32603 Computer Architecture	NMJ31403 Digital Signal Processing
	NMJ11103 Electronic Devices	NMJ10203 Analog Electronic I	NMJ20703 Signal And Systems	***NMJ20303 Analog Electronic II	NMJ30803 Reliability and Testability in Integrated Circuit Design	NMJ32004 Integrated Design Project		NMJ30403 Instrumentation	NMJXXXXX Elective Course
								NMJ42103 Analogue Integrated Circuit Design	
Non-Eng. (17)	SMQ10103 Engineering Mathematics I	SMQ10203 Engineering Mathematics II	SMQ20303 Engineering Mathematics III	SMQ27103 Engineering Statistics	NMJ31603 Management for Engineers	NMJ30602 Professional Engineers			
University Required (18)		SMU32202 Thinking Skills			SMU12202 Skill and Technology in Communication	SMU22402 Engineering Entrepreneurship		SMU13102 Appreciation of Ethics and Civilization	SMU13002 Philosophy and Current Issues
	**SMB41002 Bahasa Melayu Universiti	*SMB10102 Preparatory English	*SMB20102 English for General Communication	*SMB31202 English for Technical Communication					
	SMZXXX01 Co-Curiculum	SMZXXX01 Co-Curiculum							
139	18	18	17	17	17	17	4	16	15

Total Units for Graduation 139

Elective Course: NMJ42403 Optoelectronic System or NMJ40303 Reliability and Failure Analysis

*Compulsory and optional courses according to MUET Results

MUET	SMB10102 (Uncredited)	SMB20102	SMB31202	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
SMB41002 Bahasa Melayu Universiti	SMB11002 Bahasa Melayu Asas

***Courses with prerequisite

Course	Prerequisite
NMJ20503	NMJ10303
NMJ20303	NMJ10203
NMJ21803	SMQ10103

ENGINEERING TECHNOLOGY PROGRAMME

PROGRAMME OBJECTIVES (PEO)

The Programme Objectives for the entire ***Engineering Technology Programme*** at Universiti Malaysia Perlis (UniMAP) is as follows:

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

*At the end of the **Engineering Technology Programme**, the students are expected to attain the following attributes:*

PO 1
Knowledge: Apply knowledge of mathematics, science, engineering fundamentals and engineering specialisation principles 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 specialization.

PO 3
Design/development of solutions: 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.

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 the effective reports and design documentation, make effective presentations, 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 and leader in a team and to manage projects in multidisciplinary environments.

PO12
Life-Long Learning: Recognize the need for and have the ability to engage in independent and lifelong learning in specialist technologies.

CURRICULUM STRUCTURE
UR6523007 BACHELOR OF ELECTRONIC ENGINEERING TECHNOLOGY (ELECTRONIC SYSTEM) WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEM	I	II	III	IV	V	VI	VII	VIII
Discipline Core	NMK10103 Electric Circuit Principles	NMK10503 Electrical Engineering Technology	NMK20103 Microprocessor	NMK20603 Computer Architecture	NMK30103 Communication System	NMK30004 Final Year Project I	NMK40006 Final Year Project II	NMK40412 INDUSTRIAL TRAINING
	NMK10203 Engineering Science	NMK10603 C Programming	NMK20203 Analog Electronics I	NMK21103 Electromagnetic Theory	NMK32003 Power Electronics	NMK31003 Digital Signal Processing	NMK42003 Instrumentation	
	NMK10403 Digital Electronics	NMK10702 Writing in Engineering Technology	NMK20503 Signal & Systems	NMK21303 Analog Electronics II	NMK32103 Digital Integrated Circuit Design	NMK31203 Modern Control Systems	Elective 2	
	NMK11103 Engineering Skills	NMK10803 Digital Systems	NMK20703 Object-Oriented Programming	NMK22003 Integrated Circuit Design	NMK32203 Microcontroller	NMK31703 Design Project	Elective 3	
	NMK12003 Engineering Material				NMK34403 Engineering Technology in Management	NMK44403 Engineering Technologist in Society		
						Elective 1		
Common Core	SMQ11103 Mathematics for Engineering Technology I	SMQ11203 Mathematics for Engineering Technology II	SMQ21303 Mathematics for Engineering Technology III	SMQ27303 Statistics for Engineering Technology	SMU32202 Thinking Skill			
University Required		SMB41002 University Malay Language	SMU22402 Engineering Entrepreneurship	SMU13102 Appreciation of Ethnics and Civilizations	SMB31202 English for Technical Communication			
		SMU12202 Skills & Technology in Communication	SMB20102 English for General Communication	SMU13002 Philosophy and Current Issues				
		*SMB10102 Preparatory English	**SMB1XX02 Option Subject (Foreign Language)					
	SMZXXX01 Co-Curricular Activity	SMZXXX01 Co-Curricular Activity						
141	19	19	19	19	19	19	15	12

Total Units for Graduation = 141

Elective Subject			
NMK32303 Verification on Chip	NMK33003 Microelectronic Fabrication Technology	NMK42403 Internet of Things Technology	NMK42103 Semiconductor Testing
NMK33203 Semiconductor Packaging	NMK33103 Nanoelectronic	NMK43103 Optoelectronic System	NMK42203 Analog Integrated Circuit Design
NMK33003 Reliability and Failure Analysis		NMK43003 Micro-Electro-Mechanical-System	

Notes:

*MUET Band 2: SMB10102 Preparatory English > SMB20102 English for General Communication> SMB31202 English for Technical Communication, *Option Subject is NOT COMPULSORY
MUET Band 3: SMB20102 English for General Communication > SMB31202 English for Technical Communication, *Option Subject is NOT COMPULSORY
**MUET Band 4 and above: SMB31202 English for Technical Communication, *Option Subject is COMPULSORY (SMB1XX02)

14 = Mandarin 15=Thai 16=Arabic 17=Japanese 18=German 19=Korean

CURRICULUM STRUCTURE
UR6523008 BACHELOR OF ELECTRONIC ENGINEERING TECHNOLOGY (ELECTRONIC TELECOMMUNICATION DESIGN) WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEM	I	II	III	IV	V	VI	VII	VIII
Discipline Core	NMK10103 Electric Circuit	NMK10503 Electrical Engineering Technology	NMK20103 Microprocessor	NMK20603 Computer Architecture	NMK31003 Digital Signal Processing	NMK30004 Final Year Project I	NMK40006 Final Year Project II	NMK40412 INDUSTRIAL TRAINING
	NMK10203 Engineering Science	NMK10603 C Programming	NMK20203 Analog Electronics I	NMK21103 Electromagnetic Theory	NMK31203 Modern Control Systems	NMK31103 Antenna and Propagation	NMK41003 Satellite Technology	
	NMK10403 Digital Electronics	NMK10702 Writing in Engineering Technology	NMK20503 Signal & Systems	NMK21303 Analog Electronics II	NMK31303 Digital Communication Technology	NMK31403 Optical Technology	Elective 2/3	
	NMK11103 Engineering Skills	NMK10803 Digital Systems	NMK22003 Integrated Circuit Design	NMK30103 Communication System	NMK31503 RF and Microwave Technology	NMK31703 Design Project	Elective 3/3	
	NMK11203 Measurement & Instrumentation				NMK34403 Engineering Technology in Management	NMK44403 Engineering Technologist in Society		
						Elective 1/2		
Common Core	SMQ11103 Mathematics for Engineering Technology I	SMQ11203 Mathematics for Engineering Technology II	SMQ21303 Mathematics for Engineering Technology III	SMQ27303 Statistics for Engineering Technology	SMU32202 Thinking Skill			
University Required		SMB41002 University Malay Language	SMU22402 Engineering Entrepreneurship	SMU13102 Appreciation of Ethnics and Civilizations	SMB31202 English for Technical Communication			
		SMU12202 Skills & Technology in Communication	SMB20102 English for General Communication OR	SMU13002 Philosophy and Current Issues				
		*SMB10102 Preparatory English	**SMB1XX02 Option Subject (Foreign Language)					
	SMZXXX01 Co-Curricular Activity	SMZXXX01 Co-Curricular Activity						
141	19	19	19	19	19	19	15	12

Total Units for Graduation = 141

Elective 1	Elective 2	Elective 3
A1. NMK31603 Mobile and Wireless Communications	B1. NMK41103 Electronic and RF Circuit Design	C1. NMK40403 Artificial Intelligence
B1. NMK42403 IoT Technology	B2. NMK41203 Wireless Internetworking Technology	C2. NMK41303 Data Communication and Network

Notes:

*MUET Band 2: SMB10102 Preparatory English > SMB20102 English for General Communication> SMB31202 English for Technical Communication, *Option Subject is NOT COMPULSORY

MUET Band 3: SMB20102English for General Communication SMB31202English for Technical Communication, *Option Subject is NOT COMPULSORY

**MUET Band 4 and above: SMB31202 English for Technical Communication, *Option Subject is COMPULSORY (SMB1XX02)

14=Mandarin 15=Thai 16=Arabic 17=Japanese 18=German 19=Korean

CURRICULUM STRUCTURE
UR6523009 BACHELOR OF ELECTRONIC ENGINEERING TECHNOLOGY (ELECTRONIC NETWORK DESIGN) WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEM	I	II	III	IV	V	VI	VII	VIII
Discipline Core	NMK 10103 Electric Circuit Principles	NMK 10503 Electrical Engineering Technology	NMK 20203 Analogue Electronics I	NMK 20503 Signal & Systems	NMK 30103 Communication System	NMK 30004 Final Year Project I	NMK 40006 Final Year Project II	PIT 404 INDUSTRIAL TRAINING
	NMK 10403 Digital Electronics	NMK10803 Digital Systems	NMK 20103 Microprocessor	NMK 20603 Computer Architecture	NMK 30203 Embedded Software Technology	NMK 30503 Network Management	NMK 40103 Network Security Technology	
	NMK 10203 Engineering Science	NMK 10603 C Programming	NMK 20703 Object Oriented Programming	NMK 20803 Data Structures	NMK 30303 Operating Systems	NMK 30703 Programming for Networking	Elective 2/3	
	NMK 10003 Networking Fundamentals	NMK10702 Writing in Engineering Technology	NMK 20303 Database Management Systems	NMK 20403 Internetworking Technology I	NMK 30403 Internetworking Technology II	NMK31703 Design Project	Elective 3/3	
	NMK 11103 Engineering Skills					Elective 1/3		
Common Core	SMQ 11103 Mathematics for Engineering Technology I	SMQ 11203 Mathematics for Engineering Technology II	SMQ 21303 Mathematics for Engineering Technology III	SMQ 27303 Statistics for Engineering Technology	NMK 34403 Engineering Technology Management	NMK 44403 Engineering Technologist in Society		
University Required		SMB 41002 University Malay Language	SMU 22402 Engineering Entrepreneurship	SMU 13002 Philosophy and Current Issues	SMU 32202 Thinking Skill			
		SMU 12202 Skills & Technology in Communication	**SMB20102 English for General Purposes OR	SMU 13102 Appreciation of Ethics and Civilization	SMB 31202 English for Technical Communication			
		UVA101/0 Preparatory English	SMU XXX/2 Option Subject (Foreign Language)					
	SMZ XXX/1 Co-Curricular Activity	SMZ 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. NMK 40203 Mobile Computing	B1. NMK 40803 Enterprise Networking, Security and Automation	C1. NMK 30903 Cloud Infrastructure and Services
A2. NMK 34003 Switching, Routing and Wireless Essentials	B2. NMK 40403 Artificial Intelligent	C2. NMK 42403 IOT Technology

TECHNOLOGY PROGRAMME

PROGRAMME OBJECTIVES (PEO)

The Programme Objectives for the entire ***Technology Programme*** at Universiti Malaysia Perlis (UniMAP) is as follows:

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

*At the end of the **Technology Programme**, the students are expected to attain the followingattributes:*

PO 1
Knowledge: Apply knowledge of technology fundamentals to broadly-defined procedures processes, systems and methodologies in Electrical System Maintenance.

PO 2
Practical Skills and High Technology: Able to suggest and apply latest tools and techniques to solve broadly-defined problems.

PO 3
Analytical, Critical Thinking and Scientific Approach: Demonstrate strong analytical and critical thinking skills to solve broadly-defined problems in Electrical System Maintenance.

PO 4
Communication Skills : Able to communicate and articulate effectively in both verbal and written among technologist communities and society at large.

PO 5
Social Responsibility in Society and Technologist Community: Demonstrate understanding of the societal related issues and the consequent responsibilities relevant to broadly-defined technology practices.

PO 6
Lifelong Learning and Information Management : Recognize the needs for professional development and to engage independent lifelong learning in specialist technologists.

PO 7
Technopreneurship and Management Skills: Demonstrate an awareness of management and technopreneurship practices in real perspective.

PO 8
Ethics and Professionalism: Demonstrate professionalism and social and ethical consideration.

PO 9
Teamwork and Leadership: Demonstrate leadership quality, mentoring and work effectively in diverse teams.

CURRICULUM STRUCTURE
UR6523011 BACHELOR OF TECHNOLOGY IN INDUSTRIAL ELECTRONIC AUTOMATION WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST			SECOND			THIRD			FOURTH
SEMESTER	I	II		III	IV		V	VI	VII	VIII
COMMON CORE	NMT11602 Technology and Development Skill in Electronic Automation I	NMT12604 Technology and Development Skills in Electronic Automation II		NMT21602 Data Acquisition Technology and Analysis I	NMT22104 Data Acquisition Technology and Analysis II		NMT31104 System Optimization Technology II	NMT31304 Quality Management Technology		
	NMT11205 Product Development Technology	NMT12202 Network, Switching and Routing		NMT21503 Professional Practices	NMT22202 System Optimization Technology I		NMT31204 Application System Development II	NMT32205 Elective		
	NMT11505 Industrial Automation I	NMT12704 System Programming Technology II		NMT21305 Embedded System Programming Tool	NMT22302 Application System Development I		NMT32105 System Integration Design	NMT32304 Final Year Project I	NMT33106 Final Year Project II	NMT411012 Industrial Training
	NMT11702 System Programming Technology I	NMT12505 Industrial Automation II		NMT21403 Network Security Implementation	NMT22404 Operation Management Technology		NMT31404 Technopreneur Project II			
					NMT22504 Technopreneur Project I					
	14	15		13	16		16	13	6	12
UNIVERSITY CORE	SMZXXX01 Curriculum 1	SMZXXX01 Curriculum 2		SMB31202 English for Technical Communication	SMU22402 Engineering Entrepreneurship		SMU13102 Appreciation of Ethics and Civilization			
	SMB41002 University Malay Language	SMU32202 Thinking Skills		**SMB1XX02 Third Language						
	SMU13002 Philosophy and Current Issues	SMB20102 English for General Communication								
	*SMB10102 Preparatory English									
	5	5		4	2		2			
TOTAL CREDIT PER SEMESTER	19	20		17	18		19	13	6	12
TOTAL CREDIT FOR GRADUATION						124				

Note : *SMB10102 = Preparatory English (*Uncredited : Compulsory to students with MUET band 1 only)
**SMB1XX02 (Third Language)= Mandarin , Japanese and German
Elective : NMT32205 : Maintenance Management System

LIST OF COURSES:

COURSE CODE	COURSE NAME
NMJ10203	Elektronik Analog I [Analog Electronic I]
NMJ10303	Elektronik Digit I [Digital Electronic I]
NMJ10403	Fizik Untuk Elektronik [Physics for Electronic]
NMJ10603	Kemahiran Kejuruteraan Elektronik [Electronic Engineering Skills]
NMJ10903	Pengaturcaraan Komputer [Computer Programming]
NMJ11103	Peranti Elektronik [Electronic Devices]
NMJ11203	Sistem Kuasa Elektrik [Electrical Power System]
NMJ11303	Teori Litar [Circuit Theory]
NMJ20303	Elektronik Analog II [Analog Elctronic II]
NMJ20503	Elektronik Digital II [Digital Electronic II]
NMJ20603	Fizik Semikonduktor [Semiconductor Physics]
NMJ20703	Isyarat Dan Sistem [Signal And Systems]
NMJ21203	Mikropemproses [Microprocessor]
NMJ21603	Rekabentuk Litar Bersepadu [Integrated Circuit Design]
NMJ21803	Teori Elektromagnet [Electromagnetic Theory]
NMJ30203	Fabrikasi Mikroelektronik I [Microelectronic Fabrication I]
NMJ30303	Fabrikasi Mikroelektronik II [Microelectronic Fabrication II]
NMJ30403	Instrumentasi [Instrumentation]
NMJ30602	Jurutera Profesional [Professional Engineers]

LIST OF COURSES:

COURSE CODE	COURSE NAME
NMJ30803	Ketahanan dan Kebolehujian Dalam Rekabentuk Litar Bersepadu [Reliability and Testability In Integrated Circuir Design]
NMJ30904	Latihan Industri [Industrial Training]
NMJ31403	Pemprosesan Isyarat Digital [Digital Signal Processing]
NMJ31603	Pengurusan Untuk Jurutera [Management For Engineers]
NMJ31703	Peranti-peranti Termanju [Advanced Devices]
NMJ32004	Projek Rekabentuk Bersepadu [Integrated Design Project]
NMJ32303	Rekabentuk Litar Bersepadu Digital [Digital Intergrated Circuit Design]
NMJ32603	Senibina Komputer [Computer Architecture]
NMJ32703	Sistem Kawalan [Control Systems]
NMJ32903	Sistem Perhubungan [Communication Systems]
NMJ40303	Kebolehharapan Dan Analisa Kegagalan [Reliability and Failure Analysis]
NMJ41103	Pembungkusan Semikonduktor [Semiconductor Packaging]
NMJ41802	Projek Tahun Akhir I [Final Year Project I]
NMJ41904	Projek Tahun Akhir II [Final Year Project II]
NMJ40203	Data Analitik [Data Analytics]
NMJ40403	Kejuruteraan Nanoelektronik [Nanoelectronic Engineering]
NMJ40703	Sistem Mikroelektromekanikal [Microelectromechanical System]

LIST OF COURSES:

COURSE CODE	COURSE NAME
NMJ40903	Perhubungan Optik [Optical System]
NMJ42403	Sistem Optoelektronik [Optoelectronic System]
NMJ11404	Teori Litar Elektrik [Electric Circuit Theory]
NMJ11004	Pengaturcaraan Komputer [Computer Programming]
NMJ10803	Litar Eletrik II [Circuit Theory II]
NMJ10704	Litar Elektronik Analog I [Analog Electronic Circuits I]
NMJ10503	Kejuruteraan Elektrik [Electrical Engineering]
NMJ20904	Litar Elektronik Analog II [Analog Electronic Circuit II]
NMJ20404	Elektronik Digit II [Digital Electronics II]
NMJ20003	Algorithma Dan Struktur-Struktur Data [Algorithm And Data Structures]
NMJ21704	Sistem Mikropemproses [Microprocessor Systems]
NMJ21403	Pengaturcaraan Berasaskan Objek [Object Oriented Programming]
NMJ30504	Instrumentasi Elektronik Dan Pengukuran [Electronic Instrumentation And Measurement]
NMJ32203	Rangkaian Komputer [Computer Networks]
NMJ31602	Pengurusan Untuk Jurutera [Management For Engineers]
NMJ32404	Rekabentuk Sistem Terbenam [Embedded System Design]
NMJ31903	Projek Rekabentuk Berkumpulan [Group Design Project]
NMJ31804	Prinsip Senibina Komputer [Principles Of Computer Architecture]

LIST OF COURSES:

COURSE CODE	COURSE NAME
NMJ42304	Sistem Masa Nyata [Real Time System]
NMJ42503	Sistem Pengoperasian Moden [Modern Operating Systems]
NMJ40503	Kejuruteraan Perisian [Software Engineering]
NMJ40603	Kepintaran Buatan [Artificial Intelligence]
NMJ40803	Objek Rangkaian Internet [Internet Of Things]
NMJ41203	Pemprosesan Imej [Image Processing]
NMJ41403	Pengaturcaraan Rangkaian [Network Programming]
NMJ10004	Anatomi dan Fisiologi [Anatomy & Physiology]
NMJ11503	Elektronik Analog [Analog Electronic]
NMJ10103	Biokimia [Biochemistry]
NMJ21103	Mekanik Kejuruteraan [Engineering Mechanics]
NMJ21002	Lukisan Kejuruteraan dan Rekabentuk Terbantu Komputer [Engineering Drawing and Computer Aided Design]
NMJ20103	Biobahan [Biomaterials]
NMJ20203	Biomekanik [Biomechanics]
NMJ21304	Mikropengawal dan Pengantaramuka [Microcontroller and Interfaces]
NMJ31003	Mekanik Bahan [Mechanics Of Materials]
NMJ32804	Sistem Kawalan Lelurus [Linear Control Systems]

LIST OF COURSES:

COURSE CODE	COURSE NAME
NMJ30703	Keselamatan , Piawaian dan Etika Dalam Kejuruteraan Bioperubatan [Safety, Standards and Ethics In Biomedical Engineering]
NMJ31303	Pemprosesan Isyarat Digit dalam Aplikasi-Aplikasi Bioperubatan [Digital Signal Processing in Biomedical Applications]
NMJ33003	Termobendalir [Thermofluids]
NMJ31103	Mesin Elektrik Dan Pemacu [Electrical Machines and Drives]
NMJ32102	Projek Rekabentuk I [Design Project I]
NMJ30003	Bioinstrumentasi I [Bioinstrumentation I]
NMJ40003	Bioinstrumentasi II [Bioinstrumentations II]
NMJ41503	Pengimejan Perubatan [Medical Imaging]
NMJ41703	Projek Rekabentuk II [Design Project II]
NMJ41303	Pemprosesan Imej Perubatan [Medical Image Processing]
NMJ40103	Biopenderia dan BioMEMS [Biosensors and BioMEMS]
NMJ41003	Organ Buatan [Artificial Organs]
NMJ41603	Perubatan Robotik [Medical Robotics]
NMJ20803	Bahan Kejuruteraan [Engineering Materials]
NMJ30103	Elektronik Kuasa [Power Electronic]
NMJ31203	Mikropengawal [Microcontroller]
NMJ32503	Rekabentuk VLSI [VLSI Design]
NMJ42003	Rekabentuk Dan Fabrikasi MEMS [MEMS Design And Fabrication]

LIST OF COURSES:

COURSE CODE	COURSE NAME
NMJ42103	Rekabentuk Litar Bersepadu Analog [Analogue Integrated Circuit Design]
NMJ42203	Sistem Atas Cip [System on Chip]
NMK10103	Teori Litar [Circuit Theory]
NMK10203	Sains Kejuruteraan [Engineering Science]
NMK10403	Digital Electronics
NMK10503	Electrical Engineering Technology
NMK10603	C Programming
NMK10703	Writing In Engineering Technology
NMK10803	Sistem Digital [Digital Systems]
NMK11103	Kemahiran Kejuruteraan [Engineering Skill]
NMK11203	Pengukuran dan Instrumentasi [Measurement and Instrumentation]
NMK20103	Mikroprocessor [Microprocessor]
NMK20203	Elektronik Analog I [Analog Electronic I]
NMK20503	Isyarat Dan Sistem [Signals and Systems]
NMK20603	Seni Bina Komputer [Computer Architecture]
NMK21103	Teori Elektromagnetik [Electromagnetic Theory]
NMK21303	Elektronik Analog II [Analog Electronic II]
NMK22003	Rekabentuk Litar Bersepadu [Integrated Circuit Design]

LIST OF COURSES:

COURSE CODE	COURSE NAME
NMK30004	Projek Tahun Akhir I [Final Year Project I]
NMK30103	Sistem Komunikasi [Communication Systems]
NMK31003	Pemprosesan Isyarat Digital [Digital Signal Processing]
NMK31103	Antena Dan Perambatan [Antenna and Propagation]
NMK31203	Sistem Kawalan Moden [Modern Control System]
NMK31303	Teknologi Komunikasi Digital [Digital Communication Technology]
NMK31403	Teknologi Optik [Optical Technology]
NMK31503	Teknologi RF Dan Gelombang Mikro [RF and Microwave Technology]
NMK31603	Komunikasi Tanpa Wayar Dan Mudah Alih [Mobile and Wireless Communication]
NMK31703	Projek Rekabentuk [Design Project]
NMK34403	Pengurusan dalam Teknologi Kejuruteraan [Engineering Technology in Management]
NMK40006	Projek Tahun Akhir II [Final Year Project II]
NMK40403	Kepintaran Buatan [Artificial Technology]
NMK40412	Latihan Industri [Industrial Training]
NMK41003	Teknologi Satelit [Satellite Technology]
NMK41103	Elektronik dan Rekabentuk Litar RF [Electronics and RF Circuit Design]
NMK41203	Teknologi Antara Rangkaian Tanpa Wayar [Wireless Internetworking Technology]
NMK41303	Data Communication and Network [Komunikasi Data dan Rangkaian]

LIST OF COURSES:

COURSE CODE	COURSE NAME
NMK42403	Teknologi IoT [IoT Technology]
NMK44403	Jurutera Teknologis Dalam Masyarakat [Engineering Technologist in Society]
NMK11103	Kemahiran Kejuruteraan Elektronik [Electronic Engineering Skills]
NMK12003	Bahan Kejuruteraan [Engineering Material]
NMK20703	Pengaturcaraan Berasaskan Objek [Object-Oriented Programming]
NMK32003	Elektronik Kuasa [Power Electronics]
NMK32103	Rekabentuk Litar Bersepadu Digital [Digital Integrated Circuit Design]
NMK32203	Mikropengawal [Microcontroller]
NMK32303	Verifikasi Atas Cip [Verification on Chip]
NMK33203	Pembungkusan Semikonduktor [Semiconductor Packaging]
NMK33303	Kebolehpercayaan Dan Analisis Kegagalan [Reliability and Failure Analysis]
NMK33003	Teknologi Fabrikasi Mikroelektronik [Microelectronic Fabrication Technology]
NMK33103	Nanoelektronik [Nanoelectronic]
NMK42003	Instrumentasi [Instrumentation]
NMK43103	Sistem Optoelektronik [Optoelectronic System]
NMK42103	Pengujian Semikonduktor [Semiconductor Testing]
NMK42203	Rekabentuk Litar Bersepadu Analog [Analog Integrated Circuit Design]
NMK43003	Sistem Mikro-Elektro-Mekanikal [Micro-Electro-Mechanical System]

LIST OF COURSES:

COURSE CODE	COURSE NAME
NMK10003	Teknologi Rangkaian [Networking Technology]
NMK20303	Sistem Pengurusan Pangkalan Data [Database Management System]
NMK20403	Teknologi Antara Rangkaian 1 [Internetworking Technology 1]
NMK20808	Struktur Data [Data Structure]
NMK30203	Teknologi Perisisan Terbenam [Embedded Software Technology]
NMK30303	Sistem Pengoperasian [Operating System]
NMK30403	Teknologi Antara Rangkaian 2 [Internetworking Technology 2]
NMK30503	Pengurusan rangkaian [network management]
NMK30703	Pengatucaraan Rangkaian [Programming for Networking]
NMK30903	Infrastruktur dan Perkhidmatan Awan [Cloud Infrastructure and Services]
NMK34003	Pensuisan, Penghalaan dan Keperluan Tanpa Wayar [Switching, Routing and Wireless Essentials]
NMK40103	Teknologi keselamatan rangkaian [network security technology]
NMK40203	Pengkomputeran Mudah Alih [Mobile Computing]
NMK40803	Rangkaian Enterprise, Keselamatan dan Automasi [Enterprise Networking, Security, and Automation]
NMT11602	Kemahiran Teknologi dan Pembangunan dalam Automasi Elektronik I [Technology and Development Skills in Electronic Automation I]
NMT11205	Teknologi Pembangunan Produk [Product Development Technology]
NMT11505	Automasi Industri I [Industrial Automation I]
NMT11702	Teknologi Pengaturcaraan Sistem I [System Programming Technology I]

LIST OF COURSES:

COURSE CODE	COURSE NAME
NMT12604	Kemahiran Teknologi dan Pembangunan dalam Automasi Elektronik II [Technology and Development Skills in Electronic Automation II]
NMT12202	Rangkaian, Penukaran dan Penghalaan [Network, Switching and Routing]
NMT12704	Teknologi Pengaturcaraan Sistem II [System Programming Technology II]
NMT12505	Automasi Industri II [Industrial Automation II]
NMT21602	Teknologi Perolehan Data dan Analisis I [Data Acquisition Technology and Analysis I]
NMT21503	Amalan Profesional [Professional Practices]
NMT21305	Perkakasan Pengaturcaraan Sistem Terbenam [Embedded System Programming Tool]
NMT21403	Pelaksanaan Rangkaian Keselamatan [Network Security Implementation]
NMT22104	Teknologi Perolehan Data dan Analisis II [Data Acquisition Technology and Analysis II]
NMT22202	Teknologi Sistem Pengoptimum I[System Optimization Technology I]
NMT22302	Pembangunan Sistem Aplikasi I [Application System Development I]
NMT22404	Teknologi Pengurusan Operasi [Operation Management Technology]
NMT22504	Projek Keusahawanan Teknologi I [Technopreneur Project I]
NMT31104	Teknologi Sistem Pengoptimum II [System Optimization Technology II]
NMT31204	Pembangunan Sistem Aplikasi II [Application System Development II]
NMT32105	Rekabentuk Sistem Integrasi [System Integration Design]
NMT31404	Projek Keusahawanan Teknologi II [Technopreneur Project II]
NMT31304	Teknologi Pengurusan Kualiti [Quality Management Technology]

LIST OF COURSES:

COURSE CODE	COURSE NAME
NMT32205	Elektif [*Elective*] Sistem Pengurusan Penyelenggaraan [Maintenance Management System]
NMT32304	Projek Tahun Akhir I [Final Year Project I]
NMT33106	Projek Tahun Akhir II [Final Year Project II]
NMT41112	Latihan Industri [Industrial Training]

NMJ10203 ELEKTRONIK ANALOG I [ANALOG ELECTRONIC I]

No of Credits: 3

Course Synopsis:
This course exposes the students to the basic knowledge in analog 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 analog electronics skills covering theories and practicals.

Course Outcomes:
1. Ability to apply and explain knowledge of mathematics, electronic devices and electric circuit theory to the solution of amplifier circuit problems.
2. Ability to identify, formulate and analyse amplifier circuits.
3. Ability to apply and explain appropriate techniques used in solving amplifier circuit problems.

NMJ10303 ELEKTRONIK DIGIT I [DIGITAL ELECTRONIC I]

No of Credits: 3

Course Synopsis:
This course is intended to cover the introduction and discussion of the fundamental of digital circuit design and analysis. The lecture covers the following topics: Boolean Algebra, Numbering system, Basic Logic Gates, Combinational Circuit Design, Timing Diagram, Bi-State Memory Device and Sequential Circuit Design.

Course Outcomes:
1. Ability to apply different numbering systems and to understand basic theory of binary system.
2. Ability to apply method of minimizing Boolean functions for digital logic circuit.
3. Ability to design and evaluate combinational logic circuit in terms of Boolean Function.
4. Ability to design and evaluate sequential logic circuit in terms of Boolean Function.

NMJ10403 FIZIK UNTUK ELEKTRONIK [PHYSICS FOR ELECTRONICS]

No of Credits: 3

Course Synopsis:
This course introduces the principles of physics, which constitute the foundation for electronics and microelectronics. The topics covered in the course are mechanics, oscillations and waves, thermodynamics, electricity and magnetism, optics, photons and conduction of electricity in solids.

Course Outcomes:
CO1 - Ability to apply concepts and principles of physics to solve engineering problems
CO2 - Ability to analyze and solve engineering problems using concepts and principles of physics

NMJ10603 KEMAHIRAN KEJURUTERAAN ELEKTRONIK [ELECTRONIC ENGINEERING SKILLS]

No of Credits: 3

Course Synopsis:
This course is 100% of practical works and carries 3 credit hours. It contains five essential modules to develop basic engineering skills for the electronic students. The modules include an introduction to electronic components and instrumentation, electronic circuit design and simulation, PCB design and fabrication, technical drawing as well as product design and integration.

Course Outcomes:
1. Ability to measure the electronic components by using appropriate electronic instrumentations tools
2. Ability to construct electronic schematic diagarams and perform circuit simulation using suitable software
3. Ability to build and fabricate a printed circuit board (PCB)
4. Ability to draw a two-dimensional (2D) and a three-dimensional (3D) technical drawing
5. Ability to build a three-dimensional (3D) model of electronic product

NMJ10903 PENGATURCARAAN KOMPUTER [COMPUTER PROGRAMMING]

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:
1. Ability to analyze programming concepts and principles to solve engineering problems.
2. Ability to design computer software programs to solve engineering problems.
3. Ability to demonstrate coding, executing and debugging the computer software programs.

NMJ11103 PERANTI ELEKTRONIK [ELECTRONIC DEVICES]

No of Credits: 3

Course Synopsis:
This course focuses on electronic devices namely diodes and transistors. Firstly, types of semiconductor materials and pn junction are introduced. Then, operation, characteristics and applications of diodes are covered. Finally, operation and characteristics of Bipolar Junction Transistors BJTs) and Field Effect Transistors (FETs) are evaluated under various types of biasing.

Course Outcomes:
1. Ability to apply the fundamental concept of semiconductor materials, diodes, bipolar junction transistor (BJTs) and field effect transistors (FETs)
2. Ability to analyze diodes characteristics and application
3. Ability to examine transistor characteristics and biasing techniques

NMJ20303 ELEKTRONIK ANALOG II [ANALOGUE ELECTRONIC II]

No of Credits: 3

Course Synopsis:
The students will be exposed to the concept, operation, model, analyze and design of amplifiers. This course also prepares the students a basic understanding of operation amplifiers device and its operating principles as active filters, feedback circuits, oscillators and voltage regulators. In addition, students will be exposed to conduct experiments using operational amplifiers.

Course Outcomes:
1. Ability to explain and analyze principles and characteristics of op amp and its electronic circuits application
2. Ability to evaluate and design analogue electronic circuit given any electronic components and specification
3. Ability to apply appropriate techniques and engineering tools in solving experimental problems in analogue electronic

NMJ20503 ELEKTRONIK DIGITAL II [DIGITAL ELECTRONIC II]

No of Credits: 3

Course Synopsis:
This course introduces the students to the techniques in solving, designing and implementing complex engineering in digital electronics. The course emphasizes digital systems, focusing on sequential systems, computer design basics as well as memory devices. In this course, the students are exposed to digital basic, digital hardware and digital characteristics and parameters. For sequential systems, students are exposed to sequences in flip-flop systems and problem-solving techniques. Through finite state machines, students learn how to design and solve sequential systems using the Mealy and Moore model and their implementation using flip-flops. In addition, the algorithmic state machines to describe the sequential operations of a digital system are also included. The students will also be introduced to the basic operation of memory, types of memory and computer design basics.

Course Outcomes:
1. Ability to apply the necessary knowledge of digital electronics design concepts.
2. Ability to design and recommend solutions for complex digital electronics system.
3. Ability to create, select and apply appropriate techniques, resources and modern engineering tools to solve complex digital electronic problems.

NMJ20603 FIZIK SEMIKONDUKTOR [SEMICONDUCTOR PHYSICS]

No of Credits: 3

Course Synopsis:

This course is developed to provide the fundamental knowledge on semiconductor physics, devices characterizations and operation along with semiconductor technology. Recent advancement of semiconductor devices when scaling down the sizes also covers for this course. Semiconductor physics covers topics of introduction to semiconductor material, devices and technology, energy band and carrier concentration in thermal equilibrium, carrier transport phenomena and p-n junction. Meanwhile for semiconductor devices covers topics of bipolar transistor and related devices on the other hand other semiconductor such as MOSFET, MOS, MESFET and advanced devices related to recent semiconductor technology is discussed.

Course Outcomes:

1. Ability to apply and understand the theory of semiconductor physics and basic operation of semiconductor devices
2. Ability to identify and analyse the semiconductor devices and properties, related to engineering fundamental in terms of its problems and performances.
3. Ability to explain semiconductor operation and analyse in terms of its enhancement and problems related to advanced semiconductor technology.

NMJ20703 ISYARAT DAN SISTEM [SIGNAL AND SYSTEMS]

No of Credits: 3

Course Synopsis:
This course develops the mathematical foundation and computational tools for processing continuous time and discrete-time signals in both time nd frequency domains. Key concepts and tools introduced and discussed in this class include linear time-invariant systems, impulse response, frequency response, convolution, filtering, sampling and Fourier transform, Laplace transform and z-Transform.

Course Outcomes:

1. Ability to apply the concept of signal and system classifications, impulse response and convolution in both continuous and discrete time domain.
2. Ability to apply the concept of Fourier representation of continuous and discrete signals and their properties.
3. Ability to analyze linear and time-invariant systems using Laplace transform and its application.
4. Ability to analyze and evaluate discrete systems using Z transform and their properties.

NMJ21203 MIKROPEMPROSES [MICROPROCESSOR]

No of Credits: 3

Course Synopsis:
The aim of this course is to study the microprocessor architecture and relate 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 development tools are also emphasized as the knowledge are needed in the design of the microprocessor-based systems

Course Outcomes:

1. Ability to analyze the theory of microprocessor structure and design.
2. Ability to write and classify the microprocessor programming, interfacing and operation using assembly language.
3. Ability to design and evaluate a microprocessor program to solve engineering related problem.

NMJ21603 REKABENTUK LITAR BERSEPADU [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:

1. Ability to apply Boolean Algebra and analyze logic circuits at transistor level using schematic.
2. Ability to design the layout of a circuit based on the design rules specified.
3. Ability to evaluate the CMOS transistor characteristics
4. Ability to function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

NMJ21803 TEORI ELEKTROMAGNET [ELECTROMAGNETIC THEORY]

No of Credits: 3

Course Synopsis:
This course covers the fundamental laws and principles of electromagnetics which is the study of electric and magnetic fields in both static and dynamic cases. The topics covered are electrostatics, magnetostatics,electric and magnetic properties of matter, electromagnetic induction, Maxwell's equations, and electromagnetic wave propagation. At the end of the course, students are expected to have a firm grasp of important concepts and principles in electromagnetics, which will enable them to solve and analyze real-world complex engineering problems.

Course Outcomes:
1. Ability to apply vector calculus to electromagnetic problems
2. Ability to solve and analyze electrostatic and magnetostatic problems
3. Ability to solve and analyze problems involving time-varying fields and eletromagnetic wave propagation

NMJ30203 FABRIKASI MIKROELEKTRONIK I [MICROELECTRONIC FABRICATION I]

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:
1. Ability to analyze and evaluate the fundamental concept of the semiconductor fabrication technology which include materials, devices, processes, facilities and standard practices.
2. Ability to apply and manipulate appropriate parameters of wafer cleaning, photolithography, etching and thermal processes using microelectronic fabrication equipment.
3. Ability to engage and conclude the technological change in microelectronic fabrication technology.

NMJ30303 FABRIKASI MIKROELEKTRONIK II [MICROELECTRONIC FABRICATION II]

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, analyze and characterize 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 miniaturization.

Course Outcomes:
1. Ability to explain and construct the essential aspects of the device technology
2. Ability to apply the major CMOS process module for advanced CMOS process technology
3. Ability to analyze and predict the major CMOS process and device issues in circuit level.

NMJ30403 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 technique of signal conditioning is emphasized. Element and principle of data handling and acquisition with their application are discussed. Modern stand-alone and computer-based measurement instruments, and control system are also covered.

Course Outcomes:
1. Ability to apply and evaluate the fundamental concepts of electronic instrumentation, sensors/transducers, signal conditioning and data handling & processing.
2. Ability to identify, research literature and formulate solutions for measurement setup, data acquisition and control systems.
3. Ability to explain and devise the concept and application of the electronic instrumentation

NMJ30602 JURUTERA PROFESIONAL [PROFESSIONAL ENGINEERS]

No of Credits: 3

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:
1. Ability to interpret and appraise the various hazard, and function of risk management, occupational safety and health (OSHA) as wells as legal issues in professional engineering practice.
2. Ability to determine and discuss the sustainability and impact of engineering work on complex issues pertaining to societal and environmental contexts.
3. Ability to interpret and deduce the issues and challenges of engineering ethics and norms of engineering practice.

NMJ30803 KEBOLEHUJIAN DAN KEBOLEHARAPAN DALAM REKEBENTUK 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:
1. Ability to apply necessary knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems in Integrated Circuit Design Reliability and Testability
2. Ability to function effectively as individual, and as a member or leader in diverse teams and in multidisciplinary settings to solve Integrated Circuit Design Reliability and Testability problem.
3. Ability to assess the need for, and have the preparation of Integrated Circuit Design Reliability and Testability and engage in independent and lifelong learning in the broadest context of technological change

NMJ30904 LATIHAN INDUSTRI [INDUSTRIAL TRAINING]

No of Credits: 4

Course Synopsis:
The course will expose students to technical and practical application as well as other aspects such as the company's operation, work culture, safety procedure, project management, communication, technical skills, and presentation in achieve appreciation and/or capability of carrying out complex engineering activities. Students are required to submit their logbook and written report at the end of the industrial training.

Course Outcomes:
1. Ability to demonstrate technical knowledge and practical skills.
2. Ability to practice to health, legal and cultural requirements in a working environment.
3. Ability to perform tasks with professional ethics and responsibilities.
4. Ability to work independently, interact with co-workers and work in a team.
5. Ability to write reports and communicate verbally on internship knowledge gains and skills.

NMJ31403 PEMPROSESAN ISYARAT DIGITAL [DIGITAL SIGNAL PROCESSING]

No of Credits: 3

Course Synopsis
This course is three hour lectures per week and is designed to give the 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 in signal processing application such as speech processing and signal compression

Course Outcomes:
1. Ability to apply the knowledge of mathematic tools for analyzing and evaluating the discrete time signal
2. Ability to apply knowledge of discrete fourier transform and evaluate fast fourier transform structure.
3. Ability to design and construct digital finite impulse response and infinite impulse response filters.
4. Ability to analyze various signal processing techniques for a specific digital signal processing application.

NMJ31603 PENGURUSAN UNTUK JURUTERA [MANAGEMENT FOR ENGINEERS]

No of Credits: 3

Course Synopsis:
This course aims to teach students how to apply project management skills when undertaking projects and provide essential tools of the engineering economy to enable the students to carry out professional-quality economic evaluations. In addition, the 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:
1. Ability to combine the knowledge of engineering management principles and analyze its requirements in managing projects.
2. Ability to compile information and analyze engineering problems related to economic decision making in managing projects

NMJ31703 PERANTI-PERANTI TERMAJU [ADVANCED DEVICES]

No of Credits: 3

Course Synopsis:
In this course, students will learn about the operation of conventional MOSFETs and BJTs, including the investigations on the physical mechanisms underlying the delays and speed limitations of the devices. Moreover, since advances in the electronic industry are rapidly evolving, the aim of this course is to give sufficient background knowledge on the different semiconductor devices such as MESFETs, HEMTs, FinFETs, HBTs and BiCMOS.

Course Outcomes:
1. Ability to apply the scientific knowledge and theory on operations, characteristics, and applications of advanced semiconductor devices.
2. Ability to analyze and evaluate scientific investigation on the use of various semiconductor materials in advanced devices using research-based knowledge.
3. Ability to engage and resolve in the broadest context of technological change pertaining to advanced technology.

NMJ32004 PROJEK REKABENTUK BERSEPADU [INTEGRATED DESIGN PROJECT]

No of Credits: 4

Course Synopsis:
An exposure to the students in microelectronic 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:
1. Ability to identify, formulate, research literature and analyse complex engineering problems in Microelectronic Design Project.
2. Ability to design solutions for complex engineering problems and design systems, components or processes in Microelectronic Design Project
3. Ability to conduct investigations of complex problems using research-based knowledge and research methods in Microelectronic Design Project.
4. Ability to apply reasoning informed by contextual knowledge in Microelectronic Design Project to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.
5. Ability to understand and evaluate the sustainability and impact of professional engineering work in Microelectronic Design Project.
6. Ability to function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings to solve Microelectronic Design Project problem
7. Ability to explain through effective communication on complex engineering activities related to Microelectronic Design Project.
8. Ability to demonstrate knowledge and understanding of engineering management principles and economic decision-making in Microelectronic Design Project.

NMJ32303 REKABENTUK LITAR BERSEPADU DIGITAL [DIGITAL INTEGRATED CIRCUIT DESIGN]

No of Credits: 3

Course Synopsis:
The course introduces the students to hardware modelling using Verilog Hardware Description Language, as a means of design entry, simulation, and verification of digital circuits. The course provides hands-on experience using EDA tools, ModelSim and Quartus II. The course also teaches the students the logic synthesis and rapid prototyping with FPGAs.

Course Outcomes:
1. Ability to apply necessary knowledge of an engineering fundamentals and engineering specialization in digital electronic design using Verilog HDL.
2. Ability to evaluate solutions for complex engineering problems and design a complete digital system using Verilog HDL.
3. Ability to create and conduct investigations on principles of Field Programmable Gate Array (FPGA) to provide valid conclusions.

NMJ32603 SENIBINA KOMPUTER [COMPUTER ARCHITECTURE]

No of Credits: 3

Course Synopsis:
This course will focus on the computer system with various designs of interface techniques, organization and architecture. The syllabus will cover 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:
1. Ability to analyze the theory of computer system component and the interactions between components
2. Ability to critique and evaluate the theory of operation in term of central processing and control unit.
3. Ability to design and evaluate a computer simulation program to solve engineering related problem.

NMJ32703 SISTEM KAWALAN [CONTROL SYSTEMS]

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 root locus analysis. Finally the students will be introduced to system compensation design using PID and lead-lag controllers and digital control systems. The laboratory sessions will be conducted to enable the students to test the theory.

Course Outcomes:
1. Ability to evaluate and derive mathematical model for electrical/electronic and mechanical systems.
2. Ability to evaluate and perform system's time-domain and frequency domain analysis with response to test inputs.
3. Ability to design and analyze different types of controllers and digital control systems.

NMJ32903 SISTEM PERHUBUNGAN [COMMUNICATION SYSTEM]

No of Credits: 3

Course Synopsis:
This course covers the basic principles of analog and digital communication including elements of communication, signal analysis, amplitude modulation, angular modulation, digital modulation, various application forms and transmission channels in the presence of noise. At the end of this course, students are expected to exhibit a clear understanding of communication systems relating to various engineering applications

Course Outcomes:
1. Ability to acquire and apply knowledge of modulation techniques and its application in communication system.
2. Ability to identify, analyze and evaluate the signal power, noise characteristics, application of communication systems
3. Ability to perform effectively as individual, and as a member or leader in diverse teams and in multidisciplinary settings to solve analog and digital communication problems.

NMJ40303 KEBOLEHARAPAN DAN ANALISA KEGAGALAN [RELIABILITY AND FAILURE ANALYSIS]

No of Credits: 3

Course Synopsis:
This course intends to give students an extensive knowledge in the field of semiconductor reliability and failure analysis (FA). In the first part of the course, students will learn the concept of reliability, all the related terms & definitions, the different types of Reliability Distributions and also the different types of Reliability Prediction Techniques such as FMEA & FTA. In the second part of the course, students will be exposed to the different types of FA techniques that are commonly conducted on a failed semiconductor devices and the test instrumentation associated with each technique.

Course Outcomes:
1. Ability to apply the theories of reliabilities in a reliability system
2. Ability to analyze the types of semiconductor failures and propose the most relevant techniques and tools to perform for Failure Analysis
3. Ability to demonstrate appropriate techniques for conducting failure analysis on semiconductor devices by using relevant tools.

NMJ40403 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 field effect transistor (FET) in nanoscale dimensions, quantum effects and electron transport in nanostructures and their applications, nanocharacterization, and nanofabrication methods (e.g., submicron optical lithography and electron-beam lithography).

Course Outcomes:
1. 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
2. Ability to explain, analyze and apply scientific knowledge in nano fabrication that comprise of nano lithography, thin film technology and characterization.
3. Ability to vindicate, present and conclude the characteristics and application of nanoelectronic devices

NMJ40703 SISTEM MIKROELEKTROMEKANIKAL [MICROELECTROMECHANICAL SYSTEM]

No of Credits: 3

Course Synopsis:
This course will focus on design and simulation of MEMS devices fabrication process. The design will include various types of analysis such as structural, electrical and mechanical while the fabrication technology will focus on bulk micromachining, surface micromachining and LIGA. This course will also discuss the application and technology of MEMS packaging in various fields.

Course Outcomes:
1. Ability to evaluate the available technology in MEMS fabrication.
2. Ability to design different types of MEMS sensors and actuators for various application areas.
3. Ability to create and apply appropriate techniques and resources in designing MEMS structures.

NMJ40903 PERHUBUNGAN OPTIK [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:
1. Ability to deduce the signal propagation and degradation in optical communication systems
2. Ability to compose the limitations due to performance in transmitter and receiver, amplifications and nonlinear impairments.
3. Ability to evaluate and investigate the applications of optical communication.

NMJ41103 PEMBUNGKUSAN SEMIKONDUKTOR [SEMICONDUCTOR PACKAGING]

No of Credits: 3

Course Synopsis:

This course will cover topics such as microsystems packaging, the general semiconductor proces flow and IC assembly, critical packaging parameters, sealing and encapsulation, interconnection in IC assembly and thermal management in electronic packages. Other topics that will be included are of advanced packaging technologies (i.e TSVs, silicon interposer, 2.5D and 3D integration with TSV and others) and of the latest packaging technology trends and their associated challenges. There will also be 2 labs being embedded in this course which are of wire bonding and manual wet decapsulation.

Course Outcomes:
1. Ability to apply knowledge of the semiconductor packaging process and its flow
2. Ability to analyze and justify the solutions to specific packaging issues and processes

3. Ability to conduct investigations and formulate the future trends and challenges of the semiconductor packaging

NMJ41802 PROJEK TAHUN AKHIR 1 [FINAL YEAR PROJECT 1]

No of Credits: 2

Course Synopsis:
This course is designed to expose final year students on investigative research-based projects, related to electronic, computer, biomedical electronics and microelectronic engineering. Students learn to solve engineering problems using appropriate research methodologies, formulating engineering knowledge and performing analysis. Assessments will be on project management, technical writing and oral presentation.

Course Outcomes:
1. Ability to identify research problems, conduct literature review then formulate the theory and practical knowledge to solve complex engineering problems.
2. Ability to investigate, conduct research and design solutions using appropriate methodology to solve complex engineering problems.
3. Ability to communicate effectively in written and oral forms to defend and justify the proposed solutions.
4. Ability to plan and execute research activities systematically to meet the required research objectives and timeline

NMJ41904 PROJEK TAHUN AKHIR II [FINAL YEAR PROJECT II]

No of Credits: 4

Course Synopsis:
This course is designed to expose final year students on investigative research-based projects, related to electronic, computer, biomedical electronics and microelectronic engineering. Students learn to solve engineering problems using appropriate research methodologies, formulating engineering knowledge and performing analysis. Assessments will be on project management, technical writing and oral presentation.

Course Outcomes:
1. Ability to design, conduct investigative research and select appropriate methodology to solve complex engineering problems.
2. Ability to conduct investigations, data interpretation, deliver individual analysis, judgement in research findings and capable of being assessed independently.
3. Ability to apply appropriate techniques, tools and resources to produce engineering solutions.
4. Ability to communicate effectively in written and oral presentation to defend and justify the engineering solutions.
5. Ability to plan and execute research activities systematically and create a learning portfolio.

NMJ42403 SISTEM OPTOELEKTRONIK [OPTOELECTRONIC SYSTEM]

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 fiber 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 fiber systems and measurement will also be acquired.

Course Outcomes:
1. Ability to apply necessary knowledge to the solution of engineering problems in semiconductor system, optical fiber system, sensing system, Photovoltaic system and other optoelectronic technology.
2. Ability to design solutions for engineering problems in communication systems, sensor systems, LED systems or processes that meet specified needs.
3. Ability to function effectively as an individual, and as a member or leader in diverse teams to solve optoelectronic system problem.

NMJ11404 TEORI LITAR ELEKTRIK [ELECTRIC CIRCUIT THEORY]

No of Credits: 4

Course Synopsis:
This introductory circuit course can be divided into two ports. Part 1, 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 and rms values.

Course Outcomes:
1. Ability to apply knowledge of mathematics equations to solve problems in DC circuits.

2. Ability to analyze the first-order circuits and second-order circuits(containing passive elements, DC sources and switches) using differential equations.
3. Ability to analyze special types of circuits such as two-port networks.

NMJ11004 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 using programming, to be able to do analysis with the programming tools such as organization chart, IPO chart, flow chart and pseudo code and then to implement them by developing C program.

Course Outcomes:
1. Ability to apply knowledge of programming concepts and principles
2. Ability to apply appropriate tools for coding, compiling, executing and debugging computer program using GNU/Linux.
3. Ability to identify, formulate and analyze complex engineering problems
4. Ability to design solutions for complex engineering related problems and design systems using computer programming techniques

NMJ11103 PERANTI ELEKTRONIK [ELECTRONIC DEVICES]

No of Credits: 3

Course Synopsis:
This course focuses on electronic devices namely diodes and transistors. Firstly, types of semiconductor materials and pn junction are introduced. Then, operation, characteristics and applications of diodes are covered. Finally, operation and characteristics of Bipolar Junction Transistors (BJTs) and Field Effect Transistors (FETs) are evaluated under various types of biasing.

Course Outcomes:
1. Ability to apply the fundamental concept of semiconductor materials, diodes, bipolar junction transistor (BJTs) and field effect transistors (FETs).
2. Ability to analyze diodes characteristics and application.
3. Ability to examine transistor characteristics and biasing techniques.

NMJ10803 LITAR ELETRIK II [CIRCUIT THEORY II]

No of Credits: 3

Course Synopsis:
In this course, students will be exposed to the circuit analysis using Laplace Transform, Fourier Series and Fourier Transform technique. Students also should be able to explain and analyze the concept of frequency response of AC circuit and two-port network.

Course Outcomes:
1. Ability to analyze special types of circuit such as Two-Port Networks
2. Ability to apply knowledge of Laplace Transform, Fourier Series and Fourier Transform in solving electric circuit problem
3. Ability to construct Bode Plot for various types of transfer function and analyze frequency response of AC circuits.

NMJ10704 LITAR ELEKTRONIK ANALOG I [ANALOG ELECTRONIC CIRCUITS I]

No of Credits: 4

Course Synopsis:
This course exposes students to the basic knowledge of analog electronic circuits. The course emphasizes the use of Bipolar Junction (BJT) and Field Effect (FET) transistors to analyze direct current, small-signal and frequency response of amplifiers. It also exposes students to the design of the basic configuration of BJT and FET amplifiers. In addition, students will be able to investigate the performance of class A, B and AB of the power amplifier. The course has been designed to provide basic analog electronic skills by covering the theories and practical methods.

Course Outcomes:
1. Ability to analyze DC, small-signal analysis and frequency performance of basic configurations of amplifier (BJT and FET).
2. Ability to design basic configurations of BJT and FET amplifiers.
3. 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.

NMJ10503 KEJURUTERAAN ELEKTRIK [ELECTRICAL ENGINEERING]

No of Credits: 3

Course Synopsis:
This course is designed to provide the students with the fundamentals knowledge and applications of electrical engineering technology. This course emphasizes the students to the single phase and three phase system, magnetism and electromagnetism. These theories and concept are then applied in the power transformer and electrical machines technology. General concepts and basic operation principle for power transformer, electrical transmission, AC and DC generator, and AC and DC motor, including their characteristics and performance analysis are also covered in this course.

Course Outcomes:
1. Ability to apply the basic concept of single-phase and three-phase system, magnetism and electromagnetism.
2. Ability to identify and analyze the fundamental, operation and application of electrical transformer.
3. Ability to identify and analyze the fundamental, operation and application of AC machines and DC machines with respect to their equivalent circuits and performances.

NMJ20904 LITAR ELEKTRONIK ANALOG II [ANALOG ELECTRONIC CIRCUIT II]

No of Credits: 4

Course Synopsis:
This course offers the students to the theories, applications of operational amplifier (op-amp) and its frequency response. The theories and concept of several types of negative feedback amplifiers using op-amp are also presented in this course. The basic principle of positive feedback of an Oscillator is also discussed. Furthermore, the students will also learn in depth knowledge of active filters and voltage regulators.

Course Outcomes:
1. Ability to analyze the OP-AMP feedback concept in the circuit.
2. Ability to analyze and design amplifier, oscillator or active filter.
3. Ability to analyze the concept and principle of voltage regulators and explain their application in circuits.

NMJ20404 ELEKTRONIK DIGIT II [DIGITAL ELECTRONICS II

No of Credits: 4

Course Synopsis:
This course exposes students to enhanced knowledge in digital design. It helps them to develop technical skills in design, simulate, analyse and verify complex digital circuits. Topics covered including Combinational and Sequential Logic Design, as well as Fundamentals of Computer Design.

Course Outcomes:
1. Ability to apply knowledge of a digital system in Register Transfer Language (RTL) form.
2. Ability to analyse sequential systems on Finite State Machine (FSM) and Algorithmic State Machine.
3. Ability to design a digital system with control unit.
4. Ability to use modern engineering/CAD tool to construct digital system

NMJ20003 ALGORITHMA DAN STRUKTUR-STRUKTUR DATA [ALGORITHM AND DATA STRUCTURES]

No of Credits: 3

Course Synopsis:
This course provides solid foundation in the basic concepts of data structures and algorithms. This course makes easy to select and design data structures and algorithms in problem solving manner and clear concept on the correctness of algorithms and their computational complexities. This course covers data types, linear and nonlinear data structures as well as various searching and sorting algorithms.

Course Outcomes:
1. Ability to analyze the performance of computer programs in terms of space and time complexity
2. Ability to appropriately apply various abstract data types in computer programs.
3. Ability to apply and evaluate algorithms to solve computational problems.

NMJ21704 SISTEM MIKROPEMPROSES [MICROPROCESSOR SYSTEMS]

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:
1. Ability to apply knowledge of theory and basic architecture of microprocessor system.
2. Ability to analyse engineering problems and able to build microprocessor programs.
3. Ability to create and apply the appropriate techniques in designing the microprocessor based application system.

NMJ21403 PENGATURCARAAN BERASASKAN OBJEK [OBJECT ORIENTED PROGRAMMING]

No of Credits: 3

Course Synopsis:
This course introduces the object oriented design, analysis and programming by using Java Programming language. The main concepts of object oriented such as data abstraction, encapsulation, inheritance and polymorphism are covered in this course. Apart from that the basic UML diagrams are introduced in the object oriented design. Students will be exposed to the real-world problems and solutions using object oriented programming.

Course Outcomes:
1. Ability to apply the principles of object oriented programming in any computational problems.
2. Ability to analyze computational problem and draw appropriate UML diagrams.
3. Ability to design object oriented solution for any UML diagram or any computational problem description.

NMJ30504 INSTRUMENTASI ELEKTRONIK DAN PENGUKURAN [ELECTRONIC INSTRUMENTATION AND MEASUREMENT]

No of Credits: 4

Course Synopsis:
In this course, students will be introduced to the basic understanding of various electronic measurement system. Following that, the students will be also introduced with transducers, signal conditioning & conversion, data acquisition system, virtual instrumentation and instrumentation design. The instrumentation design specifically related with computer-based implementation. The students are expected to understand, analyse and design electronic instrumentation system.

Course Outcomes:
1. Ability to apply knowledge of principle measurements for different types of physical system and instruments.
2. Ability to analyze instrumentation method that inclusive or transducer, signal conditioning and DAS.
3. Ability to use tools/simulator to conduct and construct virtual instrument experiments.
4. Ability to design a complete instrumentation system based on the knowledge of transducers, signal conditioning and virtual instrumentation.

NMJ32203 RANGKAIAN KOMPUTER [COMPUTER NETWORKS]

No of Credits: 3

Course Synopsis:
This course gives exposure on computer network. This course highlights fundamental knowledge of computer network and its applications. This course covers related knowledge such as Local Area Network (LAN) and Wide Area Network (WAN) and also data transmission techniques as well as latest applications used.

Course Outcomes:
1. Ability to explain, discuss and apply the concepts and principles of computer networking.
2. Ability to identify, analyze and solve network problems.
3. Ability to design and evaluate the performance of computer network.

NMJ31602 PENGURUSAN UNTUK JURUTERA [MANAGEMENT FOR ENGINEERS]

No of Credits: 2

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:
1. Ability to create and analyze project requirements and integrate the processes of project management like work plans, scheduling, cost estimation and perform project evaluation.
2. Ability to create and analyze economic scenarios and integrate decision making process to engineering project and business ventures.

NMJ32404 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:
1. Ability to apply the knowledge and identify formulate solution in development embedded system based on a single chip microcontroller.
2. Ability to apply appropriate techniques to develop embedded system platform.
3. 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

NMJ31903 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:
1. Ability to apply theory and practical knowledge to solve engineering problems.
2. Ability to design a solution with consideration of public health and safety, cultural, societal, and environmental.
3. Ability to work in diverse teams and communicate effectively in a form of technical report, and presentation.
4. Ability to demonstrate project management and finance principles of a project.

NMJ31804 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:
1. Ability to apply the knowledge of Computer architecture.
2. Ability to analyze the performance of a computer system.
3. Ability to design small scale computer system.
4. Ability to apply appropriate CAD tool to design, verify, and test the computer system.

NMJ42304 SISTEM MASA NYATA [REAL TIME SYSTEM]

No of Credits: 4

Course Synopsis:
The course shall discuss the most important concept in real-time system which are the real-time reference model, real-time scheduling theory, and resource access control. Hence, terminologies which include hard/soft real-time, feasible interval, jitter, release time, absolute and relative deadline, clock-driven, static and dynamic scheduling are discussed. On the application side, concepts relevant to concurrent programming base on a particular Real-Time Operating System like PREEMPT-RT Linux or Free RTOS will be undertaken.

Course Outcomes:
1. Ability to apply knowledge of major concept relevant to real-time systems and RTOS.
2. Ability to evaluate and conclude real-time system problems utilizing algorithms/formula of various real-time system concepts.
3. Ability to design and develop software that adheres to principles of real-time software requirements
4. Ability to utilize industrial compliant Real Time API or RTOS to design and develop Real Time software

NMJ42503 SISTEM PENGOPERASIAN MODEN [MODERN OPERATING SYSTEMS]

No of Credits: 3

Course Synopsis:
This course introduces the fundamentals of operating systems. It covers theoretical and practical issues underlying operating system design and implementation. The topics include Evolution of operating system, process, thread, inter-process communication, concurrency, and mutual exclusion, scheduling, deadlock, memory management, virtual memory, and file management system.

Course Outcomes:
1. Ability apply knowledge of operating systems structures and basic principles used in the design of modern operating systems.
2. Ability to evaluate, calculate and solve problems related to process, thread, resource access control mechanisms (concurrency etc.), physical and virtual memory, scheduling.
3. Ability to design, develop and explain multiprocess / multithreaded synchronized programs using world Standard API.

NMJ40503 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:
1. Ability to apply knowledge of software engineering.
2. Ability to analyze engineering problems and develop related software engineering documentations.
3. Ability to write and present software engineering documentation in a team

NMJ40603 KEPINTARAN BUATAN [ARTIFICIAL INTELLIGENCE]

No of Credits: 3

Course Synopsis:
In this course, the students will learn the fundamental concepts of Artificial Intelligence (AI), modern AI techniques and tools; and apply them to the design of intelligent systems that solve real-world AI problems. This course will cover machine learning, deep learning, and search and optimization algorithms in AI. The students will also learn the history, philosophy, ethics, and the future of AI.

Course Outcomes:
1. Ability to describe basic artificial intelligence concepts; AI technologies and development history; AI techniques; and the ethics and future of AI.
2. Ability to apply and analyze solutions for complex engineering problems by using artificial intelligence techniques.
3. Ability to design solutions for complex engineering problems by using artificial intelligence techniques.

NMJ40803 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. 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:
1. Ability to apply sensors and actuators to IoT devices.
2. Ability to evaluate input-output signals using external interface on IoT devices.
3. Ability to design and integrate a complete Internet of Things solution.

NMJ41203 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 systems and machine vision inspection systems.

Course Outcomes:
1. Ability to evaluate and analyze the digital images in spatial and frequency domain
2. Ability to evaluate a filter in frequency and spatial domain for image enhancement.
3. Ability to analyze the multiresolution image, image compression in grey and colour, feature extraction and segmentation and design image processing application.

NMJ40203 DATA ANALITIK [DATA ANALYTICS]

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:
1. Ability to formulate the characteristics of datasets by using suitable exploratory data analytics with visualization.
2. Ability to design analytical modelsby using machine learning techniques.
3. Ability to validate and critically assess the result of the analysis.

NMJ41403 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:
1. Ability to identify and analyze the suitable protocol type (TCP and UDP) to make connection in network socket.
2. Ability to design and setting up elementary network programming.
3. Ability to design and implement the advanced socket into the network programming in a group project

NMJ10004 ANATOMI DAN FISIOLOGI [ANATOMY & PHYSIOLOGY]

No of Credits: 4

Course Synopsis:
This course introduces basic human anatomy and physiology. The students will be exposed to the basic knowledge on cell and tissues, skin and appendages, circulatory and cardiovascular system, the respiratory system, nervous system, special senses, the musculoskeletal system, digestive system and metabolism, lymphatic and immune system, the endocrine system, urinary system, and also reproductive system. At the end of the course, the students are expected to have a good grip of basic anatomical and physiological aspects of the human body and be able to apply in biomedical engineering problem solving.

Course Outcomes:
1. Ability to understand basic anatomy and physiology of cells and tissue classification and their functions of various human body systems.
2. Ability to analyze human physiology of homeostasis and their properties.
3. Ability to analyze and evaluate human system-related to the disease, treatment procedure, and their properties

NMJ11503 ELEKTRONIK ANALOG [ANALOG ELECTRONIC]

No of Credits: 3

Course Synopsis:
This course provides fundamental knowledge of analog circuit. The topics covered include basic semiconductor materials, diode, bipolar junction transistors (BJTs), field effect transistors (FETs) and thyristors. BJT and FET amplifiers are also covered in this course. The course is designed to provide basic electronic skills covering theories and practical.

Course Outcomes:
1. Ability to explain theory of semiconductor materials and analyse operation of the selected electronic devices.
2. Ability to apply and modify the circuit or biasing of selected electronic devices.

NMJ10103 BIOKIMIA [BIOCHEMISTRY]

No of Credits: 3

Course Synopsis:
The topics covered in this course include the origin of life and structure of prokaryotes and eukaryotes cells, properties and structure, classification and function of biomolecules such as protein (amino acid), sugar, lipids and carbohydrates. The role modern technique of proteins purification, molecular biology and genetics will be featured in the course. Electron transportation, citric acid cycle photosynthesis in biological processes will also be briefly highlighted. Modern biotechnologies of biochemistry also introduced as a solution for engineering problem related to the metabolism and measurement principle in human biochemistry process.

Course Outcomes:
1. Ability to explain the concepts, structure, classification and function of biomolecules
2. Ability to differentiate a technique of modern engineering tool.
3. Ability to propose the solution of engineering problem relate to the metabolism and measurement principle in biological process.

NMJ21103 MEKANIK KEJURUTERAAN [ENGINEERING MECHANICS]

No of Credits: 3

Course Synopsis:
The course provides a foundation for the students to analyze and solve mechanical problems that related to biomedical areas. The syllabus is designed to enable non-mechanical engineering students to have strong fundamentals in mechanics. It is planned to give greater emphasis on statics without neglecting the dynamics aspects of mechanics.

Course Outcomes:
1. Ability to explain and analyze two-dimensional (2D) mechanics in a static condition.
2. Ability to explain and analyze three-dimensional (3D) mechanics in a static condition.
3. Ability to explain and analyze two-dimensional (2D) mechanics in a dynamic condition

NMJ21002 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:
1. Ability to draw 2D drawing using computer aided design software according to specific dimensions and constraints.
2. Ability to design, assemble and project a 3D model using computer aided design software and simulate the motion of the model.
3. Ability to construct electronic schematic diagram, simulate the circuit's response and design PCB layout using computer aided design software.

NMJ20103 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 environmenis will be discussed.

Course Outcomes:
1. Ability to describe the concept of biocompatibility and analyze basic properties of materials in medical applications.
2. Ability to propose the suitable materials for specific biomedical applications and explain their effects with respect to biocompatibility.
3. Ability to discuss biomaterials-tissue interactions, illustrate the main components of biomedical implants and justify the important characteristics of the implanted materials.

NMJ20203 BIOMEKANIK [BIOMECHANICS]

No of Credits: 3

Course Synopsis:
This is an introductory course to biomechanics which covers the engineering mechanics, anatomy and basic applications on the analysis of the human body as mechanical systems. This course aiming to integrate the knowledge of fundamental anatomy and mechanics to develop a deeper understanding of the field of human movement science.The course also aims to introduce students to the fundamentals of biomechanics and to relate these to mechanical actions of, by and on the body.

Course Outcomes:
1. Ability to define, explain and analyse the biomechanics and anatomy terminologies and their relationships.
2. Ability to analyse the fundamental of mechanics to the structure and function of human body.
3. Ability to evaluate problem related to kinematics and kinetics of human movement.

NMJ21304 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:
1. Ability to describe and explain the theory and basic of computer architecture, microprocessor and/or microcontroller.
2. Ability to analyze and apply the concept and requirements of microcontroller-based system.
3. Ability to develop a microcontroller based system based application on given specifications

NMJ31003 MEKANIK BAHAN [MECHANICS OF MATERIALS]

No of Credits: 3

Course Synopsis:
This course introduces the basic theories of mechanics of materials. The theories in statics and biomaterials will be extended and emphasized in this course. The course covers the fundamental law of engineering mechanics, concept of stress and strain, axial load, torsion and bending. Furthermore, it also covers the stress and strain transformation.

Course Outcomes:
1. Ability to analyse the fundamental theory of mechanics of materials in engineering problems.
2. Ability to propose solutions based on problems related to various loadings.
3. Ability to analyse the combination cases by using the stress and strain transformation technology.

NMJ32804 SISTEM KAWALAN LELURUS [LINEAR CONTROL SYSTEMS]

No of Credits: 3

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. Modern engineering software will be used for the analysis and design. At the end of the course, the students should be able to analyze, evaluate, and design controlled systems.

Course Outcomes:
1. Ability to construct the mathematical model for electrical, mechanical, and biomedical systems.
2. Ability to examine system response and stability in time domain.
3. Ability to examine system response and stability in frequency domain.
4. Ability to design PID and lead-lag controllers.

NMJ30703 KESELAMATAN , PIAWAIAN DAN ETIKA DALAM KEJURUTERAAN BIOPERUBATAN [SAFETY, STANDARDS AND ETHICS IN BIOMEDICAL ENGINEERING]

No of Credits: 3

Course Synopsis:
The course provides on introduction to standards and regulations in biomedical engineering. This course focuses on the regulations and standards in the management of medical device and its life cycle. It also includes safety and ethical issues associated to active medical devices. This course also discusses the requirements and guidelines to practice Biomedical Engineering in Malaysia. At the end of this course, students will appreciate on how regulations and standards are established with the requirements in compliance with global needs. Safety aspects and measures will be emphasized so that students will be able to understand and established control and prevention when dealing with hazards, as well as monitoring good ethical responsibility when assessing medical technology.

Course Outcomes:
1. Ability to demonstrate safety awareness and analyse hazards when dealing with active medical device.
2. Ability to evaluate applications of regulatory standards in ensuring safety and reliability of medical technology.
3. Ability to apply regulatory standards and good ethical responsibility when formulate solution for problems related to healthcare technology.

NMJ31303 PEMPROSESAN ISYARAT DIGIT DALAM APLIKASI-APLIKASI BIOPERUBATAN [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. Signal processing software is used in laboratory sessions. Data processing software is usually programmed in the same languages as other science and engineering tasks.

Course Outcomes:
1. Ability to analyse biomedical signals using different types of transform domains.
2. Ability to analyse and propose suitable types of transform domain algorithms for biomedical signal application
3. Ability to select and design suitable digital filters for processing of biomedical signals

NMJ33003 TERMOBENDALIR [THERMOFLUIDS]

No of Credits: 3

Course Synopsis:
The objective of the course is to expose the students to the fundamental principle of fluid mechanics (fluid statics, fluid dynamics and flow over bodies), thermodynamic(Zeroth law, first law, and 2nd law), heat transfer (conduction, convection, and radiation), and also applications of thermofluids in Biomedical Engineering.

Course Outcomes:
1. Ability to explain and analyze the fundamental principles of fluid mechanics.
2. Ability to explain and solve fundamental principles of thermodynamics related problems.
3. Ability to analyze the fundamental principles of heat transfer.

NMJ31103 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 select and design a suitable electrical drive and design related driver circuits for engineering applications. This course also gives an introduction to actuators, system design of micro electro-mechanical systems(MEMS) and BioMEMS technologies.

Course Outcomes:
1. Ability to perform analysis on the characteristics of different types of electrical machines.
2. Ability to perform analysis and evaluate the performance of different types of electrical machines.
3. Ability to select suitable electrical drive and design related driver circuits for engineering applications

NMJ32102 PROJEK REKABENTUK I [DESIGN PROJECT I]

No of Credits: 2

Course Synopsis:
This course focuses on the methodologies, processes and design elements for the development of an integrated biomedical system. It covers the philosophy of product design including needs identification, conceptual generation and selection, embodiment design and prototyping for the development of an optimum biomedical system. It also reviews all elements of a biomedical system and introduces the first part of the integrated design project. This course requires students to work in a group to design an integrated biomedical system to solve a problem based on predefined theme. Students need to identify needs, develop design specifications and generate possible design concepts by systematically exploring all the available resources, ethics, sustainability, finance principle and others. The embodiment design of the design project will be continued in Design Project II.

Course Outcomes:
1. Ability to acquire, appraise information from a variety of sources and select suitable design process to develop solutions based on knowledge and constraints using engineering analysis tools and software for solving complex problem.
2. Ability to propose solution that meets customer needs with consideration to patents/codes/ standards for a design safety/ cultural/ societal/ environmental/and human factors.
3. Ability to create conceptual design of a biomedical system by intergrating sensor, transducer, actuator and microcontroller.

NMJ30003 BIOINSTRUMENTASI I [BIOINSTRUMENTATION I]

No of Credits: 3

Course Synopsis:
This course provides an intensive coverage to medical electronics and bioinstrumentation. It will cover sensors and instrumentation for medical applications, as well as measurement of biosignals, such as electrocardiogram (ECG), electroencephalography (EEG), blood pressure and respiratory system. At the end of the course, the students are expected to provide clear understanding in various medical instrumentation principles and demonstrate the ability to apply, evaluate and integrate basic sensors and design basic electronic circuits for medical applications.

Course Outcomes:
1. Ability to identify, apply and distinguish sensors and transducers for measurement of biological parameters in medical instrumentation system.
2. Ability to discuss, explain and analyse design requirements and constraints for specific medical devices.
3. Ability to design, assemble, analyse, and evaluate basic circuits in medical instrumentation

NMJ40003 BIOINSTRUMENTASI II [BIOINSTRUMENTATIONS II]

No of Credits: 3

Course Synopsis:
This course provides in-depth look at various types of medical equipment, such as measuring, recording and monitoring instruments, together with 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 system for implementation in medical and healthcare based on engineering principles and computer applications.

Course Outcomes:
1. Ability to apply the principles of science and engineering for application in bioinstrumentation and analyze the bioinstrumentation system.
2. Ability to construct, propose and design bioinstrumentation system based on specific requirements.

NMJ41503 PENGIMEJAN PERUBATAN [MEDICAL IMAGING]

No of Credits: 3

Course Synopsis:
This course highlights the different principles of medical imoging modalities. This will provide them the understanding of various types of diagnostic radiology such as general XRay, Mammography, Ultrasound, Computed Tomography (CT) and Magnetic Resonance Imaging (MRI). Radiation therapy is introduced to provide a better understanding of how radiation is used not only for diagnosis but also for treatment such as cancer treatment. 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 healthcore industry.

Course Outcomes:
1. Ability to apply the concept of medical imaging modalities used in clinical application.
2. Ability to investigate and propose the most suitable imaging modalities for specific needs.
3. Ability to create and select appropriate radiation technique for therapy and diagnosis purposes

NMJ41703 PROJEK REKABENTUK II [DESIGN PROJECT II]

No of Credits: 3

Course Synopsis:
This course will focus on the design of integrated biomedical instrumentation for medical applications. The course will start with application of principle of engineering design and selection of thedesign project related to biomedical instrumentation. The students are expected to work on selected project to design a project with current issues related to public health and safety/cultural/societal/environmental as well as the economic considerations. 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:
1. Ability to identify and propose concepts to solve complex Biomedical Electronic engineering problems.
2. Ability to acquire information from a variety of sources and apply the design process to develop solutions based on knowledge and constraints using engineering analysis tools and software.
3. Ability to evaluate the solution that meets customer and financial needs with consideration to patents/codes/standards for a design safety/ cultural/ societal/ environmental/and human factors.
4. Ability to communicate effectively via written, oral presentation and demonstration of the design solution.
5. Ability to function in a team for the successful delivery of design project.

NMJ41303 PEMPROSESAN IMEJ PERUBATAN [MEDICAL IMAGE PROCESSING]

No of Credits: 3

Course Synopsis:
This course introduces a basic knowledge on medical image processing. It includes basic aspects related to image fundamental, image representation, image quality, spatial filtering, enhancement, segmentation, morphological operation, color 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:
1. Ability to explain and analyse the fundamental of image processing.
2. Ability to propose and evaluate image processing techniques for medical image applications

NMJ40103 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:
1. Ability to analyze biosensors from the aspects of the fundamental principles and their construction.
2. Ability to investigate the application of the biological elements which are suitable to be used for a biosensor.
3. Ability to analyze MEMS fabrication and technology from the principles and the methodology involved.
4. Ability to propose suitable applications of biosensor and bioMEMS in biomedical engineering.

NMJ41003 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:
1. Ability to analyze mathematical concepts of human physiology, biotransport and artificial organs.
2. Ability to illustrate modeling and simulation of human physiological system and artificial organs.
3. Ability to discuss concepts, fundamental principle and propose appropriate artificial organ devices for certain problems

NMJ41603 PERUBATAN ROBOTIK [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:
1. Ability to explain and analyze the fundamental principles of robotic technology.
2. Ability to analyze and provide solutions to problems related to kinematics and kinetics aspect of robotic manipulator.
3. Ability to assess the fundamental requirements of robotic technology for medical applications.

NMJ20803 BAHAN KEJURUTERAAN [ENGINEERING MATERIALS]

No of Credits: 3

Course Synopsis:
This course is offered to equip the students with the foundation of materials science and engineering and their applications. The study includes the structure of the materials, properties, and its limitations. The subject covers fundamental aspects such as materials structure, class of material, properties measurement, and knowledge towards materials selection and properties. The common microstructural features of different material classes will be outlined in order to relate material with its characteristics.

Course Outcomes:
1. Ability to apply the fundamental concept of materials structure and properties on engineering materials related problems.
2. Ability to analyze and evaluate various material characteristics and properties.
3. Ability to act and function effectively as individual and in teams to solve engineering materials related problems.

NMJ30103 ELEKTRONIK KUASA [POWER ELECTRONIC]

No of Credits: 3

Course Synopsis:
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. It 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:
1. Ability to describe power electronic system operations, application areas and power semiconductor devices; power diode, SCR, BJT, IGBT, GTO and MOSFET.
2. Ability to analyze and design AC-DC conversion, AC-AC conversion, DC-DC conversion and DC-AC conversion.
3. Ability to learn and analyze the functioning of recently developed power electronic systems.

NMJ31203 MIKROPENGAWAL [MICROCONTROLLER]

No of Credits: 3

Course Synopsis:
The aim or this course is to study and expose students to the concept and requirement of embedded microcontroller system. This includes the characteristic of embedded microcontroller system, hardware and software development, single chip microcontroller and programming technique in the relevant language, basic multitasking concept, developing and embedded system application. Students are expected to gain knowledge and skills to analyze and develop embedded microcontroller system thus preparing them for the IC Design job market.

Course Outcomes:
1. Ability to apply necessary knowledge of microcontroller-based system architecture.
2. Ability to design solutions for complex engineering problems and design systems, components or processes in programming language for the microcontroller-based system application.
3. Ability to construct and manipulate appropriate techniques, resources, and modern engineering tools in microcontroller-based system design.

NMJ32503 REKABENTUK VLSI [VLSI DESIGN]

No of Credits: 3

Course Synopsis:
This course covers various important elements for VLSI design such as sequential circuit, clock tree, wire interconnect and power dissipation and low power design.

Course Outcomes:
1. Ability to apply necessary knowledge to analyze the behavior of the sequential design.
2. Ability to design and analyse circuit characterization and overall performance of VLSI design.
3. Ability to engage and conclude the technological change pertaining to VLSI design.

NMJ42003 REKABENTUK DAN FABRIKASI MEMS [MEMS DESIGN AND FABRICATION]

No of Credits: 3

Course Synopsis:
This course covers the fundamentals of MEMS, microfabrication techniques, MEMS materials, MEMS device principle of operation, design, simulation and fabrication. Different types of MEMS sensors and actuators are introduced in this course i.e. MEMS Electroctatic Sensor, MEMS Electroctatic Actuator, MEMS Thermal Sensor, MEMS Thermal Actuator, MEMS Piezoresistive Sensor, MEMS Piezoelectric Sensor and MEMS Piezoelectric Actuator. The course team project provides students experience in MEMS device design and anlysis using Finite Element Method/Analysis (FEM/FEA) simulation tool and fabrication simulation using Computer Aided Design (CAD) tool. At the end of the course, the students are expected to be able to design and simulate MEMS devices.

Course Outcomes:
1. Ability to explain MEMS fabrication process
2. Ability to design MEMS device
3. Ability to simulate MEMS device

NMJ42103 REKABENTUK LITAR BERSEPADU ANALOG [ANALOGUE INTEGRATED CIRCUIT DESIGN]

No of Credits: 3

Course Synopsis:
This course covers the essential MOS characteristics includes the fundamental analysis of the operation regions involving the second order effect due to scaling issues. In addition, the concepts of single stage amplifier and differential amplifier are introduced to assist the student in real IC design projects utilises the CAD simulation tool. Finally, the MOS Operational Amplifier and its applications are reviewed at the end of the course to enhance the students understanding concerning the analogue design.

Course Outcomes:
1. Ability to apply and analyse the fundamental concept of transistor behaviour using basic laws and circuit theorem.
2. Ability to design and evaluate the analogue sub-circuit using basic laws and circuit theorem
3. Ability to design and investigate the analogue system to meet the required specifications

NMJ42203 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:
1. Ability to analyse System-On-Chip design methodology.
2. Ability to design the System-On-Chip architecture.
3. Ability to evaluate the System-On-Chip performance

NMK10103 TEORI LITAR [CIRCUIT THEORY]

No of Credits: 3

Course Synopsis:
This course introduces students to the mathematical foundation and measurement tools for electric circuit analysis. It covers the analysis of simple electrical circuits consisting of a few essential components using fundamental, well-known methods and techniques. Key concepts introduced in this course include basic electrical measurements, Ohm's and Kirchhoff's laws, as well as nodal and mesh analysis in series/parallel circuits. The circuit theorems and conversions, capacitors, inductors and RLC circuits also will be discussed.

Course Outcomes:
1. Ability to demonstrate basic concepts of electrical current, voltage, resistance, capacitance and inductance.
2. Ability to discuss the concept of Ohm's and Kirchhoff's laws, nodal and mesh analysis, circuit theorems and conversions, and RLC circuits.
3. Ability to perform the appropriate technique using measurement tools for electric circuit analysis.

NMK10203 SAINS KEJURUTERAAN [ENGINEERING SCIENCE]

No of Credits: 3

Course Synopsis:
This course covers introduction to physic and science which are force and motion, circular motion, work, power and energy, electrostatic, magnetism, electric current and resistance. Fundamental physics is combined with problem solving and engineering skills through suitable tutorials. This course will expose the students to the elements and principles of basic concepts of physics and its application.

Course Outcomes:
1. Ability to apply the concept of standard unit, force, motion, work, energy and power principles.
2. Ability to examine the circular motion principles in oscillation and wave related problems
3. Ability to analyse the basics of electrostatic, electromagnetism related problems.
4. Ability to examine the basics of electric current and resistivity related problems.

NMK10403 ELEKTRONIK DIGIT [DIGITAL ELECTRONICS]

No of Credits: 3

Course Synopsis:
Introduction and discussion of fundamentals of digital circuit design and analysis. The lecture and tutorial exercise/ practical lab modules cover the following topics: Boolean Algebra, Numbering System, Basic Logic Gates, Combinational Circuit Design, Timing Diagram, and Bi-Stable Memory Device - latch and flip- flops.

Course Outcomes:
1. Ability to describe numbering systems, Boolean algebra, and Boolean expression
2. Ability to analyse Boolean expression for combinational logic circuits
3. Ability to design and evaluate combinational logic circuits.

NMK11103 KEMAHIRAN KEJURUTERAAN [ENGINEERING SKILL]

No of Credits: 3

Course Synopsis:
This course is 100% of practical works and carries 3 credit hours. It contains five essential modules to develop basic engineering skills for the electronic students. The modules include an introduction to electronic components and instrumentation, electronic circuit design and simulation, PCB design and fabrication, technical drawing and as well as product design and integration.

Course Outcomes:
1. Ability to measure the electronic components by using appropriate electronic instrumentations Tools.
2. Ability to construct electronic schematic diagrams and perform circuit simulation using suitable Software.
3. Ability to build and fabricate Printed Circuit Board (PCB)
4. Ability to construct a two-dimensional (2D) and a three-dimensional (3D) technical drawing.
5. Ability to build a three-dimensional (3D) model of electronic product.

NMK12003 BAHAN KEJURUTERAAN [ENGINEERING MATERIAL]

No of Credits: 3

Course Synopsis:
The course is tailored to give students a basic principles study that governs the materials properties, limitations and behaviour of materials. At the end of this course, the student will be familiar with the basic understanding of different material classes in order to relate the material with its characteristics.

Course Outcomes:
1. Ability to explain type of materials families (metal, polymer, ceramic, composite andsemiconductor) based on structure, property and application.
2. Ability to analyze various material characteristics and properties such as mechanical, electrical, magnetic and optical properties.
3. Ability to analyze materials reliability in terms of materials life cycle, oxidation and corrosion mechanism and function effectively as individual, and as a member or leader in diverse teams

NMK10503 TEKNOLOGI KEJURUTERAAN ELEKTRIK [ELECTRICAL ENGINEERING TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This course emphasizes basic electrical engineering and power electronics which consists of three parts: the introduction of electrical systems, equipment, electrical machines, and drives. This course also provides knowledge in the field of power transmission, machinery, equipment, and power processing meter. Teaching and learning involve theoretical, simulation of computer aided design (CAD) software and also practical skills in the fields of electricity and electromagnetism, transformer, Alternating Current (AC) and Direct Current (DC) machines.

Course Outcomes:
1. Solve the problems on electricity, electromagnetism, single and three phase system with respect to their application, reliability, and safety.
2. Analyze the basic operations of DC/AC meters and transformer based on their construction, types and application.
3. Design a basic connection to support the comprehensive solution to DC/AC machines problem with respect to their efficiency, equivalent circuits and losses

NMK10603 PENGATURCARAAN C (C PROGRAMMING)

No of Credits: 3

Course Synopsis:
The 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 programming tools such as flowcharts and pseudo code and then to implement them by developing C programme.

Course Outcomes:
1. Ability to define and describe programming concepts and principles.
2. Ability to apply tools for coding, compiling, executing and debugging computer programs.
3. Ability to develop software solutions to solve engineering related problems using computer programming techniques.

NMK10703 PENULISAN DALAM TEKNOLOGI KEJURUTERAAN [WRITING IN ENGINEERING TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This subject will expose the students to the common requirements and expectations of writing as an engineering technologist; as well as to the format and techniques of writing various types of engineering technology documents.

Course Outcomes:
1. Ability to produce engineering documents in consideration of ethics spelling, grammar and avoidance of typing errors while at the same time considering the flow and continuity of ideas.
2. Ability to explain, solve and analyse group work involving presentations, reports and communication task.
3. Ability to compose and write common engineering documents and to discover sources of engineering information.

NMK10803 SISTEM DIGITAL [DIGITAL SYSTEMS]

No of Credits: 3

Course Synopsis:
Introduction and discussion of fundamentals of digital circuit design and analysis. The lecture and tutorial exercise/ practical lab modules cover the following topics: Boolean Algebra, Numbering System, Basic Logic Gates, Combinational Circuit Design, Timing Diagram, and Bi-Stable Memory Device - latch and flip-flops.

Course Outcomes:
1. Ability to describe numbering systems, Boolean algebra, and Boolean expression
2. Ability to analyse Boolean expression for combinational logic circuits
3. Ability to design and evaluate combinational logic circuits.

NMK20103 PEMPROSES MIKRO [MICROPROCESSOR]

No of Credits: 3

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 designing 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:
1. Ability to DESCRIBE the theory and basic architecture of microprocessor system.
2. Ability to WRITE an assembly language programming.
3. Ability to DESIGN a simple application on a microprocessor-based system

NMK20203 ELEKTRONIK ANALOG I [ANALOG ELECTRONIC I]

No of Credits: 3

Course Synopsis:
This course exposes the student the basic knowledge in analog electronic. The exposure encompasses amplifier design based on bipolar and field effect transistors, for single and multi-stage, power amplifier, frequency response analysis of amplifiers. Emphasis is placed on basic design aspects and applications. The course has been designed to provide basic analog electronic skills covering theories and practices. At the end of the course, the students are expected to be able to solve engineering problems of diode application and circuits analysis related to analog electronic

Course Outcomes:
1. Ability to apply the concept of diode application and basic configuration of BJT and FET amplifier.
2. Ability to analyze DC and AC, small-signal analysis and frequency performance of basic configuration of BJT and FET amplifier.
3. Ability to analyze simple design of Classes A, B, AB of FET and BJT power amplifier in-terms of their equivalent circuit and gain.
4. Ability uses modern tools to characterize the diode application, DC and AC analysis of the amplifier.

NMK20503 ISYARAT DAN SISTEM [SIGNALS AND SYSTEMS]

No of Credits: 3

Course Synopsis:
This course introduces students to the mathematical foundation and computational tools for processing continuous-time and discrete-time signals in both time and frequency domains. Key concepts introduced and discussed in this course include linear time-invariant systems (LTI), impulse response, frequency response, convolution, filtering, sampling, Fourier series and transform, Laplace transform and Z-transform.

Course Outcomes:
1. Ability to demonstrate types, characteristics and basic operation of signals and systems.
2. Ability to discuss the concept of signal representations and transformations of continuous-time and discrete-time signals.
3. Ability to perform the appropriate technique using computational software for continuous-time and discrete-time signal analysis.

NMK20703 PENGATURCARAAN BERASASKAN OBJEK [OBJECT-ORIENTED PROGRAMMING]

No of Credits: 3

Course Synopsis:
This course discusses the fundamental concepts of programming in the object-oriented paradigm, which includes classes and objects, inheritance, polymorphism, and exception handling. Students will be able to apply object-oriented problem solving with attention to general as well as programming language-specific issues such as application design anddevelopment, packages, applets, and graphical user interface (GUI).

Course Outcomes:
1. Ability to explain and apply the basic concepts of class, object, instance, attributes, methods, inheritance, and polymorphism.
2. Ability to evaluate technology problems and prepare the solution to the problem using an object oriented paradigm.
3. Ability to develop an application and improve its robustness based on the problem-solution design using java.

NMK20603 SENIBINA KOMPUTER [COMPUTER ARCHITECTURE]

No of Credits: 3

Course Synopsis:
This course covers both the architectural and organizational aspects of computer systems. Architectural aspects of a system are defined as the features that are available to the operating system kernel such as the instruction set, data representations and peripheral interfaces. On the other hand, organizational aspects of a system are defined as the physical implementations that realize the features given for a system. These include the design of basic building blocks such as the ALU and the control unit, as well as the logic level interface of both internal and external units. This course expects the students to have a good fundamental on digital logic design (both combinatorial and sequential logic).

Course Outcomes:
1. Ability to interpret the theoretical aspects of computer organization and architecture.
2. Ability to analyze existing design issues involving performance using theoretical knowledge and/or simulation tools.
3. Ability to design and justify basic central processing unit (CPU) based on given specifications.

NMK21103 TEORI ELEKTROMAGNETIK [ELECTROMAGNETIC THEORY]

No of Credits: 3

Course Synopsis:
The course covers basic concepts and understanding of fundamental laws of electrostatic and magnetostatic. Applications of these laws for different field configurations are also introduced. The course also introduces transmission line theory and the use of transmission lines as circuit elements. Calculation of transmission line parameters like VSWR, reflection coefficient, and impedance matching using Smith's chart is also included in this course.

Course Outcomes:
1. Ability to apply knowledge on the concept of vector analysis coordinate systems in electromagnetic theory.
2. Ability to analyze the concepts of electrostatic.
3. Ability to analyze the concepts of magnetostatic.
4. Ability to evaluate the concept of electromagnetics in transmission line analysis.

NMK21303 ELEKTRONIK ANALOG II [ANALOG ELECTRONIC II]

No of Credits: 3

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; Applications of op-amp: Summing amplifier, Voltage follower, Comparator, Integrator, Differentiator; oscillator: Basic operating principles of an oscillator, phase shift, Wien Bridge, Crystal oscillator, uni-junction. Active Analog 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, Chebyshev and Elliptic.

Course Outcomes:
1. Ability to explain the basic characteristics of the op-amp, oscillators, filters, and voltage regulators.
2. Ability to analyse the operations of analogue electronic circuits.
3. Ability to measure and conclude the output of analogue circuits.

NMK22003 REKABENTUK LITAR BERSEPADU [INTEGRATED CIRCUIT DESIGN]

No of Credits: 3

Course Synopsis:
In this course, students learn about VLSI design, with emphasis on designing circuits to meet certain performance criteria. Important issues when designing a VLSI circuit are discussed. MOS transistors are reviewed, including their characteristics, structure, switch-level behavior, and current equation. SPICE model of a MOS transistor is also described. The inverter circuit is studied in detail. IC fabrication process is reviewed. Layout, design rules and stick diagram are explained. This course emphasizes circuit design for speed and power performances. Factors that affect speed are explained. Logical effort concept is introduced to explain how to design a fast circuit. Similarly, effect of input signal transitions on power dissipation is explained.

Course Outcomes:
1. Ability to analyze CMOS transistor characteristics.
2. Ability to design combinational logic circuits at transistor level and construct its layout.
3. Ability to design and recommended the logic circuits for speed optimization and understand the principles of fabrication related.
4. Ability to work in a team and communicate effectively to solve broadly defined engineering problems.

NMK30103 SISTEM KOMUNIKASI [COMMUNICATION SYSTEMS]

No of Credits: 3

Course Synopsis:
This course includes basic principles and concepts of communication engineering system such as an introduction to the basic elements of communications, information theory and signal analysis. Knowledge in Amplitude Modulation (AM), Frequency Modulation (FM) and Pulse Modulation techniques are introduced. Some pulse modulation technique is also present such as Amplitude Shift Keying (FSK), Phase Shift Keying (PSK) Frequency Shift Keying (FSK) and Pulse Code Modulation (PCM)

Course Outcomes:
1. Ability to ANALYZE the fundamentals of communication systems and information theory, and the essentials of signal analysis in communication system.
2. Ability to EVALUATE amplitude, frequency, and phase modulation signals in term of modulation index, power,noise, and the frequency spectrum.

3. Ability to INVESTIGATE the fundamental of communication system, types of modulation techniques for digital modulation. As well as the practical system that has been applied in real world.

NMK32003 ELEKTRONIK KUASA [POWER ELECTRONICS]

No of Credits: 3

Course Synopsis:
This course introduces Power Electronics as a Multidisciplinary & Interdisciplinary Applications Orientated Technology emphasizing the main criterion of energy efficiency. Topics for this course also cover Fundamental Concepts of Power Electronics, Power Semiconductor Devices, Power Electronic Circuits, AC-DC Conversion, AC-AC Conversion, DC-DC Conversion and DC-AC Conversion, including waveform analysis, is developed from the blended skills of theory AC-AC simulation – laboratory.

Course Outcomes:
1. Ability to IDENTIFY power electronic systems operation, applications area and need for efficiency design.
2. Ability to DESIGN different types of power semiconductor device by APPLYING modelling tool; power diode, SCR, BJT, IGBT, GTO and MOSFET.
3. Ability to DESIGN AC-DC conversion, AC-AC conversion, DC-DC conversion and DC-AC conversion using modern tool.

NMK32103 REKABENTUK LITAR BERSEPADU DIGITAL [DIGITAL INTEGRATED CIRCUIT DESIGN]

No of Credits: 3

Course Synopsis:
This course provides the students an exposure to hardware modeling using Verilog Hardware Description Language, as a means of design entry, simulation and verification of digital circuits including of synchronous sequential circuits and finite state machine.

Course Outcomes:
1. Ability to analyze basic digital systems using Hardware Description Language (HDL) for application specific integrated circuit-based design.
2. Ability to construct and design a complete digital system consisting of control and data path unit by design and simulation using Verilog HDL.
3. Ability to contruct and evaluate digital system using High-Level Synthesis.

NMK32203 MIKROPENGAWAL [MICROCONTROLLER]

No of Credits: 3

Course Synopsis:
This course aims to study the use of a microcontroller system for a variety of applications. It covers hardware and software aspects such as basic internal architecture, hardware peripheral interfacing techniques, software design and implementation, basic multitasking concepts, and developing an application based on a single-chip microcontroller.

Course Outcomes:
1. Ability to analyze hardware architecture of a microcontroller system and sketch the fundamental diagram describing its behavior.
2. Ability to design and write a structured programmed of microcontroller programming for the system application.
3. Ability to design and evaluate embedded system based in a single chip microcontroller.

NMK34403 PENGURUSAN DALAM TEKNOLOGI KEJURUTERAAN [ENGINEERING TECHNOLOGY IN 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:
1. Ability to evaluate the process of project management, develop work plans, do cost estimation and perform project evaluation.
2. Ability to evaluate economic scenarios and apply decision making process to engineering project and business venture.
3. Ability to demonstrate the needs of skills in economic and engineering project management.

NMK30004 PROJEK TAHUN AKHIR I [FINAL YEAR PROJECT I]

No of Credits: 3

Course Synopsis:
This is a development project that involves solving practical engineering technology problem under the supervision of faculty member. The project undertaken might be one of the following areas: hardware and/or software development and device fabrication. Each student prepares comprehensive engineering reports, presents and demonstrates project work findings and results.

Course Outcomes:
1. Ability to synthesize information for literature review including standards, management, journals, policies, field data, etc, relevant to the specific project to be undertaken and relate with societal and global issues.
2. Ability to identify problem statements, objectives and appropriate research and design solution using suitable methodology to solve broad-defined engineering problems.
3. Ability to manage research activities systematically by planning and executing in a timely manner.
4. Ability to communicate effectively in oral forms to defend and justify the proposed solutions andmprogress.

NMK31003 PEMPROSESAN ISYARAT DIGITAL [DIGITAL SIGNAL PROCESSING]

No of Credits: 3

Course Synopsis:
Digital signal processing (DSP) manipulates an information signal by modifying or improving it via some mathematical approaches. DSP has been revolutionized and applied in various areas including electronic audio/video/image media, communications, radar, automotive, biomedical, and military. Since DSP is significant for developing numerous emerging digital products and applications in information age, it becomes as a core subject in most electronics/computer/communications engineering curricula. This course will focus the mathematical basis of discrete-time signal analysis, explain the theory and implementation of Fourier transform (FT) algorithms and z-domain transform, and discuss the design and implementation of digital filters. In practical, this course will make extensive use of a mathematical software and/or a DSP kit and board as an analysis, design, and visualization tool.

Course Outcomes:
1. Ability to APPLY knowledge systematically the Fourier transform and z-transform domain representation of discrete-time signals.
2. Ability to ANALYSE the sampling and recovery processes for continuous-time signals and discrete-time signals conversion.
3. Ability to DESIGN digital filters implementing finite impulse response (FIR) and infinite impulse response (IIR) filters taking account on their structures and the effect of finite word length.
4. Ability to APPLY technique using software and/or hardware tooL for various DSP problems.

NMK31203 SISTEM KAWALAN MODEN [MODERN CONTROL SYSTEM]

No of Credits: 3

Course Synopsis:
This course introduce modern control techniques and tools in performing control and realizing control system. The implementation of mathematics and control theory become the core of this subject.

Course Outcomes:
1. Ability to explain control systems and control systems design.
2. Ability to describe the mathematical models for such mechanical, electrical and electromechanical systems. (state variable systems, stability in feedback control systems and frequency domain).
3. Ability to analyse and design linear feedback systems using root locus method, digital control systems.

NMK31703 PROJEK REKABENTUK [DESIGN PROJECT]

No of Credits: 3

Course Synopsis:
In this course, students are expected to propose a design solution of broadly defined engineering problem which consist of several integration parts development such as components, processes, modules, systems. Throughout the course implementation, participation among team members were evaluated. Upon completion, students will have the ability to design an ideal project solution with consideration of societal, health, safety, cultural and environmental issues. Related act and regulation compliance are emphasized towards sustainable design development

Course Outcomes:
1. Ability to construct a problem solving design with consideration of societal, health, safety, cultural and environmental issues.
2. Ability to justify the designed solution of engineering problem in adherence to ethical conduct.
3. Ability to contribute in a collaborative task of multidisciplinary team.

NMK44403 JURUTERA TEKNOLOGIS DALAM MASYARAKAT [ENGINEERING TECHNOLOGIST IN SOCIETY]

No of Credits: 3

Course Synopsis:
This course aims to explain the main concepts inengineeringand 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. The coursepresents the introductory nature to enable technologists to appreciate factors that have to be taken into account in decisionmaking. Examine and assess issues and challenges faced by technologists relating to engineering and technology ethics, risk management and to understand the legal requirements related engineering andtechnology field.

Course Outcomes:
1. Ability to EXAMINE the issues and challenges of engineering and technology ethics.
2. Ability to ASSESS hazards,the function of risk management and occupational safety and health (OSHA).
3. Ability to EVALUATE the aspects and procedures of legal on engineering and technology issues.

NMK32303 VERIFIKASI ATAS CIP [VERIFICATION ON CHIP]

No of Credits: 3

Course Synopsis:
In this course students will be taught on the importance of testing as one of components in IC manufacturing industry. It begins with the introduction of economic costs to carry out test procedures. To test faults it is required to understand and appreciate their types and how they are modeled. This covers test methods for combinational and sequential circuits. Advanced topics which include DFT and BIST are included to create awareness of its importance in today's IC design and test activities. Standard method of test pattern generation and test compaction using LFSR would be the main part in this topic.

Course Outcomes:
1. Ability to explain the concept of fault, fault dominance, fault equivalence and carry out testability measures.
2. Ability to demonstrate test generation for stuck-at faults.
3. Ability to construct BIST and DFT structure for test generation and test compaction.

NMK33203 PEMBUNGKUSAN SEMIKONDUKTOR [SEMICONDUCTOR PACKAGING]

No of Credits: 3

Course Synopsis:
Students will be exposed to Microsystems packaging, the role of packaging in microelectronics, general semiconductor process flow, fundamental of interconnection in IC assembly, design for reliability, thermal management, fundamental of sealing and encapsulation, packaging material and processes, and the latest packaging technology trends. The students will also be exposed to identify critical packaging parameters and interpreting data of their own designed experiment. Mathematical modeling in packaging is also introduced.

Course Outcomes:
1. Ability to appraise the semiconductor packaging process flow.
2. Ability to evaluate the process and technology needed to package the semiconductor product.
3. Ability to analyze the materials and technology trends in semiconductor packaging

NMK33303 KEBOLEHPERCAYAAN DAN ANALISIS KEGAGALAN [RELIABILITY AND FAILURE ANALYSIS]

No of Credits: 3

Course Synopsis:
Today semiconductor industry facing serious problem of devices failure and they need technologist who can systematically investigate to determine the cause of failure for taking early corrective action to fix the problem and mitigate against further failures industrial failure analysis. To do this student need to understand reliability & Failure analysis at most fundamental approach. Therefore, this course aim expose students to different types of FA techniques commonly conducted on a failed semiconductor device and the test instrumentation associated with each technique.

Course Outcomes:
1. Ability to analyze reliability-based problems.
2. ability to create the failure analysis process flow and the related procedures.
3. Ability to suggest different tools and techniques available in failure analysis, its importance and the details operation principle.

NMK33003 TEKNOLOGI FABRIKASI MIKROELEKTRONIK [MICROELECTRONIC FABRICATION TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This course on microelectronic fabrication technology focuses on the concept and basics of semiconductor materials, process technology and fabrication processes of Integrated Circuits (ICs). The students will also be exposed to the fabrication process from oxidation, lithography, etching, diffusion, implantation, metallization and characterization.

Course Outcomes:
1. Ability to relate the essential aspects of semiconductor fabrication technology, which includes materials, devices, processes, facilities, and standard practices.
2. Ability to design and appraise important parameters of the wafer cleaning, thermal processes and photolithography process.
3. Ability to design and evaluate important parameters of etching, metallization process and CMOS fabrication process module.

NMK33103 NANOELEKTRONIK [NANOELECTRONIC]

No of Credits: 3

Course Synopsis:
Fundamentals of nanotechnology and its application to engineering technology systems, emphasizing basic principles, materials, measurement methods, fabrication techniques and applications.

Course Outcomes:
1. Ability to analyze basic principles, methods of measuring properties and structures in nanoelectronic.
2. Ability to evaluate properties of particles and materials in nanoelectronic.
3. Ability to design nanomachines and nanodevices.

NMK40006 PROJEK TAHUN AKHIR II [FINAL YEAR PROJECT II]

No of Credits: 3

Course Synopsis:
The course would expose students toward the second part of a development project that involves manage solving practical engineering technology problem under the supervision of a faculty member within the time given. The project undertaken may fall under one of the following areas: hardware and/or software development or device fabrication. Each student would prepares comprehensive engineering reports, communicate effectively by presenting and demonstrating the finding in order to defend the results of project work.

Course Outcomes:
1. Ability to manage research activities systematically by planning and executing in a timely manner and create a learning portfolio.
2. Ability to apply appropriate tools, techniques and resources to develop broadly-defined engineering product.
3. Ability to communicate effectively in oral presentation to defend and justify the broadly-defined engineering solutions.
4. Ability to conduct investigations, data interpretations/analysis, and judgement in research findings to solve broadly-defined problems.

NMK42003 INSTRUMENTASI [INSTRUMENTATION]

No of Credits: 3

Course Synopsis:
This course covers the fundamental of electronic instrumentation. The core of electronic instrumentation is embedded controller which controls sensors and actuators. The importance of the working principle, transduction properties of sensors and signal conditioning is highlighted. Element and principle of data conversion and acquisition, data transmission and their applications are discussed. Local and network electronic instrumentation requirement and wireless sensor network are discussed. Technique to send acquired data from embedded controller and smart sensors to cloud storage to be shared and used by actuators is covered.

Course Outcomes:
1. Ability to outline the fundamental concept of electronic instrumentation.
2. Ability to analyze electronic instrumentation comprising of embedded controllers, sensors, actuators, data acquisition, storage.
3. Ability to design local system, wired and wireless network system, internet and cloud-based data storage.

NMK42403 TEKNOLOGI IOT [IOT TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This course which is practical in nature 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, and machines 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, ZigBee and GSM technology. Data involve may be stored locally, in local network and in cloud storage.

Course Outcomes:
1. Ability to SELECT appropriate IoT technology
2. Ability to EVALUATE sensors, actuators, and embedded systems.
3. Ability to DESIGN IoT based applications.

NMK43103 SISTEM OPTOELEKTRONIK [OPTOELECTRONIC SYSTEM]

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 fiber 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 fiber systems and measurement will also be acquired.

Course Outcomes:
1. Ability to define, describe and analyze light properties, principle in optical fiber fundamental and optical component and passive device.
2. Ability to explain, solve and evaluate the concept, principles and operation of LEDs principles and operation of lasers concept.
3. Ability to define and analyze laser diode and photodetectors.
4. Ability to analyze electro optics, construct Non Linear optics activity, acoustic optics and systems and applications for display.

NMK42103 PENGUJIAN SEMIKONDUKTOR [SEMICONDUCTOR TESTING]

No of Credits: 3

Course Synopsis:
This course is designed to provide a strong foundation in the 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. In addition, the case studies and labs will help build critical thinking abilities, which is a very important skill for troubleshooting.

Course Outcomes:
1. Ability to analyse and measure device datasheet's electrical parameters.
2. Ability to design ATE test solutions for analogue and digital devices.
3. Ability to generate new idea or ways of viewing things in the current semiconductor testing technology trends

NMK42203 REKABENTUK LITAR BERSEPADU ANALOG [ANALOG INTEGRATED CIRCUIT DESIGN]

No of Credits: 3

Course Synopsis:
The aim of this course is to expose the student to the basic knowledge in analog integrated circuit design. The course includes study and analysis of the MOS characteristics and its second-order effects, the basic cells, single stage amplifier and differential amplifier. Emphasis is put on design aspect of the circuits. The course has been designed to provide fundamental analog integrated circuit knowledge covering theories and practices.

Course Outcomes:
1. Ability to ANALYSE the MOS transistor operation and basic building block for analog circuit.
2. Ability to DESIGN single stage amplifier.
3. Ability to DESIGN differential amplifier

NMK43003 SISTEM MIKRO-ELEKTRO-MEKANIKAL [MICRO-ELECTRO-MECHANICAL SYSTEM]

No of Credits: 3

Course Synopsis:
This course will explore the Microelectromechanical systems (MEMS) which focus on the introduction, microfabrication process, sensors, and actuating systems. Measurement techniques and MEMS-related applications will be covered in this course.

Course Outcomes:
1. Ability to ANALYZE basic fabrication process, electrical and mechanical properties for MEMS technologies.
2. Ability to EXPLAIN and INVESTIGATE the concepts of MEMS sensors and actuators systems for different applications.
3. Ability to DESIGN and EVALUATE MEMS application device.

NMK40412 LATIHAN INDUSTRI [INDUSTRIAL TRAINING]

No of Credits: 3

Course Synopsis:
This practical-based course exposes students to a company technical functions and organizational structure and operation such as departmental function, work procedure, safety procedure, communication, technical skills and project management. During this course, the students will apply knowledge learned in the university and increased the related skills required in their future profession.

Course Outcomes:
1. Ability to demonstrate technical knowledge and practical skills.
2. Ability to practice the health, safety,legal and cultural issues in working enviro nment.
3. Ability to apply societal environmental and sustainable development in engi neering problems.
4. Ability to demonstrate good work performance, work ethics during training p eriod.
5. Ability to perform as individual, a member or leader in diverse technical teams.
6. Ability to communicate and operate assigned task given by host company.
7. Ability to engage in independent and life-long learning in specialist technologies.

NMK11203 PENGUKURAN DAN INSTRUMENTASI [MEASUREMENT AND INSTRUMENTATION]

No of Credits: 3

Course Synopsis:
This course discusses about theory and constructional of analog instruments, measurement standard and calibration, unit and dimension, measurement and error, use voltmeter and ammeter using PMMC (Permanent Magnet Moving Coil), AC (Alternating Current) voltmeter design, analog and digital meters, measurement using DC (Direct Current) or AC bridges. Introduction to sensors and transducers. Measurement using oscilloscope and waveform generator. Types of display device which are the output devices for presentation of information in text or image form. Also introduce topic on Data acquisition (DAQ), is the process of measuring an electrical or physical phenomenon such as voltage, current, temperature, pressure, or sound with a computer. A DAQ system consists of sensors, DAQ measurement hardware, and a computer with programmable software. At the end of the course, the students are expected to be able to determine the right measurement and instrumentation for different application.

Course Outcomes:
1. Ability to describe the standards of measurement and instrument application
2. Ability to analyze different types of DC/AC meter to measure current, voltage, resistance, inductance, and capacitance
3. Ability to analyze the knowledge of AC & DC bridge, transducer, and sensor.
4. Ability uses modern tools for data acquisition system in instrumentation and measurement.

NMK20203 ELEKTRONIK ANALOG I [ANALOGUE ELECTRONIC I]

No of Credits: 3

Course Synopsis:
This course exposes the student the basic knowledge in analog electronic. The exposure encompasses amplifier design based on bipolar and field effect transistors, for single and multi-stage, power amplifier, frequency response analysis of amplifiers. Emphasis is placed on basic design aspects and applications. The course has been designed to provide basic analog electronic skills covering theories and practices. At the end of the course, the students are expected to be able to solve engineering problems of diode application and circuits analysis related to analog electronic.

Course Outcomes:
1. Ability to apply the concept of diode application and basic configuration of BJT and FET amplifier.
2. Ability to analyze DC and AC, small-signal analysis and frequency performance of basic configuration of BJT and FET amplifier.
3. Ability to analyze simple design of Classes A, B, AB of FET and BJT power amplifier in-terms of their equivalent circuit and gain.
4. Ability uses modern tools to characterize the diode application, DC and AC analysis of the amplifier.

NMK31103 ANTENA DAN PERAMBATAN [ANTENNA AND PROPAGATION]

No of Credits: 3

Course Synopsis:
This course introduces the fundamental principle of the function, types, design and characteristic of antenna. Student should be able to analyze the characteristic of wave and waveguide. Student should be able to ability to design various type of antenna and explain the characteristic of radio wave propagation.

Course Outcomes:
1. Ability to APPLY the antenna theory, antenna fundamentals and the wave propagation concept.
2. Ability to ANALYZE the antenna characteristic and radio wave propagation concept.
3. Ability to DESIGN and DEMONSTRATE different types of antennas and explore its propagation characteristics.

NMK31303 TEKNOLOGI KOMUNIKASI DIGITAL [DIGITAL COMMUNICATION TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This course introduces the students with the basic digital communications systems including parameters, modulation technique, line and source coding, channel coding on 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 in understanding the real applications. The introduction of digital communications will enhance the students understanding about the revolution of digital communications and the latest technology.

Course Outcomes:
1. Ability to APPLY the principles of basic digital communications including the source, channel coding and modulation technique.
2. Ability to ANALYSE the performance of digital communication systems, multiplexing, multiple access, and spread spectrum techniques.
3. Ability to INVESTIGATE digital communication modulation techniques and performance parameters using modern testing equipment.

NMK31403 TEKNOLOGI OPTIK [OPTICAL TECHNOLOGY]

No of Credits: 3

Course Synopsis:
The students studying this module will develop a basic understanding of the principles and practices of optical communication components and applications to communication systems. The technology of optical communication systems which includes laser, fiber optics, and amplifier fundamentals, semiconductor sources, optical detector, optical amplifiers, optical devices, introduction to modern optics, are tailored to the needs of the optoelectronic, photonics and optical communications industry. Practical skills in optical fiber systems and measurement will also be acquired.

Course Outcomes:
1. Ability to apply the knowledge of light properties concept and principle in optical technology communication system.
2. Ability to examine the parameters describing optical fiber properties and elements in the optical communications link.
3. Ability to analyze the system design of optical fiber application and aspects that influence the system performance.
4. Ability to assemble the related optical technology equipment in performing the measurement of appropriate signals parameter.

NMK31503 TEKNOLOGI RF DAN GELOMBANG MIKRO [RF AND MICROWAVE TECHNOLOGY]

No of Credits: 3

Course Synopsis:
Radio frequency (RF) and microwave engineering relates with electrical components designed to operate specifically with alternating current (AC) or electromagnetic (EM) wave frequencies in rangebetween 100 megahertz (MHz) and 1000 gigahertz (GHz). Through RF and microwave engineering, engineers/technologists can provide/control coverage via some kind of antenna/transmission system and also generate/receive signals to/from that transmission system to other communications electronics or controls. This course focuses on in-depth knowledge of mathematics, physics, general electronics theory as well as hands-on in RF and microwave areas including transmission lines, network analysis, filters design, dividers, couplers, amplifiers, oscillators, mixers, etc. Practically, this course utilizes test equipments, such as digital oscilloscope, spectrum analyzer and network analyzer for RF and microwave signal analysis and measurements.

Course Outcomes:
1. Ability to APPLY knowledge of the microwave basic concept, transmission line theory, and network analysis systematically.
2. Ability to ANALYZE the microwave devices including filters, dividers, couplers amplifiers, oscillators, and mixer.
3. Ability to DESIGN microwave filters using electronic automation software.
4. Ability to INVESTIGATE various RF and microwave problems using test equipments.

NMK31603 KOMUNIKASI TANPA WAYAR DAN MUDAH ALIH [MOBILE AND WIRELESS COMMUNICATION]

No of Credits: 3

Course Synopsis:
The course aims to expose students with the ability to recognize main components for mobile and wireless communication systems. By the end of the course, students will be able to explain basic concept in mobile and wireless systems. Additionally, the students are required to understand main issues in mobile and wireless communication and able to overcome the issues. The latest technique and standard in communication systems will also be discussed. Practical skills in mobile and wireless communication systems and measurement will also be acquired.

Course Outcomes:
1. Ability to INTERPRET the essential cellular concept, propagation effect, and modulation technique.
2. Ability to ELUCIDATE the architecture, traffic engineering, and standard of mobile and wireless communication systems.
3. Ability to MEASURE the mobile communications signal characteristic using modern tool.

NMK41003 TEKNOLOGI SATELIT [SATELLITE TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This course introduces the fundamental principle of the function, types and characteristic of satellite technology. Student should be able to describe the satellite system, frequency bands, satellite orbits and basic satellite systems. Student should also have ability to explain the satellite access techniques, the propagation consideration and be able to analyze propagation models of satellite system.

Course Outcomes:
1. Ability to ANALYZE the satellite systems, frequency allocation and frequency bands, satellite orbits and basic satellite systems.
2. Ability to EVALUATE the satellite access technique, propagation effects and their impact on satellite earth link.
3. Ability to INVESTIGATE satellite system planning and propagation models of satellite system.

NMK41103 ELEKTRONIK DAN REKABENTUK LITAR RF [ELECTRONICS AND RF CIRCUIT DESIGN]

No of Credits: 3

Course Synopsis:
This course focuses on RF electronic components measurements and characterizations besides RF circuit design theoretically and practically. Students will use modern test equipment, such as PathWave Advanced Design System (ADS) software, signal generator (SG), vector network analyzer (VNA) and spectrum analyzer (SA) along with recent automation software for RF circuit analysis and design specifically for wireless technology

Course Outcomes:
1. Ability to ANALYZE active and passive devices of radio frequency (RF) circuit design for wireless communications such as filter, amplifier, mixer, local oscillator, and transceiver system.
2. Ability to EVALUATE RF and microwave electronic component measurements and characterizations using modern test equipment.
3. Ability to DESIGN RF circuit using modern automation software.

NMK41203 TEKNOLOGI ANTARA RANGKAIAN TANPA WAYAR [WIRELESS INTERNETWORKING TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This course will introduce students with the fundamental knowledge of wireless internetworking technology. Precisely, topics related to wireless standard, architecture,protocol, switching, security, distribution, mesh, bridging, and tunnel will be focused. Moreover, modern tools will be used to design, install and test wireless computer network.

Course Outcomes:
1. Ability to DISCUSS wireless network protocol and layered architecture.
2. Ability to EVALUATE wireless network switching, security, distribution, mesh, bridging and tunnel.
3. Ability to MEASURE wireless computer network design parameter using modern tool.

NMK41303 DATA COMMUNICATION AND NETWORK [KOMUNIKASI DATA DAN RANGKAIAN]

No of Credits: 3

Course Synopsis:
This course introduces the theory and basic of data communication and network that help students to identify the concept of multimedia networking, network security and network management. Students will be familiarized with the data communication equipment and tools to measure the computer network performance.

Course Outcomes:
1. Ability to EXPLAIN the basic concept of data communication and layered protocol model.
2. Ability to INTERPRET the multimedia networking, network security and network management.
3. Ability to EVALUATE the computer network performance using modern tool.

NMK10003 ASAS RANGKAIAN [NETWORKING FUNDAMENTALS]

No of Credits: 3

Course Synopsis:
This course introduces students to networking architectures, models, protocols, and components. These components facilitate the connection of users, devices, applications and data through the internet and across modern computer networks. By the end of the course, students can perform basic configurations for routers and switches to build simple local area networks (LANs) that integrate IP addressing schemes and foundational network security.

Course Outcomes:
1. Ability to EXPLAIN fundamental concept of networking based on reference model
2. Ability to apply and analyse the networking set-up of local area network and identify the network IP
3. Ability to DESIGN a small network including topology maps and network maps

NMK20303 SISTEM PENGURUSAN PANGKALAN DATA [DATABASE MANAGEMENT SYSTEM]

No of Credits: 3

Course Synopsis:
This subject focuses on the concept of database system and architecture. This includes data models, schemas and instances, and system environment. Students will be exposed to data modeling by using high-level conceptual data models for relational database design that includes Entity Relationship Diagram(ERD), Structured Query Language(SQL) and normalization and also covers database storage and management.

Course Outcomes:
1. Ability to explain concepts of database system, database storage and managemen.
2. Ability to write and analyze SQL statements
3. Ability to normalize and evaluate a relational database
4. Ability to design a relational database using Entity Relational Diagram

NMK20403 TEKNOLOGI ANTARA RANGKAIAN 1 [INTERNETWORKING TECHNOLOGY 1]

No of Credits: 3

Course Synopsis:
This course will introduce students with the fundamental knowledge and tools for study internetworking. Principles of computer network cover so many aspects and it is expanding rigorously. Therefore this course focuses on the fundamental concept and theories, applications and advantages of internetworks. Related technologies such as Local Area Network, Wide Area Network and techniques use in data transmission as well as latest technologies. 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:
1. Ability to explain, discuss and apply the concepts and principles of computer networking technologies.
2. Ability to apply internetworking tools to understands the principles behind theoretical concepts of internetworking technology
3. Ability to design and evaluate the connectivity of computer networks.

NMK20808 STRUKTUR DATA [DATA STRUCTURE]

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 is revisited. Then, the linear data structure i.e. stack, queue linked list and nonlinear data structure i.e. tree and graph is discussed in depth. In addition sorting and searching algorithm are also included.

Course Outcomes:
1. Ability to DETERMINE the systematic way of solving problem
2. Ability to ANALYSE different methods of organizing large amounts of data
3. Ability to DEVELOP and IMPLEMENT the different data structures in solving problems.

NMK30203 TEKNOLOGI PERISISAN TERBENAM [EMBEDDED SOFTWARE TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This course introduces contemporary software technology for embedded systems. Students will be exposed to the requirements of embedded systems that frequently impose time and/or memory constraints. Among the topics that will be discussed are embedded systems, platform hardware, cross-compilations, barebone systems, peripheral interfacing and embedded operating system. Knowledge in this subject is important for electronics engineers who are interested in system development and integration.

Course Outcomes:
1. Ability to DESCRIBE the concept of embedded software.
2. Ability to EVALUATE embedded software implementations.
3. Ability to DEVELOP embedded software for specific applications

NMK30303 SISTEM PENGOPERASIAN [OPERATING SYSTEM]

No of Credits: 3

Course Synopsis:
This course presents the fundamental concepts and design of operating systems. Students will be guided to explore basic operating system concepts like processes, memory management, scheduling, file systems and IO management. Basic design and implementation of some of these concepts will be covered during laboratory sessions.

Course Outcomes:
1. Able to discuss basic operating systems concepts.
2. Able to implement basic operating systems concepts.
3. Able to evaluate implementations of basic operating systems concepts.

NMK30403 TEKNOLOGI ANTARA RANGKAIAN 2 [INTERNETWORKING TECHNOLOGY 2]

No of Credits: 3

Course Synopsis:
Comprehensive overview of communications software and hardware involved in wide area networks and their relationship to local area networks are introduced. The course is designed for computer networking majors. The students are able to identify the major components of the WAN and the flow of data between the bridges and routers.

Course Outcomes:
1. Ability to Differentiate between the principles of the OSI and TCP/IP Models, their layers and the open communication principles for LAN and WAN interconnections.
2. Ability to Design advanced networking protocols, mechanisms and technique such as IP addressing, subnetting, connection orientation and network security.
3. Ability to Construct the network and its behaviour via network simulation tools in solving network problems.

NMK30503 PENGURUSAN RANGKAIAN [NETWORK MANAGEMENT]

No of Credits: 3

Course Synopsis:
This course aims to give knowledge of operation, and maintenance of modern computer and global networks. Network Management basics, and standards is described with focus on Internet Management with the aid of Simple Network Management Protocol (SNMP), as well as the application of the same. It discusses the components of network management framework, i.e. fault management, performance management, configuration management, security management and accounting management. This course also gives practic
al knowledge and skill in system and network administration as well as network supervision.

Course Outcomes:
1. Ability to DIFFERENTIATE functional areas of fault, configuration, accounting, performance, and security management (FCAPS).
2. Ability to explain and RECOMMEND network management applications and standards to manage practical networks.
3. Ability to manipulate and DEVISE solutions to network management issues and challenges pertaining to management of emerging network technologies.

NMK30703 PENGATUCARAAN RANGKAIAN [PROGRAMMING FOR NETWORKING]

No of Credits: 3

Course Synopsis:
The aims of this course are to introduce the students of the programming in computer network and students get familiar with the mechanism of protocols that consists in the network. This course provides 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:
1. Ability to EXPLAIN and APPLY the concepts of network programming and the related network protocols involved..
2. Ability to APPLY network programming in computer networking environments.
3. Ability to DESIGN the architecture of network applications/web.
4. Ability to DEVELOP and IMPROVE Java language as an application by using network programming techniques learned.

NMK30903 INFRASTRUKTUR DAN PERKHIDMATAN AWAN [CLOUD INFRASTRUCTURE AND SERVICES]

No of Credits: 3

Course Synopsis:
This course educates students on the knowledge and skills needed to deploy and automate a secure cloud environment that supports the high availability of business systems and data. Migration to the cloud provides opportunities to deploy, optimize, and protect mission -critical applications and data storage. Students will learn about cloud infrastructure, services, networking, security, deployment, cloud management and troubleshooting according to best practices.

Course Outcomes:
1. Ability to apply knowledge of cloud fundamental, infrastructure, services, networking, security and deployment to the cloud solution problem.
2. Ability to design solution for cloud infrastructure, services, networking, security and deployment problem according to best practices.
3. Ability to investigate and analyze the characteristics of cloud infrastructure, services, networking, security and cloud deployment strategy according to guided instructions, best practices and ethic issues.

NMK34003 PENSUISAN, PENGHALAAN DAN KEPERLUAN TANPA WAYAR [SWITCHING, ROUTING AND WIRELESS ESSENTIALS]

No of Credits: 3

Course Synopsis:
This course educates students on the knowledge and skills needed to deploy and automate a secure cloud environment that supports the high availability of business systems and data. Migration to the cloud provides opportunities to deploy, optimize, and protect mission -critical applications and data storage. Students will learn about cloud infrastructure, services, networking, security, deployment, cloud management and troubleshooting according to best practices.

Course Outcomes:
1. Ability to explain the switching, routing and wireless essentials.
2. Ability to configure the switching, routing and wireless essentials.
3. Ability to troubleshoot inter-VLAN routing, Ether Channel on switched networks

NMK40103 TEKNOLOGI KESELAMATAN RANGKAIAN [NETWORK SECURITY TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This course introduces the fundamental principle of the function, types and characteristic of satellite technology. Student should be able to describe the satellite system, frequency bands, satellite orbits and basic satellite systems. Student should also have ability to explain the satellite access techniques, the propagation consideration and be able to analyze propagation models of satellite system.

Course Outcomes:
1. Ability to ANALYZE the satellite systems, frequency allocation and frequency bands, satellite orbits and basic satellite systems.
2. Ability to EVALUATE the satellite access technique, propagation effects and their impact on satellite earth link.
3. Ability to INVESTIGATE satellite system planning and propagation models of satellite system.

NMK40203 PENGKOMPUTERAN MUDAH ALIH [MOBILE COMPUTING]

No of Credits: 3

Course Synopsis:
This course will introduce students to the fundamentals of mobile computing and mobile application development that consists of three perspectives which are mobile technology, application development, and user interaction. The course will first give an overview of various mobile computing applications, technologies and wireless communication technologies. Next, students will learn about common paradigms in mobile computing such as low power computing, computing in an environment with limited resources, fault tolerance, security, and persistence. Students will be introduced to mobile application frameworks and development environments and be able to use them. User interface, user experience, and application development guidelines will be discussed and analyzed. Lastly, the course will look at some of the current research and problems in mobile computing. Students will be expected to learn at least one mobile application development framework and use it to implement their assignments and course project.

Course Outcomes:
1. Ability to CATEGORIZE and EXPLAIN the functionalities, components and features of mobile computing technologies and applications.
2. Ability to RELATE the important issues of developing mobile computing systems and applications.
3. Ability to APPLY various techniques for realizing the mobile computing functionalities.
4. Ability to DEVELOP mobile computing applications by analyzing their characteristic and requirements.

NMK40403 KEPINTARAN BUATAN [ARTIFICIAL INTELLIGENCE]

No of Credits: 3

Course Synopsis:
This subject focuses on the concept of Artificial Intelligence(AI) field in terms of definition, history and characeristics including some example of applications in this specific field. This subject convey understanding and skill in several AI techiniques. This subject is an interesting subject and an additional skill for students to design and develop coding using advanced techniques for sophisticated systems.

Course Outcomes:
1. Ability to COMPARE concepts and characteristics of Artificial Intelligence systems.
2. Ability to DIFFERENTIATE between Artificial Intelligence systems and conventional systems.
3. Ability to DESIGN appropriate techniques to represent knowledge and DEVELOP solution for the given problems using appropriate AI techniques.

NMK40803 RANGKAIAN ENTERPRISE, KESELAMATAN DAN AUTOMASI [ENTERPRISE NETWORKING, SECURITY, AND AUTOMATION]

No of Credits: 3

Course Synopsis:
The Enterprise Networking, Security, and Automation (ENSA) course is the third course in the CCNAv7 curriculum. This course describes the architectures and considerations related to designing, securing, operating, and troubleshooting enterprise networks. This course covers wide area network (WAN) technologies and quality of service (QoS) mechanisms used for secure remote access. It also introduces software-defined networking, virtualization, and automation concepts that support the digitalization of networks. Students gain skills to configure and troubleshoot enterprise networks and learn to identify and protect against cybersecurity threats. They are introduced to network management tools and learn key concepts of software-defined networking, including controller-based architectures and how application programming interfaces (APIs) enable network automation.

Course Outcomes:
1. Ability to EXPLAIN Single-Area OSPFv2, network security, software-defined networking, virtualization, and automation concepts.
2. Ability to CONFIGURE Single-Area OSPFv2, ACLs and NAT services on the edge router.
3. Ability to troubleshoot enterprise networks and learn to identify and protect against cybersecurity threats.

NMT11602 KEMAHIRAN TEKNOLOGI DAN PEMBANGUNAN DALAM AUTOMASI ELEKTRONIK I [TECHNOLOGY AND DEVELOPMENT SKILLS IN ELECTRONIC AUTOMATION I]

No of Credits: 2

Course Synopsis:
This course aims to provide students with knowledge of the basic technical skills in electronic automation based on the use of electronic technology in the field of productionand measurement. This includes basic knowledge of technical drawings, design drawings for 2D and 3D technique, electronic formulations, visualization techniques, circuitsimulation techniques and print circuit design board (PCB).

Course Outcomes:
1. Ability to interpret the basic knowledge and standard practices of electronic circuit design layout usingsoftware.
2. Ability to perform a standard practiced of manual technical drawing and able to construct a product usingComputer-aided Design (CAD) tool.
3. Ability to demonstrate technical analysis ideas presented in electronic design.

NMT11205 TEKNOLOGI PEMBANGUNAN PRODUK [PRODUCT DEVELOPMENT TECHNOLOGY]

No of Credits: 5

Course Synopsis:

This course focuses on the fundamental concepts of circuit analysis and electronic devices. It covers the operational behaviour and application circuit of passive and activecomponents, which includes resistor, capacitor, inductor, diode, and transistor. Important parts of electronic systems such as operational amplifier, filter, power supply and otherelectronic circuits related to industrial electronic automation are also discussed and emphasized.

Course Outcomes:
1. Ability to apply the knowledge of passive and active electronic components.
2. Ability to construct electronic circuits and performs their operation.
3. Ability to act as a team member in completing tasks.

NMT11505 AUTOMASI INDUSTRI I [INDUSTRIAL AUTOMATION I]

No of Credits: 5

Course Synopsis:
The course is meant to be an introductory course on industrial automation. In this context, the course covers the basic electrical control circuit, electro mechanical, electro pneumatic system andintegration of Programmable Logic Controller (PLC) to automate industrial processes. The program covers the following areas: basic control circuit and PLC hardware and software platform.Students will learn about the basic structure of automation, control circuit knowledge. They also will be taught to configure the PLC's hardware, as well as the logic control system, timer, counter,human machine integration (HMI) as well as common programming languages such as Ladder Diagram (LD) and Function Block Diagram (FBD). Finally, students will have to troubleshoot and clearany existing faults thus implement the standard maintenance procedure for PLC system. The course has a strong practical component whereby the students have the opportunity of getting ahands-on experience on the subjects taught on the theoretical lectures.

Course Outcomes:
1. Ability to apply the basic knowledge in industrial automation and control, programmable logic control (PLC) components and system.
2. Ability to manipulate circuit layout, construct for operation, troubleshoot and maintenance the PLC systemin a correct order.
3. Ability to demonstrate and show relevant justification for performing programming into the PLC to matchthe required outcome.

NMT11702 TEKNOLOGI PENGATURCARAAN SISTEM I [SYSTEM PROGRAMMING TECHNOLOGY I]

No of Credits: 2

Course Synopsis:
This course delivers the competency to student in applying the fundamental programming concepts and ablility to analise problem and produce the solution using algorithm development tools. The course will be delivered using the basic programming language (C programming).

Course Outcomes:
1. Ability to apply the fundamental programming concepts and its principles.
2. Ability to construct a program using computer programming techniques based on a given problem.
3. Ability to demonstrate a problem-solving approach in algorithm development.

NMT12604 KEMAHIRAN TEKNOLOGI DAN PEMBANGUNAN DALAM AUTOMASI ELEKTRONIK II [TECHNOLOGY AND DEVELOPMENT SKILLS 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 coursebrings students over the beginner's threshold to a basic understanding of the use, terminology and potential of digital electronic. The skills and conceptstaught in this course are presented from an interdisciplinary approach which merges practices in sciences and technology.

Course Outcomes:
1. Ability to describe Boolean functions and logic circuit in digital applications.
2. Ability to construct simple logical operations using combinational and sequentiallogic circuits.
3. Ability to build the digital logic systems.

NMT12202 RANGKAIAN, PENUKARAN DAN PENGHALAAN [NETWORK, SWITCHING AND ROUTING]

No of Credits: 2

Course Synopsis:

This course focuses on networking structure and functions. The course introduces the principles and structure of IP addressing and thefundamentals of networks, switching and routing. It covers topics such as the introduction of networking, type of network, network layer, type ofnetwork topologies, network media, network design and basic network performance.

Course Outcomes:
1. Ability to describe the fundamental concept of networking.
2. Ability to setup the local area network and identify the network IP.
3. Ability to build a small network.

NMT12704 TEKNOLOGI PENGATURCARAAN SISTEM II [SYSTEM PROGRAMMING TECHNOLOGY II]

No of Credits: 4

Course Synopsis:

This course teaches students how to write programmes that can solve problems using high level programming.The course will be taught in the currentmarket's most popular programming language.The student can create a programme that uses basic input and output to solve problems

Course Outcomes:

1. Ability to analyse problems using programming language.
2. Ability to implement a programming language solution appropriately based on a programming concept.
3. Ability to demonstrate a solution in developing a program to solve a problem.

NMT12505 AUTOMASI INDUSTRI II [INDUSTRIAL AUTOMATION II]

No of Credits: 5

Course Synopsis:

This course is practical in nature. It introduces current industrial automation technology, from device level until system architecture throughPLC programming. This course also introduces the Modular Production System (MPS), ranging from the concept and its core elements,navigate to Smart Manufacturing for the development of Industry 4.0 Modular Production System.

Course Outcomes:

1. Ability to construct Automation System using Advanced PLC Programming.
2. Ability to construct Modular Production System using Advanced PLC Programming.
3. Ability to justify the implementation of Product Identification System.

NMT21602 TEKNOLOGI PEROLEHAN DATA DAN ANALISIS I [DATA ACQUISITION TECHNOLOGY 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, signal conditioningand data acquisition system. Software tool interface with a microprocessor also introduced. The importance of application and signal conduction techniques is emphasized.Elements and principles of data exchange, acquisition and application are discussed.

Course Outcomes:

1. Ability to apply knowledge of transducer and sensor,signal conditioning and data acquisition system.
2. Ability to employ electronic apparatus interfacing todevice consists of sensors and others.
3. Ability to justifies the working principles ofmeasurement and instrumentation in data acquisition system.

NMT21503 AMALAN PROFESIONAL [PROFESSIONAL PRACTICES]

No of Credits: 3

Course Synopsis:

Professional practices course aims to explain the main concepts in engineering and technology ethics, risk management and occupational safety and healthas well as to expose the students to basic law in the engineering and technology context.

Course Outcomes:

1. Ability to interpret hazards, the function at risk management and occupational safety and health (OSHA).
2. Ability to explains the issues and challenges of professionalism, social and ethical consideration.
3. Ability to demonstrate understanding of the societal related in technology issues.

NMT21305 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. Inaddition, this course will also focus on how to program using language
C. Meanwhile, the Resberry Pi or latest controller board will be used asa controller.

Course Outcomes:
1. Ability to determine the theory and basic architecture of microcontroller system
2. Ability to construct program into microcontroller
3. Ability to design simple system of microcontroller interface with input and output device

NMT21403 PELAKSANAAN RANGKAIAN KESELAMATAN [NETWORK SECURITY IMPLEMENTATION]

No of Credits: 3

Course Synopsis:
This course focuses on the 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. It covers topics such as introduction to cybersecurity and cyber security operations.

Course Outcomes:
1. Ability to apply network security principles as well as the tools and configurations available.
2. Ability to manipulate to security incidents.
3. Ability to identify data confidentiality, integrity, availability and security controls on networks, servers andapplications.

NMT22104 TEKNOLOGI PEROLEHAN DATA DAN ANALISIS II [DATA ACQUISITION TECHNOLOGY AND ANALYSIS II]

No of Credits: 4

Course Synopsis:
This course covers data transfer, monitoring and control. This includes data transfer techniques using wired and wireless communication technology.Also introduced is development of mobile applications which allow data monitoring and data storage using mobile devices. In addition, elements ofmodern control systems are introduced. Control techniques of motors are included.

Course Outcomes:
1. Ability to analyze data transfer techniques.
2. Ability to perform wired and wireless communication techniques.
3. Ability to demonstrate the technical approach in developing mobile applications for monitoring andcontrol

NMT22202 TEKNOLOGI SISTEM PENGOPTIMUM I [SYSTEM OPTIMIZATION TECHNOLOGY I]

No of Credits: 2

Course Synopsis:
This course covers the fundamental of data communication network, measurement and instrumentation. This includes the working with currentdata network, measurement technique and network technology. System application, configuration and troubleshooting data communicationnetwork and electronic measurement is emphasized.

Course Outcomes:
1. Able to explain the theory and basic principle of data communication, network andelectronic measurement.
2. Able to apply data communication tools and working principles of measurement tofurther understand the theoretical concepts.
3. Able to justify a small network technology including topology maps or network maps.

NMT22302 PEMBANGUNAN SISTEM APLIKASI I [APPLICATION SYSTEM DEVELOPMENT I]

No of Credits: 2

Course Synopsis:
This course provides a foundation in data management concepts and database systems. It includes representing information with the relational database model, manipulating data with an interactive query language (SQL), database development using standard Database Management System, and integration of database to application development.

Course Outcomes:
1. Ability to apply logical database design concept to represent a functioning database.
2. Ability to build a working database using relevant technology according to database standards andprocedures.
3. Ability to independently seek solution to technical issues arose during database development.

NMT22404 TEKNOLOGI PENGURUSAN OPERASI [OPERATION MANAGEMENT TECHNOLOGY]

No of Credits: 4

Course Synopsis:
Technology Operation Management gives knowledge of concepts and principles for production and operations management in Industrial Electronic Automation. This course emphasizes production functions, forecasting techniques, efficiency theory, layout techniques, economics order quantity level, control of source acquisition and project scheduling, and production standard must be comply. This course also provides knowledge and skills in planning, decision and control of production in the Electronic Industry Automation.

Course Outcomes:
1. Ability to apply theories and concepts of operational management in Industrial Electronic Automation.
2. Ability to perform project scheduling and source allocation in project management using Project Evaluationand Review Techniques (PERT), Critical Path Method (CPM) and Linear Programming.
3. Ability to demonstrate ethical values in operational management for the benefit of society

NMT22504 PROJEK KEUSAHAWANAN TEKNOLOGI I [TECHNOPRENEUR PROJECT I]

No of Credits: 4

Course Synopsis:
Entrepreneurs need money to start and to grow their business. It is important to understand how revenue is generated, how to source for funds, how to control cash flow, how to assess the success of the company in monetary terms, and how to value a company for various purposes. The course exposes students to the various financial aspects relating to new ventures. These include approaches to secure start-up capital and venture financing. Students learn about the basic accounting, essential financial indicators, the types of funds available, the different categories of investors, the importance of intellectual property in securing finance, the financial details to be included in a business plan required for investment purpose, valuation of company and the art of negotiation with investors.

Course Outcomes:
1. Ability to apply various financial indicators & tools to prepare for financial information for a new business venture.
2. Ability to integrate effective project management and technopreneur skills in solving given problems.
3. Ability to perform effectively teamwork and leadership skills in completing the technopreneur project.

NMT31104 TEKNOLOGI SISTEM PENGOPTIMUM II [SYSTEM OPTIMIZATION TECHNOLOGY II]

No of Credits: 4

Course Synopsis:
This course integrates with concepts and mathematical models. It teaches students how to apply basic principles of analyzing signals and relate with real engineering and technologyapplication. This course divided into three sections. The first section will be signal acquisition and processing, where various types of signals are measured and analyzed to facilitate thecontrol and automation. Second section will be focused on the embedded system and integration, and third section will be on system development and mobile applications.

Course Outcomes:
1. Ability to integrate basic principles of analyzing signals with real technology application.
2. Ability to construct system design and application using embedded system module.
3. Ability to explain mobile application, embedded system integration and optimization

NMT31204 PEMBANGUNAN SISTEM APLIKASI II [APPLICATION SYSTEM DEVELOPMENT II]

No of Credits: 4

Course Synopsis:
This course focuses on the analysis and development of systems to meet the increasing need for information management within organizations. It covers topics such assystems development life cycle, analysis and design techniques, software project planning, process modeling, data modeling, data management, system design andimplementation, and testing.

Course Outcomes:
1. Ability to integrate different components of a system to develop a working software application.
2. Ability to build an efficient database based on a well-designed data model using cloud data storage technology.
3. Ability to organize a plan to solve technical issues faced during application system development.

NMT32105 REKABENTUK SISTEM INTEGRASI [SYSTEM INTEGRATION DESIGN]

No of Credits: 5

Course Synopsis:
The aim of this course is to provide students with the technical knowledge and practical experience on Supervisory Control and Data Acquisition(SCADA) in automation technology. SCADA is a system of software and hardware elements that allows industrial organizations to control industrialprocesses locally or at remote locations as well as monitoring, gather, and process real-time data

Course Outcomes:
1. Ability to configure machine and plan-specific HMI tasks using the SCADA software based on the Totally Integrated Automation Portal (TIA Portal).
2. Ability to apply and manage the TIA portal and structure of automation system, configuration and parameterization of hardware and PLC programming and SCL Programming.
3. Ability to apply virtual machine and plants concept, IOT, virtual commissioning and integrated energy management.

NMT31404 PROJEK KEUSAHAWANAN TEKNOLOGI II [TECHNOPRENEUR PROJECT II]

No of Credits: 4

Course Synopsis:
The start-up and growth of an enterprise invariably involves both human and financial capital. To manage the increasing pool of human resources and to convince venture capitalists to invest becometwo main issues especially for growing venture. This course consists of two parts: in the first part, organization and human resource management are introduced; in the second part, the focus is onwriting a convincing business plan to attract venture capital investment. When enterprise starts to take shape and grow, more people will be hired, proper organization, team building and humanresource management will become important issues. In this course, students will be exposed to the various organizational aspects relevant to new ventures and established companies. These includethe pros and cons of the different organization structures, conflicts that may arise among employees, and approaches to building strong teams. Human resource management techniques will also beintroduced and discussed. In the second part of the course, the business model canvas will be described listing the connections among the different components of a business. The value of a businessplan and the techniques of writing a business plan will be introduced.

Course Outcomes:
1. Ability to design vital organizational behaviours necessary to grow a new venture.
2. Ability to arrange the business model canvas incorporating human and financial elements.
3. Ability to influence and motivate all stakeholders to build a cohesive venture team

FACULTY OF MECHANICAL ENGINEERING TECHNOLOGY (FTKM)

Programmes Offered:

1. Bachelor of Mechanical Engineering with Honours
2. Bachelor of Manufacturing Engineering with Honours
3. Bachelor of Mechanical Engineering Technology (Machining) with Honours
4. Bachelor of Mechanical Engineering Technology (Agricultural Systems) with Honours
5. Bachelor of Mechanical Engineering Technology (Product Design) with Honours
6. Bachelor of Mechanical Engineering Technology (Materials Processing) with Honours
7. Bachelor of Technology in Industrial Machining with Honours
8. Bachelor of Technology in Automotive with Honours
9. Bachelor of Technology in Welding with Honours
10. Diploma in Manufacturing Engineering

Address:

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Universiti Malaysia Perlis
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02600 Arau Perlis
Tel: 04-9885035

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ENGINEERING PROGRAMME

PROGRAMME OBJECTIVES (PEO)

The Programme Objectives for the entire ***Engineering Programme*** at Universiti Malaysia Perlis (UniMAP) is as follows:

PEO 1
Graduates who have demonstrated career advancement in the field of Electrical 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

*At the end of the **Engineering Programme**, the students are expected to attain the following attributes:*

PO 1
Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization respectively 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 consideration.

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 problem.

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 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
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.

PO12
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.

CURRICULUM STRUCTURE
UR6521001 BACHELOR OF MECHANICAL ENGINEERING WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	I	II	III	IV	V	VI		VII	VIII
Engineering Core (102)	MMJ10103 Engineering Statics	MMJ10203 Engineering Dynamics	MMJ10303 Solid Mechanics I	MMJ22103 Solid Mechanics II	MMJ32103 Mechanisms & Machines	MMJ32903 Control Engineering	MMJ 39905 Industrial Training	MMJ40202 Final Year Project I	MMJ40304 Final Year Project II
	MMJ12202 Engineering Materials	MMJ12403 Manufacturing Processes	MMJ22203 Materials in Design	MMJ22303 Component Design	MMJ32503 Engineering Design Process	MMJ32402 Integrated Design Project I		MMJ42503 Integrated Design Project II	MMJ42602 Production & Operations
	MMJ12302 Mechanical Workshop		MMJ20103 Fluid Mechanics I	MMJ22503 Fluid Mechanics II	MMJ32203 Finite Element Analysis	MMJ32603 Heat Transfer		MMJ42103 Vibration Mechanics	MMJ4XX03 Elective II
	MMJ12102 Computer Aided Drafting	MMJ10403 Thermodynamics I	MMJ22403 Thermodynamics II		MMJ32703 Fluid Machinery	MMJ32303 Parametric Modelling & Analysis		MMJ4XX03 Elective I	MMJ4XX03 Elective III
	MMJ12503 Computer Programming	MMJ12603 Electrical Circuit & Machines		MMJ22603 Instrumentations & Measurements		MMJ32803 Electronics & Microprocessors			
Non Engineering Core (19)	SMQ10103 Engineering Mathematics I	SMQ10203 Engineering Mathematics II	SMQ20303 Engineering Mathematics III	SMQ27103 Engineering Statistics		SMU12202 Skills and Technology in Communication		MMJ40102 Professional Engineers	MMJ30103 Management for Engineers
University Required (16)	SMU13102 Appreciation of Ethics and civilization	**SMB20102 English for General Communication or SMB1XX02/ SMU1XX02 Option	SMU13002 2 Philosophy and Current Issues	SMB31202 English for Technical Communication	SMB41002 University Malay Language ***SMB11002 Basic Malay Language			SMU32202 Thinking Skills	
	*SMB10102 Preparatory English				SMU22402 Engineering Entrepreneurship				
	SMZXXXX1 Co-Curriculum 1	SMZXXXX1 Co-Curriculum 2							
	18	18	17	17	16	16	5	15	15
Total Credits for Graduation 137									

Elective: MMJ42203 Fracture Mechanics / MMJ42303 Mechanics of Composite Materials / MMJ42403 Acoustic & Noise Control / MMJ42803 Additive Manufacturing / MMJ42703 Design Optimization / MMJ42903 Refrigeration & Air Conditioning / MMJ43103 Renewable Energy / MMJ43303 Computational Fluid Dynamics / MMJ43203 Internal Combustion Engine

*Uncredited. Compulsory to Students with MUET Band 1 and 2 only. This Course is a prerequisite to SMB20102 English for General Communication.

**Compulsory to students with MUET Band 3 or less. This course is a prerequisite to SMB31202 English for Technical Communication.

***For International Students only

CURRICULUM STRUCTURE
UR6540001 BACHELOR OF MANUFACTURING ENGINEERING WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	I	II	III	IV	V	VI		VII	VIII
Engineering CORE (97 + 4)	MMJ16103 Materials	MMJ10303 Solid Mechanics 1	MMJ10203 Engineering Dynamics	MMJ20103 Fluid Mechanics I	MMJ36102 Heat Transfer	MMJ36203 Computer-Aided Engineering	MMJ39905 Industrial Training	MMJ40202 Final Year Project I	MMJ40304 Final Year Project II
	MMJ10103 Engineering Statics	MMJ15203 Electronics	MMJ10403 Thermodynamics I	MMJ25203 Control Systems	MMJ36303 Vibration and Mechanics of Machines	MMJ37203 Industrial Ergonomics		MMJ47003 Manufacturing Integrated Design Project	MMJ4XXX02 Elective III*4
	MMJ15103 Electrical Technology	MMJ15402 Computer Programming	MMJ25102 Instrumentation	MMJ26203 Machine Components Design	MMJ37103 Production Planning and Control	MMJ37403 Lean Manufacturing		MMJ4XXX02 Elective I*4	
	MMJ17102 Manufacturing Process I	MMJ17203 Manufacturing Process II	MMJ27102 Computer-Aided Manufacturing	MMJ27203 Quality Engineering	MMJ37303 Advanced Manufacturing Technology	MMJ37603 Industrial Automation		MMJ 4XXX02 Elective II*4	
	MMJ17302 Engineering Workshop	MMJ16202 Engineering Design	MMJ26103 Design for Manufacture	MMJ27403 Industrial Engineering	MMJ37503 Pneumatic and Hydraulic System				
	MMJ17502 Engineering Drawing								
Non Engineering CORE (19)	SMQ10103 Engineering Mathematics I	SMQ10203 Engineering Mathematics II	SMQ20303 Engineering Mathematics III	SMQ27103 Engineering Statistics	MMJ35202 Skills and Technology in Engineering Communication	MMJ30103 Management for Engineers			MMJ40102 Professional Engineer
University Required (16)	SMZXXX01 Co-Curriculum	SMZXXX01 Co-Curriculum	SMB10102 Preparatory English*1		SMB20102 English for General Communication*1 OR Option*3	SMB31202 English for Technical Communication*1		SMU13002 Philosophy and Current Issues	SMU13102 Engineering Entrepreneurship
			SMB41002 University Malay Language*2					SMU22402 Appreciation of Ethics and Civilization	SMU32202 Thinking Skills
137	19	17	18	18	18	17	5	13	12
Total Credits for Graduation: 137									

***1 English courses depend on MUET results.**

	UVA101/0 Preparatory English	UVW201/2 English for General Communication	UVW312/2 English for Technical Communication
Band **1** & **2**	Compulsory (no credit)	Compulsory (will be counted as Option*3)	Compulsory
Band **3**	-	Compulsory (will be counted as Option*3)	Compulsory
Band **4**, **5** & **6**	-	-	Compulsory

***2 Malay Language: International student should register SMB11002 Basic Malay Language, as a replacement for SMB41002 University Malay Language.**
***3 Option: Compulsory to be registered by students with MUET Band 4 and above. (Refer Academic Guide Book on Option courses).**
*4 Elective: Subject to changes. Will be informed to students prior pre-registration.

ENGINEERING TECHNOLOGY PROGRAMME

PROGRAMME OBJECTIVES (PEO)

The Programme Objectives for the entire ***Engineering Technology Programme*** at Universiti Malaysia Perlis (UniMAP) is as follows:

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

*At the end of the **Engineering Technology Programme**, the students are expected to attain the following attributes:*

PO 1
Knowledge: Apply knowledge of mathematics, science, engineering fundamentals and engineering specialisation principles 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 specialization.

PO 3
Design/development of solutions: 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.

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 the effective reports and design documentation, make effective presentations, 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 and leader in a team and to manage projects in multidisciplinary environments.

PO12
Life-Long Learning: Recognize the need for and have the ability to engage in independent and lifelong learning in specialist technologies.

CURRICULUM STRUCTURE
UR6521002 BACHELOR OF MECHANICAL ENGINEERING TECHNOLOGY (MACHINING) WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEMESTER	I	II	III	IV	V	VI	VII	VIII
DISCIPLINECORE (107)	MMK10103 MATERIALSCIENCE	MMK11203 FLUID MECHANICS	MMK11603 COMPUTER AIDED DESIGN	MMK21103 COMPUTER AIDED ENGINEERING	MMK32303 GEOMETRIC, DIMENSIONING & TOLERANCE	MMK31204 FINAL YEAR PROJECTI	MMK41206 FINAL YEAR PROJECT II	
	MMK10203 STATICS & DYNAMICS	MMK11502 MANUFACTURING TECHNOLOGY	MMK20203 STRENGTH OF MATERIALS	MMK11403 PROJECT MANAGEMENT	MMK32403 JIGS & FIXTURES DESIGN	MMK31103 ERGONOMIC & SAFETY	ELECTIVE II	
	MMK10403 ENGINEERING GRAPHICS	MMK11103 QUALITY CONTROL	MMK20103 THERMODYNAMICS	MMK11302 COMPUTER PROGRAMMING	MMK32502 SUSTAINABLE MACHINING	MMK33104 MACHINING PROJECT	ELECTIVE III	
	MMK10502 WORKSHOP TECHNOLOGY	MMK10303 BASIC ELECTRICAL & ELECTRONIC	MMK22104 CONVENTIONAL MACHINING	MMK21203 HEAT TRANSFER	MMK32603 COMPUTER AIDED MANUFACTURING	MMK32703 ADVANCED MACHINING TECHNOLOGY		
		MMK12103 THEORY IN MACHINING		MMK22203 CNC TECHNOLOGY	MMK32103 MANUFACTURING ECONOMICS	ELECTIVE I		
COMMON CORE (15)	SMQ11103 MATHEMATICS FOR ENGINEERING TECHNOLOGY I	SMQ11203 MATHEMATICS FOR ENGINEERING TECHNOLOGY II	SMQ21303 MATHEMATICS FOR ENGINEERING TECHNOLOGY III				MMK31303 ENGINEERING TECHNOLOGIST IN SOCIETY	
							MMK30103 ENGINEERING TECHNOLOGY MANAGEMENT	
UNIVERSITY REQUIRED (18)	SMU13002 PHILOSOPHY & CURRENT ISSUES	SMB10102 PREPARATORY ENGLISH	SMB20102 ENGLISH FOR GENERAL COMMUNICATION		SMU12202 SKILLS AND TECHNOLOGY IN COMMUNICATION			
	SMB41002 UNIVERSITY MALAY LANGUAGE			SMU22402 ENGINEERING ENTREPRENEURSHIP	SMU13102 APPRECIATION OF ETHICS AND CIVILIZATION	SMU32202 THINKING SKILLS		
	SMZXXX01 CO-CURRICULAR ACTIVITY	SMZXXXX01 CO-CURRICULAR ACTIVITY		SMB31202 ENGLISH FOR TECHNICAL COMMUNICATION	SMB0XX02 OPTION SUBJECT (FOREIGN LANGUAGE)			
*MUET: 2-3	19	18	18	18	18	19	18	12
*MUET: 4-6	19	18	16	18	20	19	18	12

TOTAL CREDITS FOR GRADUATION = 140

ELECTIVE 1	ELECTIVE 2	ELECTIVE 3
A1. MMK33103 ALLOY & METAL COMPOSITE	B1. MMK43403 MODERN GRINDING TECHNOLOGY	C1. MMK43703 CUTTING TOOL TECHNOLOGY
A2. MMK33203 PLASTIC INJECTION MOULDING SIMULATION	B2. MMK43503 NON-DESTRUCTIVE TESTING	C2. MMK43803 ADVANCED CHARACTERIZATION TECHNIQUE
A3 MMK33303 COMPUTATIONAL FLUID DYNAMICS	B3. MMK43603 NOISE AND VIBRATION	

CURRICULUM STRUCTURE
UR6521003 BACHELOR OF MECHANICAL ENGINEERING TECHNOLOGY (AGRICULTURE SYSTEMS) WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEME	I	II	III	IV	V	VI	VII	VIII
DISCIPLINE CORE (107)	MMK10103 Material Science	MMK10303 Basic Electrical and Electronic	MMK20103 Thermodynamics	MMK21203 Heat Transfer	MMK34103 Automations in Agricultural Systems	MMK31204 Final Year Project 1	MMK41206 Final Year Project 2	
	MMK10203 Static and Dynamic	MMK11203 Fluid Mechanics	MMK20203 Strength of Materials	MMK24103 Pneumatic and Hydraulic Systems	MMK11403 Project Management	MMK34203 Agricultural Design project	MMK44103 Farm Power and Machinery	
	MMK10403 Engineering Graphics	MMK11603 Computer Aided Design	MMK21103 Computer Aided Engineering	MMK24203 Instrumentation and Control	MMK11103 Quality Control	MMK31103 Ergonomic and Safety	MMK45103 Agricultural waste Management and utilization Eng.	
	MMK10502 Workshop Technology	MMK11502 Manufacturing Technology	MMK11302 Computer Programming	MMK25202 Soil Engineering	MMK35103 Post-Harvest Technology	Elective I/3	Elective II/3	
	MMK15102 Applied Biology	MMK15202 Introduction to Agriculture	MMK25102 Plantation Crop Production Technology	MMK25303 Livestock and Aquaculture Production Technology				
				MMK25402 Food Crop Production Technology				MMK49912 Industrial Training
COMMON CORE (15)	SMQ11103 Mathematics for Engineering Technology I	SMQ11203 Mathematics for Engineering Technology II	SMQ21303 Mathematics for Engineering Technology III		MMK30103 Engineering Technology Management	MMK31303 Engineering Technologist in Society		
UNIVERSITY REQUIRED (18)	SMB41002 University Malay Language	SMB20102 English for General Communication or SMB0XX02 Option Subject	SMB31202 English for Technical Communication	SMU12202 Skill and Technology in Communication	SMU13102 Appreciation of Ethics and Civilization	SMU13002 Philosophy and Current Issues		
	UZW XXX/1 Co-Curriculum	UZW XXX/1 Co-Curriculum		SMU22402 Engineering Entrepreneurship	SMU32202 Thinking Skills			
	SMB10102 Preparatory English (UNCREDITED)*							
*MUET: 2-3	19	19	18	20	19	18	15	12
*MUET: 4-6	19	19	18	20	19	18	15	12

Total Credits for Graduation = 140

Elective I	Elective II
A1: MMK35203 Precision Farming Technology	B1: MMK45203 Controlled Environment Agriculture
A2: MMK35303 Renewable Energy in Agriculture Systems	B2: MMK45303 Food Processing Engineering

*NOTES:
MUET Band 2: SMB10102 Preparatory English > SMB20102 English for General Communication > SMB31202 English for Technical Communication, *Option Subject is NOT COMPULSORY
MUET Band 3: SMB20102 English for General Communication > SMB31202 English for Technical Communication, *Option Subject is NOT COMPULSORY
MUET Band 4 and above: SMB31202 English for Technical Communication, *Option Subject is COMPULSORY

CURRICULUM STRUCTURE
UR6521004 BACHELOR OF MECHANICAL ENGINEERING TECHNOLOGY (PRODUCT DESIGN) WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEM	1	2	3	4	5	6	7	8
DISCIPLINE CORE (95)	MMK10203 Statics and dynamics	MMK10103 Materials Science	MMK20203 Strength of Materials	MMK20103 Thermodynamics	MMK11403 Project Management	MMK31204 Final Year Project I	MMK41206 Final Year Project II	MMK49912 INDUSTRIAL TRAINING
	MMK10403 Engineering Graphics	MMK11603 Computer Aided Design (CAD)	MMK26003 Computer Aided Design II (CAD)	MMK21103 Computer Aided Engineering (CAE)	MMK36003 Computer Aided Engineering II (CAE II)	MMK31103 Ergonomic and Safety		
	MMK10303 Basic Electrical & Electronics	MMK11203 Fluid Mechanics		MMK11302 Computer Programming				
	MMK10502 Workshop Technology	MMK11502 Manufacturing Technology	MMK26103 Reverse Engineering & Additive Manufacturing	MMK21203 Heat Transfer	MMK37403 Innovation Management & Product Development	Elective I-3	MMK47703 DFMA	
		MMK11103 Quality Control	MMK26203 Prototyping and Model Making		MMK36503 Industrial Revolution	Elective II-3		
	MMK17003 Basic Industrial Design	MMK17102 Design Visualization	MMK27203 Design Integration	MMK27303 Design Studio I	MMK36403 Design Studio II			
COMMON CORE (15)	SMQ11103 Mathematics for Engineering Technology I	SMQ11203 Mathematics for Engineering Technology II	SMQ21303 Mathematics for Engineering Technology III			MMK30103 Engineering Technology Management	MMK31303 Engineering Technologist in Society	
UNIVERSITY (18)	SMU32202 Thinking Skills	*SMB10102 Preparatory English	**SMB20102 English for General Communication	SMU22402 Engineering Entrepreneurship	SMB31202 English for Technical Communication	SMU13002 Philosophy and Current Issues		
				SMU12202 Skills & Technology in Communication	SMB0XX02 Option Subject (Foreign Language)	SMU13102 Appreciation of Ethics and Civilization		
	SMZXXX01 Co-Curricular Activity	SMZXXX01 Co-Curricular Activity		SMB41002 University Malay Language				
Credits	20	20	20	20	17	19	12	12

Total Credits for Graduation =140

Elective 1	Elective 2
A1. MMK37503 Production Management for Designers	B1. MMK37703 Digital Rendering
A2. MMK37603 Product Study & Professional Practice	B2. MMK37803 Design for Medical Device

*NOTES:
MUET Band 2: SMB10102 Preparatory English > SMB20102 English for General Communication > SMB31202 English for Technical Communication, *Option Subject is NOT COMPULSORY
MUET Band 3: SMB20102 English for General Communication > SMB31202 English for Technical Communication, *Option Subject is NOT COMPULSORY
MUET Band 4: SMB31202 English for Technical Communication, *Option Subject is COMPULSORY

CURRICULUM STRUCTURE
UR6543001 BACHELOR OF MECHANICAL ENGINEERING TECHNOLOGY (MATERIAL PROCESSING) WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEM	I	II	III	IV	V	VI	VII	VIII
Discipline Core (96)	MMK10103 Materials Science	MMK11302 Computer Programming	MMK11603 Computer Aided Design	MMK21103 Computer Aided Engineering	MMK38103 Process Control	MMK31204 Final Year Project I	MMK41206 Final Year Project II	MMK49912 INDUSTRIAL TRAINING
	MMK10203 Statics and Dynamics	MMK11203 Fluid Mechanics	MMK20203 Strength of Materials	MMK21203 Heat Tranfer	MMK38303 Metal Fabrication Technology	MMK31103 Ergonomic and Safety	MMK48103 Material for Energy & Environmental Sustainability	
	MMK10403 Engineering Graphics	MMK11403 Project Management	MMK20103 Thermodynamics	MMK28303 Whiteware Ceramic Processing	MMK38202 Design of Die & Moulds	MMK38503 Materials Selection & Design	Elective III	
	MMK10502 Workshop Technology	MMK11502 Manufacturing Technology	MMK28103 Materials Testing	MMK28403 Metal Extraction Technology	MMK38403 Composite Materials Processing	Elective II		
	MMK10303 Basic Electrical & Electronics	MMK11103 Quality Control	MMK28203 Materials Characterization	MMK28503 Plastic Processing	Elective I			
Common Core (15)	SQM11103 Mathematics for Engineering Technology I	SQM11203 Mathematics for Engineering Technology II	SQM21303 Mathematics for Engineering Technology III			MMK30103 Engineering Technology Management	MMK31303 Engineering Technologist in Society	
University Required (18)	SMU13002 Philosophy and Current Issues	*SMB10102 Preparatory English	**SMB20102 English for General Communication	SMU22402 Engineering Entrepreneurship				
			SMB0XX02 Option Subject (Foreign Language)	SMU13102 Appreciation of Ethics and Civilization	SMB41002 University Malay Language	SMU12202 Skills & Technology in Communication		
	SMZXXX01 Co-Curricular Activity	SMZXXX01 Co-Curricular Activity			SMU32202 Thinking Skill	SMB31202 English for Technical Communication		
M: 2-3	20	17	20	19	18	20	15	12
M: 4-6	20	17	20	19	18	20	15	12
Total Credits for Graduation = 141								

Elective 1	Elective 2	Elective 3
A1. MMK39103 Polymer Adhesive and Coatings A2. MMK39203 Rubber and Latex Technology	B1. MMK39303 Advanced Metallurgy B2. MMK39403 Geopolymer Materials Technology	C1. MMK49103 Technical Ceramic Technology C2. MMK49203 Glass Technology

TECHNOLOGY PROGRAMME

PROGRAMME OBJECTIVES (PEO)

The Programme Objectives for the entire ***Technology Programme*** at Universiti Malaysia Perlis (UniMAP) is as follows:

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

*At the end of the **Technology Programme**, the students are expected to attain the followingattributes:*

PO 1
Knowledge: Apply knowledge of technology fundamentals to broadly-defined procedures processes, systems and methodologies in Electrical System Maintenance.

PO 2
Practical Skills and High Technology: Able to suggest and apply latest tools and techniques to solve broadly-defined problems.

PO 3
Analytical, Critical Thinking and Scientific Approach: Demonstrate strong analytical and critical thinking skills to solve broadly-defined problems in Electrical System Maintenance.

PO 4
Communication Skills : Able to communicate and articulate effectively in both verbal and written among technologist communities and society at large.

PO 5
Social Responsibility in Society and Technologist Community: Demonstrate understanding of the societal related issues and the consequent responsibilities relevant to broadly-defined technology practices.

PO 6
Lifelong Learning and Information Management : Recognize the needs for professional development and to engage independent lifelong learning in specialist technologists.

PO 7
Technopreneurship and Management Skills: Demonstrate an awareness of management and technopreneurship practices in real perspective.

PO 8
Ethics and Professionalism: Demonstrate professionalism and social and ethical consideration.

PO 9
Teamwork and Leadership: Demonstrate leadership quality, mentoring and work effectively in diverse teams.

CURRICULUM STRUCTURE
UR6521006 BACHELOR OF TECHNOLOGY IN INDUSTRIAL MACHINING WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEMESTER	I	II	III	IV	V	VI	VII	VIII
DICSPLINE CORE (104)	**MMT15003** Product Drafting and Specification	**MMT15404** Tool Setup and Refurbishment	**MMT25004** Precision and Finishing in CNC Technology	**MMT25404** Multi Axis Machining	**MMT35004** Assembly Method	**MMT31504** Final Year Project 1	**MMT41506** Final Year Project 2	**MMT49912** Industrial Training
	MMT15103 Standard Product Precision	**MMT15503** Sustainable Machining	**MMT25103** Precision and Finishing in EDM and Grinding Technology	**MMT25503** Complex CADCAM Product	**Elective** MMT35604 Tool and Die Making, MMT35704 Aerospace Machining, MMT35804 Rapid Machining, MMT35903 Human Factor Technology, MMT36004 Production Planning in Machining	**MMT35304** Project Management and Supervision		
	MMT15203 Workpiece and Cutting Tool Properties	**MMT15603** Assessment of Machinability	**MMT25204** Prismatic CADCAM Product	**MMT25603** Heat Treatment of Machined Component	**MMT35104** Rework and Rehabilitation of Machined Component	**MMT35404** Acts and Risks Assessment in Machining Production		
	MMT15303 Jig and Fixture	**MMT15703** Condition Monitoring in Machining	**MMT25304** Surface Aesthetics of Machined Component	**MMT25804** Technopreneur Project 1	**MMT35204** Technopreneur Project 2	**MMT35504** Machine Maintenance		
UNIVERSITY CORE	**SMBXXX02** Co-Curiculum I	**SMBXXX02** Co-Curiculum II	**SMB31202** English Technical for Communication	**SMU22402** Engineering Entrepreneurship	**SMU13102** Appreciation of Ethics and Civilization			
	SMB41002 University Malay Language	**SMU13002** Philosophy and Current Issues	**SMBXXX02** Third Language					
	SMU12202 Skill and Technology in Communication	**SMB20102** English for General Communication						
	SMB10102 *Preparatory English							
TOTAL CREDITS FOR GRADUATION = 122								

CURRICULUM STRUCTURE
UR6525001 BACHELOR OF TECHNOLOGY IN AUTOMOTIVE WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD		SHORT SEM	FOURTH
SEMESTER	1	2	3	4	5	6		7
COMMON CORE (104)	**MMT11004** Automotive Industry & Technology	**MMT 11303** Shop floor Supervision	**MMT21003** Project Management	**MMT21204** Powertrain System Service	**MMT31003** Automotive Legislation		**MMT41506** FYP 2	**MMT49912** Industrial Training
	MMT11103 Automotive Drafting	**MMT11404** Automotive Component Design & Assembly	**MMT21104** Autotronic System Service	**MMTXXX04** Elective III	**MMTXXX04** Elective V	**MMT31306** Quality Management		
	MMT11204 Automotive Workshop Practice	**MMT 11504** Automotive Component Fabrication	**MMTXXX04** Elective I	**MMT XXX04** Elective IV	**MMTXXX04** Elective VI	**MMT31403** Risk Assessment		
			MMTXXX04 Elective II	**MMT 21304** Technopreneur Project 1	**MMT31104** Technopreneur Project 2	**MMT31504** FYP 1		
					MMT31202 Vehicle Marketing	**MMT31603** Asset & Inventory Management		
	11	11	15	16	17	16	6	12
UNIVERSITY CORE (18)	**SMBXXX02** Co-Curiculum 1	**SMBXXX02** Co-Curiculum II	**SMB31202** English Technical for Communication	**SMU22402** Engineering Entrepreneurship	**SMU13102** Appreciation of Ethics and Civilization			
	SMB41002 University Malay Language	**SMU13002** Philosophy and Current Issues	**SMBXXX02** Third Language					
	SMU12202 Skill and Technology in Communication	**SMB20102** English for General Communication						
	SMB10102 *Preparatory English							
	5	5	4	2	2			
TOTAL CREDIT PER SEMESTER	16	16	19	18	19	16	6	12
TOTAL CREDITS FOR GRADUATION = 122								

CURRICULUM STRUCTURE
UR6521005 BACHELOR OF TECHNOLOGY IN WELDING WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD		Short Sem	FOURTH
SEMESTER	I	II	III	IV	V	VI		VII
COMMON CORE (104)	MMT13004 CAD and Welding Graphic	MMT13303 Product Design in Welding	MMT23004 Material Behaviour in Welding	MMT23604 Computer Aided Analysis	MMT33004 Welding Quality Assurance	MMT31504 Final Year Project 1	MMT41506 Final Year Project 2	MMT49912 Industrial Training
	MMT13104 Safety in Welding	MMT13404 Welding Documentation	MMT23104 Safety Management	MMT23704 Imperfection in Welding and Testing	MMT33104 Economic of Welding and Procurement	MMT33403 Cyber Physical System in Welding		
	MMT13204 Metal Fabrication Process	MMT13504 Non-Conventional Welding Process	MMT23204 Welding Design Analysis	MMT23804 Welding Electrical Equipment	MMT33204 Non -Destructive Test	MMT33504 Reclamation Workshop		
			ELECTIVE*	MMT23904 Technopreneur Project 1	MMT33304 Technopreneur Project 2	MMT33604 Managing Production Supervisory		
UNIVERSITY CORE (18)	**SMBXXX02** Curriculum 1	**SMBXXX02** Curriculum 2	**SMBXXX02** Third Language: Mandarin	SMB31202 English Technical for Communication	SMU13102 Appreciation of Ethics and Civilization			
	SMB41002 University Malay Language	SMU13002 Philosophy and Current Issues						
	SMU12202 Skill and Technology and communication	SMB20102 English For General Communication						
		SMU22402 Engineering Entrepreneurship						
	17	18	18	18	18	15	6	12
TOTAL CREDIT FOR GRADUATION 122								

ELECTIVE* : MMT23304 Welding Technology / MMT23404 NDT Professional / MMT23504 Welding Inspection

LIST OF COURSES:

COURSE CODE	COURSE NAME
MMJ10103	Statik Kejuruteraan [Engineering Statics]
MMJ10203	Dinamik Kejuruteraan [Engineering Dynamics]
MMJ10303	Mekanik Pepejal I [Solid Mechanics I]
MMJ10403	Termodinamik I [Thermodynamics I]
MMJ12102	Lukisan Terbantu Komputer [Computer Aided Drafting]
MMJ12202	Bahan Kejuruteraan [Engineering Materials]
MMJ12302	Bengkel Mekanikal [Mechanical Workshop]
MMJ12403	Proses-proses Pembuatan [Manufacturing Processes]
MMJ12503	Pengaturcaraan Komputer [Computer Programming]
MMJ12603	Litar dan Mesin Elektrik [Electrical Circuit & Machine]
MMJ15103	Teknologi Elektrik [Electrical Technology]
MMJ15203	Elektronik [Electronics]
MMJ15402	Pengaturcaraan Komputer [Computer Programming]
MMJ16103	Bahan [Materials]
MMJ16202	Reka Bentuk Kejuruteraan [Engineering Design]
MMJ17102	Proses Pembuatan I [Manufacturing Process I]
MMJ17203	Proses Pembuatan II [Manufacturing Process II]
MMJ17302	Bengkel Kejuruteraan [Engineering Workshop]
MMJ17502	Lukisan Kejuruteraan [Engineering Drawing]
MMJ20103	Mekanik Bendalir I [Fluid Mechanics I]
MMJ22103	Mekanik Pepejal II [Solid Mechanics II]
MMJ22203	Bahan dalam Reka Bentuk [Materials in Design]
MMJ22303	Reka Bentuk Komponen [Component Design]
MMJ22403	Termodinamik II [Thermodynamics II]
MMJ22503	Mekanik Bendalir II [Fluid Mechanics II]

LIST OF COURSES:

COURSE CODE	COURSE NAME
MMJ22603	Instrumentasi dan Pengukuran [Instrumentation & Measurement]
MMJ25102	Instrumentasi [Instrumentation]
MMJ25203	Sistem Kawalan [Control Systems]
MMJ26103	Reka Bentuk untuk Pembuatan [Design for Manufacture]
MMJ26203	Reka Bentuk Komponen Mesin [Machine Components Design]
MMJ27102	Pembuatan Berbantu Komputer [Computer-Aided Manufacturing]
MMJ27203	Kejuruteraan Kualiti [Quality Engineering]
MMJ27403	Kejuruteraan Industri [Industrial Engineering]
MMJ30103	Pengurusan Untuk Jurutera [Management for Engineers]
MMJ32103	Mekanisma dan Mesin[Mechanism & Machine]
MMJ32203	Analisis Unsur Terhingga [Finite Element Analysis]
MMJ32303	Pemodelan dan Analisa Parametrik [Parametric Modelling & Analysis]
MMJ32402	Projek Reka Bentuk Bersepadu I [Integrated Design Project I]
MMJ32503	Proses Reka Bentuk Kejuruteraan [Engineering Design Process]
MMJ32603	Pemindahan Haba [Heat Transfer]
MMJ32703	Jentera Bendalir [Fluid Machinery]
MMJ32803	Elektronik & Mikropemproses [Electronics & Microprocessors]
MMJ32903	Kejuruteraan Kawalan [Control Engineering]
MMJ35202	Kemahiran dan Teknologi dalam Komunikasi Kejuruteraan [Skills and Technology in Engineering Communication]
MMJ36102	Pemindahan Haba [Heat Transfer]
MMJ36203	Kejuruteraan Berbantu Komputer [Computer-Aided Engineering]
MMJ36303	Getaran dan Mekanik Mesin [Vibration and Mechanics of Machines]
MMJ37103	Perancangan dan Kawalan Pengeluaran [Production Planning and Control]
MMJ37203	Ergonomik Industri [Industrial Ergonomics]
MMJ37303	Teknologi Pembuatan Termaju [Advanced Manufacturing Technology]

LIST OF COURSES:

COURSE CODE	COURSE NAME
MMJ37403	Pembuatan "Lean" [Lean Manufacturing]
MMJ37503	Sistem Pneumatik dan Hidraulik [Pneumatic and Hydraulic System]
MMJ37603	Automasi Industri [Industrial Automation]
MMJ39905	Latihan Industri [Industrial Training]
MMJ40102	Jurutera Profesional [Professional Engineer]
MMJ40202	Projek Tahun Akhir I [Final Year Project I]
MMJ40304	Projek Tahun Akhir II [Final Year Project II]
MMJ42103	Mekanik Getaran [Vibration Mechanics]
MMJ42203	Mekanik Patah [Fracture Mechanics]
MMJ42303	Mekanik Bahan Komposit [Mechanics of Composite Materials]
MMJ42403	Akustik & Kawalan Hingar [Acoustic & Noise Control]
MMJ42503	Projek Reka Bentuk Bersepadu II [Integrated Design Project II]
MMJ42602	Pengeluaran & Operasi [Production & Operations]
MMJ42703	Pengoptimuman Reka Bentuk [Design Optimization]
MMJ42803	Pembuatan Penambahan [Additive Manufacturing]
MMJ42903	Penyejukan dan Penyamanan Udara [Refrigeration & Air Conditioning]
MMJ43103	Tenaga Diperbaharui [Renewable Energy]
MMJ43203	Enjin Pembakaran Dalam [Internal Combustion Engine]
MMJ43303	Perkomputeran Dinamik Bendalir [Computational Fluid Dynamics]
MMJ47003	Projek Reka Bentuk Bersepadu Pembuatan [Manufacturing Integrated Design Project]
MMK10103	Sains Bahan [Materials Science]
MMK10203	Statik dan Dinamik [Statics and Dynamics]
MMK10303	Asas Elektrikal dan Elektronik [Basic Electrical and Electronics]
MMK10403	Grafik Kejuruteraan [Engineering Graphics]
MMK10502	Teknologi Bengkel [Workshop Technology]

LIST OF COURSES:

COURSE CODE	COURSE NAME
MMK11103	Kawalan Kualiti [Quality Control]
MMK11203	Mekanik Bendalir [Fluid Mechanics]
MMK11302	Pengaturcaraan Komputer [Computer Programming]
MMK11403	Pengurusan Projek [Project Management]
MMK11502	Teknologi Pembuatan [Manufacturing Technology]
MMK20103	Termodinamik [Thermodynamics]
MMK20203	Kekuatan Bahan [Strength of Materials]
MMK11603	Rekabentuk Berbantu Komputer [Computer Aided Design]
MMK21103	Kejuruteraan Berbantu Komputer [Computer Aided Engineering]
MMK21203	Pemindahan Haba [Heat Transfer]
MMK32103	Ekonomi Pembuatan [Manufacturing Economics]
MMK33104	Projek Pemesinan [Machining Project]
MMK12103	Teori Dalam Pemesinan [Theory in Machining]
MMK22104	Pemesinan Kovensional [Coventional Machining]
MMK22203	Teknologi CNC [CNC Technology]
MMK31103	Ergonomik dan Keselamatan [Ergonomics and Safety]
MMK31204	Projek Tahun Akhir I [Final Year Project I]
MMK41206	Projek Tahun Akhir II [Final Year Project II]
MMK32303	Geometri, Pendimensian dan Toleransi [Geometric, Dimensioning and Tolerancing]
MMK32403	Rekabentuk Jig dan Lekapan [Jig and Fixture Design]
MMK32502	Pemesinan Mapan [Sustainable Machining]
MMK32603	Pembuatan Berbantu Komputer [Computer Aided Manufacturing]
MMK32703	Teknologi Pemesinan Termaju [Advanced Machining Technology]
MMK33103	Aloi dan Komposit Logam [Alloy & Metal Composite]
MMK33203	Simulasi Suntikan Acuan Plastik [Plastic Injection Moulding Simulation]

LIST OF COURSES:

COURSE CODE	COURSE NAME
MMK33303	Pengkomputeran Dinamik Bendalir [Computational Fluid Dynamics]
MMK43403	Teknologi Pengisaran Moden [Modern Grinding Technology]
MMK43503	Ujian Tak Musnah [Non-Destructive Testing]
MMK43603	Hingar & Getaran [Noise and Vibration]
MMK43703	Teknologi Mata Alat Pemotong [Cutting Tool Technology]
MMK43803	Proses Pencirian Termaju [Advanced Characterization Process]
MMK30103	Pengurusan Teknologi Kejuruteraan [Engineering Technology Management]
MMK31303	Teknologi Kejuruteraan Dalam Masyarakat [Engineering Technologist in Society]
MMK49912	Latihan Industri [Industrial Training]
MMK15102	Biologi Gunaan [Applied Biology]
MMK15202	Pengenalan kepada Pertanian [Introduction to Agriculture]
MMK25102	Teknologi Pengeluaran Tanaman Ladang [Plantation Crop Production Technology]
MMK24103	Sistem Pneumatik dan Hidraulik [Pneumatic and Hydraulic Systems]
MMK24203	Kawalan dan Instrumentasi [Instrumentation and Control]
MMK25202	Kejuruteraan Tanah [Soil Engineering]
MMK25303	Teknologi Pengeluaran Penternakan dan Akuakultur [Livestock and Aquaculture Production Technology]
MMK25402	Teknologi Pengeluaran Tanaman Makanan [Food Crop Production Technology]
MMK34103	Automasi dalam Sistem Pertanian [Automations in Agricultural Systems]
MMK35103	Teknologi Lepas Tuai [Post-Harvest Technology]
MMK34203	Projek Reka Bentuk dalam Pertanian [Agricultural Design Project]
MMK35203	Teknologi Pertanian Tepat [Precision Agriculture Technology]
MMK35303	Tenaga Diperbaharui Dalam Sistem Pertanian [Renewable Energy in Agriculture Systems]
MMK44103	Kuasa Ladang dan Mesin [Farm Power and Machinery]
MMK45103	Kejuruteraan Pengurusan dan Penggunaan Sisa Pertanian [Agricultural Waste Management and Utilization Engineering]
MMK45203	Persekitaran Terkawal untuk Pertanian [Controlled Environment Agriculture]

LIST OF COURSES:

COURSE CODE	COURSE NAME
MMK45303	Kejuruteraan Pemprosesan Makanan [Food Processing Engineering]
MMK17003	Asas Reka Bentuk Industri [Basic Industrial Design]
MMK17102	Reka Bentuk Visual [Design Visualization]
MMK26003	Reka Bentuk Berbantu Komputer II [Computer Aided Design II (CAD II)]
MMK26103	Kejuruteraan Berbalik & Pembuatan Bahan Tambah [Reverse Engineering & Additive Manufacturing]
MMK26203	Prototaip dan Pembuatan Model [Prototyping and Model Making]
MMK27203	Reka Bentuk Integrasi [Design Integration]
MMK27303	Reka Bentuk Studio I [Design Studio I]
MMK36303	Kejuruteraan Berbantu Komputer II [Computer Aided Engineering II (CAE II)]
MMK36403	Studio Reka Bentuk II [Design Studio II]
MMK36503	Revolusi Industri [Industrial Revolution]
MMK37403	Pengurusan Inovasi & Pembangunan Produk [Innovation Management& Product Development]
MMK37503	Pengurusan Produk Bagi Pereka Bentuk [Product Management for Designers]
MMK37603	Pengkajian Produk dan Amalan Profesional [Product Study and Professional Practice]
MMK47703	Reka bentuk Untuk Pembuatan dan Pemasangan [Design for Manufacturing and Assembly]
MMK28103	Pengujian Bahan [Materials Testing]
MMK28203	Pencirian Bahan [Materials Characterization]
MMK28303	Pemprosesan Seramik Tembikar Putih [Whiteware Ceramic Processing]
MMK28403	Teknologi Pengekstrakan Logam [Metal Extraction Technology]
MMK28503	Pemprosesan Plastik [Plastic Processing]
MMK38103	Kawalan Proses [Process Control]
MMK38202	Rekabentuk Acuan dan Dai [Design of Die & Moulds]
MMK38303	Teknologi Fabrikasi Logam [Metal Fabrication Technology]
MMK38403	Pemprosesan Bahan Komposit [Composite Materials Processing]

LIST OF COURSES:

COURSE CODE	COURSE NAME
MMK39103	Perekat Polimer dan Penglitup [Polymer Adhesive and Coatings]
MMK39203	Teknologi Getah dan Lateks [Rubber and Latex Technology]
MMK39303	Metalurgi Termaju [Advanced Metallurgy]
MMK39403	Teknologi Bahan Geopolimer [Geopolymer Materials Technology]
MMK38503	Pemilihan Bahan dan Rekabentuk [Material Selection and Design]
MMK48103	Bahan untuk Tenaga dan Kemampanan Alam Sekitar [Material for Energy and Environmental Sustainability]
MMK49103	Teknologi Seramik Teknikal [Technical Ceramic Technology]
MMK49203	Teknologi Kaca [Glass Technology]
MMT15003	Lukisan Produk dan Spesifikasi *[Product Drafting and Specification]*
MMT15103	Piawaian Kepersisan Produk *[Standard Product Precision]*
MMT15203	Sifat-sifat Bahan Kerja dan Alat Pemotong *[Workpiece and Cutting Tool Properties]*
MMT15303	Jig dan Lekapan *[Jig and Fixture]*
MMT15404	Penyediaan dan Pembaikpulih Mata Alat *[Tool Setup and Refurbishment]*
MMT15503	Pemesinan Mapan *[Sustainable Machining]*
MMT15603	Taksiran Kebolehmesinan *[Assessment of Machinability]*
MMT15703	Pemantauan Keadaaan dalam Pemesinan *[Condition Monitoring in Machining]*
MMT25004	Kepersisan dan Kemasan dalam Teknologi CNC *[Precision and Finishing in CNC Technology]*
MMT25103	Kepersisan Dan Kemasan dalam Teknologi EDM dan Pencanaian *[Precision and Finishing in EDM and Grinding Technology]*
MMT25204	Produk Prismatik CADCAM *[Prismatic CADCAM Product]*
MMT25304	Estetika Permukaan Komponen Mesin *[Surface Aesthetics of Machined Component]*
MMT25404	Pemesinan Paksi Pelbagai *[Multi Axis Machining]*
MMT25503	Produk Kompleks CADCAM *[Complex CADCAM Product]*
MMT25604	Rawatan Haba Kompenan Mesin *[Heat Treatment of Machined Component]*
MMT25804	Projek Keusahawanan Teknologi 1 *[Technopreneur Project 1]*
MMT35004	Kaedah Pemasangan *[Assembly Method]*

LIST OF COURSES:

COURSE CODE	COURSE NAME
MMT35104	Kerja semula dan pemulihan Komponen Mesin *[Rework and Rehabilitation of Machined Component]*
MMT35204	Projek Keusahawanan Teknologi 2 [*Technopreneur Project 2*]
MMT31504	Projek Tahun Akhir 1 *[Final Year Project 1]*
MMT35304	Pengurusan dan Penyeliaan Projek *[Project Management and Supervision]*
MMT35404	Penilaian Tindakan dan Risiko dalam Pengeluaran Pemesinan *[Acts and Risks Assessment in Machining Production]*
MMT35504	Peyelenggaraan Mesin *[Machine Maintenance]*
MMT35604	Pembuatan Alat dan Die *[Tool and Die Making]*
MMT35704	Pemesinan Aeroangkasa *[Aerospace Machining]*
MMT35804	Pemesinan Pantas *[Rapid Machining]*
MMT35903	Teknologi Faktor Manusia *[Human Factor Technologi]*
MMT36004	Perancangan Pengeluaran dalam Pemesinan *[Production Planning in Machining]*
MMT41506	Projek Tahun Akhir 2 *[Final Year Project 2]*
MMT49912	Latihan Industri *[Industrial Training]*
MMT11004	Industri Automotif dan Teknologi [*Automotive Industry & Technology*]
MMT11103	Lukisan Automotif [*Automotive Drafting*]
MMT11204	Amalan Bengkel Automotif [*Automotive Workshop Practice*]
MMT11303	Penyeliaan Bahagian Pengeluaran [*Shopfloor Supervision*]
MMT31504	Projek Tahun Akhir 1 *[Final Year Project 1]*
MMT35304	Pengurusan dan Penyeliaan Projek *[Project Management and Supervision]*
MMT11404	Reka Bentuk Komponen Automotif dan Pemasangan [*Automotive Component Design and Assembly*]
MMT11504	Fabrikasi Komponen Automotif [*Automotive Component Fabrication*]
MMT21003	Pengurusan Projek [*Project Management*]
MMT21104	Servis Sistem Autotronik [*Autotronic System Service*]
MMT21404	Servis Kenderaan Dagangan [*Commercial Vehicle Servicing*]
MMT21504	Reka Bentuk Permukaan [*Surface Design*]

LIST OF COURSES:

COURSE CODE	COURSE NAME
MMT21604	Penyenggaraan Rangkaian Pemacu [*Drivetrain Maintenance*]
MMT 21704	Pemodelan Automotif [*Automotive Modelling*]
MMT21204	Servis Sistem Rangkaian Kuasa [*Powertrain System Service]*
MMT21304	Projek Keusahawanan Teknologi 1 [*Technopreneur Project 1*]
MMT21804	Analisa Prestasi Kenderaan [*Vehicle Performance Analysis*]
MMT21904	Reka Bentuk Luaran [*Exterior Design*]
MMT22004	Diagnosis Kegagalan Kenderaan [*Vehicle Fault Diagnosis*]
MMT22104	Pembuatan Semula Komponen [*Component Remanufacturing*]
MMT31003	Perundangan Automotif [*Automotive Legislation*]
MMT31104	Projek Keusahawanan Teknologi 2 [*Technopreneur Project 2*]
MMT31202	Pemasaran Kenderaan [*Vehicle Marketing*]
MMT31704	Servis Hibrid [*Hybrid Servicing*]
MMT31804	Reka Bentuk Dalaman [*Interior Design*]
MMT31904	Servis Kenderaan Elektrik [*Electric Vehicle Service*]
MMT32004	Mengecat [*Painting*]
MMT31306	Pengurusan Kualiti [*Quality Management*]
MMT31403	Pengurusan Risiko [*Risk Assessment*]
MMT31603	Pengurusan Aset & Inventori [*Asset & Inventory Management*]
MMT13004	CAD dan Grafik Kimpalan [CAD and Welding Graphics]
MMT13104	Keselamatan dalam Kimpalan [Safety in Welding]
MMT13204	Teknologi Fabrikasi Logam [Metal Fabrication Technology]
MMT13303	Rekabentuk Produk dalam Kimpalan [Product Design in Welding]
MMT13404	Dokumentasi Kimpalan [Welding Documentation]
MMT13504	Proses Kimpalan Bukan Konvensional [Non-Conventional Welding Process]
MMT23004	Perilaku Bahan dalam Kimpalan [Material Behaviour in Welding]

LIST OF COURSES:

COURSE CODE	COURSE NAME
MMT23104	Pengurusan Keselamatan [Safety Management]
MMT23204	Analisis Rekabentuk Kimpalan [Welding Design Analysis]
MMT23304	Teknologi Kimpalan untuk Profesional [Welding Technology for Professional]
MMT23404	Ujian Tanpa Musnah untuk Profesional [NDT For Professional]
MMT23504	Pemeriksaan Kimpalan untuk Profesional [Welding Inspection for Professional]
MMT23604	Analisis Berbantu Komputer [Computer Aided Analysis]
MMT23704	Pengujian dan Ketidaksempurnaan dalam Kimpalan [Imperfection In Welding and Testing]
MMT23804	Peralatan Kimpalan Elektrik [Welding Electrical Equipment]
MMT23904	Projek Keusahawanan Teknologi 1 [Technopreneur Project 1]
MMT33004	Jaminan Kualiti Kimpalan [Welding Quality Assurance]
MMT33104	Ekonomi Kimpalan dan Perolehan [Economic Of Welding and Procurement]
MMT33204	Ujian Tanpa Musnah [Non -Destructive Test]
MMT33304	Projek Keusahawanan Teknologi 2 [Technopreneur Project 2]
MMT33403	Sistem Fizikal Siber dalam Kimpalan [Cyber Physical System in Welding]
MMT33504	Pemulihan dalam Kimpalan [Reclaimination In Welding]
MMT33604	Pengurusan Pengeluaran dan Pengawasan [Managing Production and Supervision]

MMJ10103 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:
1. Ability to analyse engineering problems by applying the fundamental concept and principle of statics.
2. Ability to evaluate static problems using the principles of equilibrium.

MMJ10203 DINAMIK KEJURUTERAAN [ENGINEERING DYNAMICS]

No of Credits: 3

Course Synopsis:
This course introduces the basic laws of motion involving kinematics and kinetics of a particle and rigid body. The concepts of force, energy, momentum, and impulse are reviewed for both particle and rigid body where several techniques are introduced to assist in the analysis of a mechanical system. At the end of the course, the students are expected to be able to solve engineering problems related to mechanisms and motions.

Course Outcomes:
1. Ability to analyze problems related to kinematics of a particle and planar kinematics of a rigid body.
2. Ability to evaluate problems related to kinetics of particle.
3. Ability to evaluate problems related to planar kinetics of a rigid body.

MMJ10303 MEKANIK PEPEJAL I [SOLID MECHANICS I]

No of Credits: 3

Course Synopsis:
This course introduces concept of stress and strain as well as mechanical properties of materials. It is also covering various type of loadings which occur in beam, shaft and member related to axial load, torsion, bending and transverse shear. The stress strain transformation analysis will also be discussed. At the end of this course, students will be able to solve related engineering problems applied by various loadings.

Course Outcomes:
1. Ability to analyze engineering problems using fundamental theory of solid mechanics and produce stress strain transformation analysis
2. Ability to evaluate problems related to various loadings

MMJ10403 TERMODINAMIK I [THERMODYNAMICS I]

No of Credits: 3

Course Synopsis:
Thermodynamics is one of the main foundations in mechanics which is the backbone of the Mechanical Engineering. This field is a combination of the concepts of thermal energy and energy movement in engineering. The extension of knowledge of the field of thermodynamics leads to the application of heat transfer, thermal-fluid and subsequently to dynamics gas.

Course Outcomes:
1. Ability to analyse the properties of pure substance.
2. Ability to formulate energy balance accordingly to the first law of thermodynamics for a system.
3. Ability to evaluate the second law of thermodynamics with entropy changes of substances in a system.

MMJ12102 LUKISAN TERBANTU KOMPUTER [COMPUTER AIDED DRAFTING]

No of Credits: 2

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, CAD software will be introduced to create 2-D and 3-D engineering drawings which including sketching techniques, multiview projections, isometric view, sectional and auxiliary view representation and dimensioning techniques. The use of solid modeling software to capture design object and generate engineering drawings gives the opportunity to apply this knowledge for engineering design projects.

Course Outcomes:
1. Ability to interpret technical drawings as a communication tool and understanding concepts of drafting in mechanical engineering discipline.
2. Ability to produce engineering drawings using computer aided software

MMJ12202 BAHAN KEJURUTERAAN [ENGINEERING MATERIALS]

No of Credits: 2

Course Synopsis:
This course provides concept that relates basic understanding of engineering materials, their structure and the influence of structure on material behaviour. The course topics involve investigating the relationships that exist between the structures and properties of materials. Upon completion of this course, student will be able to analyse aharacteristic properties of engineering materials and relate the properties for various engineering applications.

Course Outcomes:
1. Ability to analyse engineering materials including materials behavior and atomic structure
2. Ability to evaluate mechanical properties of metals and processing of metals.

MMJ12302 BENGKEL MEKANIKAL [MECHANICAL WORKSHOP]

No of Credits: 2

Course Synopsis:
The objective of this course is to introduce and provide the students with theoretical and practical skills required in normal engineering workshop practices involving the selection and operation of some commonly used workshop tools and machines. At the end of this course the students will be able to appreciate various skills and technology to fabricate some simple engineering workpieces/parts, by operating ordinary workshop machine tools and practices such as manufacturing metrology, lathe, milling and drilling machine, welding, and CNC machining.

Course Outcomes:
1. Ability to identify and choose the proper measurement tools
2. Ability to safely operate equipment and tools in metal working and distinguish between their applications.

MMJ12403 PROSES-PROSES PEMBUATAN [MANUFACTURING 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 student will be able to decide suitable manufacturing processes in fabrication of products.

Course Outcomes:
1. Ability to analyze information of the right raw materials for a manufacturing process
2. Ability to analyze an appropriate process or process sequence to the products to be produced.
3. Ability to optimize the design through the use of a desirable manufacturing process.

MMJ12503 PENGATURCARAAN KOMPUTER [COMPUTER PROGRAMMING]

No of Credits: 3

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 and their application on solving engineering problems. C programming language is utilized in this course.

Course Outcomes:
1. Ability to construct C programs with the desired input/ output.
2. Ability to construct C programs with control structure and looping.
3. Ability to construct C programs with functions and numeric arrays.

MMJ12603 LITAR DAN MESIN ELEKTRIK [ELECTRICAL CIRCUIT & MACHINE]

No of Credits: 3

Course Synopsis:
This course covers the fundamental concepts of electrical circuits including DC, AC, and electromagnetics. The students will also be exposed to the basics of the three-phase systems and their applications as well as the electrical machines. At the end of this course, the students should be able to evaluate an electrical circuit in order to solve engineering problems. In addition, the students should be able to select and characterize the electrical machines for specific applications.

Course Outcomes:
1. Ability to analyse the electrical circuit to solve engineering problems.
2. Ability to evaluate the electrical circuit and electrical machine in engineering applications.

MMJ15103 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 Direct Current (DC) and Alternating Current (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:
1. Ability to apply the electrical laws and theorems to solve direct current (dc) circuits to determine the voltage, current, resistance and power.
2. Ability to analyse and solve single phase and three phase alternating current (ac) circuits for its impedance, voltage, current, power and power factors.
3. Ability to analyse the concept of magnetic fields and the principle operation of a transformer.
4. Ability to apply the concept and principles used in electrical machines and their applications

MMJ15203 ELEKTRONIK [ELECTRONICS]

No of Credits: 3

Course Synopsis:
This course main purpose is to give introduction and exposure to student about 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), Operational Amplifier and active filters. The digital device topic includes the introduction to 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 and introduction to microprocessor . Laboratory experiment will also be done to clarify the topics learned in the class.

Course Outcomes:
1. Ability to analyse the rectifier and voltage regulator circuits.
2. Ability to analyse the applications of transistor for signal amplification and switching circuits.
3. Ability to analyse the operation and applications of operational amplifier and active filters.
4. Ability to analyse the operation of digital circuit using the digital theorem.

MMJ15402 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 and their application on solving engineering problems. An open source software of C programming language is utilized in this course. Students will gain understanding and ability to identify problems and come up with the most efficient ways to solve them via programming. Students are expected to complete several programming assignments and programming tests.

Course Outcomes:
1. Ability to construct C programs with the most suitable variables: perform correct arithmetic operations, math functions and desired input/ output.
2. Ability to construct C programs with control structure and looping.
3. Ability to construct C programs with functions and numeric arrays.

MMJ16103 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:
1. Ability to analyse transformation,microstructure and behaviors of engineering materials - ferrous, non-ferrous and polymer.
2. Ability to evaluate mechanical and corrosion properties of engineering materials.
3. Ability to justify advanced materials and sustainable materials

MMJ16202 REKA BENTUK KEJURUTERAAN [ENGINEERING DESIGN]

No of Credits: 2

Course Synopsis:
The course introduces the concepts and principles of engineering design approach to solve engineering problems. Engineering design is the systematic integration of scientific principles, technical information and aesthetics in the definition of a product, process or system to perform pre-specified functions with maximum economy and efficiency. Therefore, the course introduces the phases of the engineering design process.

Course Outcomes:
1. Ability to generate product design specifications from customer needs and market analysis, and design requirements and constraints.
2. Ability to generate design concepts based on specifications and apply design screening technique to select the best concept.
3. Ability to communicate effectively design ideas and information.
4. Ability to evaluate designs critically based on engineering criteria and application of predictive analytics.

MMJ17102 PROSES PEMBUATAN I [MANUFACTURING PROCESS I]

No of Credits: 2

Course Synopsis:
This course provides students to explore the manufacturing processes used in industries in converting raw material into finished products. This course is divided into five main processes which are solidification processes, particulate processing, deformation processes, material removal processes and joining processes. The students are expected to be able to analyze the manufacturing processes in producing good quality finished products.

Course Outcomes:
1. Ability to analyze solidification processes, particulate processing, material removal processes, deformation processes and joining processes.
2. Ability to assess the suitable manufacturing processes on a product using research based knowledge (research literature).

MMJ17203 PROSES PEMBUATAN II [MANUFACTURING PROCESS II]

No of Credits: 3

Course Synopsis:
This course covers a wide range of fundamental machining operations, including machining techniques, machine tools, cutting instruments, cutting fluid, and surface treatment technology. Machine parameters, computation speed and feed rate, handling machines, CNC programming, abrasive machining and surface technology are covered. Students will be able to undertake machining processes based on traditional machining knowledge and build rudimentary CNC programming to carry out machining processes to produce items at the conclusion of the course. In addition, they will also be furnished with knowledges on the surface technology and abrasive machining.

Course Outcomes:
CO1 - Ability to analyze the mechanics of cutting process and CNC process.
CO2 - Ability to design machining programs for CNC turning, milling and drilling procedures using complex cutting paths and tool setting.
CO3 - Ability to analyse processes for abrasive machining and surface treatment method.

MMJ17302 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 be divided into five workshops; first workshop: solidification process will be introduced including sand casting and plastic injection molding process. Second workshop: conventional machining processes including turning, milling and drilling. Third workshop: particulate processing of metal, forming and sheet metalworking. Fourth workshop: various joining and assembly processes such as welding and mechanical fastening processes, and the last workshop: students need to do fabrication and presentation of mini projects that are given by lecturers.

Course Outcomes:
1. Ability to describe, report and communicate on metal processing and polymer processing
2. Ability to demonstrate application of safety in the activities relevant to engineering practice
3. Ability to operate equipment/machine used for metal processing and polymer processing

MMJ17502 LUKISAN KEJURUTERAAN [ENGINEERING DRAWING]

No of Credits: 2

Course Synopsis:
The objective of this course is to provide exposure and skills to students in basic engineering drawing, Computer-Aided Drawing (CAD) and its engineering application. This course covers manual drafting using drawing equipment and using software (Catia). Also, this course covers Geometric Dimensioning and Tolerance (GDT), which enhance students' ability to interpret and analyse engineering data from drawing.

Course Synopsis:
1. Ability to produce technical drawing and drafting using manual technique.
2. Ability to produce technical drawing using Catia software.
3. Ability to practice Geometric Dimensioning and Tolerance (GDT) on technical drawing.

MMJ20103 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's equation. Momentum analysis, modelling, and concepts of internal flow. At the end of this course, students will be able to solve, analyse and evaluate the problems dealing with fluid mechanics.

Course Outcomes:
1. Ability to apply the various properties of fluids in evaluating problems related to fluids statics.
2. Ability to evaluate fluid dynamics and kinematics problems.
3. Ability to analyse and evaluate problems related to flow in pipe.
4. Ability to perform experiments related to fluid mechanics and measure concern parameters/ variables during the experiment.

MMJ22103 MEKANIK PEPEJAL II [SOLID MECHANICS II]

No of Credits: 3

Course Synopsis:
The topics is extended and emphasized on combined loadings related to axial load, torsion, bending and shear occur in beam, shaft and member. It is also covered an introduction on deflection, buckling, and energy method theory. At the end of this course, students will be able to solve related engineering problems applied by various loadings.

Course Outcomes:
1. Ability to analyze the stress in a member subjected to several loadings
2. Ability to design a prismatic beam for engineering application
3. Ability to evaluate engineering problems involving deflection and buckling behaviour

MMJ22203 BAHAN DALAM REKA BENTUK [MATERIALS IN DESIGN]

No of Credits: 3

Course Synopsis:
This course provides a comprehensive treatment of the selection of materials in mechanical design. Selection of materials will be performed on the basis of their properties (i.e. performance requirements), constraints imposed by the design and how the part will be manufactured for a particular end-use/application. At the end of this course, students should be able to demonstrate a sound knowledge of materials selection method, and how these must be taken into account during the design process.

Course Outcomes:
1. Ability to analyse the requirement on material selection process in solving mechanical design problems.
2. Ability to evaluate critically the mechanical design using engineering criteria, design tools and computer-based techniques.
3. Ability to propose suitable materials in mechanical design

MMJ22303 REKA BENTUK KOMPONEN [COMPONENT DESIGN]

No of Credits: 3

Course Synopsis:
This course introduces the concepts and principles of design consideration for mechanical components. Design and analysis of mechanical components that consists of screws and fasteners, springs, bearings, gears, clutches, brakes, belts and chains in mechanical systems will be studied. Theories and criteria of material failures under static and variable loadings will also be discussed. Design parameters that could contribute to the failure of those components will be considered. At the end of the course, the students are expected to be able to perform the stress analysis on mechanical components for design judgement.

Course Outcomes:
1. Ability to analyze the design parameters of components in mechanical systems.
2. Ability to analyze failure prediction under static and variable loadings for mechanical components.
3. Ability to propose solution for components design in mechanical system problems.

MMJ22403 TERMODINAMIK II [THERMODYNAMICS II]

No of Credits: 3

Course Synopsis:
This course provides the advanced analysis of the thermodynamics cycles for engineering applications. Emphasis will be given to the gas power cycles, vapour power cycles, refrigeration cycles, gas vapour mixtures, airconditioning, chemical reactions and phase equilibrium. These cycles are classified as power and refrigeration cycles. Complex engineering problem solving will be focused for industry and everyday life applications.

Course Outcomes:
1. Ability to create solution for the problems in gas, vapor and combined power cycles, each in their applications.
2. Ability to create solution for the problems in refrigeration and air conditioning cycles.
3. Ability to analyze the problem in chemical reactions, adiabatic flame temperature and phase equilibrium.

MMJ22503 MEKANIK BENDALIR II [FLUID MECHANICS II]

No of Credits: 3

Course Synopsis:
This course is offered to enhance the basic knowledge that has been developed in Fluid Mechanics I. It introduces the analysis of real/ideal fluid with and without compressibility effect in a flow system. It also emphasizes on the differential analysis of fluid flow, boundary layer, potential flow theory, compressible flow, shock waves and expansion waves in practical engineering applications. At the end of the course, students should be able to demonstrate and apply the theory to solve problems related to fluid flow.

Course Outcomes:
1. Ability to analyze the differential analysis of fluid flow and boundary layer problems on flows past a flat plate.
2. Ability to analyze the differential analysis of fluid flow and boundary layer problems on flows past a flat plate
3. Ability to evaluate the consequences of compressibility in gas flow with and without the effects of friction and heat transfer.

MMJ22603 INSTRUMENTASI DAN PENGUKURAN [INSTRUMENTATION & MEASUREMENT]

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 on 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 software for simulating or solving instrumentation and measurement applications is also covered in this course.

Course Outcomes:
1. Ability to explain and analyze basic concepts of transducers, sensors and measurement techniques and errors in measurement.
2. Ability to apply and analyze interfacing concept between transducers, computer and signals obtained from measurement techniques.
3. Ability to design and evaluate measurement system using suitable sensors and transducers.
4. Ability to use software to solve instrumentation and measurement problems.

MMJ25102 INSTRUMENTASI [INSTRUMENTATION]

No of Credits: 2

Course Synopsis:
Instrumentation is a collective term for measuring instruments that are used for indicating, measuring and recording physical quantities. Today, this system has been used in a wide range of manufacturing and industrial processes to measure variables such as pressure, flow, temperature, displacement, and etc. These variables are consistently measured and monitored to ensure the output of a specific process are within a desired acceptable range and at the same time protect the safety of equipment in the system. Essential knowledge on the principle and operation of measuring instruments will help the engineer to understand the automated system used in manufacturing technology.

Course Outcomes:
1. Ability to understand the terminology used in instrumentation systems and signal conditioning methods for measurement systems.
2. Ability to analyze the characteristic performances for displacement, motion and strain measurements.
3. Ability to analyze the characteristic performances for pressure, flow and temperature measurements.

MMJ25203 SISTEM KAWALAN [CONTROL SYSTEMS]

No of Credits: 3

Course Synopsis:
The course shall cover the essential and basic theory of control systems. The students will be exposed to mathematical modeling for electrical and mechanical systems using block diagrams and transfer functions. In addition, they will be able to determine and analyze the characteristic, stability and performance of the feedback control system in time and frequency domain. The students will also learn how to design a feedback control system.

Course Outcomes:
1. The ability to perform a system's time-domain analysis with response to test inputs. Analysis includes the determination of the system stability and steady-state errors.
2. Ability to design and analyze the controller's performance using root locus technique.
3. The ability to perform system's frequency-domain analysis with response to test inputs. Analysis includes the determination of the system stability.

MMJ26103 REKA BENTUK UNTUK PEMBUATAN [DESIGN FOR MANUFACTURE]

No of Credits: 3

Course Synopsis:
This course introduces students on the design approach that focuses on ease of manufacture and efficiency of assembly. Student will learn the guidelines and rules in designing each part/component of the product as well as the assembly analysis to determine Assembly Efficiency (AE). In term of Design for Manufacture (DFM), student will learn on how to select the appropriate material and manufacturing process of each part/component of the product. At the end, student will be able to analyze an existing product design and subsequently propose a better design with appropriate manufacturing process and material selection for ease of manufacture and assembly.

Course Outcomes:
1. Ability to apply knowledge in the selection of appropriate material and process selection.
2. Ability to improve design efficiency of products using Design for Assembly (DFA) Methodology.
3. Ability to develop parts design, with consideration of manufacturability.
4. Ability to contribute effectively as a team member in project execution.

MMJ26203 REKA BENTUK KOMPONEN MESIN [MACHINE COMPONENTS DESIGN]

No of Credits: 3

Course Synopsis:
This course presents the concepts and methods essential to mechanical engineering design, analysis, and application. In-depth coverage of major topics, including free body diagrams, force and strength analysis to design the element of machine components. This course also focused on how to identify the critical design parameters that transform, transmit or use energy, load or motion for a specific purpose. Critical thinking and problem-solving skills are strengthened through an appropriate procedure and framework, enabling the effective identification of problems and clear presentation of solutions.

Course Outcomes:
1. Ability to analyze and synthesize engineering data to design the element of machine components such as Gears, Shafts, Bearings, Screw and Fasteners, Belt, Chain Drives, Keys, Coupling, seals and Springs.
2. Ability to comprehend and write effective report writings or design documentations.

MMJ27102 PEMBUATAN BERBANTU KOMPUTER [COMPUTER-AIDED MANUFACTURING]

No of Credits: 2

Course Synopsis:
This course introduces the principles and applications of the CAM system, which is used in the field of manufacturing engineering. It enables students to comprehend theories, concepts, and applications of CAM as they apply to manufacturing processes in the industry. Students will illustrate and design components/parts in a three-dimensional (3D) model using CAD/CAM software. The students will then be exposed how to use CAM software to simulate the 3-dimensional (3D) machining process in order to generate numerical control (NC) codes that will be transferred and operated on a computer numerical control (CNC) machine.

Course Outcomes:
1. Ability to construct 3D solid modelling for CAM simulation using CAD/CAM software.
2. Ability to simulate 3D solid part and generate Computer Numerical Control (CNC) program for basic and advanced milling and turning processes in CAM software.

MMJ27203 KEJURUTERAAN KUALITI [QUALITY ENGINEERING]

No of Credits: 3

Course Synopsis:
This course gives an understanding about the concepts and techniques in total quality management and the relationship between these fields of knowledge. Students will be exposed to the technique of reliability system, accepted sampling and process capability to enhance the quality in engineering application. In addition, students learn about quality control tools, FMEA and management quality tools of engineering systems. Practical work will help student's gain effective understanding in quality and product liability.

Course Outcomes:
1. Ability to evaluate the quality problems using seven quality control (QC) tools, FMEA, management and planning tools in engineering application.
2. Ability to develop the reliability system, accepted sampling and process capability to enhance the quality in engineering application
3. Ability to analyze the quality cost, product liability and problems in troubleshooting issues related to quality.

MMJ27403 KEJURUTERAAN INDUSTRI [INDUSTRIAL ENGINEERING]

No of Credits: 3

Course Synopsis:
This course introduces the fundamentals of Industrial Engineering. It covers elements of industrial engineering, the installation of people, materials, equipment, information and economics for improvement and increase productivity. 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 productivity, minimize waste and performing necessary evaluation in work study for manufacturing operations.

Course Outcomes:
1. Ability to explain and analyze the fundamental concepts of industrial engineering and manufacturing productivity
2. Ability to analyze work study in manufacturing operations
3. Ability to analyze the facilities planning through its location and design components
4. Ability to propose block layout from layout procedures and algorithms.

MMJ30103 PENGURUSAN UNTUK JURUTERA [MANAGEMENT FOR ENGINEERS]

No of Credits: 3

Course Synopsis:
This course aims to teach students how to apply project management skills when undertaking projects. This course is also designed to provide basic tools of the 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:
1. Ability to develop and evaluate project requirements and integrate the processes of project management like work plans, scheduling, cost estimation and perform project evaluation.
2. Ability to integrate and evaluate economic scenarios and integrate decision making process to engineering project and business ventures

MMJ32103 MEKANISMA DAN MESIN[MECHANISM & MACHINE]

No of Credits: 3

Course Synopsis:
This course is intended as an advanced knowledge of mechanism and machine to design and evaluate machine elements and machinery in mechanical engineering for undergraduate level. The course will emphasize on analytical and graphical techniques to evaluate the machine elements and machinery in mechanical engineering applications to achieve effective design.

Course Outcomes:
1. Ability to determine the kinematic characteristics of mechanisms in a mechanical system.
2. Ability to derive the kinematic characteristics of displacement, velocity and acceleration in a mechanical system.
3. Ability to revise the machinery dynamics of a mechanical system.

MMJ32203 ANALISIS UNSUR TERHINGGA [FINITE ELEMENT ANALYSIS]

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 will also 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:
1. Ability to determine the stiffness matrices and identify boundary conditions for various engineering problems.
2. Ability to evaluate engineering problems using various approaches in finite element methods.
3. Ability to solve engineering problems using computational tools.

MMJ32303 PEMODELAN DAN ANALISA PARAMETRIK [PARAMETRIC MODELLING & ANALYSIS]

No of Credits: 3

Course Synopsis:
This course will develop skills and knowledge in using CAED tools for mechanical engineering design. The outcome of the course will impart knowledge related to principles, methods and techniques to create and manipulate parametric models, engineering communication, analysis and optimization using CAED software. Students will undertake practical works for design, analysis, simulation, evaluation and optimization of mass properties, static-stresses, thermal deformations by applying CAD and CAE software tools to design of simple parts, assemblies, mechanisms and structures.

Course Outcomes:
1. Ability to apply solid parametric modelling and use 3D CAD software tools in the correct manner for making geometric part models, assemblies and automated drawings of mechanical components and assemblies.
2. Ability to use CAD software tools for assembly of mechanism from schematic or component drawing and conduct position/ path/ kinematic / dynamic analysis of a mechanism in motion.
3. Ability to analyse part design and to evaluate and optimize parts using commercial CAD, CAE software for mechanical application that required mass properties/ stress, deflection / temperature distribution under realistic loading and constraining conditions.

MMJ32402 PROJEK REKA BENTUK BERSEPADU I [INTEGRATED DESIGN PROJECT I]

No of Credits: 3

Course Synopsis:
Integrated design project integrates mathematics, engineering, basic sciences and complementary studies in developing elements, systems, and processes to meet specific needs. This course aims to develop an understanding to strategically and systematically observe, develop, 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 brings together the marketing, design, and manufacturing functions. It is a creative, iterative, and often open-ended process subjected to constraints which may be governed by standards, or legislation to varying degrees within mechanical engineering discipline. This course will require students to work in a group environment and collaborate with other members of group to arrive at good design decisions and then to provide proper reports on these decisions upon completion.

Course Outcomes:
1. Ability to develop design requirements in defining and solving complex mechanical engineering problems.
2. Ability to propose design concepts that meets customer and functional requirements based on constraints and concerns using engineering design methods.
3. Ability to assist in a team for the successful delivery of design project.

MMJ32503 PROSES REKA BENTUK KEJURUTERAAN [ENGINEERING DESIGN PROCESS]

No of Credits: 3

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, develops, 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:
1. Ability to determine design requirements and produce clear design information and ideas.
2. Ability to integrate fundamentals engineering design theory in the selection creation of components and mechanism for solving structured and unstructured design problems.
3. Ability to develop critically the design of mechanical system using engineering criteria and design tools.

MMJ32603 PEMINDAHAN HABA [HEAT TRANSFER]

No of Credits: 3

Course Synopsis:
The objective of this course is to introduce fundamental concepts and applications of heat transfer to the students of mechanical engineering. Emphasis will be given in solving and evaluating engineering problems through comprehensive analysis of conduction, convection, and radiation heat transfer, as well as on the evaluation of common type of heat exchangers and other heat transfer equipment.

Course Outcomes:
1. Ability to apply principles of heat transfer mechanisms in solving engineering problems.
2. Ability to evaluate engineering problems involving heat exchangers and other heat transfer equipment

MMJ32703 JENTERA BENDALIR [FLUID MACHINERY]

No of Credits: 3

Course Synopsis:
This course introduces the operating principles of different types of fluid machines; pumps, compressors, hydraulic turbines, steam turbines and gas turbines. It covered the fundamentals of fluid mechanics, analytical and empirical relationships, and work principle used in fluid machine. It also includes the analysis of flow, selection of fluid machine, and preliminary estimation of performance characteristics. Upon completion of this course, students will be able to select the fluid machines for specific applications and solve related fluid machinery problems.

Course Outcomes:
1. Ability to analyze the performance of different pumps, fans, and compressors and select them properly for specific applications.
2. Ability to evaluate the performance of different hydraulic turbines and select them properly for specific applications.
3. Ability to explain the operating principles of thermal turbines (steam/gas turbines) and formulate their performance.

MMJ32803 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 focuses on analog and digital electronics, which covers the fundamentals of semiconductors, electronic components, electronic circuits, digital electronics and signal conversion. The second part of the course introduces students to the 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:
1. Ability to analyze and apply electronic components and circuit.
2. Ability to analyze and apply microprocessor functions.
3. Ability to develop simple microprocessor-based application with electronic circuit.

MMJ32903 KEJURUTERAAN KAWALAN [CONTROL ENGINEERING]

No of Credits: 3

Course Synopsis:
This is an introductory control engineering course. Students will learn how to apply transfer functions to mathematically represent the mechanical, electrical, and electro-mechanical systems, as well as how to evaluate system performance in the time and frequency domain to establish system stability. The curriculum will also incorporate the Internet of Things (IoT) and the open-source programming tool for deeper control system design and system's response analysis.

Course Outcomes:
1. The ability to analyze the mathematical model for systems
2. The ability to analyze and evaluate the time- and frequency-domain of the system with response to test inputs. The analysis includes the determination of the system stability.
3. The ability to design and evaluate P, PI, PD, PID, lead, lag controllers based on the response of the system in time- and frequency-domain and integrating the use of the Internet of Things (IoT) in the system.

MMJ36102 PEMINDAHAN HABA [HEAT TRANSFER]

No of Credits: 2

Course Synopsis:
The main objective of this course is to enable students to understand the concepts of conduction, convection and radiation which form the basics of heat transfer. In order to ensure students achieve the outcomes of this course, they will perform theoretical calculations such as thermal conductivity, heat loss, and other important theories.

Course Synopsis:
1. Ability to distinguish fundamental knowledge of heat transfer mechanisms.
2. Ability to evaluate thermal engineering problems in conduction, convection and radiation.
3. Ability to evaluate thermal engineering problems in heat exchanger systems.

MMJ36203 KEJURUTERAAN BERBANTU KOMPUTER [COMPUTER-AIDED ENGINEERING]

No of Credits: 3

Course Synopsis:
This is an introductory course to the theory and practice of Computer-Aided Engineering (CAE) which covers the fields of Finite Element Analysis (FEA) and Computational Fluid Dynamics (CFD) including thermal analysis. It will cover the fundamental theories, modelling and simulation approaches of FEA and CFD to practical engineering problems. This course aims to provide knowledge and understanding of engineering simulation to aid in engineering design and analysis.

Course Synopsis:
1. Ability to formulate and apply concept and principles of finite element and finite volume methods in solving engineering problems.
2. Ability to model and perform engineering analysis using CAE softwares.
3. Ability to evaluate physical problems using CAE software.

MMJ36303 GETARAN DAN MEKANIK MESIN [VIBRATION AND MECHANICS OF MACHINES]

No of Credits: 3

Course Synopsis:
The course aims at strengthening the knowledge of the machines and mechanisms with particular attention to the power transmission, balancing, flywheel, gyroscope and vibration. A method of analysis and synthesis of mechanics of machine will complement the basic concepts developed at the bachelor level. This subject also will introduce fundamentals of vibration, free and forced, undamped and damped vibration, vibration of single Degree of Freedom (DoF) system, 2-DoF and multi-DoF systems. At the end of the course students have a deep understanding of all the elements of mechanics that are fundamental for industrial automation, mastering design and construction principles that play a role in modern automatic machines.

Course Outcomes:
1. Ability to apply knowledge of mathematics, statics and dynamics to support analysis of mechanical power transmission mechanism.
2. Ability to apply knowledge of mathematics, statics and dynamics to support analysis of the velocity control mechanism in a cycle and the balancing mechanism on a machine.
3. Ability to synthesise knowledge of mathematics, statics and dynamics into a new whole or propose alternative solutions for gyroscopic motions and their effects on a rotational body
4. Ability to apply knowledge of mathematics. statics. solid mechanics and dynamics to support analysis of vibrations and in solving problems and calculate the system vibrating due to some externally force and its application in solving problems.

MMJ37103 PERANCANGAN DAN KAWALAN PENGELUARAN [PRODUCTION PLANNING AND CONTROL]

No of Credits: 3

Course Synopsis:
This course will provide the students with knowledge of production planning and control. It is designed to highlight the practical and applied techniques, which can improve the organization's quality and productivity. The designing, planning, organizing, and controlling of operating systems is the main focus of this course including analytical techniques, tools and concepts applicable to planning operations. Such concepts include Aggregate Planning and Forecasting, Capacity Planning, Materials Requirement Planning, Inventory management, Production Scheduling and Supply Chain Design and Logistic Networks. On completion of the course, students will be able to understand the strategic role of production planning and control in manufacturing plant operations.

Course Outcomes:
1. Ability to identify and apply operational methodologies to assess and improve the production performance.
2. Ability to develop a systematic approach to the solution of planning problems for a wide variety of manufacturing operations.
3. Ability to employ different strategies in manufacturing industries to plan production and control inventory

MMJ37203 ERGONOMIK INDUSTRI [INDUSTRIAL ERGONOMICS]

No of Credits: 3

Course Synopsis:
Ergonomics is an essential and integral element of occupational safety and health practice. It encompasses the physical, cognitive, psycho-social and organizational aspects of work. This course is an application of knowledge about human capabilities and limitations to the design of workplaces, equipment, work processes and environments that can optimize worker safety, health and wellbeing. Topics include ergonomics principles, Work-related Musculoskeletal Disorders, biomechanics, human information processing, anthropometry, principles of workplace design, ergonomics risk assessment and evaluation methods and ergonomics problem solving technique. This course provides students with basic skill of analysing the relationship between people and their working environment, and the skill to decide suitable ergonomic principles and method(s) to use to solve practical problems. At the end of the course, students should be able to conduct activity/work analysis and solve problem related to ergonomic, health and safety issues.

Course Outcomes:
1. Ability to apply knowledge of basic concepts and principles of ergonomics and body mechanics.
2. Ability to analyze and perform suitable anthropometric study in workplace design.
3. Ability to use suitable assessment tools in the design and evaluation of work tasks.
4. Ability to solve and design a workplace to ensure worker safety, health and wellbeing.

MMJ37303 TEKNOLOGI PEMBUATAN TERMAJU [ADVANCED MANUFACTURING TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This course deals with Advanced Manufacturing Technology (AMT). In general, AMT uses innovative technologies to produce/improve products and/or processes, while also incorporates new business/management methodologies. In this course, the focus is on material removal processes that use various medium for cutting including mechanical, lasers, electrical and chemical. Besides, micromachining, additive manufacturing and electronic manufacturing are also included. In addition, issues related to research and sustainability with respect to Advanced Machining will be also discussed.

Course Outcomes:
1. Ability to investigate and evaluate advanced manufacturing technologies.
2. Ability to identify and propose suitable advanced machining process where required.
3. Ability to design and develop research/problem solving related to advanced manufacturing technology to enhance the manufacturing efficiency, capability, and sustainability.

MMJ37403 PEMBUATAN "LEAN" [LEAN MANUFACTURING]

No of Credits: 3

Course Synopsis:
This course provides the student with Lean Manufacturing describing the background behind its development and how evaluations and assessments of production systems are performed. The course focuses on gaining an understanding of Lean thinking and practices from both a technical standpoint and the people perspective needed to bring the change and sustain the improvement. Examples of Lean applications in manufacturing systems and processes will be presented. At the end of the semester, the students should have a basic understanding of the application, design, operation, control, and sustain of lean manufacturing systems and will be able to use Lean thinking and tools to model, analyze, and optimize the manufacturing systems.

Course Outcomes:
1. Ability to CONDUCT suitable Lean tools and techniques in manufacturing problems solving and continuous improvement.
2. Ability to DEVELOP the value stream mapping of a process and significant improvement with pull system concept and suitable lean tools.
3. Ability to DEVELOP the Lean culture towards sustaining Lean in manufacturing system

MMJ37503 SISTEM PNEUMATIK DAN HIDRAULIK [PNEUMATIC AND HYDRAULIC SYSTEM]

No of Credits: 3

Course Synopsis:
This course will be exposed to students about the fundamental basics of theory and concept to Fluid Power which include Pneumatic and 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 and 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 and Hydraulic equipment aided by computer software to construct the related circuits application. 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 operate the components and actuator in the Pneumatic System.

Course Outcomes:
1. Ability to apply and evaluate theory and concepts of Pneumatic and Hydraulic Systems.
2. Ability to compare and differentiate the components and symbols of Pneumatic and Hydraulic Systems.
3. Ability to develop and evaluate applications on single and multiple circuits of Pneumatic and Hydraulic Systems.

MMJ37603 AUTOMASI INDUSTRI [INDUSTRIAL AUTOMATION]

No of Credits: 3

Course Synopsis:
This course is to enhance the knowledge and understanding on automation and robotics which have been used in the industries today. It covers topics regarding Manufacturing Automated application including Automated Assembly Line, Flexible Manufacturing system (FMS), Automated Storage/Retrieval System (ASRS), Automated Material Handling System and Computer Integrated Manufacturing (CIM). This course also covers an explanation of autonomous robotics, classification of robot systems, end-of-arm tooling, robot safety and application of robots toward industrial revolution 4.0.

Course Outcomes:
1. Ability to EVALUATE concepts of manufacturing system and automation system in industries application.
2. Ability to DIFFERENTIATE hardware components for automation including actuators, sensors, and industrial control technology.
3. Ability to EVALUATE and DESIGN solving methods using Industrial Automation Systems approach including material, transport, and storage system.
4. Ability to EVALUATE robot anatomy and related attributes in industry application.

MMJ39905 LATIHAN INDUSTRI [INDUSTRIAL TRAINING]

No of Credits: 5

Course Synopsis:
The course will expose students to technical and practical application as well as other aspects such as the company's operation, work culture, safety procedure, project management, communication, technical skills, and presentation in achieve appreciation and/or capability of carrying out complex engineering activities. Students are required to submit their logbook and written report at the end of the industrial training

Course Outcomes:
1. Ability to demonstrate technical knowledge and practical skills.
2. Ability to adapt to health, safety, legal and cultural requirements in working environment.
3. Ability to perform tasks with professional ethics and responsibilities.
4. Ability to work independently, interact with co-workers and work in a team.
5. Ability to report and communicate verbally and in written form.

MMJ40102 JURUTERA PROFESIONAL [PROFESSIONAL ENGINEER]

No of Credits: 2

Course Synopsis:
This course exposes students to the concepts of engineering ethics, sustainability, risk management, occupational safety and health, and basic of law in the engineering context. The materials will enable students to understand their future role as professional engineers to the society. Students will be confronted by issues and dilemma faced by engineers with constraints related to engineering ethics, environmental & sustainability, safety and regulatory acts. At the end of the course, students will be able to propose solutions with respect to engineering ethics, environmental & sustainability, safety and health as well as can interpret legal related to engineers.

Course Outcomes:
1. Ability to propose solutions in resolving moral responsibilities related to conditions of dilemma in engineering ethics.
2. Ability to suggest course of action to meet desired needs within realistic constraints of environmental and sustainability.
3. Ability to engender issues regarding hazards, risk management, occupational safety & health (OSHA) and procedures of legal on engineering issues.

MMJ40202 PROJEK TAHUN AKHIR I [FINAL YEAR PROJECT I]

No of Credits: 2

Course Synopsis:
This course is designed to expose students with an investigative research-based project to solve engineering issue(s)/problem(s). Students are required to identify problems, develop techniques for information gathering, conduct literature review and select appropriate methodology. Students are assessed by a written and oral presentation at the end of the semester.

Course Outcomes:
1. Ability to INTEGRATE comprehensively the needs and the insights of research works conducted.
2. Ability to investigate and conduct research literature of complex engineering problems with selected knowledge in the research literature of the discipline.
3. Ability to propose and develop design solutions or methodology for complex engineering problems that meet specified needs with appropriate consideration including design of experiments, modeling or simulation.
4. Ability to PERFORM effective presentation on complex engineering activities undertaken.
5. Ability to demonstrate and apply engineering management principles by managing research project.

MMJ40304 PROJEK TAHUN AKHIR II [FINAL YEAR PROJECT II]

No of Credits: 4

Course Synopsis:
This course is designed to expose students with an investigative research-based project to solve engineering issue(s)/problem(s). Students are required to identify problems, develop techniques for information gathering, conduct literature review and select appropriate methodology. In addition, students are required to deliver individual analysis and judgement, utilize appropriate modern technology/tools in conducting the research and assessed independently. At the end of the semester, students will prepare a final report and deliver both written and oral.

Course Outcomes:
1. Ability to integrate comprehensively the needs and the insights of research works conducted.
2. Ability to investigate and conduct research literature of complex engineering problems with selected knowledge in the research literature of the discipline.
3. Ability to propose and develop design solutions or methodology for complex engineering problems that meet specified needs with appropriate consideration including design of experiments, modeling or simulation.
4. Ability to synthesize complex engineering problems using first principles of mathematics, natural sciences or engineering sciences in order to evaluate and interpret data to provide results and conclusions with recommendations.
5. Ability to perform effective presentation on complex engineering activities undertaken.
6. Ability to demonstrate and apply engineering management principles by managing research project.

MMJ42103 MEKANIK GETARAN [VIBRATION MECHANICS]

No of Credits: 3

Course Synopsis:
This course provides the skills and knowledge in vibrations disciplines. The syllabus coven 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 os vibration control, vibration measurement and signal analysis methods.

Course Outcomes:
1. Ability to evaluate and analyse the various response to various inputs of vibratory motion.
2. Ability to construct a control system for a vibration motion.
3. Ability to measure and analyse vibration signals.

MMJ42203 MEKANIK PATAH [FRACTURE MECHANICS]

No of Credits: 3

Course Synopsis:
This course contains the theory of principles and application of fracture mechanics. The fundamental of fracture mechanics covers the linear elastic fracture mechanics and elastic plastic fracture mechanics principles. It presents the problem solving of fracture parameter solution for wide range of failure cases from engineering design applications, including the analysis of fracture mechanism and experimental testing for metallic and non-metallic material. Computational fracture mechanics approach is employed for selected fracture mechanism cases in engineering design and structures.

Course Outcomes:
1. Ability to analyse the concepts of fracture mechanics in engineering materials and structures
2. Ability to formulate and propose the fracture mechanics solution for engineering design failures.
3. Ability to construct and manipulate the computational fracture mechanics program for a specific fracture mechanic problem solving

MMJ42303 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. Students are to develop strong understanding of the role of constituent materials in overall response of composite lamina and how would the orientations and stacking sequence would affect the overall performance. Several failure criteria of laminates are introduced. Experimental methods used to characterise composite materials are presented.

Course Outcomes:
1. Ability to point out the role of constituents in overall response of composite lamina (micromechanics) and its effect on the laminate properties (macromechanics)
2. Ability to formulate elastic and strength properties, and elastic response, of orthotropic and anisotropic materials having both continuous and discontinuous reinforcements
3. Ability to analyse and discuss the basic experimental methods to characterise composite materials

MMJ42403 AKUSTIK & KAWALAN HINGAR [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, measurements 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:
1. Ability to analyse the conceptual and fundamental of engineering acoustics.
2. Ability to explain and analyse the principles and techniques of noise and their applications in controlling noise.
3. Ability to propose and evaluate the various methods for controlling exposure to noise.

MMJ42503 PROJEK REKA BENTUK BERSEPADU II [INTEGRATED DESIGN PROJECT II]

No of Credits: 3

Course Synopsis:
This course is intended as an advanced knowledge in mechanical system design for undergraduate level. Bringing together the fundamentals theories and techniques from previous courses to accomplish the design of a complete machine or mechanical system. The course covers the principle of engineering design process continuing 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 and collaborate with other members to arrive at good design decisions on selected theme. Students are required to design a project with current issues related to safety, cultural, societal, environmental as well as the economic considerations. 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 analysing and solving mechanical system design problems as part of a capstone project.

Course Outcomes:
1. Ability to propose design solutions to solve complex mechanical engineering problem to meet customer and functional needs with consideration for safety, cultural, societal, environmental and sustainability concerns.
2. Ability to fabricate design solutions by selecting and applying the appropriate modern engineering tools.
3. Ability to develop and communicate the design solutions effectively with regards to project management and finance principles.
4. Ability to function in a team for the successful delivery of design project.

MMJ42602 PENGELUARAN & OPERASI [PRODUCTION & OPERATIONS]

No of Credits: 2

Course Synopsis:
This course offers comprehensive contents about production and operation in goods producing and services providing industries. It is a process of managing people and resources in order to create product or service. This course introduces students to linear programming, inventory management, aggregate planning, transportation models, material requirements planning (MRP) as well as short-term scheduling

Course Outcomes:
1. Ability to develop solutions for a production operation.
2. Ability to detect optimum solution to production operations based on operation research.

MMJ42703 PENGOPTIMUMAN REKA BENTUK [DESIGN OPTIMIZATION]

No of Credits: 3

Course Synopsis:
This course introduces the theory and use of numerical design optimization methods. Problem formulation, practical application, and result analysis. Design optimization concepts, necessary and sufficient optimality conditions and solution techniques. Unconstrained nonlinear problems, constrained linear and nonlinear problems, and multiobjective optimization. Use of basic knowledge of numerical optimization algorithms to apply them appropriately in engineering design.

Course Outcomes:
1. Ability to formulate optimum solution in practical engineering design problems.
2. CO2 - Ability to analyze optimum solution based on mathematical constructs and theoretical tools of linear and non-linear design problems.
3. Ability to analyze optimum solution based on mathematical constructs and theoretical tools of linear and non-linear design problems.

MMJ42803 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. The course 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. The course will address the defining and applying criterion for selecting appropriate additive manufacturing process and, investigate application domain of additive manufacturing and learning the important process parameters.

Course Outcomes:
1. Ability to describe and analyze possibilities and needs of application of direct digital manufacturing in modern development, design and production.
2. Ability to describe and evaluate reverse engineering and additive manufacturing processes in the design and manufacturing of finished product.
3. Ability to evaluate and design product based on suitable additive manufacturing techniques in terms of hardware and software technologies.

MMJ42903 PENYEJUKAN DAN PENYAMANAN UDARA [REFRIGERATION & 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 recapitulation of thermodynamics, advancement of refrigeration, vapour compression cycle, P-h Diagram, actual vapour compression cycle, refrigerants, indoor and outdoor design conditions, and refrigeration system components. Advancement of Air-conditioning, properties of moist air, psychrometric chart, psychrometric processes, cooling load, air distribution system, thermal comfort, and indoor environmental health.

Course Outcomes:
1. Ability to analyse the total energy required for one confined space to achieve comfort zone.
2. Ability to demonstrate and propose methods to control temperature, humidity, air circulation and air purity in one confined space.
3. Ability to design and improve the COP of an air conditioning system while maintaining comfort.

MMJ43103 TENAGA DIPERBAHARUI [RENEWABLE ENERGY]

No of Credits: 3

Course Synopsis:
The goal of the course is to explore concepts and applications of Renewable Energy while approaching the practical limitations of some of the most addictive energy sources. This course will encourage students to examine the facts about our energy needs, wants, and supplies, as well as the environmental and human impacts of energy production and use.

Course Outcomes:
1. Ability to examine the concepts and principles of renewable energy technologies and energy resources available today for sustainable development.
2. Ability to justify the conversion of alternative energies into thermal/mechanical/electrical energy
3. Ability to construct the interrelationships of renewable energy in the field, and its environmental impact

MMJ43203 ENJIN PEMBAKARAN DALAM [INTERNAL COMBUSTION ENGINE]

No of Credits: 3

Course Synopsis:
The objective of the course is to provide a basic understanding of the operation of internal combustion engines in terms of their performance, operation, fuel requirements, and environmental impact. Topics include flow, thermodynamics, combustion, heat transfer, and fuel properties, with reference to engine performance, efficiency, as well as emissions.

Course Outcomes:
1. Ability to analyse the operating characteristics of modern internal combustion engines.
2. Ability to evaluate the interrelationships of the internal combustion process as it relates to thermodynamics, combustion, and other factors affecting engine performance, efficiency, and emissions.
3. Ability to construct analytical techniques to the engineering problems and performance analysis of internal combustion engines.

MMJ43303 PERKOMPUTERAN DINAMIK BENDALIR [COMPUTATIONAL FLUID DYNAMICS]

No of Credits: 3

Course Synopsis:
This course offers an in-depth introductory foundational and technical knowledge in solving thermo-fluids problem via computational method. In particular, students will have hands-on experience in using computational fluid dynamics to solve engineering problems. Governing equations, discretisation schemes, numerical methods, turbulence modelling, mesh quality and independence test, numerical errors, and boundary conditions will be introduced in the course.

Course Outcomes:
1. Ability to analyze and apply basic fluid dynamics related partial differential equations.
2. Ability to analyse and apply basic discretization schemes for fluid dynamics related partial differential equations.
3. Ability to assess and solve fluid dynamics related problems by using appropriate numerical procedures.
4. Ability to solve fluid dynamics related problems by using computational tools.

MMJ47003 PROJEK REKA BENTUK BERSEPADU PEMBUATAN [MANUFACTURING INTEGRATED DESIGN PROJECT]

No of Credits: 3

Course Synopsis:
Manufacturing Integrated Design Project (MIDP) is a multi-disciplinary subject in which small groups of three to five students work together to complete a major project. Each project will require students to unravel manufacturing/industry/design problems that are being confronted by any organization in the community. The course emphasizes related manufacturing engineering knowledge ranging from concept till production of a product solving specific engineering problems. This solution may include engineering specification projects schedule/planning, costing analysis, sustainability issues and design solution as well as manufacturing drawings (eg: assembly drawing).

Course Outcomes:
1. Ability to CREATE appropriate design solutions on manufacturing engineering either involving process, system, or component, which may include production management, with the aim of producing a good quality product that meets customer requirements/needs.
2. Ability to CONDUCT investigation and use appropriate methodologies for data collection in order to make learned decisions and thereby valid conclusions in solving manufacturing engineering problems.
3. Ability to SELECT and APPLY appropriate engineering technique/ method/ tool and practice in solving relevant problems/tasks.
4. Ability to EVALUATE aspects of design sustainability and environmental impact in manufacturing engineering problems.
5. Ability to effectively function as a team member in carrying out project assignments.
6. Ability to effectively and convincingly present on engineering activities undertaken either verbally or in writings.
7. Ability to IDENTIFY, ANALYSE, SYNTHESIZE, and subsequently FORMULATE research needs from various resources.
8. Ability to DEMONSTRATE understanding of engineering project management principles and engineering economics by applying them in decision making processes.

MMK10103 SAINS BAHAN [MATERIALS SCIENCE]

No of Credits: 3

Course Synopsis:
This course introduces students to the 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 of the properties of materials through phase diagrams, transformations, and heat treatment processing on ferrous and non-ferrous alloys, polymer and advanced materials.

Course Outcome:
1. Ability to differentiate the classification and properties of materials, atomic structures, bonding, crystal structure and imperfections.
2. Ability to follow and analyse the properties of materials using various equipment in laboratory.
3. Ability to manipulate the heat treatment process.
4. Ability to evaluate and explain the optical, microstructure, phase diagram and heat treatment process.

MMK10203 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 Outcome:
1. Ability to apply the basic principles of physics related to static such as force, moment, Newton's First, second and Third Law, trusses, frame and machine.
2. Ability to analyse the structures and frameworks problems by constructing, sketching and/or drawing free body diagram in ensuring static equilibrium.
3. Ability to apply the kinematics and kinetics for particles and systems of particles.
4. Ability to analyse the planar kinematics and kinetics of a rigid body.

MMK10303 ASAS ELEKTRIKAL DAN ELEKTRONIK [BASIC ELECTRICAL AND ELECTRONICS]

No of Credits: 3

Course Synopsis:
This course intends provide basic knowledge of solving 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 concepts and principles.

Course Outcome:
1. Ability to demonstrate knowledge of fundamental in basic electrical circuits,
2. Ability to evaluate and relate the knowledge in single phase and three phase AC circuits.
3. Ability to operate equipment in basic electric and electronic circuits.

MMK10403 GRAFIK KEJURTERAAN [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 Outcome:
1. Ability to demonstrate the basic drafting, sketching engineering components, geometric, dimensioning and tolerancing (GDT) and common term used in engineering drawing.
2. Ability to demonstrate orthographic, auxiliary view, cross section and isometric in engineering drawing.
3. Ability to construct detail and assembly drawing in engineering drawing.

MMK10502 TEKNOLOGI BENGKEL [WORKSHOP TECHNOLOGY]

No of Credits: 2

Course Synopsis:
This course aims to familiarize students with basic workshop technology, practices, and skills. Techniques such as cutting, drilling, filling, joining, fastening, punching, folding, shearing and finishing are among many concepts that will be familiarized. Practical work will help the students to gain effective understanding in the workshop technology course. At the end of this course, students are expected to be able to use modern tools and apply appropriately.

Course Outcome:
1. Ability to describe tools and its usage in workshops.
2. Ability to reproduce work practices using specified tools based on given instructions.
3. Ability to apply various workshop tools to produce work specimens with various processes.

MMK11103 KAWALAN KUALITI [QUALITY CONTROL]

No of Credits: 3

Course Synopsis:
This course covers the principles of quality control that can be applied in related fields of chemical engineering. The course covers related process and standard commonly used in industry. The course also discusses on the statistical method and acceptance sampling as tools and techniques that broadly implemented in quality assurance and quality control.

Course Outcome:
1. Ability to examine and apply the principles for quality assurance, quality control and management improvement.
2. Ability to formulate the processes in quality assurance and quality control with statistical method.
3. Ability to evaluate the suitable sampling and testing procedure in quality assurance and quality control.

MMK11203 MEKANIK BENDALIR [FLUID MECHANICS]

No of Credits: 3

Course Synopsis:
This course introduces the basic concepts of fluid mechanics, with emphasis on the properties of fluid, pressure and fluid statics, mass, Bernoulli and energy equations, momentum analysis of flow system, internal flows and external flows. These concepts will be applied in experiments for a better real-world understanding of fluid mechanics.

Course Outcome:
1. Ability to analyse the properties of fluids, fluid static and fluid flow principle.
2. Ability to analyse internal and external flows.
3. Ability to demonstrate fluid mechanics principles through experiments, modelling of- simulations

MMK11302 PENGATURCARAAN KOMPUTER [COMPUTER PROGRAMMING]

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 implement them by developing C program.

Course Outcome:
1. Ability to analyze and construct simple and straightforward manner in C Programs.
2. Ability to create and construct C programs with variables, to perform mathematics functions and to configure with desired input/ output.
3. Ability to create and design C Programs with control structure, looping functions and numeric arrays.

MMK11403 PENGURUSAN PROJEK [PROJECT MANAGEMENT]

No of Credits: 3

Course Synopsis:
This course includes the concepts, technique and application tools use in the related organization on business process system on operation and production. With all the topic including forecasting technique, inventory system, quality, design and production management can help to achieve smooth flow in operation system.

Course Outcome:
1. Ability to explain the organization structure and the various components, sub-system and function of operation and project management.
2. Ability to analyze production performances such as productivity, quality, process optimization and customer service of the operation and project management.
3. Ability to analyze the quantitative and qualitative techniques for designing.
4. Ability to organizes the locating the production facilities.

MMK11502 TEKNOLOGI PEMBUATAN [MANUFACTURING TECHNOLOGY]

No of Credits: 2

Course Synopsis:
This course explores the manufacturing processes and technologies, which are used in the Industry to convert raw material into finished products. This course is divided into four sections, which are the solidification and shaping process, forming process, the joining and assembly process, and special processing and assembly technologies. The solidification and shaping process covers the metal casting and shaping process for plastics. For forming process, the topics cover metal forming and sheet metalworking technologies including rolling, forging, extrusion, cutting, bending, deep drawing, etc. In joining and assembly, the topics cover are welding, soldering, brazing, adhesive bonding, and mechanical fastening. The last part is special processing and assembly technologies, which covers rapid prototyping, micro and nanofabrication technology.

Course Outcome:
1. Ability to interpret the concept and principle for solidification and shaping process.
2. Ability to analyze the related problems of metal forming and sheet metalworking process and technology.
3. Ability to analyze the related problems of joining and assembly process and technology.
4. Ability to interpret the concept and principle for special processing and assembly technologies.

MMK20103 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 Outcome:
1. Ability to analyze the properties of pure substance.
2. Ability to analyze and respond the first law of thermodynamics.
3. Ability to analyze and respond the second law of thermodynamics and entropy changes of the substances.

MMK20203 KEKUATAN BAHAN [STRENGTH OF MATERIALS]

No of Credits: 3

Course Synopsis:
This course is intended to provide the students with clear understanding of theory and application of the principles of mechanics of materials. The important concepts of statics, deformation, stresses, and strain that are exist in a solid body when subjected to external loads are discussed. Students are taught to solve problems of loading on solid bodies under axial, torsion and bending loading conditions. Besides, the state of stress caused by combination of several loadings are presented. Discussion on the stability, support types, and design of column are also covered at the end of the course.

Course Outcome:
1. Ability to analyze the basic principles of deformation, stress, and strain in load-bearing structures.
2. Ability to analyze the structures subjected to axial and torsional loading.
3. Ability to evaluate the case of bending in beams and state of stress caused by combined loadings.
4. Ability to evaluate buckling structure supporting axial compressive load.

MMK11603 REKABENTUK BERBANTU KOMPUTER [COMPUTER AIDED DESIGN]

No of Credits: 3

Course Synopsis:
This course focuses on giving exposure and skill to students about the basics of 3D and geometry modelling and its application in the engineering field by using 3D Modelling software. This course includes details on 3D modelling followed by producing 2Ddrawing, from 2D drawing into 3D modelling, assembly drawing, exploded drawing, and rendering. All this skill will help students to produce technical drawing and virtual prototype or model which suit manufacturing processes. This skill is very demanding in industry.

Course Outcome:
1. Ability to identify the principles and tools to develop 2D and 3D data.
2. Ability to construct 2D and 3D data by using tools effectively.
3. Ability to organize 2D and 3D data output formally.

MMK21103 KEJURUTERAAN BERBANTU KOMPUTER [COMPUTER AIDED ENGINEERING]

No of Credits: 3

Course Synopsis:
This course provides the students with an understanding of the structural analysis through Finite Element Analysis (FEA). It will also deliver a proper background for the intelligent and appropriate use of commercial FEA software. The course initially covers the introduction of FEA, matrix algebra, and solution of linear equation (SLE). The solutions for one-, two-, and three-dimensional problems are reviewed in theoretical basis and through the application of available FEA software. At the end of the course, the students are expected to be able to solve real-life engineering problems related to structural domains.

Course Outcome:
1. Ability to analyse engineering problems using basic concept and knowledge infinite element analysis.
2. Ability to demonstrate engineering problems using computational tools.
3. Ability to explain the processes and findings of finite element analysis in a form of oral and/or written presentation.

MMK21203 PEMINDAHAN HABA [HEAT TRANSFER]

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 the application of the principles of heat transfer and discusses the design of equipment to accomplish a certain requirement.

Course Outcome:
1. Ability to apply fundamental knowledge of heat transfer mechanism.
2. Ability to evaluate and operate thermal engineering problems in conduction, convection and radiation.
3. Ability to evaluate thermal engineering problems in heat exchanger systems.

MMK32103 EKONOMI PEMBUATAN [MANUFACTURING ECONOMICS]

No of Credits: 3

Course Synopsis:
This course proposes the decision-making techniques that should be taken into consideration in a particular engineering's projects. It also examines the profitability consequences on the project designed. Besides, this course introduces fundamental economics and costs concepts in decision making to the students. Time relationship (also called time value of money) and concept of equivalence expose the students to the value of investment by estimating future costs or revenues. The application of money-time relationship in comparing different alternatives helps to choose the best solution before enhancing any project.

Course Outcome:
1. Ability to analyse the general concept of engineering economy and the time value of money concept.
2. Ability to analyse the benefit-cost ratios of public works projects.
3. Ability to evaluate the economical problems involving comparison with specified methods/analysis and economic decision making.
4. Ability to demonstrate the effects of depreciation, income taxes, inflation, and price change in engineering economic analysis problems.

MMK33104 PROJEK PEMESINAN [MACHINING PROJECT]

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 Outcome:
1. Ability to generate problem solution based on knowledge and comprehension of concept, methodologies & project management principles.
2. Ability to demonstrate solution by using techniques, skills and modern engineering tools to solve and evaluate the machining practices.
3. Ability to organize in group and communicates effectively using the project management principles.

MMK12103 TEORI DALAM PEMESINAN [THEORY IN MACHINING]

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 practices. 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 tooling 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 Outcome:
1. Ability to discuss the principles of metal cutting and chip formation processes.
2. Ability to analyses Merchant force equation for machining force relationships.
3. Ability to evaluate the concepts machine tools and machining operations for various engineering shapes.
4. Ability to formulate the machinability of various metallic materials based on technical and economic factors.

MMK22104 PEMESINAN KONVENSIONAL [CONVENTIONAL MACHINING]

No of Credits: 4

Course Synopsis:
This course is a practical exposure to conventional machining processes used in the industry to transform raw materials into final products that involve selecting of machining operation, cutting tools and cutting conditions to get good surface finish. Conventional machining operations involved include turning, milling, drilling, and grinding.

Course Outcome:
1. Ability to perform turning process by using appropriate machining operations, cutting tools and machining conditions.
2. Ability to perform milling process by using appropriate machining operations, cutting tools and machining conditions.
3. Ability to perform drilling and grinding process by using appropriate machining operations, cutting tools and machining conditions.
4. Ability to construct product with suitable machining process in group.

MMK22203 TEKNOLOGI CNC [CNC TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This course studies on the principles and concepts of computer numerical control (CNC) used in the modern manufacturing facilities. The student will develop an increased understanding of CNC machine set-up, machine operation, tooling, and programming principles. G & M code programming language will be utilized to write part programs. Although there is a variety of machines and CNC controllers, this course focuses on the G & M codes that remain common from one machine to another. Students will also be exposed with Programmable Logic Controller (PLC).

Course Outcome:
1. Ability to apply the concept of NC machining operation such as workpiece zero setting and tool setting.
2. Ability to generate G and M code programs and documentation for machining operation on CNC machine tools.
3. Ability to explain concept of automated system available in a CNC machine.
4. Ability to demonstrate CNC milling and turning machine.

MMK31103 ERGONOMIK DAN KESELAMATAN [ERGONOMICS AND SAFETY]

No of Credits: 3

Course Synopsis:
The objectives of this course are to introduce to the students the ergonomics fundamental principles, human capacity and body mechanics in product design and development process, the application of suitable ergonomics assessment tool to solve the ergonomics issues in product design and to guide the students on effective design solutions in order to enhance product intervention, usability, sustainability and safety for society benefits. The contents of this course will cover the ergonomics introduction in design, human capacity and biomechanics, ergonomics assessment and evaluation, design for usability and user centered design, design for safety and health, design of equipment and hand operated devices and finally designs for the special population. This course will be delivered by applying lectures, lab and problem-based approach and continuous assessment will be conducted to assess the understanding of the students on this course. At the end of this course, student will be able to APPLY the ergonomics fundamental principles, human capacity and body mechanics in product design and development process, able to ANALYSIS the application of suitable ergonomics assessment tool to solve the ergonomics issues in product design and to able to PROPOSE effective design solutions in order to enhance product intervention, usability, sustainability and safety for society benefits.

Course Outcome:
1. Ability to apply the ergonomics fundamental and principles, human capacity and body mechanics in product design and development process.
2. Ability to analysis and evaluate ergonomic issues using suitable assessment tools and method for society impact.
3. Ability to propose an effective design solution to enhance product intervention, usability, sustainability, and safety for society benefits.

MMK31204 PROJEK TAHUN AKHIR I [FINAL YEAR PROJECT I]

No of Credits: 4

Course Synopsis:
This course consists of lectures 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 Outcome:
1. Ability to integrate knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to solve engineering problems related to the research area.
2. Ability to apply, identify and formulate related research literature in order to understand and construct the research comprehensively.
3. Ability to develop methodology or design solutions that meet specified needs in order to solve broadly defined engineering technology problems.
4. Ability to conduct effective management principle into the project progress by demonstrating knowledge and understanding of engineering management principles to manage projects in multidisciplinary environments.
5. Ability to exhibit effective presentation and write effective reports and design documentation for the research undertaken.
6. Ability to establish the need to engage in independent and lifelong learning in specialist technologies to complete the research project.

MMK41206 PROJEK TAHUN AKHIR II [FINAL YEAR PROJECT II]

No of Credits: 6

Course Synopsis:
In this course, students will apply the knowledge they have learned throughout this program to complete the ongoing research project (Final Year Project I) under the supervision of a supervisor. The supervisor is responsible for guiding students on the techniques and overall implementation of the research. For the Final Year Project II, students will be focused on the fabrication of the product (if applicable), data analysis and interpretation, and conclusion. The documentation of the whole project will be written in the Final Year Project II report. Students will present their works and finding on the research project during the viva session.

Course Outcome:
1. Ability to interpret related research literature in constructing a comprehensive scope of the FYP Project and develop specific solutions for the objectives set.
2. Ability to conduct investigations based on experiment and/or prototype, in order to evaluate, interpret and analyze the outcome of the FYP project.
3. Ability to analyze knowledge of mathematics, science, engineering fundamentals, and engineering and engineering specialization in order to solve problems of the FYP project and give conclusions.
4. Ability to combine appropriate techniques and modern engineering tools to solve the problems of the FYP project.
5. Ability to exhibit effective presentation and write effective reports and documentation for the FYP project.
6. Ability to conduct effective management principles in a multidisciplinary environment to manage the FYP project.

MKM32303 GEOMETRI, PENDIMENSIAN DAN TOLERANSI [GEOMETRIC, DIMENSIONING AND TOLERANCING]

No of Credits: 3

Course Synopsis:
This course focuses on the theory of Geometric Dimensioning and Tolerancing (G, D & T) as a graphic language in practical applications in engineering. This course is designed in a way to build a basic understanding of the core concepts of engineering drawing. The concept, rules, and language of GD&T from a functional viewpoint to a real example application will be delivered.

Course Outcome:
1. Ability to apply knowledge on theories and concepts of Geometric Dimensioning and Tolerancing using symbols, terms, and rules.
2. Ability to investigate datums, position, concentricity and symmetricity applied to the type of forms, orientation, profile, and runout of Geometric Dimensioning and Tolerancing.
3. Ability to evaluate the concept of tolerance and fits and strategize.

MMK32403 REKABENTUK JIG DAN LEKAPAN [JIG AND FIXTURE DESIGN]

No of Credits: 3

Course Synopsis:
This course introduces students to fundamental of Jig and Fixture Design in machining applications. It starts with types and functions of Jig and Fixture. In addition, students will be exposed to knowledge about classification of jig and fixture for selected operation on sample parts that apply in machining process. In this course, the tool drawing is important to students to design the jig and fixture according specifies methods and rule of metric dimensioning. This course also will introduce student to identify the principles and economic analysis of a tool design in jig and fixture application. One project will be given (in group) to evaluate the knowledge of students in this course.

Course Outcome:
1. Ability to apply knowledge and comprehension of fundamental jig and fixture design in machining application.
2. Ability to apply the knowledge in order to select and use the tool material in jig and fixture design.
3. Ability to evaluate the principles of design economy in jig and fixture design.

MMK32502 PEMESINAN MAPAN [SUSTAINABLE MACHINING]

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 unsustainable machining, offline and online optimization of machining processes, economics of environmentally friendly machining, and epilogue: looking at the future.

Course Outcome:
1. Able to analyse the concept of green manufacturing and sustainability machining practices and relates with the economical and future issues in sustainable machining.
2. Able to evaluate the principles and sustainability using minimum cutting fluid, dry machining and gas-cooled in various machining operations.
3. Able to evaluate the practices of optimisation in machining operations and the advanced material used in machining operations

MMK32603 PEMBUATAN BERBANTU KOMPUTER [COMPUTER AIDED MANUFACTURING]

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 Outcome:
1. Ability to perform the NC part programming for 2-axis and 3-Axis machining of milling process using CAM software.
2. Ability to perform the NC part programming for turning operation using CAM software.
3. Ability to demonstrate the CNC 3-Axis milling and CNC turning machine.
4. Ability to perform the NC part programming for multi axis machining of milling process using CAM software

MMK32703 TEKNOLOGI PEMESINAN TERMAJU [ADVANCED MACHINING TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This course exposes the students about various non-traditional manufacturing technologies which are used in industries nowadays. It covers four classifications of techniques in non-traditional machining technologies which are Mechanical, Electrical, Thermal and Chemical. The topics are Electrical Discharge Machining (EDM) technology, Chemical Machining, Electrochemical Machining, Ultrasonic Machining, Water Jet Machining, Laser-Beam machining, Electron Beam Machining and Additive Manufacturing (3D printing). It also covers the criteria for process selections and economics of the advanced machining processes. It gives students the basic skills in analysing advanced manufacturing technology and the necessary knowledge to operate and manufacture a particular product.

Course Outcome:

1. Ability to evaluate the concept and methodology of Electrical and Wire Electrical Discharge Machining (EDM and WEDM) processes.
2. Ability to evaluate the concept and methodology of Chemical and Electrochemical Machining (CHM and ECM) processes.
3. Ability to evaluate the concept and methodology of Ultrasonic and Water Jet Machining (USM and WJM) processes.
4. Ability to evaluate the concept and methodology of Laser Beam and Electron Beam Machining (LBM and EBM) processes.
5. Ability to evaluate the concept and methodology of additive manufacturing particularly for 3D printing.

MMK33103 ALOI DAN KOMPOSIT LOGAM [ALLOY AND METAL COMPOSITE]

No of Credits: 3

Course Synopsis:

Most of the advanced manufacturing and machining industries involved metals either as their main products or equipments and tools used during the processing. This course consists of complete review on metal and their alloys and has been designed to suit with mechanical (machining) students. The course started with the introduction of fundamental knowledge of metal-alloys regarding their types, properties, classifications, fabrications, and applications. The important physical and mechanical properties of metal were discussed including the common mechanical failures occurred in metals. The basic knowledge in metal phase diagram and common practiced heat treatments were also discussed. Apart from that, metal composites area was also overviewed in this course including their classification, fabrications, and applications. During this course, students need to complete a mini project which covering the element of design, fabrication, machining, and heat treatment intended for specific application. This course will impose an extra added value for mechanical (machining) students before they are entering into the real industrial sector.

Course Outcome:

1. Ability to apply fundamental knowledge of science and engineering for describing basic process, properties and applications of metals, alloys and composites.
2. Ability to analyse information and technical data for assessing problems and provide conclusions in metals, alloys and composites.
3. Ability to design specific process or composition to meet specified needs in metals, alloys and composites.
4. Ability to reproduce investigation effectively on a given task using appropriate techniques.

MMK33203 SIMULASI SUNTIKAN ACUAN PLASTIK [PLASTIC INJECTION MOULDING SIMULATION]

No of Credits: 3

Course Synopsis:

This course introduces students to basic knowledge of plastic injection mould technology and plastic materials used in the injection moulding process. This module focuses more on analyzing and evaluating the finite element mesh technology introduced in Moldflow and how these mesh quality influence the quality of the mesh. This module also introduces the concept of gate placement as well as the design concept of gates, runners and cooling system. Emphasis also be given on conducting several analysis in evaluating the part and mould design via gate location analysis, molding window analysis, fast fill analysis and cool+flow+pack+warp analysis in eliminating the causes of defects that might be occurred in the plastic part produced.

Course Outcome:

1. Ability to evaluate the basic terminology in plastic injection moulding, process, mould types and components, plastic materials for injection moulding.
2. Ability to create good and satisfactory simulation models that fulfil meshing requirements.
3. Ability to evaluate gate location and moulding window simulation and interpret the results.
4. Ability to design feed system for fast fill simulation and evaluate the results
5. Ability to create cooling system, setting the injection processing parameters in cool+flow+pack+warp simulation and evaluate the results

MMK33303 PENGKOMPUTERAN DINAMIK BENDALIR [COMPUTATIONAL FLUID DYNAMICS]

No of Credits: 3

Course Synopsis:
This course exposes the techniques for obtaining solution of fluid flow problems numerically. The aim of this course is to introduce the fundamental application of simulation of fluid dynamics and heat transfer phenomenon and solving thermo-fluids problem via computational method. Holistic approaches of commercial software are essential towards solving, analyzing and evaluating the results of thermo-fluid problems. The course focuses on solving of two- and three-dimensional fluid flow and heat transfer problems utilize commercial software. The course starts by introducing the history and applications of Computational Fluid Dynamics (CFD). Then it revises the behavior of fluids in motion and derivation of the governing flow equations before detail discussion of various discretization techniques. Moreover, the course discusses the practical guidelines for CFD and simulation of thermo-fluid problems using commercial software.

Course Outcome:
1. Ability to apply the basic concept and knowledge of computational fluid dynamics.
2. Ability to operate the software tools in solving the various thermo-fluids problems.
3. Ability to Justify the results of computational fluid dynamics analysis.

MMK43403 TEKNOLOGI PENGISARAN MODEN [MODERN GRINDING TECHNOLOGY]

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 explanation 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 Outcome:
1. Ability to evaluate the concept of grinding process and grinding wheel composition, properties, geometry and kinematics.
2. Ability to evaluate the concept of dressing, truing and analyze the wheel contact and wear effects.
3. Ability to evaluate the concept of grinding machine and operation including centerless, high-speed grinding as well as deflections and problems related to grinding operation.

MMK43503 UJIAN TAK MUSNAH [NON-DESTRUCTIVE TESTING]

No of Credits: 3

Course Synopsis:
Non-Destructive Testing (NDT) plays a crucial role in everyday life for companies using pipelines, bridges, refineries, oil platforms, power stations, and many more. NDT is a comprehensive way to find, size, and locate surface and subsurface flaws and defects that could have an adverse impact on safety, reliability, and the environment. Testing implies for finding defective area does not damage or ruined the tested part. Identifying defects and flaws in material which could not be seen using our naked eyes is absolutely important in determining the structural life span and the material performance. The effective method of NDT is also depending on the knowledge and skill of the person in charge. This course offering the introduction, fundamental and basic knowledge on NDT technology. This course is basically covering the general NDT methods that are commonly used during inspection such as liquid penetrants, magnetic particles, eddy current, ultrasonics, and radiography techniques. Besides that, this course also introduces other types of up-to-date NDT techniques such as optical inspection probes, neutron radiography, laser-induced ultrasonics, acoustic emission
inspection gauges and thermography.

Course Outcome:
1. Ability to apply fundamental knowledge of science and engineering specialization in NDT.
2. Ability to identify flaws and defects conditions for assessment and provide conclusions in NDT inspections.
3. Ability to displays appropriate techniques and procedures effectively on the given task using NDT tools.

MMK43603 HINGAR & GETARAN [NOISE & VIBRATION]

No of Credits: 3

Course Synopsis:
This course introduces the student with the skills and knowledge in vibrations and noise disciplines. The syllabus covers the fundamental of vibration and oscillation motion, free vibration, force vibration, two degree of freedom systems, multiple degree of freedom systems the effects of noise and how to control the problems. The student will be well-prepared towards industrial application elements such as vibration control, vibration measurement, and noise control.

Course Outcome:
1. Ability to analyse free and force vibration for single and two degree of freedom.
2. Ability to evaluate the response of various systems (multi degrees of freedom) and noise measurement.
3. Ability to OPERATE the apparatus and equipment in the laboratory.

MMK43703 TEKNOLOGI MATA ALAT PEMOTONG [CUTTING TOOL TECHNOLOGY]

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 Outcome:
1. Able to differentiate cutting tools types and materials for different application of metal, polymer, and composite material.
2. Able to evaluate the technologies of cutting tool for different method of machining processes.
3. Able to analyze the cutting tool monitoring system for wear and life.

MMK43803 PROSES PENCIRIAN TERMAJU [ADVANCE CHARACTERIZATION PROCESS]

No of Credits: 3

Course Synopsis:
This course covers a fundamental of the advanced characterization processes, divided into three categorize; physical, mechanical, and thermal analysis. This includes spectroscopic characterization such as Fourier Transform Infrared Spectroscopy (FTIIR) and Spark or Arc Atomic Emission Spectroscopy (AAEM); electron microscopy techniques such as Transmission Electron Microscopy (TEM), Scanning Electron Microscopy (SEM) and, Field Emission Scanning Electron Microscope (FeSEM) and, its sample preparation processing. X-Ray Diffraction (XRD) and Xray Fluorescence (XRF); Thermal Analysis such as Thermal Gravimetric Analysis (TGA) and Differential Scanning Calorimetry, (DSC), surface roughness and follow by mechanical analysis; Impact, bending and flexural analytical test.

Course Outcome:
1. Ability to identifying the basic concepts of material (ceramic, composite, metal, and polymer) through various testing and characterization process.
2. Ability to interpret the obtained experimental results of materials.
3. Ability to analyze various testing and characterization process to solve problems related to materials.
4. Ability to conduct the experiments and determine the results obtained associate with materials.

MMK30103 PENGURUSAN TEKNOLOGI KEJURUTERAAN [ENGINEERING TECHNOLOGY MANAGEMENT]

No of Credits: 3

Course Synopsis:
This course aims to teach students on how to apply the projects 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 Outcome:
1. Ability to evaluate the process of project management, develop work plans, do cost estimation and perform project evaluation.
2. Ability to evaluate economic scenarios and apply decision-making process to engineering project and business venture.
3. Ability to propose successfully establish, lead, manage and work in multidisciplinary teams.
4. Ability to demonstrate the problem-solving and rational effective decision making under uncertainty by applying the principles and core concepts of project/business venture.

MMK31303 TEKNOLOGI KEJURUTERAAN DALAM MASYARAKAT [ENGINEERING TECHNOLOGIST IN SOCIETY]

No of Credits: 3

Course Synopsis:
This 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. The course presents an 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 requirements related engineering and technology field.

Course Outcome:
1. Ability to explain hazards, the function of risk management and occupational safety and health (OSHA).
2. Ability to analyse the aspects and procedures of legal on engineering and technology issues.
3. Ability to integrate and cooperate the issues and challenges of engineering and technology ethics in the community.

MMK49912 LATIHAN INDUSTRI [INDUSTRIAL TRAINING]

No of Credits: 12

Course Synopsis:
This practical-based course exposes students to a company technical functions and organizational structure and operation such as departmental function, work procedure, safety procedure, communication, technical skills and project management in achieve appreciation and/or capability of carrying out complex engineering activities. During this course, the students will apply knowledge acquired at the university and increase their related skills in their future profession.

Course Outcome:
1. Ability to demonstrate technical knowledge and practical skills.
2. Ability to practice the health, safety, legal and cultural issues in a working environment.
3. Ability to apply societal environmental and sustainable development in engineering problems.
4. Ability to demonstrate good work performance, work ethics during training period.
5. Ability to perform as individual a member or leader in diverse technical teams.
6. Ability to communicate and operate assigned task given by host company.
7. Ability to engage in independent and life- long learning in specialist technologies.

MMK15102 BIOLOGI GUNAAN [APPLIED BIOLOGY]

No of Credits: 2
Course Synopsis:
This course introduces general concepts of biology which are related to the agricultural technology and system. The general concepts include the molecular and cellular aspects of living things, structure and function of plants and animals, plant and animal diversity, physiological requirements and response of plant and animal towards internal and external stimuli. At the end of this course, the students are expected to apply the knowledge of biology science agroecosystem and agrotechnology.

Course Outcomes:
1. Able to illustrate biological phenomena at various levels, from cellular to ecological systems.
2. Able to identify various groups of organisms according to morphological, anatomical, reproductive and physiological parameters.
3. Able to illustrate organism responses to internal and external stimuli

MMK17003 ASAS REKA BENTUK INDUSTRI [BASIC INDUSTRIAL DESIGN]

No of Credits: 3

Course synopsis:
The course introduces students to the philosophy of art and design, theory and practice of art and design including of exploration of art elements (line, colour, shape/ form, space, value, and texture) and the principles of art (balance, harmony, unity, emphasis, repetition, rhythm, contrast, and composition). In addition, this course will expose the student in practicality and developing skills regarding conventional techniques 2 dimensional and 3-dimensional manual sketching and rendering, design processes and manual mock-up/ model making. Hence, topics will also be focusing on concepts and methods in designing; elements of good quality product; included concepts sketching and presentation drawing; model making; and design portfolio/ documentation for final design project.
The course also provides an understanding student to the basic industrial design and methods for solving design problems. At the end of this course, students are expected to be able to produce a design project for final task by utilizing knowledge and skills gained.

Course outcomes:
1. Ability to APPLY the philosophy of Industrial Design and the elements of art in relation to culture, compositions, environment, technology, manufacturing, and practice in industrial design
2. Ability to REPRODUCES techniques, skills, methods, and theories of design practice into industrial design work
3. Ability to BUILD design ideas via 2-Dimensional and 3-Dimensional illustration approach to the relevant stakeholders

MMK17102 REKA BENTUK VISUAL [DESIGN VISUALIZATION]

No of Credits: 2

Course synopsis:
This course aims to introduce design skills and knowledge in presenting the idea or design concept. 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 exploration towards visual elements and design concept. In addition, the student will learn about image editing, photo-realistic for 3D design objects, and animation skill. The student also will undergo discussion on related topics and experience some design visualization projects including presentations and critique sessions. This course covers the use of various computer software in studying graphics illustration and technical design skills for visualization presentation purposes significantly.

Course outcomes:
1. Ability to CONSTRUCT basic image editing skill, colouring skill and printing skill
2. Ability to COMPOSE Photo Realistic modelling and rendering skill
3. Ability to BUILD 3D object animation skill
4. Ability to COMPOSE Video editing skill

MMK26003 REKA BENTUK BERBANTU KOMPUTER II [COMPUTER AIDED DESIGN II (CAD II)]

No of Credits: 3

Course synopsis:
This course focuses on giving exposure and skill to students about the advance of 3D and geometry modelling and its application in the design and engineering field by using 3D modelling software. This course includes details on basic surface modelling, advanced surface modelling, rendering and animation. All this skill will help students to produce external and internal surfacing with complex shapes for virtual prototypes or models which suit manufacturing processes. This skill is very demanding in industry.

Course outcomes:
1. Ability to IDENTIFY the principles and tools to develop surface modelling in computer aided design
2. Ability to CONSTRUCT surface modelling data by using tools effectively in computer aided design
3. Ability to ORGANIZE complete CAD data output formally along with rendering work

MMK26103 PROTOTAIP DAN PEMBUATAN MODEL [REVERSE ENGINEERING & ADDITIVE MANUFACTURING]

No of Credits: 3

Course synopsis:
This course provides the knowledge and skills regarding reverse engineering and additive manufacturing for product design development. Students will be exposed to emerging technologies in Additive Manufacturing such as FDM, SLA, SLS, DLP and Polyjet. Besides that, students will experience performing 3D scanning operations as one of the processes in Reverse Engineering. At the end of the courses, students can apply various methods and techniques to construct prototypes and models based on these technologies. The course outlines opportunities to value add to professional skills developed during the course.

Course outcomes:
1. Ability to INTEGRATE fundamental knowledge in Reverse Engineering and Additive Manufacturing in parts fabrication.
2. Ability to CONSTRUCT parts or components by implementing Reverse Engineering and selected Additive Manufacturing technologies.
3. Ability to ORGANIZE the project based on timeline, rules and regulations with understanding of professional ethics.

MMK26203 PROTOTAIP DAN PEMBUATAN MODEL [PROTOTYPING AND MODEL MAKING]

No of Credits: 3

Course synopsis:
This course provides the knowledge and skills regarding prototyping and model making for product design development. From this course, students enable to apply various methods and techniques in constructing prototype and model based on technical specification that has been given. The course outlines opportunities to value add to professional skills developed during the course.

Course outcomes:
1. Ability to INTEGRATE fundamental knowledge of prototyping and model making in product design development.
2. Ability to CONSTRUCT 3-Dimensional physical model or prototype based on 2-Dimensional data using suitable tools, equipment's, and materials.
3. Ability to ORGANIZES systematic workflow and process in completing the task that have been given.

MMK27203 REKA BENTUK INTEGRASI [DESIGN INTEGRATION]

No of Credits: 3

Course synopsis:
This course will introduce to the student about the integration of other disciplines within a product design and development at early stage from a point of view of a design engineering technologist. Students will be guided to collaborate in a team consists of appointed elements such as industrial design, mechanical, electric/electronic engineering and material/manufacturing selection process. This course will enable the student to apply the skill of industrial design within integration of other elements to a product. In the end, the student will be able to deliver a functional product with several combination aspects as well as product design and development documentation required.

Course outcomes:
1. Ability to INTEGRATE the inter-disciplinary aspect into product design and development concept.
2. Ability to FABRICATE a functional product with necessary product design development requirements and documentations.
3. Ability to work as an individual and teamwork to ORGANIZE a collaborative work and able to communicate effectively on engineering activities

MMK27303 REKA BENTUK STUDIO I [DESIGN STUDIO I]

No of Credits: 3

Course synopsis:
Design Studio I aim to develop an understanding of customers and product marketability by using appropriate engineering methods to analyze user needs and formulate solutions to the design problems. Students will generate and develop ideas through sketching and express the idea with mock-up construction. Students are also required to apply 3D CAD software in detailing product specification then transform to technical drawing and animation. Prototype making process is essential for students to simulate the real and future product.

Course outcomes:
1. Ability to analyse user's needs and formulate solution to the design problem based on product design and development process.
2. Ability to construct two dimensional visual and three-dimensional object using various visualization and modelling techniques with appropriate tools, equipment's, and technologies.
3. Ability to discuss the proposal and results of the project effectively using visual, oral, or written format.

MMK36303 KEJURUTERAAN BERBANTU KOMPUTER II [COMPUTER AIDED ENGINEERING II (CAE II)]

No of Credits: 3

Course synopsis:
This course exposes the techniques for obtaining solution of fluid flow problems numerically. The aim of this course is to introduce the fundamental application of simulation of fluid dynamics and heat transfer phenomenon and solving thermo-fluids problem via computational method. Holistic approaches of commercial software are essential towards solving, analyzing and evaluating the results of thermo-fluid problems. The course focuses on solving of two- and three-dimensional fluid flow and heat transfer problems utilize commercial software. The course starts by introducing the history and applications of Computational Fluid Dynamics (CFD). Then it revises the behavior of fluids in motion and derivation of the governing flow equations before detail discussion of various discretization techniques. Moreover, the course discusses the practical guidelines for CFD and simulation of thermo-fluid problems using commercial software.

Course outcomes:
1. Ability to apply the basic concept and knowledge of computational fluid dynamics.
2. Ability to operate the software tools in solving the various thermo-fluids problems.
3. Ability to Justify the results of computational fluid dynamics analysis.

MMK36403 STUDIO REKA BENTUK II [DESIGN STUDIO II]

No of Credits: 3

Course synopsis:
The student will apply and analyse their knowledge on design activities method throughout the course. The students shall be able to analyze advanced product architecture and product design specification. User interaction in relation to the user needs and design concepts is the second topic to be discussed in this course. The course will enhance student in designing skill and communication by combining advanced technology and design elements in the project.

Course outcomes:
1. Ability to ANALYZE product part and function in relation to user need using suitable methods and techniques and appropriate design method in design activities.
2. Ability to CONSTRUCT investigations and product testing to provide valid product function and usability.
3. Ability to work as an individual and teamwork to COMPLETE a project and able to communicate effectively on broadly defined-engineering activities.

MMK36503 REVOLUSI INDUSTRI [INDUSTRIAL REVOLUTION]

No of Credits: 3

Course synopsis:
In this course, the students will discuss about recent or trend issues/topics regarding product design and development. The student will prepare a report of the issues/policy/agenda in group and present them. There will be invited speakers to close the gap between the student and the industry by organising a seminar/talk/conference offering two-way communication.

Course outcomes:
1. Ability to ANALYSE issues/topics/policies/agenda related to product design and development.
2. Ability to DEMONSTRATE impact of product design and development solutions in societal and environment context.
3. Ability to PRESENT a collaborative work and process necessary.

MMK37403 PENGURUSAN INOVASI & PEMBANGUNAN PRODUK [INNOVATION MANAGEMENT& PRODUCT DEVELOPMENT]

No of Credits: 3

Course synopsis:
Innovation Management & Product Development is an essential foundation of project planning and management for Engineering Technology (Product Design) Program. The knowledge throughout this course is important to help the student understand the importance of comprehensive management in product innovation and technology development. The student will learn the appropriate fundamentals, basic principle of planning and management approach applied in the industries.

Course outcomes:
1. Ability to APPLY the basic concepts and principles of innovation management and product development.
2. Ability to ANALYSE the fundamental, principles and approach of product innovation technology development.
3. Ability to manage and CREATE a novel innovation design concept using appropriate approach and technique.

MMK37503 PENGURUSAN PRODUK BAGI PEREKA BENTUK [PRODUCT MANAGEMENT FOR DESIGNERS]

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.

Course outcomes:
1. To DEMONSTRATE the corporate identity in the product design.
2. Ability to ANALYZE in the aspect of design, usability and function.
3. Ability to EVALUATE the product based on design guidelines.

MMK37603 PENGKAJIAN 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.

Course outcomes:
1. To DEMONSTRATE the corporate identity in the product design
2. Ability to ANALYZE in the aspect of design, usability and function
3. Ability to EVALUATE the product based on design guidelines

MMK47703 REKA BENTUK UNTUK PEMBUATAN DAN PEMASANGAN [DESIGN FOR MANUFACTURING AND ASSEMBLY]

No of Credits: 3

Course synopsis:
This course introduces methods and tools that is used in the design process to ease the manufacture and assembly of the part. The term "Design for Manufacture (DFM)" means design for ease of manufacture of the parts or component that will form the product, and "Design for Assembly (DFA)" means to design the part/component for ease of assembly. Thus, in general "Design for Manufacture and Assembly (DFMA)" is the combination of DFA and DFM which directly purposed for (1) Simplify the structure of a product (2) Provide correct, good, and efficient design practices for designer and (3) Reduce the overall product development cost. Student will learn the design guidelines and rules in DFMA to develop suitable component design according to the Boothroyd Dewhurst DFA Methodology and do the assembly analysis based on handling and insertion time to determine Assembly Efficiency (AE). Student will also learn how to select the appropriate material and manufacturing process of each part or components based on the DFMA concept. Student will have a group project to analyse existing product then propose a better design in manufacturing and assembly aspect.

Course outcomes:
1. Ability to ANALYSE the existing design for part reduction process based on the concepts and principles of Design for Manufacturing and Assembly (DFMA) using Boothroyd Dewhurst DFA Method.
2. Ability to RECOMMEND the suitable materials and manufacturing process based of DFMA method to optimize the process selection.
3. Ability to ANALYSE the manufacturing processes such as casting, sheet metal working, and die casting to select the correct process parameters.
4. Ability to PROPOSE new design and/or simplify the existing components for products studied in the "Mini Project" based on the DFMA concept.

MMK28103 PENGUJIAN BAHAN [MATERIALS TESTING]

No of Credits: 3

Course Synopsis:
This course is designed to expose students to the theory and practical aspects of material testing using destructive and non -destructive tests such as compression testing, tension testing, bending testing, ultrasonic testing, magnetic particle testing and liquid penetration testing. Students will also be introduced to the mechanical properties of materials such as hardness, brittleness, etc.

Course Outcome:
1. Able to analyze the importance of materials testing, the types of materials testing, the basic of materials imperfection and impurities in solids.
2. Able to evaluate the destructive and non-destructive materials tests.
3. Able to construct various testing techniques such as tensile test, compression test, flexural testing, magnetic particle test and liquid penetration test.
4. Able to response the result and defects that exist on inspection materials through destructive and non-destructive testing.

MMK28203 PENCIRIAN BAHAN [MATERIALS CHARACTERIZATION]

No of Credits: 3

Course Synopsis:
This course is designed to expose students the basic principles of materials characterization. The materials characterization is divided into several sections, including Surface or Topography examination (LM, SEM, SPM), Thermal Analysis (TGA, DSC, DTA), Phase Analysis (XRD) as well as Spectroscopy Analysis (FTIR, AAS).

Course Outcome:
1. Ability to select suitable characterization technique to characterize the materials.
2. Able to determine a materials characterization concept and method.
3. Able to categories material via various characterization techniques.
4. Able to elaborate physical properties of materials through various characterization technique for materials selection purposes.

MMK28303 PEMPROSESAN SERAMIK TEMBIKAR PUTIH [WHITEWARE CERAMIC PROCESSING]

No of Credits: 3

Course Synopsis:
Whiteware refers to ceramic ware that is white, ivory, or light gray in color after firing. Student will be exposed to introduction to the traditional whiteware ceramics materials including types, properties and their applications. Moreover, traditional ceramics processing methods including different shaping techniques, drying, firing and glazing processes are conducted.

Course Outcome:
1. Able to examine the fundamental concept in whiteware ceramic processing including raw materials used, properties, preparation technique.
2. Able to compare different types of shaping technique in whiteware ceramic processing.
3. Able to explain the detail process in drying, firing and glazing stages.
4. Able to operate the equipment and instrument used in whiteware ceramic processing.

MMK28403 TEKNOLOGI PENGEKSTRAKAN LOGAM [METAL EXTRACTION TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This course will introduce students to mineral processing and general the principle in extracting metal from ore by using metal extraction methods; hydrometallurgy, electrometallurgy and pyrometallurgy. This course will expose students to the advantages of mineral processing and other mineral separation process, leaching technique, electro recovery and electro purification of the ore and ore treatment at high temperatures.

Course Outcome:
1. Ability to explain the principle and process involved in mineral processing.
2. Ability to analyse the theory in hydrometallurgy, electrometallurgy and pyrometallurgy.
3. Able to practice the principle and processes involved in mineral processing.
4. Ability to demonstrate mineral or metal extraction process from its ore using hydrometallurgy, electrometallurgy and pyrometallurgy.

MMK28503 PEMPROSESAN PLASTIK [PLASTIC PROCESSING]

No of Credits: 3

Course Synopsis:
This course is designed to provide students with a broad knowledge on the aspect of properties and physical basis of plastic processing, thermoplastic and thermoset processing methods, processing parameters, knowledge on the thermoplastic and thermoset compounding and additives. This also introduces the finishing and assembly of plastic end product and expose students to the impact of solid waste plastic to environment.

Course Outcome:
1. Able to examine the concept of plastic materials and the physical basis of plastic processing.
2. Able to prepare plastic products via different techniques parameter for thermoplastic and thermoset processing.
3. Able to propose the finishing and assembly of plastic processing end products.
4. Able to relate the environmental aspect of plastic products

MMK38103 KAWALAN PROSES [PROCESS CONTROL]

No of Credits: 3

Course Synopsis:
This course introduces basic knowledge of process control such as application of process control in daily life and in industry, principle of process control and the importance of learning this coarse. Students will learn to solve control system problem through simplification of block diagram, Laplace transformation and stability. Lab session using MATLAB enhanced the students understanding of this course.

Course Outcome:
1. Ability to determine types and essential features of process control, simplify block diagram and solve differential equation.
2. Ability to formulate different types of analysis to explain the nature of stability of the system.
3. Ability to construct coding to solve mathematical problems, matrix operations and transfer function using MATLAB software.

MMK38202 REKABENTUK ACUAN DAN DAI [DESIGN OF DIE & MOULDS]

No of Credits: 3

Course Synopsis:
This course covers the moulds and dies design fundamental for injection moulding, extrusion, compression moulding and transfer moulding. Students firstly been exposed to the parts and function of each related moulds and dies, followed by material selection, fabrication techniques and principles of design economy for moulds and dies. Students skill in engineering design will be enhanced through the CAD software, which they learn during the lab session.

Course Outcome:
1. Able to determine the importance of moulds and dies, the materials requirement, and the fabrication techniques involve in moulds and dies design.
2. Able to determine the design criteria require in designing moulds and dies for selected processes.
3. Able to construct 3D model of a part, assembly drawing from numbers of part and orthographic projection using CAD software.

MMK38303 TEKNOLOGI FABRIKASI LOGAM [METAL FABRICATION TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This course provides knowledge and practice focusing on developing and improving technical skills and knowledge student on different types of metal fabrication techniques such as welding, fitting and cutting. Through this course, advanced concepts and technical skills related to various metal fabrication techniques able to be developed through applications and comprehensive practical skills. Students will have opportunities to reinforce, apply and transfer knowledge and skills to a variety of setting and problems. This helps the student in comprehensive problem solving which related to metal fabrication technology.

Course Outcome:
1. Ability to analyse the basic process, concepts, tool and techniques in angular measurement, fitting, and metal forming.
2. Ability to evaluate the joining process and the different types of cutting process.
3. Ability to manipulate the apparatus and equipment of fitting process in the laboratory.
4. Ability to perform joining process and cutting process such its type, process, mechanism, and application.

MMK38403 PEMPROSESAN BAHAN KOMPOSIT [COMPOSITE MATERIALS PROCESSING]

No of Credits: 3

Course Synopsis:
This course is designed to provide the students fundamental knowledge and the important concepts in composite material classification such as metal matrix composites, ceramic matrix composites, polymer matrix composites. Besides that, processing techniques, physical and mechanical properties and limitation of each type of the composites need to be focused. Moreover, students are able to analysis and solve the problems present in the composites system by applying the formulations and calculations. The students are also able to elaborate the fabrication of each composite materials using conventional and advanced processing.

Course Outcome:
1. Ability to analyse and relate the knowledge of science and engineering specialization to the solution of composite materials processing problems.
2. Ability to appraise science and engineering technology principle to the solution of composite materials.
3. Able to indicate problems and follow a suitable fabrication technique of composite materials to develop better composite system.
4. Able to perform failure test of behavior and strengthening mechanism of composite materials.

MMK38503 PEMILIHAN BAHAN DAN REKABENTUK [MATERIAL SELECTION AND DESIGN]

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 the 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, statistical 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 Outcome:

1. Able to relate the fundamental of materials selection and design.
2. Able to evaluate materials knowledge, processing, microstructure, and performance and their implication with materials design.
3. Able to design and make a selection material using a method: performance index and efficiency of materials, Weibull modulus, based on mechanical factors, semi-quantitative, and others.
4. Ability to communicate with team members and public during gaining solution to problem and to make effective presentation to convince the solution provided.
5. Ability to work with team members effectively in carrying out and complete tasks assigned.

MMK39103 PEREKAT POLIMER DAN PENGLITUP [POLYMER ADHESIVE AND COATINGS]

No of Credits: 3

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 Outcome:

1. Able to examine the basic knowledge of adhesive and coatings.
2. Able to differentiate the adhesives and coating process for certain applications.
3. Able to propose the formulation and compounding on the surface coating and classification of coatings in the industry.
4. Able to evaluate the adhesives and coating in various fields.

MMK39203 TEKNOLOGI GETAH DAN LATEKS [RUBBER AND LATEX TECHNOLOGY]

No of Credits: 3

Course Synopsis:

This course exposes student to knowledge, principle and concept of rubber and latex technology. These courses also focus on compounding, formulation, production, characterization, testing of latex and rubber processing and rubber nanotechnology.

Course Outcome:

1. Able to identify the physical and chemical properties of rubber and latex.
2. Able to differentiate compounding types of rubber and latex regards to its formulation, mixing and purposes.
3. Able to categorise different testing method relate with design solutions for various types of rubber and latex compounds.
4. Able to propose various rubber and latex processing techniques, safety handling, machineries and application of nanotechnology in rubber industry.

MMK39303 METALURGI TERMAJU [ADVANCED METALLURGY]

No of Credits: 3

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-base, Ti-Base and Mg-base alloys along with precious metal metallurgy and intermetallic and their modern developments. Characteristics and formation mechanisms of various microstructures of metals and alloys produced during fabrication processes such as cast/solidification, plastic deformation and heat treatments are comprehensively introduced.

Course Outcome:

1. Able to explain the fundamentals of thermodynamics for metallurgy.
2. Able to evaluate on phase diagram of metals (ferrous and non-ferrous) and its alloys.
3. Able to demonstrate the principles of phase transformation on the microstructures and mechanical properties of metals and apply appropriate techniques in process of metal forming.
4. Able to design a material for specific application based on characteristics of solid solution alloys and intermetallic compound.

MMK39403 TEKNOLOGI BAHAN GEOPOLIMER [GEOPOLYMER MATERIALS TECHNOLOGY]

No of Credits: 3

Course Synopsis:
Introduction to the geopolymer materials including theory, processing, characterization, and application. The 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. The geopolymer will cover ceramic, metal, polymer, and also composite materials. The student will be exposed to the important aspect of geopolymer materials technology including concept, principles, properties, and applications by considering environmental and sustainable development.

Course Outcome:
1. Able to analyze the basic knowledge of Geopolymer process and properties of geopolymer materials technology.
2. Able to analyze the materials, processing, and mechanism of geopolymer materials technology.
3. Able to evaluate the performance of geopolymer materials, testing and analysis the geopolymer samples.
4. Able to design geopolymer properties and application for sustainable development.

MMK48103 BAHAN UNTUK TENAGA DAN KEMAMPANAN ALAM SEKITAR [MATERIAL FOR ENERGY AND ENVIRONMENTAL SUSTAINABILITY]

No of Credits: 3

Course Synopsis:
This course builds an understanding of critical relationship between the environment, energy and sustainability. It will expose 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 Outcome:
1. Able to examine the relationship between energy, environment and sustainability.
2. Able to demonstrate materials knowledge and processing on non-renewable and renewable energy.
3. Able to evaluate the industrial case study in energy efficiency.
4. Able to evaluate the green processing and recycling process.

MMK49103 TEKNOLOGI SERAMIK TEKNIKAL [TECHNICAL CERAMIC TECHNOLOGY]

No of Credits: 3

Course Synopsis:
Introduction to technical ceramics including properties and applications. Students will be exposed to the modern technical ceramic, glass, and glass ceramics processing technology including raw materials preparation, different shaping techniques, sintering, and finishing. The student will be exposed to the important aspect of ceramic technology including concepts, principles, properties, and applications by considering environmental and sustainable development. Students will learn corrosion engineering principles. This course covers a basic but thorough review of the causes of corrosion and the methods by which corrosion is identified, monitored, and controlled. Therefore, students will be exposed to corrosion electrochemistry, types of corrosion, and common corrosion problems in industries through this subject.

Course Outcome:
1. Able to analyze basic knowledge of ceramic properties and processes in technical ceramic technology.
2. Able to compare processing routes suitable for the forming and design the specific types of ceramic products, including selection of specific equipment used.
3. Able to justify technical ceramics problems from existing knowledge of technology and science.
4. Able to design the solutions for complex technical ceramics problems to meet specified needs.

MMK49203 TEKNOLOGI KACA [GLASS TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This course is introduced to enhance the knowledge on ceramic materials. It consists of the principles of glass formation, understanding on phase diagram and structure of glass. It will also include the understanding of glass properties and its performance on the final applications.

Course Outcome:
1. Able to determine and explain the principles of glass formation in glass technology.
2. Able to determine an understanding on phase diagram and structure of glass.
3. Able to evaluate and justify the properties of glass for complex glass design solutions.
4. Able to propose and design the characterization method for the glass properties and performance.

MMK15202 PENGENALAN KEPADA PERTANIAN [INTRODUCTION TO AGRICULTURE]

No of Credits: 2

Course Synopsis:
This course is one of the integral components of the Program curriculum aims to impart a basic understanding of concepts behind the agricultural industry. Knowledge particularly in agriculture enables the students to manage natural resources, food, plant and animal production enterprises in a sustainable manner.

Course Outcomes:
1. Ability to understand the crop, soil and animal science in an agricultural system
2. Ability to describe the soil-plant-animal interactions in an agricultural system
3. Ability to demonstrate systems related to good agricultural practices and sustainable farming

MMK25102 TEKNOLOGI PENGELUARAN TANAMAN LADANG [PLANTATION CROP PRODUCTION TECHNOLOGY]

No of Credits: 2

Course Synopsis:
This course covers principles of crop production, growth condition and nutritional requirements, including diseases and pest management in Malaysia's plantation sector (e.g., oil palm, rubber, cocoa and coconut). Students will be exposed to good agricultural practices and good manufacturing practices applied in our plantation crop production. Mechanization and technology developed for plantation crop production will also be taught in this course.

Course Outcomes:
1. Ability to explain the production, growth condition and nutritional requirements involved in plantation crop production..
2. Ability to discover the diseases and pests involved in plantation crop production.
3. Ability to apply good agricultural practices and good manufacturing practices for plantation crop production technology.

MMK24103 SISTEM PNEUMATIK DAN HIDARULIK [PNEUMATIC AND HYDRAULIC SYSTEMS]

No of Credits: 3

Course Synopsis:
This course exposes students about the fundamental of theory and concept to pneumatic & hydraulic systems. This course focuses on introduction of 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 using pneumatic and hydraulic equipment during laboratory to construct the related circuits. At the end of this course, the pneumatic system application is combined with electro-pneumatic system which uses electric power, relay, sensor and limit switch to control the pneumatic components.

Course Outcomes:
1. Ability to apply fundamental knowledge of pneumatic & hydraulic systems.
2. Ability to evaluate problems on single and multiple pneumatic and hydraulic circuits
3. Ability to propose solution and design circuit operation, in relation to the performance of the individual components themselves.

MMK24203 INSTRUMENTASI DAN KAWALAN [INSTRUMENTATION AND CONTROL]

No of Credits: 3

Course Synopsis:
This course introduces students to fundamental knowledge about instrumentation and control system technology. Students will be exposed to basic instrumentation and measurement concepts including the general measurement system, transducers, working principle of various sensors and signal conditioning. Students will also be exposed to the basic knowledge of control system technology, including control system models, transfer functions, system response and process controllers.

Course Outcomes:
1. Ability to analyse concepts of instrumentation system including sensors, transducers and signal processing..
2. Ability to analyse basic concepts of control system technology.
3. Ability to demonstrate instrumentation and control principles through experiments, modelling and simulations

MMK25202 KEJURUTERAAN TANAH [SOIL ENGINEERING]

No of Credits: 2

Course Synopsis:
This course introduces the basic concepts of soil engineering and soil mechanics. It covers the fundamental multi-phase nature of soils, provides an understanding of soil description and classification, the soil effective shear-strength-stress concept and the soil properties that is associated with soil tillage.

Course Outcomes:
1. Able to analyse soils including soil and water weight-volume relationship and PERFORM soils analysis as demonstrated during laboratory
2. Able to evalute the state of stress and shear strength of a soil mass.
3. Able to relate soil properties to soil tillage

MMK25303 TEKNOLOGI PENGELUARAN PENTERNAKAN DAN AKUAKULTUR [LIVESTOCK AND AQUACULTURE PRODUCTION TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This course covers terminology, basic biological aspects of animal and fish, production management technology, nutrition and feed, disease management, meat, dairy and aquaculture product management and marketing. The students are able to use innovative technology and products which enhance the growth of animal protein production in Malaysia and allow entrepreneurs to learn new methods to improve their efficiency. The relevance of livestock industry in Malaysia and global, including production and market aspects will also be taught.

Course Outcomes:
1. Ability to discuss and display the processes involved in livestock and aquaculture production
2. Ability to differentiate and present the characteristics and management of ruminant, non-ruminant livestock and aquaculture production systems
3. Ability to apply and demonstrate good agricultural practices in livestock and aquaculture production

MMK25402 TEKNOLOGI PENGELUARAN TANAMAN MAKANAN [FOOD CROP PRODUCTION TECHNOLOGY]

No of Credits: 2

Course Synopsis:
This course covers principles of agronomy, soil and plant relationships, farm management, and enterprise management in the agricultural sector for sustaining agricultural growth and slowing down environmental degradation. Students are able to use innovative science and technology which enhance the growth of food crop production in Malaysia and allow them to learn new methods to improve their efficiency. The relevance of crop industry in Malaysia and global, including production and market aspects will also be taught.

Course Outcomes:
1. Ability to discuss and describe the principles and processes involved in food crop production.
2. Ability to choose and perform the appropriate food crop production technology.
3. Ability to apply and determine good agricultural practices in food crop production.

MMK34103 AUTOMASI DALAM SISTEM PERTANIAN [AUTOMATIONS IN AGRICULTURAL SYSTEMS]

No of Credits: 3

Course Synopsis:
This course covers the use of automation in the agricultural system. Various automation elements such as sensors, controllers, actuators, regulators, servos and others that are used in farm vehicles will be studied in this course. In addition, automation technologies in field crops and orchard productions such as irrigation, drainage and soil conservation practices, chemical applications, post-harvest operations, animal and aquacultural productions, food processing operations and waste management.

Course Outcomes:
1. Ability to apply principle of automation and sensor technology in agricultural systems
2. Ability to analyse and respond to different actuator components and applications in agricultural engineering.
3. Ability to design automation system for agricultural and biological production system

MMK35103 TEKNOLOGI LEPAS TUAI [POST-HARVEST 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:
1. Ability to compare the principles and operations applied in postharvest technology.
2. Ability to analyse and operate the effects of processing and selected methods on quality properties of agricultural produce
3. Ability to evaluate the problem that involved during postharvest handlings and operation

MMK35203 TEKNOLOGI PERTANIAN TEPAT [PRECISION FARMING TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This course covers the essential aspects of Precision Farming Technology concepts including soil/landscape and crop spatial variability, GIS, GPS, sensors, variable rate machinery, PA software, remote sensing, geostatistics, sampling, experimental designs, precision integrated crop management, data acquisition, processing, management, socio-economical aspects.

Course Outcomes:
1. Ability to illustrate the concept, component and application of precision farming.
2. Ability to analyze geo- referenced data using spatial information technologies.
3. Ability to practice spatial information and precision farming technology to improve soil and crop management, environmental, socio-economical aspects.

MMK35303 TENAGA DIPERBAHARUI DALAM SISTEM PERTANIAN [RENEWABLE ENERGY IN AGRICULTURE SYSTEMS]

No of Credits: 3

Course Synopsis:
Renewable energy has the potential to contribute significantly to energy security and greenhouse gas reduction worldwide. This course will educate mechanical engineering technology students to the utilisation of diverse energy resources to provide power for processing biological materials, with a focus on the technology development process and engineering of renewable energy sources such as solar, wind, hydro and biomass energy.

Course Outcomes:
1. Ability to explain technologies used in generating mechanical and electrical power
2. Ability to evaluate the efficiency and performance of different renewable energy generating systems.
3. Ability to practice renewable energy conversion.

MMK44103 KUASA LADANG DAN MESIN [FARM POWER AND MACHINERY]

No of Credits: 3

Course Synopsis:
This course covers the basic of machines and the importance of mechanization for various farm operations for agricultural output, selection of appropriate machines, maintenance and the management of farm machineries.

Course Outcomes:
1. Ability to analyze the basic principles, construction and working of farm machinery for different crops and livestock
2. Ability to evaluate and respond to appropriate machinery and its applications.
3. Ability to organise agro machinery service centre

MMK45103 PENGURUSAN SISA PERTANIAN DAN KEJURUTERAAN KEPENGGUNAAN [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:
1. To recommend systems for the collection, handling, treatment and utilization of wastes
2. To operate the suitable physical, chemical and/or biological treatment of industrial and agricultural organic wastes..
3. To construct the suitable utilization technique for agricultural waste and wastewater to sustain an environmental.

MMK45203 PERSEKITARAN TERKAWAN UNTUK PERTANIAN [CONTROLLED ENVIRONMENT AGRICULTURE]

No of Credits: 3

Course Synopsis:
The course covers design of controlled environment of agricultural structures which include thermal and environmental engineering analyses appropriate for controlled environment of agricultural production facilities for plants and animals. Major topics include psychrometrics, heat transfer, ventilation and heating, air distribution within buildings, and control systems.

Course Outcomes:
1. Ability to analyze heat and mass transfer of plants and animals structure
2. Ability to analyze and illustrate natural and forced cooling and heating for plants and animals structure
3. Ability to evaluate and demonstrate mechanical and natural ventilation for plants and animal structure.

MMK45303 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, extrusion, cleaning and sanitation, elements of food plant design and food safety systems.

Course Outcomes:
1. Ability to categorize the mechanisms involved in unit operations of food processing in optimizing food quality and extend the shelf life of foods.
2. Ability to differentiate and operate the principles and current practices of food processing techniques and the effects of processing parameters on product quality.
3. Ability to plan food processing flow to attain specific process strategies.

MMT15003 LUKISAN PRODUK DAN SPESIFIKASI [PRODUCT DRAFTING AND SPECIFICATION]

No of Credits: 3

Course Synopsis:
This course teaches the students on product drafting and specification principles. Students are required to learn topics on part drawings such as geometries, sectional views and multi-view drawings. Students will learn to use CAD software to produce part drawings and apply the lettering functions, product tolerances and dimensions. Students will also learn the method for assembling the individual parts and generate the assembly drawing of the product. Finally, students will be taught to interpret part drawings especially from 2-dimensional industrial part drawings

Course Outcomes:
1. APPLY knowledge required for product drafting processes based on part examination, analysis and interpretation suitable for machining processes.
2. DEMONSTRATE the ability to produce 2D and 3D part drafting complete with technical specifications suitable for machining processes.
3. JUSTIFY reasons of applying the chosen drafting requirements to meet objectives of the project.

MMT15103 PIAWAIAN KEPERSISAN PRODUK [STANDARD PRODUCT PRECISION]

No of Credits: 3

Course Synopsis:
This course teaches the students about the principles and methods of applying product precision based on the standards for the machining of parts and product. Basically, the application involves with dimensional metrology and quality control of the machined parts and the relationship between those two fields of knowledge. Students will learn to use the dimensional metrology equipment for linear and angular measurements, surface measuring equipment and a coordinate measuring machine. Student will also learn and apply the quality control tools (7 QC Tools) and sampling method for quality control proses.

Course Outcomes:
1. Ability to DISCUSS and EXPLAIN knowledge required for product precision according to the standards related to industrial machining processes
2. DEMONSTRATE the ability to produce 2D and 3D part drafting complete with technical specifications suitable for machining processes.
3. JUSTIFY reasons of applying the chosen drafting requirements to meet objectives of the project.

MMT15203 SIFAT-SIFAT BAHAN KERJA DAN ALAT PEMOTONG [WORKPIECE AND CUTTING TOOL PROPERTIES]

No of Credits: 3

Course Synopsis:
This course covers types, setup, applications and specifications of common cutting tools and workpiece materials that frequently applied in industry. The course also introduces why the selection of the appropriate cutting tools and cutting fluids are essential in metal cutting operations to reduce the heat and friction produced during material removal operations and how the selection, setup and applications affect the quality, accuracy, efficiency and productivity of the workpiece produced.

Course Outcomes:
1. Ability to DISCUSS the properties of common cutting tools and workpiece material that being applied in industries
2. Ability to CLASSIFY the usage of cutting tools and workpiece materials in the specific application in industry
3. Ability to CONSTRUCT manufacturing process to produce cutting tool and/or workpiece materials

MMT15303 JIG DAN LEKAPAN [JIG AND FIXTURE]

No of Credits: 3

Course Synopsis:
This subject introduces students to jig and fixture. It starts with types and functions of jig and fixture. In addition, students will be exposed to knowledge about classification of jig and fixture for selected operation. This course also introduces student to identify the principles and analysis of a tool design in jig and fixture application. The tool drawing is important to students in order to design the jig and fixture therefore the guideline of tool and jig design are explained.

Course Outcomes:
1. Ability to apply the knowledge to use the proper work holding, clamping mechanism and specialized work holding systems through effective designs of jig and fixtures.
2. Ability to follow the specific design and manufacturing process to build the jig and fixtures.
3. Ability to organize a task for integrating multi components to fabricate the jig and fixtures.

MMT15404 PENYEDIAAN DAN PEMBAIKPULIH MATA ALAT [TOOL SETUP AND REFURBISHMENT]

No of Credits: 4

Course Synopsis:
This course covers types, setup, applications and specifications of common cutting tools and workpiece materials that frequently applied in industry. The course also introduces why the selection of the appropriate cutting tools and cutting fluids are essential in metal cutting operations to reduce the heat and friction produced during material removal operations and how the selection, setup and applications affect the quality, accuracy, efficiency and productivity of the workpiece produced.

Course Outcomes:
1. Present the importance specification of cutting tool design for turning, milling and drilling operations
2. Perform the cutting tool setup for turning, milling and drilling operations
3. Propose the usage of refurbished cutting tools in machining and other application

MMT15503 PEMESINAN MAPAN [SUSTAINABLE MACHINING]

No of Credits: 3

Course Synopsis:
This subject covers the recent technologies in sustainable machining processes. It starts with principles, applications and direction of sustainable manufacturing. Furthermore, students will be exposed to knowledge related to coolant-lubricant strategies, eco-friendly metal cutting fluids and energy/power consumption in machining operations. This course also introduces students to machining cost, design of experiments and life cycle assessments in the machining processes.

Course Outcomes:
1. APPLY knowledge to ILLUSTRATE sustainable concepts appropriate to the machining processes.
2. FOLLOW the concepts and techniques in RESPONDING the output/data of the machining
3. ORGANIZE a task that INTEGRATES methods and justify reasons for application in machining processes.

MMT15603 TAKSIRAN KEBOLEHMESINAN [ASSESSMENT OF MACHINABILITY]

No of Credits: 3

Course Synopsis:
This course provides students with the measurement of machining performances i.e. machinability. Machinability is an indicator of one engineering material on how easy or difficult to be machined to achieve acceptable performances. Engineers are often challenged to find ways to improve machinability without harming material performance, which are focused on the machining efficiency and productivity. However, unlike most material properties, machinability cannot be simplified into a unique work material property, but rather considering as a resultant property of the machining system which is mainly affected by work material's physical properties, heat treatment processes, and work-hardening behavior, as well as cutting tool materials, tool geometry, machining operation type, cutting conditions and cutting fluids. In addition factors and method for improving machinability are also covered in this course.

Course Outcomes:
1. Ability to define the factors that is governed or influenced on the machinability
2. Ability to demonstrate and to perform various type of assessment according to the standards related to assessment of machinability
3. Ability to organize various methods of improvement for machinability

MMT15703 PEMANTAUAN KEADAAN DALAM PEMESINAN [CONDITION MONITORING IN MACHINING]

No of Credits: 3

Course Synopsis:
This course teaches students the fundamental concepts of condition monitoring technique and its application in the industry. Students will also learn to utilize several tools to monitor and analyze signals from machine such as vibration, acoustic and electrical current. In addition, conventional methods such as visual inspection, machine performance and trend monitoring will also be used to examine machine condition. Basic analysis methods will also be learned in this course to identify the root problem. Finally, common types of machine maintenance such as corrective and preventive maintenances will be exposed to the students.

Course Outcomes:
1. Ability to explain knowledge regarding machine condition monitoring technique, its application and related tools used.
2. Demonstrate the ability to perform the required techniques and skills to be applied in machine condition monitoring.
3. Able to formulates the systematic planning in identifying machine problem using related tools.

MMT25004 KEPERSISAN DAN KEMASAN DALAM TEKNOLOGI CNC [PRECISION AND FINISHING IN CNC TECHNOLOGY]

No of Credits: 4

Course Synopsis:
This course provides student with concept and practices of CNC machining process. It emphasis on how to program and operate CNC milling and CNC turning. Students will learn to develop the CNC program base on G-Code and M-Code languages. In addition, student will acquire in specific knowledge and skill in precision and finishing processes such as drilling, tapping, boring, grooving, facing, pocketing, radius forming, angular cutting and threading.

Course Outcomes:
1. Ability to explain and recognize capabilities of 2,3 axis CNC machining
2. Ability to develop programs and conduct processes using coordinate system and ISO coding system for turning and milling processes
3. Ability to manage CNC machining processes with a good precision and finishing requirement

MMT25103 KEPERSISAN DAN KEMASAN DALAM TEKNOLOGI EDM DAN PENCANAIAN [PRECISION AND FINISHING IN EDM AND GRINDING TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This subject introduces students to Electrical Discharge Machine (EDM) and grinding technologies. In addition, students will be exposed to knowledge about classification of EDM and grinding technologies for selected operation. This course also will introduce student to identify the principles and analysis of a tool design and tool manufactured in both machine application. In this course, the tool drawing is important to students in order to operate and manage the machine in laboratory

Course Outcomes:
1. Ability to ANALYSE and DIFFERENTIATE the abilities and principle of EDM and grinding machine
2. Ability to CONSTRUCT and CREATES program by using a coordinate system for EDM and grinding for machining solution
3. Ability to ORAGNISE and PREPARE the production by using EDM and grinding machines to produce components

MMT25204 PRODUK PRISMATIK CADCAM [PRISMATIC CADCAM PRODUCT]

No of Credits: 4

Course Synopsis:
This course teaches the students on the principles and application of CADCAM system used in manufacturing industries. Students are required to learn the concepts and applications of CADCAM as used in the industries for product development and machining processes. Students will use CAD software to produce 3-dimensional (3D) models including parts and their assembly followed by generating 2-dimensional (2D) drafting. Students will also learn the CAM software that can be used to simulate the 3D machining processes of the developed parts in order to generate numerical control (NC) codes for the CNC machines. This course focuses on prismatic products that can only be machined using 3-axis milling machines and 2-axis lathe machines.

Course Outcomes:
1. Ability to APPLY knowledge required for prismatic product development that can be machined using 3-axis milling machines and 2- axis lathe machines.
2. Ability to CONSTRUCT 2D and 3D product drawings. Use the drawings to simulate machining processes and PRODUCE the NC programs for milling and lathe CNC machines
3. Ability to JUSTIFY reasons of applying the chosen processes to meet objectives of the project.

MMT25304 ESTETIKA PERMUKAAN KOMPONEN MESIN [SURFACE AESTHETICS OF MACHINED COMPONENT]

No of Credits: 4

Course Synopsis:
This course covers many types of coating methods for machined component performance and aesthetics. It explains the fundamentals of coating technologies, as well as the testing and procedures for each coating method. Physical Vapor Deposition, Chemical Vapor Deposition, Electroless Plating, Chroming, Embossing, Flame Surface Treatment, and Plasma Nitriding are some of the coating processes that will be discussed in detail.

Course Outcomes:
1. Ability to Propose the suitable surface treatment process for suitable application.
2. Ability to Organize a process to be applied to treat the surface from machining to coating.
3. Ability to Present the benefit of fine surface finish of machined component to reduce operational costs.

MMT25404 PEMESINAN PAKSI PELBAGAI [MULTI AXIS MACHINING]

No of Credits: 4

Course Synopsis:
This subject gives in depth knowledge to students regarding multi axis machining. As compared to basic CNC machining which comprises of 3 linear axes namely X, Y and Z axis, multi axis machining gives further capability to machine complex parts with the additional rotary axis A, B and C as well as mill-turn and turn-mill capability. Understanding machines configuration will be key to avoid collision during machining. Students will be introduced to different types of machine configuration and machine kinematics to have better understanding of machine tools in order to create effective and safe CNC machining programs.

Course Outcomes:
1. Ability to create machining program for complex parts that require multi axis machining
2. Ability to differentiate different types of machine configuration and machine kinematics.
3. Ability to Present sources and possibility of machine collision during machining

MMT25503 PRODUK KOMPLEKS CADCAM [COMPLEX CADCAM PRODUCT]

No of Credits: 3

Course Synopsis:
This course is the continuity from the course of Prismatic CADCAM Product. Complex CADCAM product will be produced by using 3, 5 or 9 axis CNC machines. The topics involved with construction views; cross section surface construction; trim plane surface; extruded surface; surface of revolution; drive curve surface construction; surface fillet construction; extending surface; composite surface construction.

Course Outcomes:
1. Ability to distinguish the different procedures in NC programming for complex product
2. Ability to apply the method of converting to the CNC programs
3. Ability to develop the geometric features and method to design complex CAD/CAM part

MMT25604 RAWATAN HABA KOMPENAN MESIN [HEAT TREATMENT OF MACHINED COMPONENT]

No of Credits: 3

Course Synopsis:
This course will discuss the concept and application of heat treatment on various types of metal. The topics involved with the main alloying element that affected the hardenability of steel. The students will be exposed to the common heat treatment practice in industry. Student will also practice the quality control evaluation after heat treatment. Several advanced heat treatment process also will be discussed.

Course Outcomes:
1. Ability to conduct heat treatment to alter the properties of selected steel
2. Ability to differentiate the heat treatment application to change the properties of material
3. Ability to present the capability heat treated steel to be applied in other application

MMT25804 PROJEK KEUSAHAWANAN TEKNOLOGI 1 [TECHNOPRENEUR PROJECT 1]

No of Credits: 4

Course Synopsis:
Entrepreneurs need money to start and to grow their business. It is important to understand how revenue is generated, how to source for funds, how to control cash flow, how to assess the succes of the company in monetary terms, and how to value a company for various purposes. The course exposes students to the various financial aspects relating to new ventures. These include approaches to secure start-up capital and venture financing. Students learn about the basic accounting, essential financial indicators, the types of funds available, the different categories of investors, the importance of intellectual property in securing finance, the financial details to be included in a business plan required for investment purpose, valuation of company and the art of negotiation with investors

Course Outcomes:
1. Ability to apply various financial indicators & tools to prepare for financial information for a new business venture
2. Ability to acquire skills to analyze financial statements
3. Ability to Present financial information for new business
4. Ability to Display the art of negotiation with investors

MMT35004 KAEDAH PEMASANGAN [ASSEMBLY METHOD]

No of Credits: 4

Course Synopsis:
This subject introduces students to assembly method. It starts with types and functions of joining techniques in metal and plastic part. In addition, students will be exposed to knowledge about process assembly for metal and plastic parts. This course also will introduce student to design for manufacturing and assembly application. In this course, the principle of assembly method is important to students in order to design effectively step by step of assembly.

Course Outcomes:
1. Ability to Develop of product by assembly component manufacture various technique
2. Ability to present the possibility to assemble components by using various techniques
3. Ability to Organize the components that can be assembled by design for manufacturing assembly (DMFA) approach

MMT35104 KERJA SEMULA DAN PEMULIHAN KOMPONEN MESIN [REWORK AND REHABILITATION OF MACHINED COMPONENT]

No of Credits: 4

Course Synopsis:
This subject gives an exposure on rework of machined part and rehabilitating machined components which are out of tolerance due to wear and tear. Reworks are required when machined parts are under machined and still have unremoved materials due to tool wear during machining. Whereas rehabilitation of parts is required when a machined part is out of tolerance after servicing its purpose in the field. Students will gain understanding of rework and rehabilitation and be aware of its purposes in the field of manufacturing.

Course Outcomes:
1. Ability to identify parts that can be reworked or rehabilitated
2. Ability to propose the methods and procedures that can be utilized for rework and rehabilitation process
3. Ability to verify whether reworked or rehabilitated parts are ready for use

MMT35204 PROJEK KEUSAHAWANAN TEKNOLOGI 2 [TECHNOPRENEUR PROJECT 2]

No of Credits: 4

Course Synopsis:
The start-up and growth of an enterprise invariably involves both human and financial capital. To manage the increasing pool of human resources and to convince venture capitalists to invest become two main issues especially for growing venture. This course consists of two parts: in the first part, organization and human resource management are introduced; in the second part, the focus is on writing a convincing business plan to attract venture capital investment. When enterprise starts to take shape and grow, more people will be hired, proper organization, team building and human resource management will become important issues. In this course, students will be exposed to the various organizational aspects relevant to new ventures and established companies. These include the pros and cons of the different organization structures, conflicts that may arise among employees, and approaches to building strong teams. Human resourse management techniques will also be introduced and discussed. In the second part of the course, the business model canvas will be described listing the connections among the different components of a business. The value of a business plan and the techniques of writing a business plan will be introduced.

Course Outcomes:
1. Apply the business model canvas incorporating human and financial elements
2. Acquire skills to resolve organizational conflicts
3. Write a convincing business plan
4. Evaluate vital organizational behaviours necessary to grow a new venture
5. Motivate all stakeholders and build a cohesive venture team

MMT35304 PENGURUSAN DAN PENYELIAAN PROJEK [PROJECT MANAGEMENT AND SUPERVISION]

No of Credits: 4

Course Synopsis:
The student will be exposed to the maintenance technique, trouble-shooting and fault diagnosis for mechanical equipment. Among the basic maintenance methods are: condition based monitoring, vibration analysis, alignment dynamic balancing and mechanical seals. Students also will also learn about trouble-shooting and maintenance of various machines and components such as valve, pump, compressor, gear etc. The essential steps of disassemble, check, trouble-shoot, repair and reassemble of mechanical components will be stressed in this course

Course Outcomes:
1. Present the case study that exhibit excellent project manager
2. Analyzing the main factors influencing project management outcome with consideration of profesionalism and ethics
3. Develop project management skills through theoretical understanding and practical application of the project management principles

MMT35404 PENILAIAN TINDAKAN DAN RISIKO DALAM PENGELUARAN PEMESINAN [ACTS AND RISKS ASSESSMENT IN MACHINING PRODUCTION]

No of Credits: 4

Course Synopsis:
This subject teaches students the about health and safety and work in safer and healthier ways. student will be exposed with the related act.

Course Outcomes:
1. Be able to assess, analyze and interpret risks to the health and safety
2. Able to plan, organize, control, monitor and review the preventive and protective measures
3. Implementing operational risk management (ORM)

MMT35504 PEYELENGGARAAN MESIN [MACHINE MAINTENANCE]

No of Credits: 4

Course Synopsis:
The student will be exposed to the maintenance technique, trouble-shooting and fault diagnosis for mechanical equipment. Among the basic maintenance methods are: condition based monitoring, vibration analysis, alignment dynamic balancing and mechanical seals. Students also will also learn about trouble-shooting and maintenance of various machines and components such as valve, pump, compressor, gear etc. The essential steps of disassemble, check, trouble-shoot, repair and reassemble of mechanical components will be stressed in this course.

Course Outcomes:
1. Present the different techniques in machine maintenance
2. Propose preventive maintenance program with consideration of cost, manpower and time
3. Demonstrate problem solving of real life condition regards to machine maintenance issues

MMT35604 PEMBUATAN ALAT DAN DIE [TOOL AND DIE MAKING]

No of Credits: 4

Course Synopsis:
This subject introduces students to tool and die making. It starts with introduction about press machine. Further, students will be exposed to the knowledge about elements of progressive combination and compound die. This course also introduces to student how to identify the principles and analysis of a mould. Finally student will be explained the design considerations in design tool, mould and die.

Course Outcomes:
1. Relate the profession of design, maintenance, process and inspection in the tool and die making
2. Elaborate the potential of machining experts in the tool and die making
3. Develop on characteristics that can be adapted in the tool and die making

MMT35704 PEMESINAN AEROANGKASA [AEROSPACE MACHINING]

No of Credits: 4

Course Synopsis:
This course provides students with advanced concepts and practices in CNC machining that are advanced computer programming of CNC milling and turning specific for aerospace machining processes such as profiling, drilling, boring, grooving, facing and threading. Emphasis is on programming and production of complex aerospace parts including investigation in 3, 4 and 5-axis programming techniques, utilizing canned cycles, macros (subroutines), looping and parametric programming. The uses of CAM in producing complex and efficient programming techniques are also covered.

Course Outcomes:
1. Relate the profession of design, maintenance, process and inspection in the aerospace industry
2. Elaborate the potential of machining experts in the aerospace industry
3. Develop on characteristics that can be adapted in the aerospace industry

MMT35804 PEMESINAN PANTAS [RAPID MACHINING]

No of Credits: 4

Course Synopsis:
The course will introduce the concepts of Rapid Machining (RM). It covers the knowledge on materials as workpiece, cutting tools, cutting conditions and machines used in the RM. Instead of that, students will learn to develop CNC programming for RM and also analyze the cutting performance of RM.

Course Outcomes:
1. Relate the profession of design, maintenance, process and inspection in the rapid machining
2. Elaborate the potential of machining experts in the rapid machining
3. Develop on characteristics that can be adapted in the rapid machining

MMT35903 TEKNOLOGI FAKTOR MANUSIA [HUMAN FACTOR TECHNOLOGY]

No of Credits: 3

Course Synopsis:
Ergonomics (or human factors) is the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance. Ergonomists in machining contribute to the design and evaluation of tasks, jobs, products, environments and systems in order to make them compatible with the needs, abilities and limitations of a machinist. Domains of specialization within the discipline of ergonomics in machining are broadly the following; Physical ergonomics is concerned with human anatomical, anthropometric, physiological and biomechanical characteristics as they relate to operating the machining lathes. Cognitive ergonomics is concerned with mental processes, such as perception, memory, reasoning, and motor response.

Course Outcomes:
1. Relate the profession of design, maintenance, process and inspection in the human factor technology
2. Elaborate the potential of machining experts in the human factor technology
3. Develop on characteristics that can be adapted in the human factor technology

MMT36004 PERANCANGAN PENGELUARAN DALAM PEMESINAN [PRODUCTION PLANNING IN MACHINING]

No of Credits: 4

Course Synopsis:
The process planning in machining is basically a plan of how the designed parts will be fabricated, machine and equipment selection, to achieve required specification. It involves proper and strategic decisions along with analysis in order to plan and adapt the production of every single component that will be built.This course intent to provide substantial knowledge on production planning in machining. The course covers from the philosophy of process and machining engineering, methods of production planning, and up until production planning practices..

Course Outcomes:
1. Relate the profession of design, maintenance, process and inspection in the production planning
2. Elaborate the potential of machining experts in the production planning
3. Develop on characteristics that can be adapted in the production planning

MMT31504 PROJEK TAHUN AKHIR 1 [FINAL YEAR PROJECT 1]

No of Credits: 4

Course Synopsis:
The student needs to plan and implement the project individually that related to the respective engineering technology field. The student should implement a project, do the analysis and apply the theory to solve the problems related to topic. At the end, the student should write a problem based learning report that covers problem statement, literature review, methodology to overcome the problem. The student needs to achieve the objective of the project and presented it in the report

Course Outcomes:
1. Explain the problem, objectives and scope of project associated to the industrial or community needs.
2. Use relevant theory to produce solution
3. Choose a proper methodology.
4. Present the preliminary findings in the oral and written forms effectively

MMT41506 PROJEK TAHUN AKHIR II [FINAL YEAR PROJECT 2]

No of Credits: 6

Course Synopsis:
This is the second part of the Bachelor Degree Project. Students are expected to continue the project performed in Bachelor Degree Project until completion. At the end of the semester, students are required to submit the Bachelor Degree Project report and present their projects for assessment.

Course Outcomes:
1. Perform project implementation systematically
2. Interpret data in a meaningful form using relevant tools
3. Work independently and ethically.
4. Present the results in the oral and written forms effectively

MMT49912 LATIHAN INDUSTRI [INDUSTRIAL TRAINING]

No of Credits: 12

Course Synopsis:
The experience and skills acquired from a period of placement can be invaluable and provide the advantage to the students when applying for employment after graduation. During the training period with the relevant industry, students are expected to involve in the following areas of training in order to achieve the underlying objectives: Manufacturing, production process and / or its optimization process, mechanical design and product, maintenance and repair of equipments, poduct testing and quality control.

Course Outcomes:
1. Solve technology related problems using methods, tools and techniques learnt throughout the training
2. Explain effectively with the technical community and produce technical reports and presentations
3. Demonstrate social etiquette and professionalism in technology practice

MMT11004 INDUSTRI AUTOMOTIF DAN TEKNOLOGI [*AUTOMOTIVE INDUSTRY & TECHNOLOGY*]

Credit Hour: 4

Course Synopsis:
This course is relevant to expose the students about the knowledge of automotive industry and technology revolutions that happened in global. It's also included the knowledge of automotive industrial revolutions, national automotive policy, and automotive ecosystem in general. Students will be exposed with current automotive activity process, able to view clearly the latest technology involve and responsible agency in automotive sector monitoring this industry.

Course Outcomes:
1. Able to relate the emerging of smartness technology in automotive industry.
2. Able to display knowledge on various systems used and their role in the automotive industrial world.
3. Able to justify the opportunities, challenges brought about by Industry and how organisations and individuals should prepare to reap the benefits.

MMT11103 LUKISAN AUTOMOTIF [*AUTOMOTIVE DRAFTING*]

No of Credits: 3

Synopsis
This course introduce method that is used to generate the 2D drawing which is usually applied by industries. The suitable view and method in generating dimension on the selected view will be applied. It also introduces the geometric dimensioning and tolerancing along with manufacturing processes symbols in the drafting process which helps to produce technical drawing correctly and efficiently for technical communication. Students will have a mini project to re-create the existing automotive component CAD data and propose the 2Ddrafting drawing with respect to the manufacturing aspect.

Course Outcomes:
1. APPLY knowledge and comprehension in generating 2D drafting for technical communication purpose.
2. CONSTRUCT 2D view and 2D drafting with correct dimensions, tolerances, and symbols.
3. PREPARE automotive components drafting with correct dimensions, tolerances, and symbols.

MMT11204 AMALAN BENGKEL AUTOMOTIF [*AUTOMOTIVE WORKSHOP PRACTICE*]

No of Credits: 4

Course Synopsis:
This module aims to expose students to the operation of the general vehicle servicing internal combustion engine technology. The course also discusses how the service, repair, maintenance, design and test the performance of conventional internal combustion engines. In addition, students must solve engineering problems in real time by leveraging their knowledge and learn new information to solve problems of related engines.

Course Outcomes:
1. APPLY the knowledge on essential components in the automotive systems.
2. FOLLOW the basic routine maintenance to the major automotive components.
3. DEMONSTRATE the work productively on diagnostic procedures and resources to the workshop safety regulation

MMT11303 PENYELIAAN BAHAGIAN PENGELUARAN [*SHOPFLOOR SUPERVISION*]

No of Credits: 4

Course Synopsis:
Shop Floor Supervision is the system by which standards for running day-to-day business are established, maintained, controlled, and improved. This approach is to continuously improve daily operation to gain better achievement in safety, quality, cost, delivery, and morale of the business operation, as well as for the workers. This contributes to waste elimination at all levels throughout the manufacturing system. This module reviews the skills and techniques required to analyse manufacturing system and to design improved methods and layouts. The focus of this module will be on the application of the technique through studies and industrial experience and will identify the benefits to be gained by their success.

Course Outcomes:
1. Explain the philosophy and foundation of shopfloor supervision.
2. Execute the shopfloor operation using related tools.
3. Display a good leadership and teamwork in shopfloor supervision.

MMT11404 REKA BENTUK KOMPONEN AUTOMOTIF DAN PEMASANGAN [*AUTOMOTIVE COMPONENT DESIGN AND ASSEMBLY*]

No of Credits: 4

Course Synopsis:
This course introduced method that is used to construct the 3D CAD data which usually applied in industrial field. The suitable features in constructing 3D CAD data will be applied which helps producing the correctly and efficiently 3D CAD data for technical communication purpose. Students will have a mini project to construct the 3D CAD data of automotive component which considering the related manufacturing process aspect.

Course Outcomes:
1. Apply knowledge and comprehension in constructing 3D CAD data for technical communication purpose.
2. Decide the proper features to use in constructing 3D CAD data based on the manufacturing process aspect
3. Construct 3D CAD data of automotive components and generate the complete assembly and exploded drawings.

MMT11504 FABRIKASI KOMPONEN AUTOMOTIF [*AUTOMOTIVE COMPONENT FABRICATION*]

No of Credits: 4

Course Synopsis:
The automotive manufacturing processes play a major role in deciding on the vehicles' design characteristics and the overall cost. Thus, it is important for technologist to identify suitable manufacturing process to fabricate automotive component. Technologist also should be able to pinpoint the manufacturing capabilities and limitations of each process to fabricate part according to the specified design tolerances.

Course Outcomes:
1. Explain the fundamental concepts of manufacturing processes in automotive.
2. Construct various skills of manufacturing techniques as an individual or a group.
3. Perform the manufacturing process according to detail drawing or Standard Operating Procedure (SOP).

MMT21003 PENGURUSAN PROJEK [*PROJECT MANAGEMENT*]

No of Credits: 3

Course Synopsis:
This subject focuses on the principles of project management including the importance and interrelationship of all its components. Students will be familiarized with the Project Management process group functions (initiating, planning, executing, controlling, and costing) and project knowledge areas (integration, scope, time, cost, quality, human resources, communications, risks, and procurement). Various tools for supporting the analysis of works in engineering project management will be introduced. Topics including initiating and planning the project, working with the management, project appraisal & sensitivity, creating budget and work breakdown structure, managing uncertainty & risk, building project plan, implementing, and revising project plan, completing the project and contract laws

Course Outcomes:
1. Explain the core concepts and principles, functions, and process in project management.
2. Manage a project from planning, preparing project proposal until costing out the project.
3. Ability to function effectively as members or group leader in achieving project goal.

MMT21104 SERVIS SISTEM AUTOTRONIK [*AUTOTRONIC SYSTEM SERVICE*]

No of Credits: 4

Course Synopsis:
This course focuses on theory, operation, and application of automotive electrical and electronic systems. Topic covered include vehicle electrical wiring systems, sensors, and actuators, charging system, ignition system, starting system, lighting system, chassis electrical system, auxiliary systems, mechatronics, automotive networking, bus systems.

Course Outcomes:
1. Identify the components of the electrical and electronics in automotive systems.
2. Explain the functions and operations of automotive electrical and electronic systems.
3. Construct of automotive electrical and electronic system.

MMT21204 SERVIS SISTEM RANGKAIAN KUASA [*POWERTRAIN SYSTEM SERVICE*]

No of Credits: 4

Course Synopsis:
This subject focuses on powertrain services for light/heavy vehicle and engine repair management

Course Outcomes:
1. Demonstrate vehicle service information, vehicle identification and routine maintenance.
2. Apply knowledge of comprehensive vehicle engine repair and assembly.
3. Apply knowledge of powertrain service management in real 3S Centre.

MMT21304 PROJEK KEUSAHAWANAN TEKNOLOGI 1 [*TECHNOPRENEUR PROJECT 1*]

No of Credits: 4

Prerequisite: Engineering Entrepreneurship

Course Synopsis:
Entrepreneurs need money to start and to grow their business. It is important to understand how revenue is generated, how to source for funds, how to control cash flow, how to assess the success of the company in monetary terms, and how to value a company for various purposes. The course exposes students to the various financial aspects relating to new ventures. These include approaches to secure start-up capital and venture financing. Students learn about the basic accounting, essential financial indicators, the types of funds available, the different categories of investors, the importance of intellectual property in securing finance, the financial details to be included in a business plan required for investment purpose, valuation of company and the art of negotiation with investors.

Course Outcomes:
1. Apply various financial indicators & tools to prepare for financial information for a new business venture.
2. Acquire skills to analyse financial statements.
3. Present financial information for new business.
4. Display the art of negotiation with investors.

MMT31304 PROJEK KEUSAHAWANAN TEKNOLOGI 2[*TECHNOPRENEUR PROJECT 2*]

No of Credits: 4

Prerequisite: Technopreneur Project 1

Course Synopsis
The start-up and growth of an enterprise invariably involves both human and financial capital. To manage the increasing pool of human resources and to convince venture capitalists to invest become two main issues especially for growing venture. This course consists of two parts: in the first part, organization and human resource management are introduced; in the second part, the focus is on writing a convincing business plan to attract venture capital investment. When enterprise starts to take shape and grow, more people will be hired, proper organization, team building, and human resource management will become important issues. In this course, students will be exposed to the various organizational aspects relevant to new ventures and established companies. These include the pros and cons of the different organization structures, conflicts that may arise among employees, and approaches to building strong teams. Human resources management techniques will also be introduced and discussed. In the second part of the course, the business model canvas will be described listing the connections among the different components of a business. The value of a business plan and the techniques of writing a business plan will be introduced.

Course Outcomes:
1. Apply the business model canvas incorporating human and financial elements.
2. Acquire skills to resolve organizational conflicts.
3. Write a convincing business plan.
4. Evaluate vital organizational behaviours necessary to grow a new venture.
5. Motivate all stakeholders and build a cohesive venture team.

MMT31202 PEMASARAN KENDERAAN [*VEHICLE MARKETING*]

No of Credits: 2

Course Synopsis:
This subject introduces the student to basic marketing concepts and how these concepts can be applied to entrepreneur technology setting in any organization. Additionally, they will be introduced to how management of the marketing function within technology-based industries is critical to the entrepreneur's success. This subject will take a COse examination of the definition of marketing. Through a dissection of the key terms in the definition we will show that marketing's primary focus is to identify and satisfy customers in a way that helps build a solid and, hopefully, sustained relationship that encourages customers to continue doing business with the entrepreneur. The student will come to understand that marketing consists of the strategies and tactics used to identify, create, and maintain satisfying relationships with customers that result in value for both the customer and entrepreneur. This subject will help students plan, implement, and evaluate decisions related to product know how, price, promotion, and place to meet the needs of the technology-based industries.

Course Outcomes:
1. Acquire the knowledge of integrating technology into strategic marketing to create new business opportunities for entrepreneur.
2. Analyse the various in marketing management activities and their roles in strengthening entrepreneur technology-based industry competitiveness.
3. Apply various marketing methods including presenting a marketing plan report.

MMT31003 PERUNDANGAN AUTOMOTIF [*AUTOMOTIVE LEGISLATION*]

No of Credits: 3

Course Synopsis:
This course provides the students with the basic knowledge and theory regarding legislative on every aspect related to automotive aspects. The students can apply the obtained theory to the practical activities involving inspection for many aspects in automotive parts. This subject exposed the students to handle the project related to inspection for lamp, wheel, noise and emission level, the safety features, and the automotive homologation. Every inspection activity required the students to present the technical report according to the universal standard.

Course Outcomes:
1. Apply the knowledge and implement the theory for inspection process.
2. Evaluate technical specification for each component and identity the problems.
3. Analyse the technical aspects and qualified the checked components in automotive parts.

MMT31603 PENGURUSAN ASET & INVENTORI [*ASSET & INVENTORY MANAGEMENT*]

No of Credits: 3

Course Synopsis:
Students will be introduced to the maintenance strategy, calculating the life of each unit machine and instrument. identifying maintenance workshop and scheduling, maintenance organisation, effective use of maintenance resources, maintenance system, maintenance best practices, engineering economy such as Weibull and pareto analysis, cost estimation, asset replacement analysis, risk analysis and control, application of reliability data, accident prevention, fire protection and cost control.

Course Outcomes:
1. Distinguish the method and strategy for maintenance and asset management.
2. Reproduce by using computerized maintenance management system in maintenance problem.
3. Present the best practices of maintenance and asset management

MMT31306 PENGURUSAN KUALITI [*QUALITY MANAGEMENT*]

No of Credits: 6

Course Synopsis:
This course provides a useful insight into concept, theories, and application of quality management in an organization. Student will be introduced to tools and techniques of quality that are useful for practice, people, and process improvement. This also includes approaches for planning, controlling, and improving the quality management function of a system. Quality is a universal concept; its application and management encompass a wide variety of field. Therefore, this course is suitable for individuals who aspire to be managers in their organizations in future regardless of their area of specialization.

Course Outcomes:
1. Explain the basic quality principles and practices, quality solving techniques and product reliability related to manufacturing process.
2. Solve the manufacturing process quality problem using appropriate problem-solving technique.
3. Perform the ability to apply the quality control tools.

MMT31403 PENGURUSAN RISIKO [*RISK ASSESSMENT*]

No of Credits: 3

Course Synopsis:
Factors such as appropriate selection of personnel, adequate provision of training and thorough consideration of occupational safety and health issues all help to reduce the incidence of injury and illness resulting from inadequate examination of potential hazards, poor ergonomic design, equipment failure, defective products, or hazardous materials. The working environment, suitability of equipment and the competencies of staff all must be considered in the context of legislative requirements and good management of health and safety. This document presents a structured approach to good management of safety and describes a universal framework for task or activity planning. It defines steps and processes which, if used as a common reference, will simplify, and unify our management of health and safety risk and streamline our approach to planning tasks and activities.

Course Outcomes:
1. Determine and apply knowledge of complex risk assessment theory to your professional practice and/or further study.
2. Apply logical, critical, and creative thinking to analyse, synthesise and apply theoretical knowledge, and technical skills, to formulate evidenced based solutions to industry problems or issues.
3. Collaborate effectively with others and demonstrate intellectual independence and autonomy to solve problems and/or address industry issues and imperatives.

MMT21404 SERVIS KENDERAAN DAGANGAN [*COMMERCIAL VEHICLE SERVICING*]

No of Credits: 4

Course Synopsis:
A commercial vehicle is any type of motor vehicle used for transporting goods or paying passengers. The European Union defines a "commercial motor vehicle" as any motorized road vehicle, that by its type of construction and equipment is designed for, and capable of transporting, whether for payment or not. In this course, student will learn the rules and regulations service, maintenance and repair or commercial vehicles system and the engine.

Course Outcomes:
1. Explain the rules, regulation, and commercial vehicle system.
2. Construct various skills of servicing and repair as an individual or a group.
3. Perform the servicing and maintenance according to Standard Operating Procedure (SOP).

MMT 21604 PENYENGGARAAN RANGKAIAN PEMACU [*DRIVETRAIN MAINTENANCE*]

No of Credits: 4

Course Synopsis:
Introduction to chassis load and tire contact forces. modelling of chassis dynamics in vertical, lateral, and longitudinal directions. Performance criteria in suspension design. The use of suspension test machine for investigating the suspension characteristics. Effects of suspension parameters to the chassis dynamics. Semi-active and active suspension system.

Course Outcomes:
1. Apply kinematics and dynamics principle to determine suspension forces due to chassis loads and tire contact forces.
2. Undertake some basic tests for determining suspension parameters in the forms of force-velocity and force displacement characteristics.
3. Explain the concept and the working principles of some advanced suspension systems such as active and semi-active suspension system.

MMT21504 REKA BENTUK PERMUKAAN [*SURFACE DESIGN*]

No of Credits: 4

Course Synopsis:
This course introduced surfacing method that is used to construct the 3D CAD data which usually applied in industrial field. The suitable features in constructing industrial design surfacing will be applied which helps producing the quality and efficiently surfaces data for technical communication purpose. Students will have a mini project to construct the 3D CAD data of automotive vehicle or component using surfacing module with quality verification

Course Outcomes:
1. Demonstrate knowledge and comprehension in constructing surfacing data for technical communication purpose.
2. Justify the proper features to use in constructing surfacing data which emphasize the quality aspect.
3. Construct surfacing data from the scanning data of automotive vehicles or components.

MMT21704 PEMODELAN AUTOMOTIF [*AUTOMOTIVE MODELLING*]

No of Credits: 4

Course Synopsis:
This course provides the knowledge and skills regarding modelling process in automotive design development. From this course, students enable to apply various method and technique in modelling scale vehicle model, automotive component and fabricate working parts for automotive purposes. The course outlines opportunities to value add to professional skills developed during the course.

Course Outcomes:
1. Demonstrate proficiency in working with and exploration of relevant materials, technology, and processes.
2. Integrated various types of materials, tools and equipment used in modelling process.
3. Construct 3-Dimensional physical model based on 2-Dimensional data using suitable tools, equipment and materials.

MMT21804 ANALISA PRESTASI KENDERAAN [*VEHICLE PERFORMANCE ANALYSIS*]

No of Credits: 4

Course Synopsis:
History of vehicle engines. Engine geometry, performance parameters of gas exchange for 4-stroke and two stroke. Spark ignition engine combustion. The market situation for the development of vehicles, gearboxes, and components. The selection of the transmission ratio of the vehicle. Basic approach to the performance of automotive engines, power conversion, adjustment of the engine and transmission, transmission system design principles.

Course Outcomes:
1. Analyse the historical development and future trend of engine.
2. Determine the design principle of engine.
3. Utilize the engine and chassis dynamometer for engine performance test.

MMT22004 DIAGNOSIS KEGAGALAN KENDERAAN [*VEHICLE FAULT DIAGNOSIS*]

No of Credits: 4

Course Synopsis:
This course introduces the diagnostic equipment, tools, engine diagnostic and general electrical system diagnostics.

Course Outcomes:
1. Describe the various diagnostic tools and method used to check vehicle performance systems (drivetrain, powertrain, and electrical components).
2. Demonstrate the proper method to diagnose vehicle system (drivetrain, powertrain, and electrical components).
3. Present the precaution and methodology during diagnostic the vehicle system (drivetrain, powertrain, and electrical components).

MMT21904 REKA BENTUK LUARAN [*EXTERIOR DESIGN*]

No of Credits: 4

Course Synopsis:
This course aims to introduce exterior components. Important concept consideration of safe environment for the occupants. Active and passive safety system will be introduced. Location, shape, surface hardness and supporting structures must be carefully designed to protect the occupants.

Course Outcomes:
1. Ability to describe the concept of exterior components and system developed and manufactured components by various suppliers who work with OEM from beginning of design process.
2. Ability to demonstrate and establish the car interior components with consideration of design for safety.
3. Ability to consider and construct car exterior components, cargo, and interface design, with consideration of ergonomics, design for cargo and human machine interface (HMI).

MMT22104 PEMBUATAN SEMULA KOMPONEN [*COMPONENT REMANUFACTURING*]

No of Credits: 4

Course Synopsis:
This course aims to implement additive manufacturing and reverse engineering in retrofitting process. Student will be exposed with process in 3D Scanning until fabrication process by using Additive Manufacturing Technology. At the end of this course, student will be able to redesign and reconstruct automotive component by using selected tools and process.

Course Outcomes:
1. Ability To correlate the broad range of Additive Manufacturing process, parameters, devices, capabilities, and materials that available in remanufacture quality automotive component.
2. Ability To produce the parts and components by using selected additive manufacturing process and materials.
3. Ability to organize systematic workflow and process in completing the task that have been given.

MMT31704 SERVIS HIBRID [*HYBRID SERVICING*]

No of Credits: 4

Course Synopsis:
Hybrid technology is an emerging technology. Development of high-performance batteries and downsizing engines requires technologies to be familiar with this technology and manage to perform maintenance and servicing activities.

Course Outcomes:
1. Explain the functions and operations of hybrid powertrain system and components.
2. Construct various skills of servicing and repair as an individual or a group.
3. Perform the servicing and maintenance according to Standard Operating Procedure (SOP).

MMT31904 SERVIS KENDERAAN ELEKTRIK [*ELECTRIC VEHICLE SERVICE*]

No of Credits: 4

Course Synopsis:
This subject focuses on EV servicing and repair management

Course Outcomes:
1. Analyse knowledge of EV Vehicle technology
2. Apply knowledge of EV Vehicle Safety and Service Procedure
3. Apply knowledge of EV Service Management at 3S Centre

MMT31804 REKA BENTUK DALAMAN [*INTERIOR DESIGN*]

No of Credits: 4

Course Synopsis:
This course aims to introduce interior components. Important concept consideration of safe environment for the occupants. Active and passive safety system will be introduced. Location, shape, surface hardness and supporting structures must be carefully designed to protect the occupants.

Course Outcomes:
1. Ability to describe the concept of interior components and system developed and manufactured components by various suppliers who work with OEM from beginning of design process.
2. Ability to demonstrate and establish the car interior components with consideration of design for safety.
3. Ability to consider and construct car interior components, cargo, and interface design, with consideration of ergonomics, design for cargo and human machine interface (HMI).

MMT32004 MENGECAT [*PAINTING*]

No of Credits: 4

Course Synopsis:
This course aims to introduce the process and technique of automotive painting. This course will help student to execute painting jobs for automotive steel and plastic parts. Sticker wrapping and water transfer will be introduced.

Course Outcomes:
1. Ability to describe the concepts and methodologies of automotive painting process, technology, and materials in industrial practice.
2. Ability to apply and produce surface preparation for painting, wrapping and water transfer on steel and plastic parts.
3. Ability to apply and produce good technique on painting, wrapping and water transfer on finished steel and plastic parts.

MMT13004 CAD DAN GRAFIK KIMPALAN [CAD AND WELDING GRAPHICS]

No of Credits: 4

Course Synopsis:
The course will provide students with an understanding of the importance of engineering graphics as a communication tool specially for welding applications. Students will be exposed to the geometry drawing, dimensions and tolerance drawings, orthographic drawing, isometric drawing sectioning and assembly drawings and also welding symbols and standard codes using manual sketches and computer aided design (CAD) software.

Course Outcomes:
1. Analyze engineering drawings including welding symbols and standard codes.
2. Construct technical drawing using manual sketching and computer aided design.
3. Communicate by using engineering drawings for welding applications.

MMT13104 KESELAMATAN DALAM KIMPALAN [SAFETY IN WELDING]

No of Credits: 4

Course Synopsis:
The aim of this course is to expose students on safety practices and procedures. The students are required to identify types of hazards that may incur in industries especially related to welding processes. The students are required to understand equipment, instruction and carefully review the material safety data sheets.

Course Outcomes:
1. Examining welding hazards that impact the safety, health, and environment at working area.
2. Explain the welding risk control by various procedures in the working environment.
3. Identifies control method or procedure to minimize or remove the impact of possible hazard in the working environment.

MMT13204 TEKNOLOGI FABRIKASI LOGAM [METAL FABRICATION TECHNOLOGY]

No of Credits: 4

Course Synopsis:
This course is to equip students with the knowledge of metal fabrication and welding technology to improve manufacturing expertise in providing human capital development at par with global technological developments.

Course Outcomes:
1. Organizing themselves either its individuals or in groups during project generating process.
2. Manipulating the basic principles and scientific processes and materials to produce products with reasonable judgment.
3. Demonstrate understanding of the concept and use of the terms contained in metal fabrication and welding technology.

MMT13303 REKABENTUK PRODUK DALAM KIMPALAN [PRODUCT DESIGN IN WELDING]

No of Credits: 3

Course Synopsis:
This subject covers product design problems, formulating design problems, concept design, configuration design, parametric design, product costing, project and teamwork especially for welding product application.

Course Outcomes:
1. Apply an appropriate design method of developing a practical solution of product design problem.
2. Display welding product as a practical design solution of a through a systematic investigation of the product design problem.
3. Communicate effectively in written, oral and visual including teamwork.

MMT13404 DOKUMENTASI KIMPALAN [WELDING DOCUMENTATION]

No of Credits: 4
Course Synopsis:
The job of welding inspection requires that the inspector possess or have access to a great deal of information and guidance. Welding inspectors cannot evaluate a welded structure without information from the designer or the welding engineer egarding weld quality. The inspector also needs to know when and how to evaluate the welding. To satisfy this need, there are documents available to be performed. Many of these documents also include acceptance criteria with codes and standards. The course identifies the competence required in welding design, welding joint detail and welding symbol according to AWS/BS/ISO standard

Course Outcomes:
1. Apply welding procedure qualification and welder qualification Interpret various type of drawing design and symbol in welding according to related standard.
2. Construct various type of drawing design and symbol in welding according to related standard.
3. Demonstrate type drawing design and symbol in welding as required according to related standard.

MMT13504 PROSES KIMPALAN BUKAN KONVENSIONAL [NON-CONVENTIONAL WELDING PROCESS]

No of Credits: 4

Course Synopsis:
This course is to provide student with welding processes that are not commonly used in the current industries that can be categories as new or advanced welding technology. Students will be exposed all welding processes and required should be able to perform process selection when deal with the special and complex demand of welding work.

Course Outcomes:
1. Manipulate types of joining processes applied in manufacturing sector.
2. Appreciate the characteristics of joining in terms of process, equipment and setup.
3. Practice the joining processes using certain equipment to make variety of joints.

MMT23004 PERILAKU BAHAN DALAM KIMPALAN [MATERIAL BEHAVIOUR IN WELDING]

No of Credits: 4

Course Synopsis:
This course describes the materials used in engineering. Scope covers engineering materials; latest developments in materials. Metal classification and its structure; physical metallurgy includes solidification, recovery, recrystallization and grain growth. This course also will provide the students with understanding of the microstructure development with heat treatment and phase diagram and relate to mechanical properties. This course emphasis to steel especially structural and high strength steels; metallurgy of welding. This course also covers the knowledge of the ceramic classification, polymer classification and composite on microstructure relationship and mechanical properties.

Course Outcomes:
1. Ability to classify metals based on generic properties, structural relationships with properties, especially the emergence of microstructures by heat treatment methods for the metal class.
2. Understand the behaviour of structural in fusion welding and testing of materials welded joints.
3. Identifying the classification of composite and ceramic based on the testing and the microstructure.

MMT23104 PENGURUSAN KESELAMATAN [SAFETY MANAGEMENT]

No of Credits: 4

Course Synopsis:
Safety management is a course that is designed to provide knowledge for managing activities in the business workplace that applies comprehensive management system design to manage safety elements in the workplace. It includes acts, policy, objectives, plans, risk assessment, procedures, organization responsibilities and other measures. This is important to prevent accidents, injuries and other impact on organization that show the role of management that focus deter such catastrophic.

Course Outcomes:
1. Ability to explain the different requirements and regulations of Factory and Machinery Act, Occupational Safety and Health.
2. Ability to conduct hazard identification and risk assessment in workplace.
3. Ability to construct preventive and control technique according the acts pertinent to the acts pertinent to the Occupational Safety and Health.

MMT23204 ANALISIS REKABENTUK KIMPALAN [WELDING DESIGN ANALYSIS]

No of Credits: 4

Course Synopsis:
The subject covers: Static: General principle, Force vector and Equilibrium of Particle; Mechanics: Principle of Stress & Strain, Torsion; Mechanics:Pure Bending and analysis and design of beams for bending; Welded design Program; Design Equations; Welded design Considerations ; Design for welded join; Weld join design

Course Outcomes:
1. Describe basic concepts and fundamental principles of mechanical applications.
2. Apply basic concepts and fundamental principles to solve design for welding application.
3. Analyze basic problems in design considerations for welding.

MMT23304 TEKNOLOGI KIMPALAN UNTUK PROFESIONAL [WELDING TECHNOLOGY FOR PROFESSIONAL]

No of Credits: 4

Course Synopsis:
This subject provides students with knowledges and skills related with welding technology. They will be taught with various topics covering Introduction to Welder Certification Scheme, Welding Processes and Procedures, Welding Codes and Standards, Welding Procedure specification (WPS), Welding Procedure Qualification Test (WPQT), Pre and Post-weld Inspection, Reports and Documentations and Welder Qualification Training and Testing (WQT).

Course Outcomes:
1. Design a WPS and WPQT using according specifications and standards.
2. Develop the welding procedure based on knowledge related to weld techniques and position.
3. Apply creative thinking in problem solving to solve the problems associated with welding qualifiaction.

MMT23404 UJIAN TANPA MUSNAH UNTUK PROFESIONAL [NDT FOR PROFESSIONAL]

No of Credits: 4

Course Synopsis:
This subject covers the preparation for the certification in the selected NDT technology. Certification is important because NDT personnel need to make critical judgments that can have safety and/or significant financial consequences. Therefore, in this subject elements of technology preparation, operation, planning, data collection and interpretation, and maintenance are being provided.

Course Outcomes:
1. Construct testing instruction and work planning.
2. Analyze the NDT data for evaluating the condition of the tested materials.
3. Recommend the maintenance and calibration of the NDT equipment.

MMT23504 PEMERIKSAAN KIMPALAN UNTUK PROFESIONAL [WELDING INSPECTION FOR PROFESSIONAL]

No of Credits: 4

Course Synopsis:
The integrity of the welds and welded assemblies are depending on various factors of welding quality control. Knowledgeable welding inspectors in dimensional inspection, nondestructive examination methods, welding processes, welding metallurgy, destructive testing, and the qualification of welding procedures and personnel are required to ensure the all the factors are taken into account. Understanding regarding the standard of welding practices in accordance to welding codes, criteria and specification is great important during welding inspection. An ability to inspect welding defect and evaluate the various welding procedure is also an important element of welding inspection.

Course Outcomes:
1. Describe basic concepts and fundamental principles of welding inspection processes.
2. Perform visual inspection, the testing of parent metals and welds, and destructive and non-destructive test techniques.
3. Practice procedure approval based on codes and standards, and an outline of safe working practices.

MMT23604 ANALISIS BERBANTU KOMPUTER [COMPUTER AIDED ANALYSIS]

No of Credits: 4

Course Synopsis:
This course will empower the students with fundamental knowledge and technical skills of 3D solid modeling skills using industry-proven 3D mechanical CAD software. The students will learn about the different techniques for creating solid models and surface with emphasis on design intent. The students also will expose to the introduction to FEA structure/stress analysis, FEA application for weld product (welding connection analysis). The course includes hands-on exercises and best practice methods for students during drafting stage, part, assembly (weld product) and Finite element Analysis (weld product)

Course Outcomes:
1. Apply fundamental sketching and feature modeling, build feature based models of parts and assemblies for easy editing.
2. Produce document design intent of parts and assemblies (include weld design) in manufacturing drawings.
3. Analyse basic stress analysis for welding connection.

MMT23704 PENGUJIAN DAN KETIDAKSEMPURNAAN DALAM KIMPALAN [IMPERFECTION IN WELDING AND TESTING]

No of Credits: 4

Course Synopsis:
This course introduces the basic principles of non-destructive testing and the methods of non-destructive testing that are widely use in the industry, which are Visual Inspection, Penetrant Test, Magnetic Particle Testing, Eddy Current Testing, Ultrasonic Testing and Radiographic Testing. This course also covers the execution, evaluation and interpretation of each NDT techniques. The advantages, limitations and main application of each NDT techniques are also provided.

Course Outcomes:
1. Explain the current basic and some advanced principles of Non-Destructive Testing (NDT) techniques to satisfy complex engineering problems.
2. Select and propose suitable NDT techniques based on their analysis onengineering problems that fulfill the standard practice.
3. Develop the ability to communicate effectively using available resources to disseminate knowledge of NDT techniques in relation with industrial problem.

MMT23804 PERALATAN KIMPALAN ELEKTRIK [WELDING ELECTRICAL EQUIPMENT]

No of Credits: 4

Course Synopsis:
This subject is aimed to provide the students with the understanding of static and dynamic characteristics of the electric arc and its associated power characteristics. Students will learn the basic principles, methods and circuit components that control operating power and the volt-ampere characteristics in electrical resistance and arc welding. Through that students will gain knowledge of the operating principles of Alternators, D.C. generators and motors used for welding.

Course Outcomes:
1. Explain the physical phenomenon occurring in the arc and the types of forces and metal transfer in the arc based on measurements of power source characteristics.
2. Select the right choice of diode material, thyristors and inverters based on the understanding of the basic principles and methods for controlling the volt-ampere characteristics of the electric welding machines.
3. Measure the welding current, voltage, temperature, load and displacement using equipment's such as clamp meter, LVDT, arc welding analyzer and resistance welding monitors.

MMT23904 PROJEK KEUSAHAWANAN TEKNOLOGI 1 [TECHNOPRENEUR PROJECT 1]

No of Credits: 4

Course Synopsis:
Entrepreneurs need money to start and to grow their business. It is important to understand how revenue is generated, how to source for funds, how to control cash flow, how to assess the succes of the company in monetary terms, and how to value a company for various purposes. The course exposes students to the various financial aspects relating to new ventures. These include approaches to secure start-up capital and venture financing. Students learn about the basic accounting, essential financial indicators, the types of funds available, the different categories of investors, the importance of intellectual property in securing finance, the financial details to be included in a business plan required for investment purpose, valuation of company and the art of negotiation with investors.

Course Outcomes:
1. Apply various financial indicators & tools to prepare for financial information for a new business venture.
2. Acquire skills to analyze financial statements.
3. Present financial information for new business.
4. Display the art of negotiation with investors.

MMT33004 JAMINAN KUALITI KIMPALAN [WELDING QUALITY ASSURANCE]

No of Credits: 4

Course Synopsis:
This subject provides students with knowledge related with welding quality assurance. They will be taught with various topics covering Introduction to Welding Quality Assurance, Quality System Management and Responsibilities, Quality Assurance Planning, Welding Quality Standards, Inspections and Tests, Statistical Process Control, Nonconformances and Corrective Actions, Preventive Actions, Quality Audits, Records and Documents Control.

Course Outcomes:
1. Design a plan for quality assurance and control in welding manufaturing process using according specifications and standards.
2. Demonstrate the procedure and inspection techniques related to welding assurance and control.
3. Apply creative thinking in problem solving to solve the problems associated with welding assurance and control.

MMT33104 EKONOMI KIMPALAN DAN PEROLEHAN [ECONOMIC OF WELDING AND PROCUREMENT]

No of Credits: 4

Course Synopsis:
The aim of this course is to provide participants with a clear understanding of the principles of effective procurement by utilising the capabilities to plan, implement, and evaluate a sourcing process appropriate to the value/ risk of the joining technology, materials/ part/ equipment being procured, communication and negotiation skills, and capacity to to manage strategic supply, services and consultancy contracts. Besides To acquire knowledge in welding economics in the selection of process, consumables and workpiece materials.

Course Outcomes:
1. Explain the importance of effective costing and the factors influencing welding costs.
2. Calculate welding costs that iclude machine, material and labour.
3. Record of transactions in jurnal and ledgers, trial-balance and preparation of final account.

MMT33204 UJIAN TANPA MUSNAH [NON -DESTRUCTIVE TEST]

No of Credits: 4

Course Synopsis:
This course introduces the basic principles of non-destructive testing and the methods of non-destructive testing that are widely use in the industry, which are Visual Inspection, Penetrant Test, Magnetic Particle Testing, Eddy Current Testing, Ultrasonic Testing and Radiographic Testing. This course also covers the execution, evaluation and interpretation of each NDT techniques. The advantages, limitations and main application of each NDT techniques are also provided.

Course Outcomes:
1. Explain the current basic and some advanced principles of Non-Destructive Testing (NDT) techniques to satisfy complex engineering problems.
2. Select and propose suitable NDT techniques based on their analysis on engineering problems that fulfill the standard practice.
3. Develop the ability to communicate effectively using available resources to disseminate knowledge of NDT techniques in relation with industrial problem.

MMT33304 PROJEK KEUSAHAWANAN TEKNOLOGI 2 [TECHNOPRENEUR PROJECT 2]

No of Credits: 4
Course Synopsis:
The start-up and growth of an enterprise invariably involves both human and financial capital. To manage the increasing pool of human resources and to convince venture capitalists to invest become two main issues especially for growing venture. This course consists of two parts: in the first part, organization and human resource management are introduced; in the second part, the focus is on writing a convincing business plan to attract venture capital investment. When enterprise starts to take shape and grow, more people will be hired, proper organization, team building and human resource management will become important issues. In this course, students will be exposed to the various organizational aspects relevant to new ventures and established companies. These include the pros and cons of the different organization structures, conflicts that may arise among employees, and approaches to building strong teams.

Course Outcomes:
1. Apply the business model canvas incorporating human and financial elements
2. Acquire skills to resolve organizational conflicts.
3. Write a convincing business plan.
4. Evaluate vital organizational behaviours necessary to grow a new venture.
5. Motivate all stakeholders and build a cohesive venture team.

MMT33403 SISTEM FIZIKAL SIBER DALAM KIMPALAN [CYBER PHYSICAL SYSTEM IN WELDING]

No of Credits: 3

Course Synopsis:
The aim of this course is to provide participants with a clear understanding of the potential application of cyber-physical systems (CPS) in welding industry. Competency in applying CPS technology, both with standalone and built-in CPS in analysis of welding parameters (e.g. current, temperature) and welding outputs (e.g. fume composition, welding bead) is thought for improving the marketability of the graduates in the era industrial revolution 4.0.

Course Outcomes:
1. Explain the added value that can be achieved through application of CPS in welding process.
2. Demonstrate effectively the appropriate CPS tools in acquiring process variables in real time.
3. Criticise the logged data acquired from conventional and non conventional welding techniques.

MMT33504 PEMULIHAN DALAM KIMPALAN [RECLAIMINATION IN WELDING]

No of Credits: 4

Course Synopsis:
The aim of this subject is to to acquire knowledge and to solve problems associated with failure and to update personal on the latest technology to ensure welded subject would be maintained in good operating condition and at low maintenance cost.

Course Outcomes:
1. Repair quality of welding which will benefit the industry in term of productivity and savings.
2. Develop the skills .to carry out practical feasible repair techniques maintaining low cost.
3. Selection of repair welding and apply techno-economics for practical problems.

MMT33604 PENGURUSAN PENGELUARAN DAN PENGAWASAN [MANAGING PRODUCTION AND SUPERVISION]

No of Credits: 4

Course Synopsis:
Welding production planning is another very important element in manager's responsibility to allocate the resources required to achieve cost-effectiveness in welding processes. Furtheremore , this subjet shall cover managers responsibility to maintain equipment and consistently meet throughput requirements with a level of quality that conforms to the required standards.

Course Outcomes:
1. Identify the standardized the welding procedure.
2. Identify required maintenance of equipment and record.
3. Explain supervisor scope to minimize reject, scrap and rework reduce rework analyze the quality management system.

MMT11204 AMALAN BENGKEL AUTOMOTIF [*AUTOMOTIVE WORKSHOP PRACTICE*]

No of Credits: 4

Course Synopsis:
This module aims to expose students to the operation of the general vehicle servicing internal combustion engine technology. The course also discusses how the service, repair, maintenance, design and test the performance of conventional internal combustion engines. In addition, students must solve engineering problems in real time by leveraging their knowledge and learn new information to solve problems of related engines.

Course Outcomes:
1. APPLY the knowledge on essential components in the automotive systems.
2. FOLLOW the basic routine maintenance to the major automotive components.
3. DEMONSTRATE the work productively on diagnostic procedures and resources to the workshop safety regulation.

MMT35304 PENGURUSAN DAN PENYELIAAN PROJEK [PROJECT MANAGEMENT AND SUPERVISION]

No of Credits: 4

Course Synopsis:
The student will be exposed to the maintenance technique, trouble-shooting and fault diagnosis for mechanical equipment. Among the basic maintenance methods are: condition based monitoring, vibration analysis, alignment dynamic balancing and mechanical seals. Students also will also learn about trouble-shooting and maintenance of various machines and components such as valve, pump, compressor, gear etc. The essential steps of disassemble, check, trouble-shoot, repair and reassemble of mechanical components will be stressed in this course

Course Outcomes:
1. Present the case study that exhibit excellent project manager
2. Analyzing the main factors influencing project management outcome with consideration of profesionalism and ethics
3. Develop project management skills through theoretical understanding and practical application of the project management principles

MMT31403 PENGURUSAN RISIKO [*RISK ASSESSMENT*]

No of Credits: 3

Course Synopsis:
Factors such as appropriate selection of personnel, adequate provision of training and thorough consideration of occupational safety and health issues all help to reduce the incidence of injury and illness resulting from inadequate examination of potential hazards, poor ergonomic design, equipment failure, defective products, or hazardous materials. The working environment, suitability of equipment and the competencies of staff all must be considered in the context of legislative requirements and good management of health and safety. This document presents a structured approach to good management of safety and describes a universal framework for task or activity planning. It defines steps and processes which, if used as a common reference, will simplify, and unify our management of health and safety risk and streamline our approach to planning tasks and activities.

Course Outcomes:
1. Determine and apply knowledge of complex risk assessment theory to your professional practice and/or further study.
2. Apply logical, critical, and creative thinking to analyse, synthesise and apply theoretical knowledge, and technical skills, to formulate evidenced based solutions to industry problems or issues.
3. Collaborate effectively with others and demonstrate intellectual independence and autonomy to solve problems and/or address industry issues and imperatives.

MMT31804 REKA BENTUK DALAMAN [*INTERIOR DESIGN*]

No of Credits: 4

Course Synopsis:
This course aims to introduce interior components. Important concept consideration of safe environment for the occupants. Active and passive safety system will be introduced. Location, shape, surface hardness and supporting structures must be carefully designed to protect the occupants.

Course Outcomes:
1. Ability to describe the concept of interior components and system developed and manufactured components by various suppliers who work with OEM from beginning of design process.
2. Ability to demonstrate and establish the car interior components with consideration of design for safety.
3. Ability to consider and construct car interior components, cargo, and interface design, with consideration of ergonomics, design for cargo and human machine interface (HMI).

FACULTY OF CHEMICAL ENGINEERING TECHNOLOGY (FTKK)

Programmes Offered:

1. Bachelor of Materials Engineering with Honours
2. Bachelor of Chemical Engineering with Honours
3. Bachelor of Polymer Engineering with Honours
4. Bachelor of Agricultural Engineering with Honours
5. Bachelor of Chemical Engineering Technology (Food Technology) with Honours
6. Bachelor of Chemical Engineering Technology (Industrial Chemical Process) with Honours
7. Bachelor of Chemical Engineering Technology (Industrial Biotechnology) with Honours
8. Diploma in Metallurgical Engineering

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ENGINEERING PROGRAMME

PROGRAMME OBJECTIVES (PEO)

The Programme Objectives for the entire ***Engineering Programme*** at Universiti Malaysia Perlis (UniMAP) is as follows:

PEO 1
Graduates who have demonstrated career advancement in the field of Electrical 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

*At the end of the **Engineering Programme**, the students are expected to attain the following attributes:*

PO 1
Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization respectively 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 consideration.

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 problem.

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 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
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.

PO12
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.

CURRICULUM STRUCTURE
UR6527001 BACHELOR OF MATERIALS ENGINEERING WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	I	II	III	IV	V	VI		VII	VIII
Engineering Core (102)	KMJ15603 Engineering Drawing	KMJ10103 Engineering Quality Control	KMJ20004 Materials Structure & Properties	KMJ20204 Whiteware, Glass and Glass-Ceramic	KMJ30004 Polymer Properties	KMJ30003 Polymer Processing	KMJ39905 Industrial Training	KMJ49802 Final Year Project I	KMJ49904 Final Year Project II
	KMJ15303 Electrical Technology	KMJ16203 Statics	KMJ20203 Dynamics	KMJ20104 Physical Metallurgy	KMJ30104 Materials Characterization	KMJ30303 Surface Engineering		KMJ40203 Non Destructive Testing	KMJ40103 Corrosion Engineering
	KMJ16803 Introduction to Computer Programming	KMJ10003 Engineering Skills	KMJ20303 Strength of Materials	KMJ20403 Transport Phenomena in Materials Engineering	KMJ30203 Fluid Mechanics	KMJ30103 Process Control		KMJ40303 Technical Ceramic	ELECTIVE II
			KMJ20003 Materials Physical Chemistry	KMJ20103 Analytical Chemistry	KMJ30503 Electronic Materials Engineering	KMJ30403 Materials Thermodynamics		ELECTIVE I	
						KMJ30002 Materials Selection and Design I		KMJ40003 Materials Selection and Design II	
Non-Engineering Core (19)	SMQ10103 Engineering Mathematics I	SMQ10203 Engineering Mathematics II	SMQ20303 Engineering Mathematics III	SMQ27103 Engineering Statistics		KMJ42403 Engineering Management			KMJ45802 Professional Engineers
	SMU12202 Skills and Technology in Communication								
121	14	12	16	17	14	17		14	12
University Required (16)		* SMB10102 Preparatory English	** SMB20102 English for General Communication		SMB31202 English for Technical Communication				
	SMU13002 Philosophy and Current Issues	SMU13102 Appreciation of Ethics and Civilization	*** SMBxxx02 OR SMUxxx02 Option Subject	SMU32202 Thinking Skill	SMU22402 Engineering Entrepreneurship				
		SMB41002 University Malay Language OR # SMB11002 Basic Malay Language							
	SMZxxx01 Co-Curriculum	SMZxxx01 Co-Curriculum							
16	3	5	2	2	4	-	-	-	-
137	17	17	18	19	18	17	5	14	12
Total Units for Graduation 137									

ELECTIVE COURSES: KMJ40403 Composite Materials, KMJ40503 Construction Materials, KMJ40703 Advanced Material Engineering, KMJ40803 Advanced Electronic Packaging, KMJ40903 Materials for Energy Application, KMJ41003 Materials Failure Analysis, KMJ40603 Joining of Materials and Structures

For international students only. * Uncredited. Compulsory to students with MUET Band 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 students with MUET Band 4 and above.

CURRICULUM STRUCTURE
UR6524001 BACHELOR OF CHEMICAL ENGINEERING WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	I	II	III	IV	V	VI		VII	VIII
ENGINEERING CORE (93)	KMJ15303 Electrical Technology	KMJ10003 Engineering Skills	KMJ22003 Chemical Eng. Thermodynamics	KMJ22503 Mass Transfer	KMJ32003 Reaction Engineering	KMJ32803 Engineering Economics	KMJ39905 Industrial Training	KMJ42003 Chemical Plant Design I	KMJ42704 Chemical Plant Design II
	KMJ12402 Engineering Mechanics	KMJ16803 Introduction to Computer Programming	KMJ22103 Fluid Mechanics	KMJ22703 Biochemical Engineering	KMJ32104 Process Dynamics & Control	KMJ32503 Bioreactor System		KMJ49802 Final Year Project I	KMJ49904 Final Year Project II
	KMJ12303 Introduction to Sustainability	KMJ12602 Thermodynamics	KMJ22204 Material and Energy Balance	KMJ22403 Heat Transfer	KMJ32203 Separation process	KMJ32603 Safety & Loss Prevention		KMJ42203 Good Manufacturing Practice	KMJ4XXXX Elective 3
		KMJ12802 Process Instrumentations		KMJ22601 Transport Phenomena Application	KMJ32301 Skills in Separation Process	KMJ32702 Simulation for Chemical Engineering		KMJ42303 Industrial Waste Treatment	
						KMJ3XXXX Elective 1		KMJ4XXXX Elective 2	
NON-ENGINEERING CORE (28)	SMQ10103 Engineering Mathematics I	SMQ10203 Engineering Mathematics II	SMQ20303 Engineering Mathematics III	SMQ27103 Engineering Statistics	KMJ42403 Engineering Management	KMJ45802 Professional Engineers			
	KMJ12102 Organic Chemistry I	KMJ12702 Organic Chemistry II	KMJ22303 Analytical Chemistry						
	KMJ12203 Introduction to Biological and Chemical Science Principles	KMJ12501 Biochemical Science							
UNIVERSITY REQUIRED (16)	SMB41002 Bahasa Melayu Universiti	SMB20102** English For General Communication		SMB31202 English For Technical Communication	SMU13102 Appreciation of Ethics and Civilization	SMU22402 Engineering Entrepreneurship			
	SMB10102* Preparatory English		SMU13002 Philosophy and Current Issues	SMUXXXXX*** Option Subject	SMU32202 Thinking Skill				
	SMZxxx01 Co-curriculum	SMZxxx01 Co-curriculum							
137	19	17	18	17	18	18	5	14	11

Total Units for Graduation 137

Elective courses	PROCESS ENGINEERING	BIOCHEMICAL ENGINEERING	SUSTAINABILITY
Elective 1	KMJ32903 Colloidal and Biomaterials Processing	KMJ33003 Halal Processing	KMJ33103 Sustainable Energy
Elective 2	KMJ43203 Energy and Process Utility Engineering	KMJ42503 Food Engineering	KMJ42603 Biomass Utilization
Elective 3	KMJ42903 Petrochemical Process	KMJ43003 Pharma and Nutraceutical Engineering	KMJ43103 Fuel Cells

Note:
1. * Must register for students who obtained either Band 1 or Band 2 for Malaysian University English Test (MUET).
2. ** Must register for students with ONE of the following criteria 1) Obtained Band 3 in Malaysian University English Test (MUET) 2) Passed SMB10102 Preparatory English with minimum grade C.
3. *** For student who obtained Band 4, 5 and 6 in Malaysian University English Test (MUET), they are exempted from taking SMB20102 English for General Communication course and are required to take an optional course to earn credit for graduation

CURRICULUM STRUCTURE
UR6524002 BACHELOR OF POLYMER ENGINEERING WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEM	I	II	III	IV	V	VI		VII	VIII
Engineering Core (102)	KMJ15204 Organic Chemistry	KMJ10003 Engineering Skills	KMJ25203 Physical Chemistry	KMJ10103 Engineering Quality Control	KMJ30203 Fluid Mechanics	KMJ30103 Process Control	KMJ39905 Industrial Training	KMJ45203 Polymer Engineering Integrated Design Project	* *KMJ45403 Polymer Adhesive & Coating* OR * *KMJ45503 Environmental Friendly Polymer*
	KMJ15303 Electrical Technology	KMJ15403 Engineering Mechanics	KMJ24003 Plastic Materials	KMJ25304 Polymer Synthesis	KMJ34803 Polymer Testing & Characterization	KMJ35203 Polymer Engineering Design		KMJ44003 Polymer Composites	
	KMJ16803 Introduction to Computer Programming	KMJ15503 Introduction to Polymer	KMJ24403 Elastomeric Materials	KMJ25404 Structure & Polymer Properties	KMJ34404 Rubber Processing	KMJ35304 Mass & Heat Transfer for Polymer Engineering		KMJ44104 Polymer Blends	KMJ45603 Polymer in Electronic Application
		KMJ15603 Engineering Drawing		KMJ25503 Thermodynamics for Polymer Engineering	KMJ34004 Plastic Processing	KMJ34504 Latex Processing		KMJ49802 Final Year Project I	KMJ49904 Final Year Project II
						* *KMJ35402 Polymers in Biomedical Applications* OR * *KMJ35502 Photoluminescent Polymers & their Appplications*			
Non-Engineering Core (19)	SMQ10103 Engineering Mathematics I	SMQ10203 Engineering Mathematics II	SMQ20303 Engineering Mathematics III	SMQ27103 Engineering Statistics		KMJ42403 Engineering Management			KMJ45802 Professional Engineer
	SMU12202 Skills & Technology in Communication								
121	15	15	12	17	14	19		12	12
University Required (16)		*SMB10102 Preparatory English	**SMB20102 English for General Communication		SMB31202 English for Technical Communication			SMU13002 Philosophy & Current Issues	
	SMB1XX02 Option Subject	SMB41002 University Malay Language or ***SMB11002 Basic Malay Language	SMU13102 Appreciation of ethics and civilization		SMU32202 Thinking Skill			SMU22402 Engineering Entrepreneurship	
	SMZXXX01 Co-Curriculum	SMZXXX01 Co-Curriculum							
16	3	3	4	-	4	-	-	4	
137	18	18	16	17	18	19	5	16	12
Total Units for Graduation 137									

Elective Subject. *Uncredited. Compulsory to students with MUET Band 2 only. This course is a prerequisite to SMB20102 English for General Communication.
Compulsory to students with MUET Band 3 or less. This course is a prerequisite to SMB31202 English for Technical Communication. * For international student only.

CURRICULUM STRUCTURE
UR6524003 BACHELOR OF AGRICULTURAL ENGINEERING WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEM	I	II	I	II	I	II		I	II
Engineering Core (96)	KMJ16003 Fundamental of Agricultural Engineering	KMJ16503 Dynamics	KMJ26004 Fluid Mechanics Engineering	KMJ26303 Heat and Mass Transfer	KMJ36003 Soil Engineering	KMJ36402 Farm Machinery	KMJ39905 Industrial Training	KMJ49802 Final Year Project 1	KMJ49904 Final Year Project 2
	KMJ16102 Computer Aided Engineering Design	KMJ16603 Strength of Materials	KMJ26103 Thermodynamics	KMJ26403 Hydrology and Water Resources Engineering	KMJ36103 Farm Structural Design	KMJ36503 Unit Operation		KMJ46003 Agricultural Engineering Design 1	KMJ46103 Agricultural Engineering Design 2
	KMJ16203 Statics		KMJ26203 Electrical and Electronic Technology	KMJ26503 Engineering Properties of Biological Materials	KMJ36203 Instrumentation, Measurement and Control	KMJ36603 Design of Automation Systems		KMJ46203 Design of Machines	KMJ46803 Bioproduct Manufacturing
	KMJ16303 Geomatics Engineering		KMJ10003 Engineering Skills	KMJ16803 Introduction to Computer Programming	KMJ36303 Energy and Power	KMJ36702 Modelling and Simulation		KMJ46303 Postharvest Engineering	KMJ4XX03 Elective 2
								KMJ4XX03 Elective 1	
Non-Engineering Core (25)	SMQ10103 Engineering Mathematics I	SMQ10203 Engineering Mathematics II	SMQ20303 Engineering Mathematics III	SMQ27103 Engineering Statistics	KMJ42403 Engineering Management	KMJ45802 Professional Engineers			
	KMJ16403 Plant and Animal Sciences	KMJ16703 Crop and Livestock Production Systems							
		SMU12202 Skills and Technology in Communication							
University Required (16)	SMZXXX01 Co-Curricular Activity	SMZXXX01 Co-Curricular Activity	SMU13002 Philosophy and Current Issues	SMB31202 English for Technical Communication	SMU22402 Engineering Entrepreneurship	SMU32202 Thinking Skills			
	* SMB10102 Preparatory English	SMB41002 University Malay Language		*** SMBXXX02 OR SMUXXX02 Optional Courses		SMU13102 Appreciation of Ethics and Civilization			
		** SMB20102 English for General Communication							
137	18	17	18	19	17	16	5	14	13

Elective Courses	Natural Resources Management	Smart Farming	Controlled Environment Agriculture	Waste to Wealth Management
Elective 1 (Semester 1)	KMJ46403 Biowaste Management	KMJ46503 Precision Agriculture	KMJ46603 Controlled Environment Engineering	KMJ46703 Waste to Wealth Technology
Elective 2 (Semester 2)	KMJ46903 Land Reclamation & Remediation	KMJ47003 Decision Support System for Smart Farming	KMJ47103 Advance Controlled Environment Production Systems	KMJ47203 Biomass Conversion Technology

Descriptions:
- * Must register for student who obtained either Band 1 or Band 2 for Malaysian University English Test (MUET).
- ** Must register for students with ONE of the following criteria 1) Obtained Band 3 in Malaysian University English Test (MUET) 2) Passed UVA101 Preparatory English with minimum grade C.
- *** 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.

ENGINEERING TECHNOLOGY PROGRAMME

PROGRAMME OBJECTIVES (PEO)

The Programme Objectives for the entire ***Engineering Technology Programme*** at Universiti Malaysia Perlis (UniMAP) is as follows:

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

*At the end of the **Engineering Technology Programme**, the students are expected to attain the following attributes:*

PO 1
Knowledge: Apply knowledge of mathematics, science, engineering fundamentals and engineering specialisation principles 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 specialization.

PO 3
Design/development of solutions: 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.

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 the effective reports and design documentation, make effective presentations, 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 and leader in a team and to manage projects in multidisciplinary environments.

PO12
Life-Long Learning: Recognize the need for and have the ability to engage in independent and lifelong learning in specialist technologies.

CURRICULUM STRUCTURE
UR6524004 BACHELOR OF CHEMICAL ENGINEERING TECHNOLOGY (FOOD TECHNOLOGY) WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEM	I	II	III	IV	V	VI	VII	VIII
Discipline Core (87) & Elective (9)	KMK10003 Materials Engineering	KMK10502 Physical Chemistry	KMK20003 Thermodynamics for Chemical Engineering	KMK20303 Reaction Engineering	KMK30002 Safety and Loss Prevention	KMK30403 Final Year Project I	KMK40005 Final Year Project II	KMK49912 INDUSTRIAL TRAINING
	KMK10103 Organic Chemistry	KMK10603 Analytical Chemistry	KMK20103 Fluid Mechanics	KMK20403 Mass Transfer	KMK30103 Process Control and Dynamics	KMK33503 Plant Design for Food Technology 1	KMK43503 Plant Design for Food Technology 2	
	KMK10202 Engineering Graphics for Chemical Engineering	KMK10704 Principles of Chemical Process	KMK20203 Heat Transfer for Chemical Engineering	KMK23103 Food Biochemistry	KMK30203 Separation Engineering	KMK33403 Food Waste Management and Utilization	KMK43003 Food Product Development and Commercialization	
	KMK10303 Engineering Skills	KMK10802 Introduction to Process Instrumentation	KMK23003 Food Microbiology	KMK23203 Postharvest Technology	KMK33003 Analysis and Instrumentation for Food Technology	KMK33603 Quality and Safety Management System in Food Production		
	KMK10403 Electrical Technology				KMK33104 Food Processing and Preservation			
					Elective 1/3 (A1 or B1)	Elective 2/3 (A2 or B2)	Elective 3/3 (A3 or B3)	
Common Core (15)	SMQ11103 Mathematics for Engineering Technology I	SMQ11203 Mathematics for Engineering Technology II	SMQ21303 Mathematics for Engineering Technology III			KMK30303 Engineering Technology Management	KMK40103 Engineering Technologist in Society	
University Required (18)	SMB10102 Preparatory English	SMB20102 English for General Communication OR	SMB31202 English for Technical Communication	SMU32202 Thinking Skills				
	SMZXXX01 Co-Curricular Activity	SMBXXX02 Option Subject	SMB41002 University Malay Language	SMU13102 Appreciation of Ethics and Civilization				
		SMU13002 Philosophy and Current Issues		SMU12202 Skills and Technology in Communication				
		SMZXXX01 Co-Curricular Activity		SMU22402 Engineering Entrepreneurship				
141	18	19	19	20	18	18	17	12

Total Units for Graduation =141

Elective 1
A1. KMK33203 Fats and Oils Technology
B1. KMK33303 Food Ingredients

Elective 2
A2. KMK33703 Functional Foods and Nutraceuticals
B2. KMK33803 Dairy and Meat Technology

Elective 3
A3. KMK43103 Food Packaging Technology
B3. KMK43203 Poultry and Fish Technology

Chemical Engineering Courses | Food Technology Specialization Courses | Elective Courses

CURRICULUM STRUCTURE
UR6524006 BACHELOR OF CHEMICAL ENGINEERING TECHNOLOGY (INDUSTRIAL BIOTECHNOLOGY) WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEMESTER	I	II	III	IV	V	VI	VII	VIII
DISCIPLINE CORE (99) & ELECTIVE (9)	KMK10403 Electrical Technology	KMK10103 Organic Chemistry	KMK20003 Thermodynamics for Chemical Engineering	KMK20103 Fluid Mechanics	KMK30002 Safety & Loss Prevention	KMK30403 Final Year Project I	KMK40005 Final Year Project II	INDUSTRIAL TRAINING (LI) KMK49912
	KMK10502 Physical Chemistry	KMK10704 Principles of Chemical Process	KMK20303 Reaction Engineering	KMK20203 Heat Transfer for Chemical Engineering	KMK30203 Separation Engineering	KMK32503 Plant Design for Industrial Biotechnology 1	KMK42503 Plant Design for Industrial Biotechnology 2	
	KMK10003 Materials Engineering	KMK10202 Engineering Graphics for Chemical Engineering	KMK20403 Mass Transfer	KMK22104 Biochemistry & Enzyme Technology	KMK32002 Waste Management & Utilization	KMK30103 Process Control & Dynamics	KMK42003 Issues & Commercialization in Biotechnology	
	KMK10802 Introduction to Process Instrumentation	KMK10603 Analytical Chemistry	KMK22004 Industrial Microbiology	KMK22203 Biomolecular & Genetic Engineering	KMK32103 Cell & Tissue Culture Technology	KMK32603 Biopharmaceutical Technology		
	KMK10303 Engineering Skills				KMK32204 Upstream & Downstream Processing Technology			
					Elective 1 (A1 or A2)	Elective 2 (B1 or B2)	Elective 3 (C1 or C2)	
COMMON CORE	SMQ11103 Mathematics for Engineering Technology I	SMQ11203 Mathematics for Engineering Technology II	SMQ21303 Mathematics for Engineering Technology III			KMK30303 Engineering Technology Management	KMK40103 Engineering Technologist in Society	
UNIVERSITY REQUIRED (19)	SMU13002 Philosophy and Current Issues	SMB10102 Preparatory English	SMB20102 English for General Communication OR	SMB31202 English for Technical Communication				
	SMZXXX Co-Curricular Activity	SMB41002 University Malay Language	SMB1XX02 Option Subject	SMU32202 Thinking Skills				
		SMZXXX Co-Curricular Activity	SMU12202 Skills & Technology in Communication	SMU22402 Engineering Entrepreneurship				
		SMU13102 Appreciation of Ethics and Civilization						
142	19	20	20	19	17	18	17	12
Total Units for Graduation =142								

Elective 1	Elective 2	Elective 3
A1. KMK32303 Biotechnology Facility Design	B1. KMK32703 Bioactive Compounds Extraction Technology	C1. KMK42103 Bioenergy Production Technology
A2. KMK31503 Scale up & Process Optimization	B2. KMK32803 Sustainable Green Technology	C2. KMK41403 Food Processing Technology

Notes:

MUET Band 2: SMB10102 Preparatory English >SMB20102 English for General Communication>SMB31202 English for Technical Communication, 'Option Subject is NOT COMPULSORY'
MUET Band 3: SMB20102 English for General Communication> SMB31202English for Technical Communication, 'Option Subject is NOT COMPULSORY'
MUET Band 4 and above: SMB31202English for Technical Communication, 'Option Subject is COMPULSARY

CURRICULUM STRUCTURE
UR6524006 BACHELOR OF CHEMICAL ENGINEERING TECHNOLOGY (INDUSTRIAL CHEMICAL PROCESS) WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEM	I	II	III	IV	V	VI	VII	VIII
Discipline Core	KMK10303 Engineering Skills	KMK10704 Principles of Chemical Process	KMK20003 Thermodynamics for Chemical Engineering	KMK20403 Mass Transfer for Chemical Engineering	KMK30103 Process Control & Dynamics	KMK30403 Final Year Project I	KMK40005 Final Year Project II	KMK49912 INDUSTRIAL TRAINING
	KMK10403 Electrical Technology	KMK10802 Introduction to Process Instrumentation	KMK20103 Fluid Mechanics	KMK20303 Reaction Engineering	KMK30203 Separation Engineering	KMK30002 Safety & Loss Prevention	KMK41903 Plant Design For Industrial Chemical Process 2	
	KMK10502 Physical Chemistry	KMK10103 Organic Chemistry	KMK20203 Heat Transfer for Chemical Engineering	KMK21503 Bioresource Processing Technology	KMK31203 Environmental Engineering	KMK31903 Plant Design For Industrial Chemical Process I	KMK41102 Quality Assurance & Control in Chemical Engineering	
	KMK10003 Materials Engineering	KMK10603 Analytical Chemistry	KMK21303 Oleochemical Process & Products	KMK21602 Plant Utilities	KMK31303 Petroleum & Gas Processing Technology	KMK31603 Polymer Processing Technology	KMK41203 Particle Processing Technology	
	KMK10202 Engineering Graphics for Chemical Engineering			KMK21703 Renewable Energy				
					Elective 1/3	Elective 2/3	Elective 3/3	
Non-ore	SMQ11103 Mathematics for Engineering Technology I	SMQ11203 Mathematics for Engineering Technology II	SMQ21303 Mathematics for Engineering Technology III			KMK30303 Engineering Technology Management	KMK40103 Engineering Technologist in Society	
University	SMB41002 University Malay Language	SMBXXX02 Option Subject (Foreign Language)	SMU22402 Engineering Entrepreneurship	SMU13102 Appreciation of Ethics and Civilization	SMU12202 Skills & Technology in Communication			
	SMB10102 Preparatory English	SMU13002 Philosophy & Current Issues		SMU32202 Thinking Skills				
		SMB20102 English for General Communication						
	SMZXXX01 Co-Curricular Activity	SMZXXX01 Co-Curricular Activity		SMB31202 English for Technical Communication				
141	19	20	17	20	17	17	19	12
141	19	20	17	20	17	17	19	12
Total Units for Graduation = 141								

Elective 1	Elective 2	Elective 3
A1. KMK31403 Industrial Electrochemistry	B1. KMK31703 Pharmaceutical Processing Technology	C1. KMK32703 Bioactive compounds Extraction Technology
A2. KMK31503 Scale Up & Optimization	B2. KMK31803 Advanced Membrane Technology & Application	C2. KMK41403 Food Processing Technology

Notes:
MUET Band 2: SMB10102 Preparatory English >SMB20102 English for General Communication>SMB31202 English for Technical Communication, 'Option Subject is NOT COMPULSORY'
MUET Band 3: SMB20102 English for General Communication> SMB31202English for Technical Communication, 'Option Subject is NOT COMPULSORY'
MUET Band 4 and above: SMB31202English for Technical Communication, 'Option Subject is COMPULSARY

LIST OF COURSES:

COURSE CODE	COURSE NAME
KMJ10003	Kemahiran Kejuruteraan (Engineering Skills)
KMJ10103	Kawalan Mutu Kejuruteraan (Engineering Quality Control)
KMJ12102	Kimia Organik I (Organic Chemistry I)
KMJ12203	Pengenalan kepada Prinsip-Prinsip Sains Biologi dan Kimia (Introduction to Biological and Chemical Science Principles)
KMJ12303	Pengenalan kepada Kelestarian (Introduction to Sustainability)
KMJ12402	Mekanik Kejuruteraan (Engineering Mechanics)
KMJ12501	Sains Biokimia (Biochemical Science)
KMJ12602	Termodinamik (Thermodynamics)
KMJ12702	Kimia Organik II (Organic Chemistry II)
KMJ12802	Instrumentasi Proses (Process Instrumentation)
KMJ15204	Kimia Organik (Organic Chemistry)
KMJ15303	Teknologi Elektrik (Electrical Technology)
KMJ15403	Mekanik Kejuruteraan (Engineering Mechanics)
KMJ15503	Pengenalan Kepada Polimer (Introduction To Polymer)
KMJ15603	Lukisan Kejuruteraan (Engineering Drawing)
KMJ16003	Asas Kejuruteraan Pertanian (Fundamental Of Agricultural Engineering)
KMJ16102	Reka Bentuk Kejuruteraan Berbantu Komputer (Computer Aided Engineering Design)
KMJ16203	Statik (Statics)
KMJ16303	Kejuruteraan Geomatik (Geomatics Engineering)
KMJ16403	Sains Tumbuhan Dan Haiwan (Plant And Animal Sciences)
KMJ16503	Dinamik (Dynamics)
KMJ16603	Kekuatan Bahan (Strength Of Materials)
KMJ16703	Sistem Pengeluaran Tanaman Dan Ternakan (Crop And Livestock Production Systems)
KMJ16803	Pengenalan Kepada Pengaturcaraan Komputer (Introduction To Computer Programming)
KMJ20003	Kimia Fizikal Bahan (Materials Physical Chemistry)

LIST OF COURSES:

COURSE CODE	COURSE NAME
KMJ20004	Struktur Dan Sifat-Sifat Bahan (Materials Structure And Properties)
KMJ20103	Kimia Analitikal (Analytical Chemistry)
KMJ20104	Metalurgi Fizikal (Physical Metallurgy)
KMJ20203	Dynamics (Dinamik)
KMJ20204	Tembikar Putih, Kaca dan Kaca-Seramik (Whiteware, Glass and Glass-Ceramic)
KMJ20303	Kekuatan Bahan (Strength Of Materials)
KMJ20403	Fenomena Pengangkutan dalam Kejuruteraan Bahan (Transport Phenomena in Materials Engineering)
KMJ22003	Termodinamik Kejuruteraan Kimia (Chemical Engineering Thermodynamics)
KMJ22103	Mekanik Bendalir (Fluid Mechanics)
KMJ22204	Imbangan Bahan dan Tenaga (Material and Energy Balance)
KMJ22303	Kimia Analisis (Analytical Chemistry)
KMJ22403	Pemindahan Haba (Heat Transfer)
KMJ22503	Pemindahan Jisim (Mass Transfer)
KMJ22601	Aplikasi Fenomena Pengangkutan (Transport Phenomena Application)
KMJ22703	Kejuruteraan Biokimia (Biochemical Engineering)
KMJ24003	Bahan-Bahan Plastik (Plastic Materials)
KMJ24403	Bahan-Bahan Elastomerik (Elastomeric Materials)
KMJ25203	Kimia Fizikal (Physical Chemistry)
KMJ25304	Sintesis Polimer (Polymer Synthesis)
KMJ25404	Struktur & Sifat-Sifat Polimer (Structure & Polymer Properties)
KMJ25503	Termodinamik Untuk Kejuruteraan Polimer (Thermodynamics For Polymer Engineering)
KMJ26004	Kejuruteraan Mekanik Bendalir (Fluid Mechanics Engineering)
KMJ26103	Termodinamik (Thermodynamics)
KMJ26203	Teknologi Elektrik Dan Elektronik (Electrical And Electronic Technology)
KMJ26303	Pemindahan Haba Dan Jisim (Heat And Mass Transfer)

LIST OF COURSES:

COURSE CODE	COURSE NAME
KMJ26403	Kejuruteraan Hidrologi Dan Sumber Air (Hydrology And Water Resources Engineering)
KMJ26503	Sifat Kejuruteraan Bahan Biologi (Engineering Properties Of Biological Materials)
KMJ30002	Pemilihan Bahan dan Reka Bentuk I (Materials Selection and Design I)
KMJ30003	Pemprosesan Polimer (Polymer Processing)
KMJ30004	Sifat-sifat Polimer (Polymer Properties)
KMJ30103	Kawalan Proses (Process Control)
KMJ30104	Pencirian Bahan (Materials Characterization)
KMJ30203	Mekanik Bendalir (Fluid Mechanics)
KMJ30303	Kejuruteraan Permukaan (Surface Engineering)
KMJ30403	Termodinamik Bahan (Materials Thermodynamics)
KMJ30503	Bahan Elektronik Kejuruteraan (Electronic Materials Engineering)
KMJ32003	Kejuruteraan Tindakbalas (Reaction Engineering)
KMJ32104	Dinamik dan Kawalan Proses (Process Control and Dynamics)
KMJ32203	Proses Pemisahan (Separation Process)
KMJ32301	Kemahiran dalam Proses Pemisahan (Skills in Separation Process)
KMJ32503	Sistem Bioreaktor (Bioreactor System)
KMJ32603	Keselamatan dan Pencegahan Kehilangan (Safety and Loss Prevention)
KMJ32702	Simulasi untuk Kejuruteraan Kimia (Simulation for Chemical Engineering)
KMJ32803	Ekonomi Kejuruteraan (Engineering Economics)
KMJ32903	Pemproses Koloid dan Biobahan (Colloidal and Biomaterials Processing)
KMJ33003	Pemprosesan Halal (Halal Processing)
KMJ33103	Tenaga Lestari (Sustainable Energy)
KMJ34004	Pemprosesan Plastik (Plastic Processing)
KMJ34404	Pemprosesan Getah (Rubber Processing)
KMJ34504	Pemprosesan Lateks (Latex Processing)

LIST OF COURSES:

COURSE CODE	COURSE NAME
KMJ34803	Pengujian & Pencirian Polimer (Polymer Testing & Characterization)
KMJ35203	Reka Bentuk Kejuruteraan Polimer (Polymer Engineering Design)
KMJ35304	Pemindahan Jisim & Haba Untuk Kejuruteraan Polimer (Mass & Heat Transfer For Polymer Engineering)
KMJ35402	Polimer Dalam Aplikasi Bioperubatan (Polymers In Biomedical Applications)
KMJ35502	Polimer Pemancar Cahaya & Aplikasinya (Photoluminescent Polymers & Their Applications)
KMJ36003	Kejuruteraan Tanah (Soil Engineering)
KMJ36103	Reka Bentuk Struktur Ladang (Farm Structural Design)
KMJ36203	Peralatan, Pengukuran Dan Kawalan (Instrumentation, Measurement And Control)
KMJ36303	Tenaga Dan Kuasa (Energy And Power)
KMJ36402	Jentera Ladang (Farm Machinery)
KMJ36503	Operasi Unit (Unit Operation)
KMJ36603	Reka Bentuk Sistem Automasi (Design Of Automation Systems)
KMJ36702	Permodelan Dan Simulasi (Modelling And Simulation)
KMJ39905	Latihan Industri (Industrial Training)
KMJ40003	Pemilihan Bahan dan Reka Bentuk II (Materials Selection & Design II)
KMJ40103	Kejuruteraan Kakisan (Corrosion Engineering)
KMJ40203	Ujian Tanpa Musnah (Non Destructive Testing)
KMJ40303	Seramik Teknikal (Technical Ceramic)
KMJ40403	Bahan Komposit (Composite Materials)
KMJ40503	Bahan Binaan (Construction Materials)
KMJ40603	Penyambungan Bahan dan Struktur (Joining of Materials and Structures)
KMJ40703	Kejuruteraan Bahan Termaju (Advanced Material Engineering)
KMJ40803	Pembungkusan Elektronik Termaju (Advanced Electronic Packaging)
KMJ40903	Bahan Untuk Aplikasi Tenaga (Materials For Energy Application)
KMJ41003	Analisis Kegagalan Bahan (Materials Failure Analysis)

LIST OF COURSES:

COURSE CODE	COURSE NAME
KMJ42003	Reka Bentuk Loji Kimia I (Chemical Plant Design I)
KMJ42203	Amalan Pengilangan Baik (Good Manufacturing Practice)
KMJ42303	Rawatan Sisa Industri (Industrial Waste Treatment)
KMJ42403	Pengurusan Kejuruteraan (Engineering Management)
KMJ42503	Kejuruteraan Makanan (Food Engineering)
KMJ42603	Penggunaan Biomas (Biomass Utilization)
KMJ42704	Reka Bentuk Loji Kimia II (Chemical Plant Design II)
KMJ42903	Proses Petrokimia (Petrochemical Process)
KMJ43003	Kejuruteraan Farma dan Neutraseutikal (Pharma and Nutraceutical Engineering)
KMJ43103	Sel Bahan Api (Fuel Cells)
KMJ43203	Kejuruteraan Tenaga dan Utiliti Proses (Energy and Process Utility Engineering)
KMJ44003	Komposit Polimer (Polymer Composites)
KMJ44104	Adunan-Adunan Polimer (Polymer Blends)
KMJ45203	Projek Reka Bentuk Bersepadu Kejuruteraan Polimer (Polymer Engineering Integrated Design Project)
KMJ45403	Perekat Polimer & Penglitup (Polymer Adhesive & Coating)
KMJ45503	Polimer Mesra Alam (Environmental Friendly Polymer)
KMJ45603	Polimer Dalam Aplikasi Elektronik (Polymer In Electronic Application)
KMJ45802	Jurutera Profesional (Professional Engineers)
KMJ46003	Reka Bentuk Kejuruteraan Pertanian 1 (Agricultural Engineering Design 1)
KMJ46103	Reka Bentuk Kejuruteraan Pertanian 2 (Agricultural Engineering Design 2)
KMJ46203	Reka Bentuk Mesin (Design Of Machines)
KMJ46303	Kejuruteraan Lepas Tuai (Postharvest Engineering)
KMJ46403	Pengurusan Bio Sisa (Biowaste Management)
KMJ46503	Pertanian Tepat (Precision Agriculture)
KMJ46603	Kejuruteraan Persekitaran Terkawal (Controlled Environment Engineering)

LIST OF COURSES:

COURSE CODE	COURSE NAME
KMJ46703	Teknologi Kekayaan Dari Sisa (Waste To Wealth Technology)
KMJ46803	Pembuatan Bioproduk (Bioproduct Manufacturing)
KMJ46903	Penebusgunaan Dan Pemulihan Tanah (Land Reclamation And Remediation)
KMJ47003	Sistem Sokongan Keputusan Pertanian Pintar (Decision Support Systems For Smart Farming)
KMJ47103	Sistem Pengeluaran Persekitaran Terkawal Lanjutan (Advanced Controlled Environment Production Systems)
KMJ47203	Teknologi Penukaran Biomas (Biomass Conversion Technology)
KMJ49802	Projek Tahun Akhir I (Final Year Project I)
KMJ49904	Projek Tahun Akhir II (Final Year Project II)
SMU12202	Kemahiran Dan Teknologi Dalam Komunikasi (Skills and Technology in Communication)
SMU22402	Keusahawanan Kejuruteraan (Engineering Entrepreneurship)
KMK10003	Materials Engineering [Kejuruteraan Bahan]
KMK10103	Organic Chemistry [Kimia Organik]
KMK10202	Engineering Graphics for Chemical Engineering [Grafik Kejuruteraan Untuk Kejuruteraan Kimia]
KMK10303	Engineering Skills [Kemahiran Kejuruteraan]
KMK10403	Electrical Technology [Teknologi Elektrik]
KMK10502	Physical Chemistry [Kimia Fizikal]
KMK10603	Analytical Chemistry [Kimia Analisis]
KMK10704	Principles Of Chemical Process [Prinsip-Prinsip Bagi Proses-Proses Kimia]
KMK10803	Introduction To Process Instrumentation [Pengenalan Kepada Proses Instrumentasi]
KMK20003	Thermodynamics For Chemical Engineering [Termodinamik Untuk Kejuruteraan Kimia]
KMK20103	Fluid Mechanics [Mekanik Bendalir]
KMK20203	Heat Transfer For Chemical Engineering [Pemindahan Haba Untuk Kejuruteraan Kimia]
KMK20303	Reaction Engineering [Kejuruteraan Tindakbalas]
KMK20403	Mass Transfer [Pemindahan Jisim]
KMK30002	Safety & Loss Prevention [Keselamatan Dan Pencegahan Kehilangan]

LIST OF COURSES:

COURSE CODE	COURSE NAME
KMK30103	Process Control & Dynamics [Kawalan Proses Dan Dinamik]
KMK30203	Separation Engineering [Kejuruteraan Pemisahan]
KMK30403	Final Year Project I [Projek Tahun Akhir I]
KMK30303	Engineering Technology Management [Pengurusan Teknologi Kejuruteraan]
KMK40005	Final Year Project Ii [Projek Tahun Akhir Ii]
KMK40103	Engineering Technology In Society [Jurutera Teknologi Dalam Masyarakat]
KMK49912	Industrial Training [Latihan Industri]
KMK23003	Food Microbiology [Mikrobiologi Makanan]
KMK23103	Food Biochemistry [Biokimia Makanan]
KMK23203	Postharvest Technology [Teknologi Lepas Tuai]
KMK33003	Analysis & Instrumentation For Food Technology [Analisis Dan Instrumentasi Untuk Teknologi Makanan]
KMK33104	Food Processing & Preservation [Pemprosesan Dan Pengawetan Makanan]
KMK33203	Fats & Oils Technology [Teknologi Lemak Dan Minyak]
KMK33303	Food Ingredients [Ingredien Makanan]
KMK33503	Plant Design For Food Technology 1 [Reka Bentuk Loji Untuk Teknologi Makanan 1]
KMK33403	Waste Management & Utilization Of Food Waste [Pengurusan Dan Penggunaan Sisa Makanan]
KMK33603	Quality & Safety Management System In Food Production [Sistem Pengurusan Kualiti Dan Keselamatan Dalam Pengeluaran Makanan]
KMK33703	Functional Foods & Nutraceuticals [Makanan Berfungsi Dan Nutraseutikal]
KMK33803	Dairy & Meat Technology [Teknologi Tenusu Dan Daging]
KMK43503	Plant Design For Food Technology 2 [Reka Bentuk Loji Untuk Teknologi Makanan 2]
KMK43003	Food Product Development & Commercialization [Pembangunan Dan Pengkomersilan Produk Makanan]
KMK43103	Food Packaging Technology [Teknologi Pembungkusan Makanan
KMK43203	Poultry & Fish Technology [Teknologi Poltri Dan Ikan]
KMK21303	Oleochemical Process & Products
KMK21503	Bioresource Processing Technology

LIST OF COURSES:

COURSE CODE	COURSE NAME
KMK21602	Plant Utilities
KMK31203	Environmental Engineering
KMK31303	Petroleum & Gas Processing Technology
KMK31603	Polymer Processing Technology
KMK31903	Plant Design For Industrial Chemical Process I
KMK31703	Pharmaceutical Processing Technology
KMK31803	Advanced Membrane Technology & Application
KMK31403	Industrial Electrochemistry
KMK41903	Plant Design For Industrial Chemical Process 2
KMK41102	Quality Assurance & Control In Chemical Engineering
KMK41203	Particle Processing Technology
KMK21703	Renewable Energy
KMK22004	Mikrobiologi Industri [Industrial Microbiology]
KMK22104	Biokimia & Teknologi Enzim [Biochemistry & Enzyme Technology]
KMK22203	Biomolekular & Kejuruteraan Genetik [Biomolecular & Genetic Engineering]
KMK32002	Pengurusan Sisa & Penggunaan [Waste Management & Utilization]
KMK32103	Sel & Teknologi Kultur Tisu [Cell & Tissue Cell Culture]
KMK32204	Teknologi Pemprosesan Huluan & Hiliran [Upstream & Downstream Processing]
KMK32303	Reka Bentuk Fasiliti Bioteknologi [Biotechnology Facility Design]
KMK32503	Reka Bentuk Loji Untuk Bioteknologi Industri 1 [Plant Design For Industrial Biotechnology 1]
KMK32603	Teknologi Biofarmaseutikal [Biopharmaceutical Technology]
KMK32803	Teknologi Hijau Lestari [Sustainable Green Technology]
KMK42003	Isu & Komersialisasi Dalam Bioteknologi [Issues & Commercialization In Biotechnolgy
KMK42103	Teknologi Penghasilan Tenaga Bio [Bioenergy Production Technology]
KMK45203	Reka Bentuk Loji Untuk Bioteknologi Industri 2 [Plant Design For Industrial Biotechnology 2]

LIST OF COURSES:

COURSE CODE	COURSE NAME
KMK31503	Peningkatan & Proses Optimasi [Scale Up & Process Optimization]
KMK32703	Teknologi Pengestrakan Sebatian Bioaktif [Bioactive Compounds Extraction Technology]
KMK41403	Teknologi Pemprosesan Makanan [Food Processing Technology]

KMJ10103 KAWALAN MUTU KEJURUTERAAN (ENGINEERING QUALITY CONTROL)

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:
1. Ability to analyse engineering fundamentals to solve problems related to quality management systems, quality management tools and quality management philosophy.
2. Ability to evaluate engineering problems related to quality management systems and quality control tools.
3. Ability to perform the appropriate modern engineering quality control tool to the solution of complex engineering quality control problem.

KMJ10003 KEMAHIRAN KEJURUTERAAN (ENGINEERING SKILLS)

No of Credits: 5

Course Synopsis:
This subject is 100 % practical coursework and carried out 3 units credit hours. This course contains basic practical works for engineer which are Mechanical Workshop Practice, Welding, Domestic Electrical Wiring, Basic Electronic, Simulation/ Analysis Software, Technical Drawing and AutoCAD that specifically planned for non-electronic based programs.

Course Outcomes:
1. Ability to demonstrate effectively the skills and standard practice of mechanical machining process, equipment and tools.
2. Ability to perform the skills and standard practice of domestic electrical wiring and explain the theoretical approach when resolving physical issues.
3. Ability to construct the electronic circuit based on schematic circuit diagram and demonstrate basic knowledge of electronic components.
4. Ability to perform modern engineering and IT tools /software to analyse the data for engineering problem solving.
5. Ability to perform standard practice of engineering drawing to design a product using common drawing tool or software.
6. Ability to communicate effectively on laboratory/ workshop activities, make effective explanation, and give and receive clear.

KMJ16203 STATIK (STATICS)

No of Credits: 3

Course Synopsis:
The course exposes the students 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
related to the concepts of equilibrium, the concepts of a particle and rigid body. Students also will 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 mass and moment inertia will also be discussed to understand the overall basic statics.

Course Outcomes:
1. Ability to analyse the properties (components, resultants and moments) of a force system in 2-dimension and 3-dimension.
2. Ability to solve equilibrium problems of various types of rigid bodies, structures and trusses using FBDs and equations of equilibrium.
3. Ability to evaluate the properties (centroid, center of gravity and moment of inertia) of areas, lines and volumes and apply these properties in equilibrium problems.
4. Ability to evaluate various types of friction problems using FBDs and equation.s of equilibrium.

KMJ15303 TEKNOLOGI ELEKTRIK (ELECTRICAL TECHNOLOGY)

No of Credits: 3

This course is intended to provide students with knowledge and ability to apply, analyze as well as to evaluate basic electrical technology for materials such as basic DC and AC circuits, i.e. Ohm's law, Kirchhoff's current and voltage law and basic principles of 3-phase AC circuits, basic electromagnetism and magnetic circuits i.e. Faraday's law, Lenz's law, LC circuits and transformer, and basic electric machines i.e. dc machines and induction motors.

Course Outcomes:
1. Ability to analyse the DC and AC circuits by using Ohm's law, Kirchhoff's current law, Kirchhoff's voltage law and Thevenin's theorem.
2. Ability to calculate and evaluate properties of magnetic materials such as magnetic field, magnetic induction, eddy current etc. Using basic electromagnetic principles.
3. Ability to evaluate and design dc and ac machines such as transformer, induction motors etc using properties of suitable magnetic materials.

KMJ15603 LUKISAN KEJURUTERAAN (ENGINEERING DRAWING)

Course Synopsis:
This course will introduce student to Engineering Drawing including; Basic Drafting Skills - Lines and Lettering, Circles and Arcs, Basic Dimensioning, Dimensioning Circular and Common Features, Dimensioning Methods, Limits and Tolerances. Geometry - Beginning Geometry: Straight Lines, Polygons, Ellipse, Helix and Parabola, Geometric Symbols. Orthographic - Orthographic Representation, Methods of Representation, Orthographic Projection – First angle projection, Orthographic Projection – Third angle projection, Reference Arrows Layout, Identifying Symbols, Hidden Surface and Edges, Inclined Surface, Circular Features, Oblique Surface. Pictorial Drawing - Isometric Drawing, Nonisometric Drawing, Dimensioning isometric Drawing. Auxiliary - Primary Auxiliary View, Secondary Auxiliary View. Sections - Sectional Views, Cutting-Plane Lines, Full Sections, Section Lining, Half Sectioning. Computer-Aided Drawing (CAD) - AutoCAD, IronCAD, CAD Mould, Plotting/Printing

Course Outcomes:
1. Able to examine and explain the basic of engineering drawings and CAD software
2. Able to distinguish common terms used in drawing and design
3. Able to interpret the elements of engineering drawings
4. Able to design the required engineering drawing based on industrial needs.

KMJ20004 STRUKTUR DAN SIFAT-SIFAT BAHAN (MATERIALS STRUCTURE AND PROPERTIES)

No of Credits: 4

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:
1. Ability to analyse the properties (components, resultants and moments) of a force system in 2-dimension and 3-dimension.
2. Ability to solve equilibrium problems of various types of rigid bodies, structures and trusses using FBDs and equations of equilibrium.
3. Ability to evaluate the properties (centroid, center of gravity and moment of inertia) of areas, lines and volumes and apply these properties in equilibrium problems.
4. Ability to evaluate various types of friction problems using FBDs and equations of equilibrium.

KMJ20104 METALURGI FIZIKAL (PHYSICAL METALLURGY)

No of Credits: 4

Course Synopsis:
This course is focused more on metallographic study, the relation between microstructure and properties of steels and nonferrous alloys. The subtopic in this subject are: introduction to physical metallurgy, solidification process, imperfections in solid, slip mechanism, metallography quantitative, non-ferrous alloys, strengthening mechanism, introduction to phase diagram, iron-iron carbide phase diagram, recovery, recrystallization and grain growth, procedure of steel heat treatment, surface of heat treatment, introduction to isothermal transformation (IT) and continuous cooling transformation (CCT) diagrams, hardenability and cast iron.

Course Outcomes:
1. Ability to apply knowledge of physical metallurgy, phase diagrams and their relationship with the microstructures.
2. Ability to design heat treatment processes to achieve the required properties for required application.
3. Ability to investigate and analyse the microstructures and properties from different heat treatment processes.
4. Ability to diagnose and engage in independent and life-long learning in the physical metallurgy concept.

KMJ20203 DINAMIK (DYNAMICS)

No of Credits: 3

Course synopsis:
In this course, students use the concepts of mechanics in dynamics conditions. This 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, students learn the dynamics of a particle first, followed by topics in rigid-body dynamics in two dimensions. Emphasis will be given on the kinematics and kinetics of a particle and planar kinematics and kinetics of a rigid body.

Course Outcomes:
1. Ability to apply knowledge of mathematics and engineering fundamentals in the solution of complex 2-dimensional kinematics and kinetics of a particle/ rigid body.
2. Ability to evaluate complex problems of 2-dimensional kinematics and kinetics of a particle/ rigid body using principles of mathematics and engineering sciences.

KMJ20204 TEMBIKAR PUTIH, KACA DAN KACA-SERAMIK (WHITEWARE, GLASS AND GLASS-CERAMIC)

No of Credits: 4

Course Synopsis:
This course presents the essential knowledge on the production of whitewares, glasses and glass-ceramic from raw materials to the final product. Topic covers under whitewares including processing/recovery of the raw materials from mineral sources e.g. crushing, milling, purification, sieving, filter pressing. Preparation of feedstock materials and related testing: granulated powder, ceramic slurry for slip casting process. Testing for quality control purposes (flowability, plasticity, thixotropy, viscosity, specific gravity, particle size of powder). Production and properties of plaster mould. Compositions and batch recipe. Type of additives and the scientific basis for their use in optimizing the processing processes. Various shaping techniques e.g powder pressing, slip casting, tape casting, extrusion, jiggering, jollying. Drying and firing process. Sintering mechanism: solid state and liquid phase sintering. Topics in glasses include different types of glass, glass constituents and batch ingredients, decolourises and refining agents, batch calculation, Glass melting: Fundamental of glass formation, factors that influence glass formation, Zachariasen's rules, kinetic & thermodynamic criteria for glass formation, nucleation and crystal growth, structural models of silicate and non-silicate glasses, bridging and non-bridging oxygen, melting process, refining of glass, electric heating, cold top furnace, pot melting. Viscosity, liquid immiscibility and phase separation in glasses. Theories and thermodynamics of liquid immiscibility, mechanism of phase separation and chemical durability of glass. different methods of producing glasses (pressed and blown wares, flat glass, tubing and bulbs, fibre glass raw materials), Heat treatment of glass and defect in glass. Technology of making radiation shielding glasses, optical glass, photosensitive glasses, heat absorbing glasses, solder glasses. Optical properties of glass, coating of glass, colour glass including photochromic and electrochromic glass. Topics in glass-ceramics included production of glass- ceramics, description & application of various glass-ceramics, types of glass- ceramic. Viscous sintering mechanism. Various types of glaze and decoration techniques.

Course Outcomes:
1. Ability to explain the basics of various types of ceramics materials including whiteware, ceramic mold, glass, glass-ceramic and glaze.
2. Ability to formulate, evaluate, analyse, solve, and propose designed solutions to problems related to producing the crystalline and non-crystalline ceramics.
3. Ability to work effectively in a team to make plaster mould and ceramic products.

KMJ20003 KIMIA FIZIKAL BAHAN (MATERIALS PHYSICAL CHEMISTRY)

No of Credits: 3

Course Synopsis:
This course is designed to introduce the students on the 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:
1. Ability to explain the knowledge and fundamentals of materials physical chemistry
2. Ability to evaluate problem of materials physical chemistry
3. Ability to conduct the experiments associated with materials physical chemistry
4. Ability to commit and function effectively as an individual, and as a member or leader in diverse form

KMJ20303 KEKUATAN BAHAN (STRENGTH OF MATERIALS)

No of Credits: 3

Course Synopsis:
Strength of Materials course introduces the concepts and principles in engineering mechanics of materials (statics) and behaviour of the materials and structures under external loadings. The fundamental knowledge on the mechanics of solids incorporating static equilibrium, materials geometry, deformations under applied loads are basics for solving numerous engineering problems involving materials and various structural members subjected to axial load, torsion, bending, transverse shear and combined loadings in engineering applications.

Course Outcomes:
1. Ability to apply knowledge of mathematics, science and engineering fundamentals to solve problems of various types and conditions of stresses and mechanical properties of materials involving behaviour of different material structures (shaft, beams, column, rivets, joints, etc.) and loading or combined loadings.
2. Ability to evaluate complex/applied material or structural engineering problems related to various types and conditions of stresses and mechanical properties of materials involving behaviour of different material structures (shaft, beams, column, rivets, joints, etc.) and loading or combined loadings and design formulas.

KMJ20103 KIMIA ANALITIKAL (ANALYTICAL CHEMISTRY)

No of Credits: 3

Course Synopsis:
This course is designed to introduce the students about the nature and scope of analytical chemistry, analytical reaction in the solution, separation technique using precipitation, solvent extraction, solid phase extraction, ion exchange, complexometric methods and chromatographic technique. Instrumental analysis of thermal, spectrochemical, atomic spectrometric analysis, sensor, automation and computing. And evaluation of analytical data with statistical treatment.

Course Outcome:
1. Ability to apply the knowledge and fundamentals of analytical chemistry to the solution of the problem.
2. Ability to evaluate the solution to solve the calculation and the analytical chemistry problem

KMJ20403 FENOMENA PENGANGKUTAN DALAM KEJURUTERAAN BAHAN (TRANSPORT PHENOMENA IN MATERIALS PROCESSING)

No of Credits: 3

Course Synopsis:
This course is divided into three (3) main topics: momentum transfer, heat transfer and mass transfer. In momentum transfer, students will learn the basic concept of fluid behaviour in static, fluid dynamics, 1-D solutions to Navier-Stokes equations and energy equations. While heat transfer deals with the transfers of heat through conduction, convection and radiation. In mass transfer, students will learn about Fick's Law and diffusion in materials, mass transfer in fluid systems and interphase mass transfer.

Course Outcomes:
1. Ability to apply knowledge of science and analyse the engineering fundamentals to the solution of complex problems in momentum, heat and mass transfer.
2. Ability to evaluate the complex momentum, heat and mass transfer problems reaching substantiated conclusions using principles of engineering sciences in materials engineering transport phenomena.

KMJ30103 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 processes; capability of selecting instrumentation for process control; proficiency of managing and handling projects from designing to applying the process control approach into the system.

Course Outcomes:
1. Ability to analyse the essential features of process control.
2. Ability to evaluate the dynamic process by constructing balance equation, differential equation, and transfer function for open and closed loop.
3. Ability to design a suitable controller by analysing the stability and comparing different responses from the control system.
4. Ability to perform the behaviour of dynamic processes using modern tools.

KMJ30203 MEKANIK BENDALIR (FLUID MECHANICS)

No of Credits: 3

Course Synopsis:
Course will be concentrated 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 conditions. Students also will learn momentum principles including basic equations for controlled system and volume, and then basic equations in differential form. The students will see fluid application in flow topics in pipes and turbomachine. The course also concentrates flow measurement aspects, like tools and procedures which are used in flow measurement.

Course Outcomes:
1. Ability to solve common fluid problems by using the concepts of static, dynamic and kinematic.
2. Ability to evaluate the pipe flow problems involving turbulent and laminar flows.
3. Ability to design the suitable pump for pipe flow.
4. Ability to perform a simple simulation for pipe flow behaviour analysis.

KMJ30303 KEJURUTERAAN PERMUKAAN (SURFACE ENGINEERING)

No of Credits: 3

Course Synopsis:
This course provides the fundamentals of thin film and processing for various industrial applications. Thin film science and technology have gone through a thorough development which results in numerous new devices (e.g., Light Emitting Diodes (LED), fuel cell and solar cell) and new materials with fundamentally new properties. Topics include, but are not limited to, fundamentals on crystal structures and defects in thin films, the basic nucleation and growth mechanisms of thin films (growth models, lattice matching epitaxy and domain matching epitaxy), thin film processing techniques (CVD, MOCVD, PVD, PLD, Laser-MBE, sputtering, sol-gel, electrochemical and evaporation etc.), thin film growth instrumentation aspect (energy source, chamber configurations, vacuum systems. This course also includes the characterizations and applications which are related for surface coating/thin films.

Course Outcomes:
1. Ability to apply knowledge of science and to analyse the concepts fundamental and mechanism for surface engineering problem.
2. Ability to evaluate the thin film in terms of its optical, electrical and mechanical properties using principles of engineering science and the applications in surface engineering.
3. Ability to evaluate the sustainability impact of thin film in the solution of complex engineering problem.
4. Ability to propose the significance new methods or technique of coating/ thin film and engage in life- long learning in the broadest context of surface engineering applications/problems.

KMJ30104 PENCIRIAN BAHAN (MATERIALS CHARACTERIZATION)

No of Credits: 4

Course Synopsis:
This course is an overview of the basic principles of materials characterization involving crystallography, thermal, microscopy and related spectroscopy. The basic and working principles of the instrument are reviewed where several methods, factors and errors related to measurements are introduced to assist in the analysis of materials characterization. At the end of the course, the students are expected to be able to investigate and perform engineering problems related to materials characterization.

Course Outcomes:
1. Ability to apply science, mathematics and engineering fundamentals knowledge to explain or describe the basic and working principles of various kinds of materials characterization tools and consequently choose appropriate tools for testing and measurements.
2. Ability to conduct investigations using research-based knowledge and research methods including analysis, interpretation and evaluation of data, and synthesis of the information to provide valid conclusions.
3. Ability to perform the appropriate technique and modern engineering tools to analyse the testing data for engineering problems solving related to materials.

KMJ30403 TERMODINAMIK BAHAN (MATERIALS THERMODYNAMICS)

No of Credits: 3

Course Synopsis:
Materials thermodynamics introduces the laws of thermodynamics including first law of thermodynamics, second law of thermodynamics and the combined law. The concept of thermodynamic variables and relations as well as equilibrium in thermodynamic system and statistical thermodynamics are introduced to assist in its application towards unary heterogeneous systems and multicomponent homogeneous nonreacting systems. From thermodynamic properties analysis, students are expected to be able to develop phase diagrams.

Course Outcomes:
1. Ability to derive the knowledge of mathematics, science, engineering fundamentals and engineering application to the solution of complex materials thermodynamic problems.
2. Ability to assess complex materials thermodynamic problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
3. Ability to assess complex materials thermodynamic properties by applying appropriate numerical modelling.

KMJ30004 SIFAT-SIFAT POLIMER (POLYMER PROPERTIES)

No of Credits: 4

Course Synopsis:
This course introduces the fundamental aspects of polymeric materials including their type of matrix as well as reinforcements. In addition, the students may also be exposed to several testing and characterization including physical, mechanical, thermal and chemical properties. Students may also be exposed to fundamental concepts, sample preparation, standard procedures, etc for all related testing and characterizations. At the end of the course, the students are expected to be able to relate various aspects of polymer properties by using numerous characterizations and testing equipment.

Course Outcomes:
1. Able to analyse the knowledge and concepts in fundamentals of polymer to access the solution of engineering problems.
2. Able to evaluate complex problems in polymers properties to reach substantiated conclusions by using engineering science.
3. Able to investigate polymer properties problems through experiments, analysis, interpret data and provide valid conclusions.

KMJ30003 PEMPROSESAN POLIMER (POLYMER PROCESSING)

No of Credits: 3

Course Synopsis:
This course is aimed to equip students with knowledge and basic concepts of polymer processing for thermoplastic, thermoset and rubber materials. Particular emphasis will be given on the principle of the related processing techniques and rheological behaviour of polymer melt during processing. The influence of processing variables or parameters on the final products such as the existence of product defects and solutions to overcome the processing issues will also be introduced. Several readily available techniques namely injection moulding, compression moulding, extrusion, gelling time and casting of thermoset will be explored, and students will gain the knowledge and ability to compare and evaluate the advantages and disadvantages of these processing techniques respectively. The students will be also introduced to sustainable concepts in polymer processing and their applications towards environmental and global needs within this course.

Course Outcomes:
1. Ability to apply the knowledge of engineering specialisation/fundamentals to develop and propose solutions to complex polymer processing problems.
2. Ability to assess complex polymer processing problems using research-based knowledge and research methods including analysis, interpretation and evaluation of data, and synthesis of information to provide valid conclusions.
3. Ability to propose solutions to the sustainability and impact of professional engineering work for complex polymer processing problems in societal and environmental contexts.

KMJ30503 BAHAN ELEKTRONIK KEJURUTERAAN (ELECTRONIC MATERIALS ENGINEERING)

No of Credits: 3

Course Synopsis:
This course is designed to introduce the students' various aspects of Electronic Materials such elementary materials science concepts, electrical and thermal conduction in solids, elementary quantum physics, the modern theory of solids, semiconductors and devices, dielectric materials and insulators, the magnetic properties of materials, superconductivity and the optical properties of materials.

Course Outcome:
1. Ability to apply knowledge of engineering fundamentals (materials science) and engineering specialisation (materials engineering) to the solution of engineering problems in semiconductor and any electronic devices.
2. Ability to evaluate engineering problems using principles of mathematics, materials science and/or engineering materials.
3. Ability to use computer software to perform electronic structure calculations

KMJ40103 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:
1. Ability to ASSESS the value of materials for corrosion engineering through the knowledge of mathematics, science and engineering specialization to find the solution for complex materials engineering problems.
2. Ability to DESIGN solutions for complex corrosion engineering problems and design systems that meet specific needs with appropriate consideration for public health and safety, through the understanding in mechanism, thermodynamics and kinetic of corrosion.
3. Ability to FACILITATE, judge and conduct investigations of complex corrosion engineering problems using research methods including design of experiments, analysis and interpretation of data to provide valid conclusions.
4. Ability to EVALUATE knowledge on the impact of professional engineering solutions in societal and environmental contexts and the need for sustainable development.

KMJ40203 UJIAN TAK MUSNAH (NON DESTRUCTIVE TESTING)

No of Credits: 3

Course Synopsis:
Non-destructive testing (NDT) is a method used for inspection of a materials surface and internal part. Testing implies for finding defective parts inside or on the surface of a material and does not damage or ruined tested part/specimen. Identifying defects and flaws in material which could not be seen using our naked eyes is absolutely important in determining the material life span and the material performance. The effective method of NDT is almost depending on the knowledge and skill of the person in charge. Because of that reason, this course offered several topics which is covering the general NDT methods that are normally used in engineering field such as visual testing, liquid penetrant, magnetic particle, eddy current, ultrasonic, and radiography technique. This course also introduces to other NDT techniques such as optical inspection probes, neutron radiography, laser-induced ultrasonics, acoustic emission inspection gauges and thermograph.

Course Outcomes:
1. Ability to demonstrate engineering knowledge of science and engineering specialization of NDT.
2. Ability to evaluate engineering problems/defects and propose NDT tools for inspection.

KMJ40703 KEJURUTERAAN BAHAN TERMAJU (ADVANCED MATERIALS ENGINEERING)

No of Credits: 3

Course Synopsis:
This course introduces the principles, fabrications and characterization of nanomaterials with emphasis to Quantum Dots (QDs), and Carbon-based Nanomaterials; Carbon Nanotubes (CNT) and graphene. In the meantime, materials that exhibits extraordinary properties and able to overcome the existing limit in engineering such as Advanced Alloys, Advanced Coatings, Advanced Polymers and Smart Materials also will be discussed. Therefore, students will be familiar with the recent advancement in the field of Materials Science and Engineering that revolutionized the world.

Course Outcomes:
1. Ability to apply knowledge of engineering fundamentals/specialization to develop and solve engineering problems in advanced materials.
2. Ability to propose the solution to overcome the existing limit for the current applications using the principle of Materials Science and Engineering.

KMJ40503 BAHAN BINAAN (CONSTRUCTION MATERIALS)

No of Credits: 3

Course Synopsis:
The subject provides a clear and comprehensive perspective on the range of materials used in the construction. It will cover the production, types, uses in construction, properties and related tests for the construction materials which includes concrete, masonry, plastic, glass, timber and bituminous materials. The concrete mix design calculations will also be covered. The critical factors affecting in situ materials are examined, such as deterioration, behaviour and durability of materials under performances. The role and involvement of various organizations in the construction industry will be discussed.

Course Outcomes:
1. Ability to analyse the theory and knowledge of science and engineering specialization to the solution of construction materials problems.
2. Ability to propose new construction materials from existing knowledge of different types of construction materials by understanding the impact of the materials on the engineering solutions in societal and demonstrate knowledge of and need for sustainable development.
3. Ability to design the solution of construction materials problems in relation to science and engineering principles.

KMJ40303 SERAMIK TEKNIKAL (TECHNICAL CERAMIC)

No of Credits: 3

Course Synopsis:
The content of this course covers several important topics related with advanced ceramics materials in modern science and engineering perspectives. This course covers from initial concept and basic principles, functions and properties, synthesis route and processing method until current and potential applications for wide ranges of advanced ceramics including electroceramics (ionic conductivity, superconductor, dielectric, ferroelectric, piezoelectric, magnetic and photonic ceramic), refractories, structural and biocompatible (bio-ceramic) ceramics utilized in biomedical applications. Discussion in the fundamental issues and related problems involving different areas of advanced ceramics materials will be carried out. Overall, this course emphasizes on the relation between the materials-structure-properties and characteristics.

Course Outcomes:
1. Able to apply the knowledge of engineering specialization to assess materials in technical ceramics
2. Able to identify technical ceramics problems to develop new structures from existing knowledge using engineering sciences
3. Able to create and propose solutions for complex technical ceramics problems

KMJ40403 BAHAN KOMPOSIT (COMPOSITE MATERIALS)

No of Credits: 3

Course Synopsis:
The course is focusing on the three major type of composite materials which are ceramic matrix composite (CMC), metal matrix composite (MMC) and polymer matrix composite (PMC). Lecture cover on several important aspects of composite materials. This includes the introductions, classifications, properties, application and characterizations of composite materials, matrix and reinforcements phase. Also, the manufacturing and processing methods, types and influence of different reinforcement, inter-phase properties, mechanical and failure behavior, current and future pointed applications of composites products. At the end of the course, students will have a comprehensive knowledge and well understanding regarding composite materials.

Course Outcomes:
1. Ability to apply, analyze, categorize and relate the knowledge of science and engineering specialization to the solution of composite materials problems
2. Ability to design solution of composite materials problem in relation to science and engineering principle
3. Ability to evaluate the solutions from existing knowledge of composite by understanding the impact of composite materials on the engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development

KMJ40803 PEMBUNGKUSAN ELEKTRONIK TERMAJU (ADVANCED ELECTRONIC PACKAGING)

No of Credits: 3

Course Synopsis:
This course is designed to introduce the students to various aspects of electronic packaging technology currently being used in the electronic industry. Topics such as types of electronic packages, materials involved in packing, thermal considerations, package assembly and design characteristics, fundamental and process of board and IC assembly, soldering technology, MEMS and MOEMS, thin film processing and reliability assessment techniques will be discussed.

Course Outcomes:
1. Ability to apply knowledge of engineering fundamentals/specialisation to develop and solve engineering problems in electronic packages and various semiconductor industries.
2. Ability to propose the solution to electronic packaging problems using principles of mathematics, materials science and/or engineering materials.

KMJ49802 PROJEK TAHUN AKHIR I (FINAL YEAR PROJECT I)

No of Credits: 2

Course Synopsis:
Students are expected to apply their knowledge on conducting research. In this course, students are to carry out independent studies on a selected research topic. The topic chosen is supposed to be within the scope of Materials Engineering practice. Each student is assigned with a supervisor. The supervisor will assist students in planning and conducting their research. For this stage, students are compulsory to attend seminars, prepare Introductory Chapter, Literature Review and proposed method of study and report preliminary results.

Course Outcomes:
Ability to identify engineering problems and compose research literature to reach substantiated conclusions for research projects.
Ability to propose research methodology incorporating clear fundamentals, theories and benchmarked against standard practices governing the research project.
Ability to apply health, safety and the consequence responsibilities relevant to professional engineering practice and solutions.
Ability to value the ethical principle to professional ethics and show responsibilities in research projects.
Ability to perform communication effectively on research activities with the engineering community and with society at large, make effective presentations, and give and receive clear instructions.
Ability to demonstrate clear project management in research activities planning to meet the required research objectives and deadlines.
Ability to perform research independently and engage in long-life learning in the broadest context of technological change

KMJ49904 PROJEK TAHUN AKHIR II (FINAL YEAR PROJECT II)

No of Credits: 4

Course Synopsis:
Students are expected to apply their knowledge on conducting research. In this course, students are to carry out independent studies on a selected research topic. The topic chosen is supposed to be within the scope of Materials Engineering practice. Each student is assigned with a supervisor. The supervisor will assist students in planning and conducting their research. For this stage, students are compulsory to attend seminars, prepare Introductory Chapter, Literature Review and proposed method of study and report preliminary results.

Course Outcomes:
1. Ability to identify engineering problems and compose research literature to reach substantiated conclusions for research projects.
2. Ability to conduct research experiments, analyze and interpret data and synthesize the information to provide valid conclusions based on knowledge in the broadest context.
3. Ability to value the ethical principle to professional ethics and show responsibilities in research projects.
4. Ability to perform communication effectively on research activities with the engineering community and with society at large, make effective presentations, and give and receive clear instructions.
5. Ability to demonstrate clear project management in research activities execution to meet the required research objectives and deadlines.
6. Ability to perform research independently and engage in long-life learning in the broadest context of technological change.

KMJ30002 PEMILIHAN BAHAN DAN REKA BENTUK I (MATERIALS SELECTION AND DESIGN I)

No of Credits: 2

Course Synopsis:

This course contains a foundation of knowledge on engineering design and the role of materials in it. Knowledge and understanding of engineering materials and their properties, material property charts, principles of materials and processing selection, and sustainability of material are required to reinforce the foundation of knowledge. Practical knowledge in understanding engineering design and selection of material will be assessed through integrated design capstone-project.

Course Outcomes:
1. Ability to analyse complex engineering problems reaching substantiated conclusions in the concept of materials selection and design
2. Ability to design solutions for materials selection and designing complex engineering problems for systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.
3. Ability to investigate materials engineering complex problems using research-based knowledge and research methods including analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
4. Ability to create reasoning informed by the 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 in selecting and designing materials.

5. Ability to assess the sustainability and impact of professional engineering work in the solution of complex materials engineering problems in societal and environmental contexts including the ability to have entrepreneurship skills.
6. Ability to contribute effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings
7. Ability to communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend, justify and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
8. Ability to analyse engineering management principles and economic decision-making and assess these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

KMJ40003 PEMILIHAN BAHAN DAN REKA BENTUK II (MATERIALS SELECTION AND DESIGN II)

No of Credits: 3

Course Synopsis:
This course contains a foundation of knowledge on engineering design and the role of materials in it. Knowledge and understanding of engineering materials and their properties, material property charts, principles of materials and processing selection, and sustainability of material are required to reinforce the foundation of knowledge. Practical knowledge in understanding engineering design and selection of material will be assessed through integrated design capstone-project.

Course Outcomes:
1. Ability to analyse complex engineering problems reaching substantiated conclusions in the concept of materials selection and design
2. Ability to design solutions for materials selection and designing complex engineering problems for systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.
3. Ability to investigate materials engineering complex problems using research-based knowledge and research methods including analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
4. Ability to create reasoning informed by the 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 in selecting and designing materials.
5. Ability to assess the sustainability and impact of professional engineering work in the solution of complex materials engineering problems in societal and environmental contexts including the ability to have entrepreneurship skills.
6. Ability to contribute effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings
7. Ability to communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend, justify and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
8. Ability to analyse engineering management principles and economic decision-making and assess these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

KMJ42403 ENGINEERING MANAGEMENT

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:
1. Ability to evaluate project requirements and integrate the processes of project management like work plans, scheduling, cost estimation and perform project evaluation.
2. Ability to analyse and evaluate economic scenarios and integrate decision making process to engineering projects and business ventures.

KMJ45802 JURUTERA PROFESIONAL (PROFESSIONAL ENGINEER)

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:

1. Ability to understand, identify and evaluate the issues and challenges of engineering ethics.
2. Ability to understand the sustainable and impact in societal and environmental context.
3. 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.

KMJ41003 ANALISIS KEGAGALAN BAHAN (MATERIALS FAILURE ANALYSIS)

No of Credits: 2

Course synopsis:

This course is designed to bridge the gap between theory and practice of failure analysis in terms of materials aspect. It presents a very practical approach to failure analysis for materials engineering students who are interested in understanding how knowledge of failure analysis can lead to better productivity, safety and/ or cost saving. A comprehensive overview of the field, this course covers four principal areas of interest, which are procedures for forensic analysis, root-causes of failure, failure mechanisms and recommendation 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. Students will also be exposed to technical report writing techniques.

Course Outcomes:

1. Ability to apply the knowledge and fundamentals of materials science & engineering to investigate and overcome the complex materials component failure problems.
2. Ability to develop corrective and preventive actions based on analysis of complex engineering problems in material failure analysis finding.

KMJ40903 BAHAN UNTUK APLIKASI TENAGA (MATERIALS FOR ENERGY APPLICATION)

No of Credits: 3

Course synopsis:

In this course, students will be exposed to several materials associated with energy conversion and energy storage. The overview of current global energy needs and challenges, as well as types of energy conversion and storage will be introduced to students. Applicable materials for energy application, the properties of materials, fundamental of reactions involved, exploration of advanced materials, the vital criteria in selection of materials, extended issues and challenges towards green technology and how to solve the related issue are discussed. Materials for energy applications in lithium-ion battery, supercapacitor, fuel cell, photo-sensitive and thermoelectric materials will be highlighted. The importance role of advanced materials in these energy applications towards high performance and efficient-energy conversion and storage will be discussed.

Course Outcomes:

1. Able to APPLY knowledge to identify the fundamental reaction and materials in energy conversion and storage.
2. Able to ANALYZE properties of materials and develop materials that can optimize the performance and overcome complex engineering problems in energy application.

KMJ40603 PENYAMBUNGAN BAHAN DAN STRUKTUR (JOINING OF MATERIALS AND STRUCTURES)

No of Credits: 3

Course synopsis:

Joining is the process used to bring separate parts or components together to produce a unified whole assembly or structural entity. Joining is often one of the last processes to be used in a complex products manufacturing, following part shaping by casting, rolling, drawing, extrusion, forging, forming, machining and powder compacting. This course is comprehensive of various joining fundamental and techniques of materials. It is not only a pragmatic process for manufacturing that we need every day, but as an enabling technology for what we will need for the future of materials development. Topics includes joining conventional, advanced and emerging materials, as well as large, complex structures, primarily from the material perspective. Joining by mechanical fasteners, integral designed- or formed-in features, adhesives, welding, brazing, soldering, thermal spraying, and hybrid processes are addressed as processes and technologies, as are issues associated with the joining of metals, ceramics, glass, plastics, and composites. While focused on materials issues, issues related to joint design, production processing, quality assurance, process economics, and joint performance in service are not ignored.

Course Outcomes:

1. Ability to analyse the knowledge of science and materials engineering to join various materials and structures.
2. Ability to evaluate suitable joining processes to various types of materials and structures by understanding the impact of the materials and process to the societal and environmental context for sustainable development.
3. Ability to design the solution of materials joining and structures in relation to science and engineering principles.

KMJ12102 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:
1. Ability to demonstrate the basic concepts theoretically and apply the knowledge of science such as the physical and chemical properties of each functional group.
2. Ability to illustrate theoretical organic chemical reactions of alkenes, alkynes and alkylhalides at molecular level and solve complex engineering problems.
3. Ability to analyze the concept on the stereochemistry and reactions involving aromatic compounds.

KMJ12203 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:
1. Ability to acquire and apply knowledge of biological basics, enzymes, cell function and metabolisms.
2. 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.
3. Ability to evaluate the solutions of engineering problem related to the application of biochemistry and microbiology in chemical industry.

KMJ12303 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:
1. Ability to understand and analyse the need of the sustainability in the solutions of complex engineering problems for environmental and sustainable development.
2. Ability to apply contextual knowledge to assess global issues and the consequent responsibilities relevant to professional engineering practice.
3. Ability to evaluate a viable solution to a particular challenge to sustainability and defend a persuasive proposal that advocates this solution.

KMJ12402 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:
1. Ability to apply knowledge of mathematics, sciences, and engineering to analyze the basic principles of statics on mechanism and bodies.
2. 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.

4. 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.

KMJ12501 SAINS BIOKIMIA (BIOCHEMICAL SCIENCE)

No of Credits: 1

Course Synopsis:
This course combines the stud y 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:
1. Ability to explain and characterize the properties of biomolecules and microbial samples.
2. 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.
3. Ability to write a good and effective report with appropriate data analysis and presentation.

KMJ12602 TERMODINAMIK (THERMODYNAMICS)

No of Credits: 2

Course Synopsis:
This course introduces the basic concepts of thermodynamics including thermodynamic systems and properties, phase equilibrium of pure substances, equations of state for gases, tables of thermodynamic properties, work and heat. The relationship between heat and temperature with energy, work, radiation, and properties of matter is discussed. The course also explains the laws of thermodynamics and applications of these basic laws in thermodynamic systems.

Course Outcomes:
1. Ability to estimate thermodynamic properties for systems.
2. Ability to discuss the three laws of thermodynamics.
3. Ability to describe thermodynamic processes in graphical diagrams.

KMJ12702 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 theories on 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 sulphide compounds as well as the chemical reactions related to these compounds.

Course Outcomes:
1. 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.
2. Ability to analyze complex engineering problems reaching substantiated conclusions using principles of organic chemistry of drugs, nmr spectroscopy and mass spectrometry.
3. Ability to examine the chemistry of amines, thiols and sulfides compounds and their chemical reaction to design solutions for complex engineering problem.

KMJ12802 INSTRUMENTASI PROSES (PROCESS INSTRUMENTATION)

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:
1. Ability to identify different types of valves and produce solutions for complex engineering problems involving valves by calculating the valve sizing.
2. Ability to evaluate, 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.
3. 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.

KMJ15204 KIMIA ORGANIK (ORGANIC CHEMISTRY)

No of Credits: 4

Course Synopsis:
This course is developed to introduce the basic concepts of organic chemistry, chemical structures and reactions, to familiarize with mechanism concepts of reactions and to understand the theoretical and conceptual background of organic chemistry.

Course Outcomes:
1. Ability to IDENTIFY structure and bonding, nomenclature, functional groups and their physical properties and intermolecular forces.
2. Ability to RECOGNIZE and DIFFERENTIATE selected natural polymers, classification and their behaviours: carbohydrates and polysaccharides, amino acids, and protein.
3. Ability to DEMONSTRATE concepts and principles and PREDICT on major organic reactions and mechanisms.
4. Ability to ANALYSE the experimental results on purification technique, structural related properties and reactions.

KMJ15403 MEKANIK KEJURUTERAAN (ENGINEERING MECHANICS)

No of Credits: 3

Course Synopsis:
The main objective of this course is to expose students to the basic concepts of force and resultant force. They will also learn about friction and distributed forces. Students will apply this basic knowledge to analyse the stability and equilibrium of structures such as truss and machines. In terms of dynamics, the students will learn how to solve kinematics problems for particles and rigid bodies. They will also learn how to solve kinetics problems, which can be considered by using forces and acceleration and principle of work and energy.

Course Outcomes:
Ability to calculate the basic concepts and principles of physics related to engineering mechanics based on static or dynamic state.
Ability to solve static or dynamic problems through further analysis by applying concepts and principles of describing, sketching and/or drawing free body diagram.

KMJ15503 PENGENALAN KEPADA POLIMER (INTRODUCTION TO POLYMER)

No of Credits: 3

Course Synopsis:
This course intends to expose the fundamentals of polymers that cover classification, introduction, characteristics and applications of polymers. There are also discussions related to the differences in polymer, metal and ceramic materials. The students will also be exposed to the applications of polymer materials and their relation with the environment.

Course Outcomes:
1. Ability to COMPARE the fundamental principles of the polymerization reaction and polymer identification.
2. Ability to CATEGORIZE a different material in description of the structure, mechanical properties and processing.
3. Ability to DISCUSS recyclability/disposability issues related to metals, glass, plastics and rubber and composite materials.

KMJ16003 ASAS KEJURUTERAAN PERTANIAN (FUNDAMENTAL OF AGRICULTURAL ENGINEERING)

No of Credits: 3

Course Synopsis:
This course introduces students to the basic concept of agricultural engineering and its applications in the biosphere, the ecosystem and the biological systems involving microbes, plants and animals. Students will learn the systems methodologies, life cycle assessment, growth and feedback, biological models and data measurement and analysis. The application of conservation of mass and energy in determining the input, process and output components in agriculture systems are also covered.

Course Outcomes:
1. Ability to distinguish the major interacting systems critical in food and agricultural systems confronting the agricultural engineering discipline within the context of responsibilities to the society, cultural, global and environment towards sustainable development.
2. Ability to relate the characteristics of the respective integrated systems, apply systems approach and engineering principles for sustainable food & agricultural production.
3. Ability to evaluate the interfacing effect of bio and physical systems in terms of production efficiency by considering the sustainability of agriculture system.

KMJ16102 REKA BENTUK KEJURUTERAAN BERBANTU KOMPUTER (COMPUTER AIDED ENGINEERING DESIGN)

No of Credits: 3

Course Synopsis:
This course introduces and elaborates designing and modelling techniques commonly used in mechanical and civil designs covering 2D and 3D geometry related to drafting and design of mechanical and structural components and/or systems in Agricultural Engineering. The primary software used in AUTODESK's AutoCAD and Inventor Pro or any CAD software package available.

Course Outcomes:
1. Ability to apply designing and modelling techniques to construct engineering drawing using CAD.
2. Ability to use CAD software to compose 2D and 3D model to produce solution related to the engineering drawing problem
3. Ability to use CAD software to construct engineering model and evaluate behavior of the constructed model.
4. Ability to propose and justify an engineering model by preparing written report.

KMJ16303 KEJURUTERAAN GEOMATIK (GEOMATICS ENGINEERING)

No of Credits: 3

Course Synopsis:

This course covers geodetic, remote sensing, and geographical information systems (GIS) with emphases on basic surveying, fundamentals of remote sensing and its applications, and principles and applications of GIS in agricultural field. The students are exposed to field works to develop skill in using surveying equipment. The main topics discussed are traversing, tachometry, mapping, calculation of areas and volumes, GIS, GPS, and remote sensing.

Course Outcomes:
1. Ability to apply the knowledge of geomatics engineering principles on various types of geomatics surveying.
2. Ability to perform the surveying task and evaluate data from various types of geomatics surveying.
3. Ability to relate the component in precision farming and geospatial data interpretation using geographical information systems (GIS).

KMJ16403 SAINS TUMBUHAN DAN HAIWAN (PLANT AND ANIMAL SCIENCES)

No of Credits: 3

Course Synopsis:
This course covers various aspects of plant and animal sciences which are necessary to comprehend several subjects in agricultural engineering such as soil engineering, agricultural engineering design, biomass conversion technology, postharvest engineering and bioproduct manufacturing. The first aspect of this course will deal with basic sciences of plant and animal such as structures, anatomy and physiology. The second aspect deals with various mechanisms in plant and animal systems, including growth and development. The third aspect comprises applied sciences of plant and animal which includes enhancement of plant and animal properties as well as in food and agricultural products.

Course Outcomes:
1. Ability to apply the fundamental knowledge of plant and animal anatomy and physiology.
2. Ability to examine the interaction and mechanism of different systems and processes in plant and animal.
3. Ability to assess the advances in industrial and environmental practices to improve plant and animal productivity.

KMJ16503 DINAMIK (DYNAMICS)

No of Credits: 3

Course Synopsis:
The course covers the engineering basic knowledge especially on kinematics of particles which includes displacement, velocity and acceleration, kinetics of particles: Newton's law of motion, equation of motion, work, impulse, momentum, principle of work and energy, principle of impulse and momentum, planar kinetics and kinematics of rigid bodies, three-dimensional kinematics of rigid bodies, three-dimensional kinetics of rigid bodies and mechanical vibration.

Course Outcomes:
1. Ability to analyze the problems in the kinematics of parttde, problems related to kinetics of particle involving force and acceleration, work. eneray and momentum.
2. Ability to evaluate the problems in the kinematics and kinetics of rigid bodies in 2D and 3D.
3. Ability to formulate the solutions of the problems for damped and undamped vibrations.

KMJ16603 KEKUATAN BAHAN (STRENGTH OF MATERIALS)

No of Credits: 3

Course Synopsis:
This course covers the fundamental and behaviour of solid objects subjected to mechanical forces. The course deals with the relations between the external forces applied to elastic bodies and the resulting deformations and stresses. The course also covers stress-strain, strain energy, shear forces, bending stress, deflection, torsion, fatigue and material testing.

Course Outcomes:
1. Ability to analyze the mechanical properties of materials that related to engineering problems; stress and strain, and strain energy.
2. Abllity to evaluate and assess the axial load, bending moment, stress and deflection of beam for complex engineering problems.
3. Ability to formulate the problem based on fatigue; torsion of shaft, plastic bending and torsion of materials for complex engineertng problems.

KMJ16703 SISTEM PENGELUARAN TANAMAN DAN TERNAKAN (CROP AND LIVESTOCK PRODUCTION SYSTEMS)

No of Credits: 3

Course Synopsis:
The Crops and Animals Production Systems course begins with an introduction of current status and issues besetting selected food and industrial crops, livestocks and fisheries production. The course then elaborates and evaluates conventional and advanced production systems which include the use of appropriate mechanization technologies, structures and resources management in relation to agriculture 4.0. The course finally exposes students to the economics of production systems and marketing aspects of agricultural produce.

Course Outcomes:
1. Abiltty to analyse status and issues of agricultural production.
2. Ability to evaluate different production systems of selected crops, animals and fisheries with respect to conventional and advanced production systems in relation to mechanization, structures and technologies
3. Ability to evaluate agricultural productivity and propose the optimum solutions to production systems.

KMJ22003 TERMODINAMIK KEJURUTERAAN KIMIA (CHEMICAL ENGINEERING THERMODYNAMICS)

No of Credits: 3

Course Synopsis:
This course covers the concept of chemical and biochemical engineering thermodynamics. It provides the basic tools necessary for the students to be exposed to the fundamentals properties of thermodynamics and the law of thermodynamics in engineering systems. Also are provided with a comprehensive exposure to the theory as well as to the application of thermodynamics solution and the equation of state for pure and mixture fluids, the phase equilibrium and chemical reaction equilibrium calculations.

Course Outcomes:
1. Ability to analyse and calculate volumetric and thermodynamic properties at specified conditions using appropriate thermodynamic approaches.
2. Ability to evaluate complex thermodynamic problems by applying the thermodynamic property relations for fluids.
3. Ability to design solution in evaluating complex thermodynamic equilibria problems using chemical engineering principles.
4. Ability to use techniques and skills to solve problems in thermodynamics, individually and in team.

KMJ22103 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:
1. Ability to analyze the essential parameters describing a fluid system and demonstrate dimensional analysis and homogeneity.
2. 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.
3. Ability to evaluate appropriate control volumes and surfaces for developing the equations of fluid mechanics and analyse phenomena associated with external flow.

KMJ22204 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:
1. Ability to solve basic engineering calculations, convert units in the same dimensions and scientifically interpret series of data.
2. 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.
3. Ability to measure parameters, solve energy balance problems and discuss energy balance concepts.
4. 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.

KMJ22303 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. To introduce, discuss and apply classical analytical methods such as gravimetriy and titrimetry. This course also meant to introduce, discuss and apply modern methods in analytical chemistry such as chromatographic and spectroscopic technique.

Course Outcomes:
1. Ability to analyze the correct statistical method for data analytical and to remember the steps in quantitative analysis
2. Ability to evaluate the concentration of analytes of various classical titrimetric (acid-base, complexation, redox and precipitation) and gravimetric methods for mass determination
3. Ability to evaluate modern chromatography and spectroscopic principles and to interpret and calculate the sample concentration.

KMJ22403 PEMINDAHAN HABA (HEAT TRANSFER)

No of Credits: 3

Course Synopsis:
This course covers the principles of steady-state heat transfer through three basic mechanisms, which are conduction, convection and radiation. The course introduces the methods to calculate conduction and convection heat transfer under various conditions. The course also focuses on the application of heat transfer such as heat exchanger, evaporator and dryer. Students are exposed to problem-solving procedures in heat exchanger design in this course.

Course Outcomes:
1. Ability to apply knowledge of mathematics and engineering to solve engineering problems involved in the principles of steady-state heat transfer.
2. Ability to analyze and solve engineering problems involved in the steady-state heat transfer principles of conduction and convection.
3. Ability to evaluate the heat transfer knowledge as well as designing heat transfer equipment.
4. Ability to evaluate knowledge of selected heat transfer equipment when function as an individual, and a member or leader in a team.

KMJ22503 PEMINDAHAN JISIM (MASS TRANSFER)

No of Credits: 3

Course Synopsis:
This course emphasizes the fundamental concepts and problem-solving techniques on mass transfer mechanisms 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. Moreover, the course introduces numerical method to solve molecular diffusion system.

Course Outcomes:
1. Ability to differentiate the mechanisms process of mass transfer, analyse and calculate mass transfer problems related to the diffusion and mass transfer coefficient in different systems using engineering sciences.
2. Ability to design solution for complex engineering problems involving molecular diffusion plus convection and chemical reaction and transport phenomena knowledge of drops and bubbles..
3. Ability to apply techniques and modern engineering tools to analyses transport phenomena problems individually and can communicate in a team.

KMJ22601 APLIKASI FENOMENA PENGANGKUTAN (TRANSPORT PHENOMENA APPLICATION)

No of Credits: 1

Course Synopsis:
This course provides the necessary lab for students to understand the application of transport phenomena. Transport Phenomena deals with the movement of different physical quantities such as energy and mass in any chemical or mechanical process and combines the basic principles (conservation laws) and laws of various types of transport. The labs are designed such that students will identify the heat transfer, mass transfer and fluid flow phenomena in lab, industrial and daily environment.

Course Outcomes:
1. Ability to apply the principles of mass/fluid to investigate the complex problems relating fluid flow/heat transfer systems.
2. Ability to analyze heat and mass transfer/fluid mechanic skills by applying the engineering knowledge.
3. Ability to develop skills in engineering experimentation and data analysis through design/development of solutions.

KMJ22703 KEJURUTERAAN BIOKIMIA (BIOCHEMICAL ENGINEERING)

No of Credits: 3

Course Synopsis:
This course covers the relevant and extensive knowledge of biochemistry and microbiology comprising enzyme kinetics study; stoichiometry and growth kinetics in batch and continuous cultures: bioprocess improvement steps by utilizing genetically engineered organisms and current trend/technologies and productions in biochemical engineering. Students will be exposed in an integrated project which they can practice communication and teamwork effectively on related topics/titles of this course.

Course Outcomes:
1. Ability to solve complex engineering problems related to its enzyme kinetics study and applied catalysis by applying the fundamental knowledge of enzyme reactions.
2. Ability to identify and analyses complex engineering problems in microbial system based on its stoichiometry and kinetics study in batch and continuous cultures.
3. Ability to evaluate complex bioprocessing problems for process improvement by designing solutions of utilizing genetically engineered organisms.
4. Ability to design solutions and propose current trends/technologies and productions in biochemical engineering and defend it through verbal presentation in a group.

KMJ24003 BAHAN-BAHAN PLASTIK (PLASTIC MATERIALS)

No of Credits: 3

Course Synopsis:
The aim of this course is to introduce students to the concept and types of plastic materials. Students will be able to distinguish the relationship between structures and properties of different plastic materials and able to provide crucial ideas on plastic material/plastic additives selection principles and the sustainability concept of plastic materials.

Course Outcomes:
1. Ability to discuss the concept of plastic materials/plastic additives and differentiate the types of plastic materials/plastic additives.
2. Ability to compare the relationship between structure and properties of different plastic materials.
3. Ability to evaluate the sustainability and impact of plastic recycling in plastic engineering.

KMJ24403 BAHAN-BAHAN ELASTOMERIK (ELASTOMERIC MATERIALS)

No of Credits: 3

Course Synopsis:
To introduce basic knowledge on elastomeric materials based on types and classification, structure and properties relationship, additives used in elastomer and some common formulations, and use of elastomer in engineering applications. The principle of viscoelasticity are extended for rubber engineering applications. After studying this course, the students have the basic knowledge on different types to elastomer. They also learn structure properties relationship for fabricating and designing rubber engineering product.

Course Outcomes:
1. Ability to differentiate the classification of elastomeric materials.
2. Ability to assess the structure properties for fabricating and designing rubber engineering product.

KMJ25203 KIMIA FIZIKAL (PHYSICAL CHEMISTRY)

No of Credits: 3

Course Synopsis:
This course aims to introduce the knowledge of physical properties in the polymer solutions to understand the related principles and basic physical chemistry, which requires a prior mathematical background for calculating and solving a problem of the chemical and kinetic properties in the polymeric materials. The basic knowledge of electrochemistry and surface chemistry is also included.

Course Outcomes:
1. Ability to calculate the basic concept of concentration solution and molecular weight of polymer.
2. Ability to derive the chemical equilibrium and identify phase diagram and distribution law.
3. Ability to evaluate the surface chemistry, catalysis, rate of reaction and kinetics in a chemical process.
4. Ability to evaluate the basic knowledge of electrochemical cells, batteries and fuel cells and calculate the ions present in the electrolyte solutions and electrochemical cell system.

KMJ25304 SINTESIS POLIMER (POLYMER SYNTHESIS)

No of Credits: 4

Course Synopsis:
This course is developed to introduce the basic concepts of synthesis polymer involving chemical structures, reaction schemes and mechanistic aspects of polymerization. Understanding the theoretical, conceptual background and practicality of synthesis polymer.

Course Outcomes:
1. Ability to explain the basic concepts of polymerization and relationship toward structure and polymer properties.
2. Ability to distinguish between step polymerization and chain-growth polymerization with respect to synthesis mechanisms and kinetics.
3. Ability to evaluate the polymeric materials based on method and polymer properties.

KMJ25404 STRUKTUR & SIFAT-SIFAT POLIMER (STRUCTURE & POLYMER PROPERTIES)

No of Credits: 4

Course Synopsis:
This course is offered to provide knowledge on the principles and concept of structure/property relationship of polymeric materials. This includes the understanding of viscoelasticity concepts, transition phenomena, mechanical and thermal properties of polymers.

Course Outcomes:
1. Ability to explain the fundamental concept of polymer structures and properties.
2. Ability to relate the concepts of viscoelasticity to the transition phenomena in polymers.
3. Ability to evaluate the mechanical and thermal properties in polymeric materials.
4. Ability to conduct the experiments and analyze the results obtained to mechanical properties in polymeric materials.

KMJ25503 TERMODINAMIK UNTUK KEJURUTERAAN POLIMER (THERMODYNAMICS FOR POLYMER ENGINEERING)

No of Credits: 3

Course Synopsis:
This course deals with the fundamentals of thermodynamics including thermodynamic systems and properties, the three laws of thermodynamics and chemical equilibrium. This course emphasises the use of theories in solving problems related to the basic concepts of thermodynamics.

Course Outcomes:
1. Ability to determine work, heat, energy and enthalpy change that are related to the formulation of the First Law.
2. Ability to calculate the thermodynamic properties related to the First Law.
3. Ability to calculate the thermodynamic properties related to the Second and Third Law of thermodynamics.
4. Ability to discuss the criteria of spontaneity and predict the direction of a reaction before reaching equilibrium.

KMJ26004 KEJURUTERAAN MEKANIK BENDALIR (FLUID MECHANICS ENGINEERING)

No of Credits: 4

Course Synopsis:
This course covers and emphasizes fundamental concepts, principles, theories and problem-solving techniques pertaining to fluid properties, static and kinematics, control volume analysis, momentum analysis of flow system, dimensional analysis, internal flows (pipe flows), differential analysis, and open channel design. Upon the completion of this course, student would be able to design the right sizing of pipes and open channels and to analysis their flow characteristic.

Course Outcomes:
1. Ability to analyze and measure the essential parameters describing a fluid system and recognize the common devices used in measuring pressure and flow rates.
2. Ability to analyze and solve problem related to pressures, forces, and stability in static fluid systems in steady or unsteady, uniform or non-uniform, laminar and turbulent fluid.
3. Ability to design and demonstrate the open channel and related hydraulic structures using fundamental approaches such as Froude number and specific energy.

KMJ26103 TERMODINAMIK (THERMODYNAMICS)

No of Credits: 3

Course Synopsis:
This course covers the study of heat related to matter in motion. The course elaborates on the First Law of Thermodynamics which involves the conversion of energy from one form to another and the Second Law of Thermodynamics which determines the direction of heat flow, and the availability of energy to do work. Topics on gas power and refrigeration cycles as well as phase equilibrium are also covered.

Course Outcomes:
1. Ability to analyse the properties of pure substances and apply the fundamental knowledge of basic thermodynamic properties.
2. Ability to analyse the engineering problems relate to energy in closed system and apply second law of thermodynamics in refrigeration cycle.
3. Ability to predict the P-V-T behavior of gas mixture and analyze the gas vapor pressure and chemical reaction using knowledge of thermodynamics properties for process of innovation.

KMJ26203 TEKNOLOGI ELEKTRIK DAN ELEKTRONIK (ELECTRICAL AND ELECTRONIC TECHNOLOGY)

No of Credits: 3

Course Synopsis:
This course covers the principle of Ohm's Law and Kirchhoff's law in the complex series-parallel DC and AC circuit. This course discusses the basic concept of magnetism and electromagnetism in complex magnetic circuit, transformer, AC and DC machines systems. This course also introduces basic electronic engineering covering type of electronic filter, semiconductor, rectifier, and amplifier. This course elaborates logic circuit system using Boolean function and Karnaugh maps, combinational and sequential circuit.

Course Outcomes:
1. Ability to apply knowledge of Ohm's law, Kirchhoff's law in the complex series-parallel DC and AC circuit.
2. Ability to apply the basic concept of magnetism and electromagnetism in complex magnetic circuit, transformer, basic DC and AC machine systems.
3. Ability to analyse basic type of electronic filters, n-type and p-type semiconductor in complex rectifiers and amplifier circuit.
4. Ability to design complex logic circuit system using Boolean function and Karnaugh maps and propose combinational and sequential logic circuit.

KMJ26303 PEMINDAHAN HABA DAN JISIM (HEAT AND MASS TRANSFER)

No of Credits: 3

Course Synopsis:
This course introduces mechanisms by which heat is transferred from one body to another. The course covers steady state and transient heat conduction, convection and radiation, also mass transfer with special address on agricultural systems. Emphases are placed on formulation and application of respective mathematical models of heat and mass transfer across both physical and biological bodies, as well as design of heat exchangers for application to agricultural systems.

Course Outcomes:
1. Ability to apply appropriate mathematical equations, problems related to various heat and mass transfer mechanisms.
2. Ability to formulate and evaluate heat transfer on a given problem related to agricultural systems.
3. Ability to design heat exchanger for application to agricultural related problems exhibiting competence in performing energy analysis on the heat exchanger.

KMJ26403 KEJURUTERAAN HIDROLOGI DAN SUMBER AIR (HYDROLOGY AND WATER RESOURCES ENGINEERING)

No of Credits: 3

Course Synopsis:
This course introduces principles of surface water hydrology and their applications in water resources engineering. These include 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 applications of hydrologic and frequency analysis with respect to basic water management design procedure with emphases on earth embankments, reservoir and flood design. The use of water in agriculture especially in irrigation and water quality management are also introduces in this course.

Course Outcomes:
1. Ability to identify, solve and analyze the components of hydrologic cycle and concept of watershed in solving problem in agricultural engineering.
2. Ability to assess and use the hydrologic analyses techniques to solve problem in water budget and hydrological gain and loss.
3. Ability to design solution on problem based on hydrology for unit hydrograph, frequency analysis, flood routing, and irrigation.

KMJ26503 SIFAT KEJURUTERAAN BAHAN BIOLOGI (ENGINEERING PROPERTIES OF BIOLOGICAL MATERIALS)

No of Credits: 3

Course Synopsis:
This course introduces principles and methods for determination and analysis of physical as well as thermal and electromagnetic properties of biological materials. The course also covers aspect of moisture determination and management of biological materials. These properties are essentials for engineers in designing process and equipment related to materials and food processing.

Course Outcomes:
1. Ability to analyze the knowledge of sciences relate to the physical and rhelogical attributes and properties of biological materials.
2. Ability analyze the engineering problems relate to thermal and electromagnetic properties of biological materials.
3. Ability assess and formulate the solutions for engineering problems relate to water activity of biological materials for handling, storage and effective moisture management.
4. Ability to demonstrate the use of modern technology and equipment as well as analyze and interpret data for engineering properties of biological materials.

KMJ32003 KEJURUTERAAN TINDAKBALAS (REACTION ENGINEERING)

No of Credits: 3

Course Synopsis:
Reaction Engineering concerns 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:
1. Ability to acquire, apply and analyze knowledge of chemical & biochemical reaction to solve problems regarding the rate law and rate law parameters.
2. Ability to design solutions for chemical reactors conversion & sizing and to explain steady-state isothermal reactor.
3. Ability to identify and evaluate the difference of catalysis & catalytic reactions and to solve Residence Time Distribution (RTD) functions in non-ideal reactors.
4. Ability to function in a group to integrate reaction engineering knowledge and identify problems related with integrated project as well as communicate effectively on complex engineering activities.

KMJ32104 DINAMIK DAN KAWALAN PROSES (PROCESS DYNAMICS AND CONTROL)

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:
1. 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.
2. 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.
3. Ability to analyze control system instrumentation and propose feedback control system for bioprocess and chemical processes.
4. Ability to calculate and analyze dynamic behavior of closed-loop control system.

KMJ32203 PROSES PEMISAHAN (SEPARATION PROCESS)

No of Credits: 3

Course Synopsis:
This course introduces different types of separation processes that can be found in chemical and bioprocessing industries. The unit operations for gas-liquid, liquid-liquid, liquid-solid separation are included such as humidification, distillation, absorption, adsorption, solvent extraction, solid leaching, crystallization, membrane separation, filtration, settling, sedimentation, and fluidization. They are designed from materials and energy balance and based on mass and heat transfer principles.

Course Outcomes:
1. Ability to apply knowledge of material and energy balance as well as heat and mass transfer for the selected unit operations for gas-liquid, liquid-liquid, and liquid-solid separation processes.
2. Ability to identify, formulate, and analyze complex engineering problems related to the separation unit operations to reach substantiated conclusions.
3. Ability to design engineering solutions with proper considerations for separation unit operations.
4. Ability to communicate effectively on complex engineering activities related to separation unit operations when function as an individual, and a member or leader in a team.

KMJ32301 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:
1. Ability to explain the separation processes in chemical industries such as distillation, evaporation, leaching, microfiltration, and absorption.
2. 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.
3. Ability to write a good and effective report with appropriate data analysis and presentation.

KMJ32503 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:
1. Ability to design and formulate fermentation media and decide on the types of carbon and nitrogen source.
2. Ability to recognize, compare and draw the schematic diagram for specific types of bioreactors.
3. Ability to design a stirred tank bioreactor according to the specific application.
4. Ability to develop scale up based on geometric similarities or constant power number.

KMJ32603 KESELAMATAN DAN PENCEGAHAN KEHILANGAN (SAFETY AND 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:
1. Ability to analyze the source, toxic release and dispersion models and evaluate the significance of the events.
2. Ability to distinguish fires and explosion as well as examine ways to prevent it.
3. Ability to evaluate relief concepts as well as calculate or sizing the relief system.
4. Ability to propose and evaluate process safety to identify the hazard and risk in the industry.

KMJ32702 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 modelling and simulation purposes. Subsequently, sustainability assessment will be introduced, emphasizing on economic and profitability analysis.

Course Outcomes:
1. Ability to apply and analyze engineering calculation like mass and energy balance, stoichiometry and kinetics of the chemical processes.
2. Ability to analyze process and organize unit operation in chemical processes using simulation software.
3. Ability to analyze, collect and organize economic process data and apply environmental impact and sustainability assessment.

KMJ32803 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:
1. Ability to apply a suitable economy technique in solving engineering problems for decision making.
2. Ability to estimate the cost of a production process and identify alternatives in an engineering project.
3. Ability to evaluate the financial performance of a business firm from its financial statement.
4. Ability to prepare a business plan for an engineering entrepreneurship project.

KMJ32903 PEMPROSES KOLOID DAN BIOBAHAN (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:
1. Ability to differentiate various colloidal systems and biomaterials production and processing.
2. Ability to explain the structure and properties of colloidal particles and polymeric polymers.
3. Ability to formulate a suitable biomaterial for a specific application.

KMJ33003 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:
1. 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.
2. Ability to distinguish complex engineering problem related to halal production and propose halal control points of the production.
3. 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.

KMJ33103 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:
1. Ability to differentiate the characteristics of biofuels and compare the process descriptions of various biofuel production.
2. Ability to evaluate the limitations of biofuel productions processes.
3. Ability to propose a biofuel production process from potential biological feedstocks.

KMJ34004 PEMPROSESAN PLASTIK (PLASTIC PROCESSING)

No of Credits: 4

Course Synopsis:
Plastic Processing; a course that exposes students to the methods of processing related to thermoset and thermoplastics materials. To ensure an understanding of these processes, a few topics will be discussed including; rheology, appropriate tests, parameters and processing methods, troubleshooting, product characterization. Also exposed in this course are the knowledge of the compounding process and the use of additives for specific purposes.

Course Outcomes:
1. Ability to distinguish thermoset and thermoplastic processing techniques.
2. Ability to implement troubleshooting on various thermoset and thermoplastic processing.
3. Ability to appraise typical rheology behavior of thermoset and thermoplastic materials.
4. Ability to produce and evaluate polymer specimens made by various thermoset and thermoplastic processing techniques.

KMJ34404 PEMPROSESAN GETAH (RUBBER PROCESSING)

No of Credits: 4

Course Synopsis:
This course is 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:
1. Ability to assess rubber formulation and differentiate rubber processing techniques
2. Ability to evaluate the characteristics and properties of rubber compounds for related applications.
3. Ability to conduct the experiments and analyze the results obtained associate to rubber processing.

KMJ34504 PEMPROSESAN LATEKS (LATEX PROCESSING)

No of Credits: 4

Course Synopsis:
This course emphasizes on the fundamental characteristics of natural and synthetic lattices, latex compounding and processing, as well as their applications in latex industries and others.

Course Outcomes:
1. Ability to apply fundamentals of latex science and technology, to discuss and analyse characteristics, flow, behaviour, colloidal properties, and vulcanization in natural rubber and synthetic lattices.
2. Ability to formulate and produce natural rubber/synthetic latex products.
3. Ability to assess various applications and related matters and issues in natural and synthetic rubber lattices by consideration of health and safety aspects.

KMJ34803 PENGUJIAN & PENCIRIAN POLIMER (POLYMER TESTING & CHARACTERIZATION)

No of Credits: 3

Course Synopsis:
This course introduces the students to basic concepts of testing and characterization, explain the usage of various polymer characterization equipment, analyze the concept to identify and characterize the polymeric materials.

Course Outcomes:
1. Able to explain the basic concept of polymer testing and characterization.
2. Able to interpret the obtained experimental results of polymeric materials.
3. Able to propose various testing and characterization techniques to solve problems or defects related to polymeric materials.
4. Able to conduct the experiments and analyze the results obtained associated to polymeric materials.

KMJ35203 REKA BENTUK KEJURUTERAAN POLIMER (POLYMER ENGINEERING DESIGN)

No of Credits: 3

Course Synopsis:
This course is to develop knowledge on the polymer engineering design specifically for plastic injection moulding cavities, dies for extrusion process using CAD software and a design consideration in plastic products. The generated knowledge will provide effective skills to counter and solve the common problem approach on the fundamental basis of polymer engineering design.

Course Outcomes:
1. Ability to apply basic engineering design process, the concept of mould and die design and discuss design consideration for plastic products.
2. Ability to design components or products that meet specific needs with appropriate consideration.
3. Ability to construct the design of plastic products, mould and die using CAD software.
4. Ability to analyze the effect of parameters on flow behavior properties in cavity and die, and failure mechanism from the simulation results.
5. Ability to function effectively as a member or a leader in multidisciplinary tasks.
6. Ability to demonstrate knowledge in evaluating the cost of a product.

KMJ35304 PEMINDAHAN JISIM & HABA UNTUK KEJURUTERAAN POLIMER (MASS & HEAT TRANSFER FOR POLYMER ENGINEERING)

No of Credits: 4

Course Synopsis:
The aim of this course is to provide the knowledge of mass and heat transfer in polymer engineering application. For mass transfer, students are exposed to the fundamentals and laws used during the mass transfer process. Meanwhile for heat transfer, students will learn the detailed concept of conduction, convection and radiation. At the end of the course, students are able to relate and apply the knowledge in polymer engineering applications.

Course Outcomes:
1. Ability to differentiate the fundamentals of mass and heat transfer.
2. Ability to calculate mass transfer in molecular diffusion, convection and mass transfer between phases.
3. Ability to calculate heat transfer for conduction, convection and radiation.
4. Ability to calculate and evaluate the heat transfer and mass transfer in polymer processing equipment of injection molding and screw extruder.

KMJ35402 POLIMER DALAM APLIKASI BIOPERUBATAN (POLYMERS IN BIOMEDICAL APPLICATIONS)

No of Credits: 2

Course Synopsis:
This course introduces structure, properties and processing of polymers for biomedical applications. These include biodegradable polymers, non-biodegradable polymers, biosynthetic polymers and hybrid polymers for tissue engineering, drug delivery and implantable devices. Students are expected to understand the degradation mechanisms of polymeric materials in biological environments (such as under certain pH, ion, enzymes) and surrounding environment, the interaction between biological materials such as proteins and cells with polymeric materials and how the surface modification could affect such interaction. This course also highlights methods to produce the polymeric biomaterials and techniques to assess their biocompatibility, biostability and bioactivity.

Course Outcomes:
1. Ability to compare polymeric materials for biomedical applications.
2. Ability to propose the methods involved in preparing, testing and characterizing polymeric biomaterials for biomedical applications.
3. Ability to predict degradation of polymers in biological, environmental conditions and the involved mechanism.

KMJ35502 POLIMER PEMANCAR CAHAYA & APLIKASINYA (PHOTOLUMINESCENT POLYMERS & THEIR APPLICATIONS)

No of Credits: 2

Course Synopsis:
This course introduces a class of polymers that plays a big role in the era IR 4.0 which is the photoluminescent polymers. This course covers the basic theory about light absorption and emission, types of polymers that can emit light, characterisation methods, and their applications. This course focuses on two classes of polymers. Those are the conjugated polymers and polymer composites filled with light emitting compounds.

Course Outcomes:
1. Ability to describe the types of photoluminescent polymers and the basic theory of absorption and emission.
2. Ability to analyse the UV/Visible and photoluminescent (PL) spectra and recognise the electronic transitions.
3. Ability to propose the applications of the photoluminescent polymers in tackling environmental issues.

KMJ36003 KEJURUTERAAN TANAH (SOIL ENGINEERING)

No of Credits: 3

Course Synopsis:
This course introduces the fundamental concept of soil engineering properties in relation to agricultural irrigation and crop water requirement; and soil mechanics that provide the knowledge on soil mechanical properties in relation to soil foundation for infrastructures and machinery. It also introduces the fundamental theories involve in various methods of soil dynamics in relation to agricultural machinery.

Course Outcomes:
1. Ability to analyze the soil textural classification and physical characteristics in relation to irrigation/drainage and foundation design.
2. Ability to evaluate the mechanical properties of soil in relation to soil foundation under the static condition (building) and dynamic condition (machine).
3. Ability to synthesis the soil dynamics behaviour in relation to soil-machine-traction design for agricultural production.

KMJ36103 REKA BENTUK STRUKTUR LADANG (FARM STRUCTURAL DESIGN)

No of Credits: 3

Course Synopsis:
This course covers planning of farm layout, engineering structural design together with materials cost estimation of farm structures includes greenhouses, structures for livestock husbandry and other related agricultural structures. This course also covers in depth analysis of structural design by structural elements using reinforced concrete, stainless steel and timber for shear forces, bending moments and deflection.

Course Outcomes:
1. Ability to plan farm structural layout and materials for structural elements planning and management.
2. Ability to evaluate the structural elements subjected to the applied load related to agricultural production structures.
3. Ability to design the structural element using Eurocode 2 and Eurocode 3, and reflectunderstanding of professional and ethical responsibilities to community.
4. Ability to determine the construction cost of farm structures in selecting the constructionmaterials by understanding the impact of environment and sustainability.

KMJ36203 PERALATAN, PENGUKURAN DAN KAWALAN (INSTRUMENTATION, MEASUREMENT AND CONTROL)

No of Credits: 3

Course Synopsis:
This course introduces the basic principle of instrumentation and measurement which covers various of measuring devices and its process of manipulation, transmission and recording of data. It also includes the roles of instruments in various industries especially in agricultural engineering applications. Different methods in measuring and problem solving to various use in agricultural engineering will be addressed where applicable. This course also covers control engineering applications, which is an essential feature of any measurement programme.

Course Outcomes:
1. Ability to analyse the main functional components in instrumentation and their working principle of various measurement devices.
2. Ability to differentiate roles and features of appropriate instruments for various measurements in agriculture engineering applications.
3. Ability to evaluate control engineering application to solve problems in agricultural system.

KMJ36303 TENAGA DAN KUASA (ENERGY AND POWER)

No of Credits: 3

Course Synopsis:
The course encompasses on the concepts of energy and power generation from mechanical devices including engine, pump, compressor, fan and blower. The recent technology, production processes and engineering renewable energy development for sustainability from various sources such as wind, solar, hydro power, ocean and bioenergy are also discussed.

Course Outcomes:
1. Ability to evaluate the application of renewable energy for power generation.
2. Ability to analyze the working principles and performance of the internal combustion engines
3. Ability to analyze the performance and efficiency of different types of engines.
4. Ability to synthesis the production of energy and power harvest from solar panels, also the processing of biofuels, biodiesel and biogas from biological materials.

KMJ36503 OPERASI UNIT (UNIT OPERATION)

No of Credits: 3

Course Synopsis:
The topic in this course includes the introduction to different types of unit operations in food and agro-based processing industries. Topics in this course covers unit operations in drying, evaporation, absorption, and distillation processes. The course also includes the operation of mixing and size reduction such as milling, filtration and sieving.

Course Outcomes:
1. Ability to apply a basic principle of material and energy balances for selected unit operations in food and agrobased industries.
2. Ability to evaluate a basic design for drying equipment and to distinguish the single and multiple effects evaporators.
3. Ability to design size reduction and mixing operation for food and agrobased industries.
4. Ability to evaluate gas absorption, distillation and mechanical separation operations and equipment of each process.

KMJ36603 REKA BENTUK SISTEM AUTOMASI (DESIGN OF AUTOMATION SYSTEMS)

No of Credits: 3

Course Synopsis:
This course covers automation and sensor technology applied in agricultural systems. It also includes the components of automation system such as actuators and drivers, AC and DC motors. Topics such as control engineering application in agricultural and biological systems, and microcontroller are also discussed.

Course Outcomes:
1. Ability to apply principle of automation and sensor technology for life long learning in agricultural systems.
2. Ability to analyze engineering problem of the actuator components and application of an automation system in Agricultural Engineering.
3. Ability to propose solution for applications of an automation system in Agricultural Engineering using microcontroller programming.
4. Ability to perform investigation to design an automation system for agricultural and biological systems using modern engineering tools in teams and communicate effectively

KMJ36702 PERMODELAN DAN SIMULASI (MODELLING AND SIMULATION)

No of Credits: 2

Course Synopsis:
The course advances students on concepts of system analysis, modelling and computer simulation of agricultural and biological systems. Primary focus is on developing knowledge and skills to construct static as well as dynamic models, perform sensitivity analysis, parameter estimation and model evaluation. Review and analysis of models in agricultural and biological systems emphasizing crops, animals, and environment are also covered. Laboratory work using MATLAB and Lab VIEW enhances student's ability in simulating biological systems. A group project culminates the course.

Course Outcomes:
1. Ability to formulate mathematics model governing biological and physical behavior of biosystems.
2. Ability to construct computer programming to simulate biosystems behavior response.
3. Ability to propose solution for applications of an automation system in Agricultural Engineering using microcontroller programming.
4. Ability to prepare simulation report in a team.

KMJ42003 REKA BENTUK LOJI 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:
1. Ability to differentiate between ethical and legal issues and relate how these are related to design projects in chemical engineering field.
2. Ability to demonstrate teamwork through group weekly meetings, project planning and management, analysis of case studies and class presentation.
3. Ability to analyze and assess the impact of design and engineering solutions on society and environment.
4. Ability to evaluate economic and feasibility study of a design project in chemical engineering.
5. Ability to compose engineering problems and alternative solutions and formulate a sound proposal in chemical engineering project using systematic design process.

KMJ42203 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:
1. Ability to analyze the concepts and the requirements of GMP and Validation, the Standard Operation Procedure (SOP) and Safety and Health Environment (SHE) aspects.
2. Ability to develop the GMP requirement and primary and secondary bioprocess engineering products, together with the Hazard Analysis and Critical Control Point (HACCP).
3. Ability to evaluate the utilities and services, laboratory design, process development facilities and pilot manufacturing facilities.

KMJ42303 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:
1. Ability to calculate the physical, chemical, and biological properties of waste material.
2. Ability to calculate and compare the treatment methods for particular waste.
3. Ability to design and evaluate various unit operations for waste treatments.
4. Ability to propose the landfill, incineration waste treatments and waste management systems.

KMJ42403 PENGURUSAN KEJURUTERAAN (ENGINEERING MANAGEMENT)

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:
1. Ability to evaluate project requirements and integrate the processes of project management like work plans, scheduling, cost estimation and perform project evaluation.
2. Ability to analyse and evaluate economic scenarios and integrate decision making process to engineering projects and business ventures.

KMJ42503 KEJURUTERAAN MAKANAN (FOOD ENGINEERING)

No of Credits: 3

Course Synopsis:
This course covers multidisciplinary field of applied physical sciences which combines science, microbiology, and engineering education for food and related industries. Topics to be covered include introduction to food engineering, food ingredients, nutrition, nutritional information, spoilage, food production systems, pasteurization, heat sterilization, dehydration, microwave and infrared radiation heating, freezing, extrusion and packaging.

Course Outcomes:
1. Ability to apply knowledge of mathematics like calculation of nutrition information in food and differentiate types of food processing ingredients.
2. Ability to assess the food spoilage and food production system through the industrial need.
3. Ability to interpret function of food processing operation and design solution for food engineering problems.

KMJ42603 PENGGUNAAN BIOMAS (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:
1. Ability to explain the properties, pretreament, and processing of biomass.
2. Ability to propose a biomass conversion system for fuels, solvents, or single cell protein production.
3. Ability to assess sustainability of biomass utilisation with respect to environmental, economic, and social impact.

KMJ42704 REKA BENTUK LOJI 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:
1. 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.
2. Ability to formulate and produce solutions that properly address critical issues and assumptions that are conceptually and contextually valid and meet client expectation.
3. Ability to design component, equipment, process, plant and systems in bioprocess engineering using engineering tools and design softwares for optimum performance.
4. Ability to display understanding of bioprocess engineering project and integrate the design for manufacturability, utility and sustainability.
5. Ability to write project report that conforms to engineering professional standard and to perform verbal presentation on the project.

KMJ42903 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:
1. Ability to explain the basic procedures and role of all fundamental systems used in crude petroleum oil and gas production.
2. Ability to differentiate raw materials, end product and manufacturing process of petrochemicals.
3. Ability to describe basic concepts of reservoir engineering, methods and technologies for petroleum oil recovery.
4. Ability to analyse the key issues in the design and optimisation of refineries and petrochemical plants.

KMJ43003 KEJURUTERAAN FARMA DAN NEUTRASEUTIKAL (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:
1. Ability to explain the basic concept of drug absorption and disposition and analyze the related pharmacokinetics.
2. Ability to explain how nutrients, phytochemicals, toxins and food processing products, including the dietary supplements and functional foods affect the body.
3. Ability to evaluate the pharmaceutical engineering processes in formulation and production of pharmaceutical and nutraceutical products.
4. Ability to design pharmaceutical and nutraceutical manufacturing facilities.

KMJ43103 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 modelling both at the component and system levels.

Course Outcomes:
1. Ability to describe the basic principles of fuel cell.
2. Ability to analyse the properties of fuel cells components.
3. Ability to design a theoretical fuel cell.

KMJ43203 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:
1. Ability to identify thermal and chemical constraints and incorporate them into optimization models and solutions.
2. Ability to assess energy, process and utility system and propose system optimization.
3. Ability to evaluate retrofit project and its implementation

KMJ44003 KOMPOSIT POLIMER (POLYMER COMPOSITES)

No of Credits: 3

Course Synopsis:
This course provides the concepts of polymer composites with several fabrication techniques. This course also provides knowledge on fibres reinforcement of polymer matrices and their corresponding properties. The course includes the mechanics of composites and some composite testing methods.

Course Outcomes:
1. Ability to discuss the concepts and differentiate polymer composites.
2. Ability to propose suitable fabrication techniques and applications for polymer composites.
3. Ability to assess the mechanical properties and defects of polymer composites using destructive and non-destructive testing (NDT) techniques.
4. Ability to develop the selective polymer composite products.

KMJ44104 ADUNAN-ADUNAN POLIMER (POLYMER BLENDS)

No of Credits: 4

Course Synopsis:
The aim of this course is to provide knowledge of polymer blends/alloys. Understanding of their properties relationship and knowledge on testing and characterisation, the concept of reactive blending in high-performance polymer blends and alloys, and engineering application of polymer blends/alloys.

Course Outcomes:
1. Ability to discuss the concept of polymer blends and apply the principles of blending in polymer blends.
2. Ability to evaluate blending condition to structure, properties, testing and characterisation of polymer blends.
3. Ability to conduct and assess the experiment associated to polymer blends according to applications.

KMJ45203 PROJEK REKA BENTUK BERSEPADU KEJURUTERAAN POLIMER (POLYMER ENGINEERING INTEGRATED DESIGN PROJECT)

No of Credits: 3

Course Synopsis:
This course demonstrates student's ability to apply interdisciplinary knowledge and skills related to product design and project management. The project emphasises the innovation of conceptual designs using modern tools through development of design solutions with engineering considerations.

Course Outcomes:
1. Ability to analyse complex engineering problems using principles of engineering sciences and survey analysis results.
2. Ability to design solutions in product design, selection of materials and processing methods that meet specific needs with appropriate consideration for public health and safety and environment.
3. Ability to apply modern tools in designing products, performing simulation and analysis.
4. Ability to solve complex engineering problems with appropriate consideration for societal, safety and health.
5. Ability to solve complex engineering problems with appropriate consideration for the environment.
6. Ability to apply ethical principles in professional writing.
7. Ability to communicate effectively in delivering concepts and ideas with the engineering community.
8. Ability to appraise economic evaluation and apply knowledge of engineering management principles.
9. Ability to organise reviewed relevant information and keep up to date with technological changes.

KMJ45403 PEREKAT POLIMER & PENGLITUP (POLYMER ADHESIVE & COATING)

No of Credits: 3

Course Synopsis:
This course is to introduce the basic knowledge on principles, properties of adhesion and adhesives polymer coatings. This course is focused on application of adhesives and coating products, study on working properties, characterization and also their application.

Course Outcomes:
1. Able to explain, apply and differentiate the concept of adhesives and coatings for certain applications.
2. Able to create, formulate and characterize different polymer adhesives and coatings systems.
3. Able to select and adapt the testing methods for adhesives and coatings, preparation and performance.
4. Able to communicate effectively in sharing information of adhesives and coatings.

KMJ45503 POLIMER MESRA ALAM (ENVIRONMENTAL FRIENDLY POLYMER)

No of Credits: 3

Course Synopsis:
The aim of this course is to provide the knowledge of environmentally polymer. Solve their issues and understand their future needs of environmental polymers and create alternative ways for handling polymer issues such as degradable polymer, biopolymer and polymer recycling.

Course Outcomes:
1. Able to apply knowledge in polymer recycling to solve environthis mental issues using 3R (reuse, reduce, recycling) approach.
2. Able to justify biopolymers related to its structures-properties relationship towards biodegradability and its application.
3. Able to communicate effectively in sharing information of environmental friendly polymers.

KMJ45603 POLIMER DALAM APLIKASI ELEKTRONIK (POLYMER IN ELECTRONIC APPLICATION)

No of Credits: 3

Course Synopsis:
This course is to provide knowledge of polymer application in electronic industries. This includes an understanding of 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:
1. Able to apply the basic knowledge and to categorize the materials involved.in polymer in electronic application requirements.
2. Able to identify the importance of polymers and select testing and characterization of some polymers for electronic application.
3. Able to communicate effectively in sharing the information of polymers in electronic applications.

KMJ46003 REKA BENTUK KEJURUTERAAN PERTANIAN 1 (AGRICULTURAL ENGINEERING DESIGN 1)

No of Credits: 3

Course Synopsis:
Agricultural Engineering Design is a 2-part course covering aspects of engineering design related to open-ended design projects at professional level engineering design task in agricultural 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:
1. Ability to differentiate between ethical and legal issues and relate how these are related to design projects in agricultural engineering field.
2. Ability to demonstrate team work through group weekly meetings, project planning and management, analysis of case studies and class presentation.
3. Ability to analyze and assess the impact of design and engineering solutions on society and environment.
4. Ability to evaluate economic and feasibility study of a design project in agricultural engineering.
5. Ability to compose engineering problems and alternative solutions and formulate a sound proposal in agriculural engineering project using systematic desiqn process

KMJ46103 REKA BENTUK KEJURUTERAAN PERTANIAN 2 (AGRICULTURAL ENGINEERING DESIGN 2)

No of Credits: 3

Course Synopsis:
This course covers topic on design aspects within related agricultural engineering thematic areas including (but not limited to) automation and emerging technologies, machine systems, postharvest technology, structures and environment, soil and water, information technology, and sustainable agriculture and cutting across several important food and industrial crops. The scope of the class is to design component, equipment, process, plant and systems to meet desired project needs within realistic constraint and to comprehend diverse and fast changing technology and open-end design problems in agricultural engineering and technology fields. The use of modern engineering design practices, tools and product/solution development process, trouble-shooting methodology, learn and utilize a realistic simulation of the real-world design process, engineering analysis and synthesis through their projects. Knowledge integration from other Agricultural Engineering courses is required to identify, solve, and design solution for complex engineering problems.

Course Outcomes:
1. Ability to conduct engineering analysis and adeptly apply principles and tools of mathematics and science to solve multilacetted design project to produce credible solutions.
2. Ability to formulate and produce solutions that properly address critical issues and assumptions that are conceptually and contexually valid and meet client expectation.
3. Ability to design component, equipment, process, plant and systems in agricultural engineering using engineering tools and design software for optimum performance.
4. Ability to gather and systematically apply codified (and tacit) knowledge in the broadest context in the design of systems or process or components in agricultural engineering involving the multifaceted sources of information including knowledge repository.
5. Ability to write project report that conforms to engineering professional standard and to perform verbal presentation on the project.

KMJ46303 KEJURUTERAAN LEPAS TUAI (POSTHARVEST ENGINEERING)

No of Credits: 3

Course Synopsis:
This course covers the importance of moisture content in agricultural products and its method for determination, principle of drying, theory of diffusion, and mechanisms of drying including puff drying, foam mat drying, freeze drying, calculation of drying air temperature and air flow rate, air pressure within the grain bed. The course also elaborates on different types of dryers, their performances, energy utilization and efficiency in relation to drying and dehydration of agricultural products. The course discusses the types and causes of spoilage in storage, conditions for storage such as functional requirements of storage with emphasis on highly perishable agricultural produce as well as cereal
grains, control of temperature and relative humidity inside storage, and calculation of refrigeration load, designing conditioning of environment inside storage through natural, mechanical ventilation and cooling and transportation of refrigerated agricultural produce.

Course Outcomes:
1. Ability to analyze drying/refrigeration process of biological materials and calculate the parameters influencing the process in solving complex engineering problems.
2. Ability to compare mechanisms of spoilage in highly perishables horticultural produce and cereal grain and design solutions based on appropriate postharvest handling technologies to control them.
3. Ability to select appropriate conditioning of environments and post harvest treatments for safe handlings of highly perishables horticultural and livestock produce.

KMJ46403 PENGURUSAN BIO SISA (BIOWASTE MANAGEMENT)

No of Credits: 3

Course Synopsis:
This course covers the sources and properties of agricultural farm and agricultural related industries waste and wastewater, and their effect on the environment. Also, the physical, chemical and biological waste and wastewater treatment and disposal. The waste characteristics and handling knowledge is included in the course. Finally, the organizational waste management design is also covered.

Course Outcomes:
1. Ability to analyze the properties of waste and their impact on the environment for sustainable development.
2. Ability to design physical, chemical and biological treatment systems of agricultural related industrial waste and wastewater for sustainable environment.
3. Ability to propose the management solution and responsibilty for different characteristics of solid and agricultural waste.

KMK10003 KEJURUTERAAN BAHAN [MATERIAL ENGINEERING]

No of Credits: 3

Course Synopsis:
This course covers the introduction to materials science and engineering which emphasizes on different type of material properties, structures, application and selection The course encompasses the classification of material properties that determine their applicability and fundamental of material structures. The characteristics of materials and methods of assessing the characteristics of materials including the behavior of material in thermal equilibrium are also embedded in this course. The application and processing of specific material as well as introduction of electrical, magnetic and optical properties of materials are also presented in the course

Course Outcomes:
1. Ability to apply fundamental knowledge in different classes of material engineering.
2. Ability to apply knowledge of material properties with processing methods and application.
3. Ability to analyze and select the suitability of material in engineering related problem

KMK10103 KIMIA ORGANIK [ORGANIC CHEMISTRY]

No of Credits: 3

Course Synopsis:
This course covers structure, nomenclature, synthesis, physical and chemical properties, reactions of the major classes of organic compounds such as alkanes, alkenes, alkynes, alcohols, ethers, aldehydes and ketones, benzene ring, other aromatic rings, and carboxylic acids. Reaction mechanisms and multisteps organic synthesis involves these organic compounds will also be covered.

Course Outcomes:
1. Ability to differentiate different classes of organic compounds based on nomenclature, structure, physical and chemical properties.
2. Ability to distinguish types of organic reaction and mechanism involved based on starting materials, functional groups and reaction condition.
3. Ability to follow standard procedure for handling laboratory equipments and techniques such as distillation and reflux.

KMK10202 KEJURUTERAAN GRAFIK UNTUK KEJURUTERAAN KIMIA [ENGINEERING GRAPHICS FOR CHEMICAL ENGINEERING]

No of Credits: 2

Course Synopsis:
This course offers a fundamental introduction to engineering graphics techniques, with the goal of developing the ability to comprehend, envision, evaluate, create, and produce engineering drawings with proficiency and accuracy. At the end of this course, students will be able to (depict the engineering process / acquire the engineering process drawing skill) using an appropriate software package.

Course Outcomes:
1. Ability to create 2D plans and 3D models using AutoCAD
2. Ability to construct parallel and perspective projections using AutoCAD
3. Ability to analyse and solve the drafting and design of engineering process using AutoCAD

KMK10303 ENGINEERING SKILLS [KEMAHIRAN KEJURUTERAAN]

No of Credits: 3

Course Synopsis:
This course intends to give students with basic knowledge of engineering skills. The subtopics that will be emphasized are technical drawing with CAD, PCB design and fabrication, electrical wiring, GNU Octave, sample preparation and mechanical testing.

Course Outcomes:
1. Ability to apply a basic skill and standard practice of sample preparation and mechanical testing
2. Ability to apply and complete the basic skills and standard practice of domestic wiring.
3. Ability to apply and construct a mathematical analysis using GNU Octave software
4. Ability to apply a standard practice of manual technical drawing and able to design a product using common software (AutoCAD)
5. Ability to apply the basic skills and standard practice of PCB layout design and fabrication process.

KMK10403 ELECTRICAL TECHNOLOGY [TEKNOLOGI ELEKTRIK]

No of Credits: 3

Course Synopsis:
This course covers the international system of measurement, introduction to the electrical systems including characteristics and principles of operation of DC and AC circuits, capacitance, and inductance. The students will also be exposed to the simple magnetic circuit and electromagnetism as well as the application of electrical technology in a variety of sectors.

Course Outcomes:
1. Ability to explain the fundamental concepts of the electrical circuits.
2. Ability to analyze the concept and operation principle of DC and AC circuits
3. Ability to analyze magnetic circuits, electromagnetism, and the application of electrical technology in various sectors.

KMK10502 KIMIA FIZIKAL [PHYSICAL CHEMISTRY]

No of Credits: 2

Course Synopsis:
The course discusses the concept of physical chemistry in terms of laws of thermodynamics, involving entalphy and entropy. The course also covers the topics of material equilibrium, standard thermodynamic functions of reactions, reaction equilibrium in a gas mixture, reaction kinetics, phase diagram and equilibrium electrochemistry.

Course Outcomes:
1. Ability to explain the basic concepts, laws and principles in physical chemistry.
2. Ability to differentiate the given problem related to the basic concepts, laws and principles in physical chemistry
3. Ability to analyze the laws and principles in physical chemistry

KMK10603 ANALYTICAL CHEMISTRY [KIMIA ANALISIS]

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:
1. Ability to understand and apply the basic chemical concepts that are particularly important to analytical chemistry
2. Ability to apply basic principle of different analytical techniques in order to calculate and solve analytical problems by integrating different analytical techniques
3. Ability to differentiate, demonstrate and write about different analytical techniques

KMK10704 PRINSIP-PRINSIP PROSES KIMIA [PRINCIPLES OF CHEMICAL PROCESS]

No of Credits: 4

Course Synopsis:
This course emphasizes the underlying concepts of material and energy balance in chemical processes. More fundamentally, it introduces the engineering approach to solving process-related problems. Topics to be covered include basic process calculations, process system variables, material and energy balances on reactive and non-reactive processes. At the end of this course, students will be able to identify and perform material and energy balances on reactive and non-reactive processes.

Course Outcomes:
1. Ability to apply knowledge of material balances and analyze the reactive and nonreactive chemical processes
2. Ability to apply knowledge of energy balances and analyze the reactive and nonreactive chemical processes
3. Ability to apply appropriate simulation tools to perform material and energy balances for reactive and nonreactive chemical processes

KMK10802 PENGENALAN KEPADA PROSES INSTRUMENTASI [INTRODUCTION TO PROCESS INSTRUMENTATION]

No of Credits: 2

Course Synopsis:
This course provides the students 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. Students are also trained with the ability to examine both process flow diagram (PFD) as well as piping and instrumentation diagram (P&ID) using the Instrumentation Systems and Automation Society (ISA) symbology and tangging systems. Ultimately, the design and development of both PFD and P&ID of both simple and complex systems are studied and practiced

Course Outcomes:
1. Ability to analyze the function of various industrial process instrumentation and application of engineering drawings.
2. Ability to demonstrate the ISA symbology and tagging as well as numbering
3. Ability to construct process flow diagram (PFD) and piping and instrumentation diagram (P&ID) using appropriate tools

KMK20003 THERMODYNAMICS FOR CHEMICAL ENGINEERING [TERMODINAMIK UNTUK KEJURUTERAAN KIMIA]

No of Credits: 3

Course Synopsis:
This course introduces students to the basic of thermodynamics for chemical engineering application and problem solving, which covers on first and second laws of thermodynamics. The course also highlights on pure substance properties, mass and energy analysis, entropy, refrigeration cycles, thermodynamic property relations, thermodynamics of gas mixture and solutions, as well as the chemical and phase equilibrium.

Course Outcomes:
1. Ability to analyze the fundamentals properties and laws of thermodynamics involved in chemical engineering system.
2. Ability to evaluate the thermodynamic property relations, mass, work, energy and heat transfer analysis, as well as the thermodynamic behaviour of pure substance and mixtures.
3. Ability to measure the thermodynamic properties of gaseous and solutions, as well as the phase equilibrium of vapor-liquid and chemical reaction systems.
4. Ability to justify the concept and cycle of thermodynamics in chemical engineering system applications.

KMK20103 MEKANIK BENDALIR [FLUID MECHANICS]

No of Credits: 3

Course Synopsis:
This course covers all of the basic principles of fluid mechanics, both static and dynamics. This course emphasizes fundamental concepts and problem-solving technique that ties theory directly to real system used in chemical process industries. In the fluid static part, students will be introduced to basic properties of fluid, pressure measurement, buoyancy and stability and also force due to static fluid. In the fluid dynamics, students will be learning general equation of fluid flow, friction loss and separation losses.

Course Outcomes:
1. Ability to analyse problems related to fluid static
2. Ability to evaluate broadly-defined engineering problems related to fluid dynamics
3. Ability to conduct fluid mechanics experiments based on the objectives outlined according to procedures.

KMK20203 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. In particular, the fundamental knowledge gained from the single heat exchanger analysis is further applied for designing a heat exchanger network for specific processes towards minimum energy requirement and rejection.

Course Outcomes:
1. Ability to analyze the principles of conduction, convection and radiation heat transfer.
2. Ability to assess the problems related to heat transfer processes.
3. Ability to design the heat exchangers and the networks related to specific processes.

KMK20303 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 reactor sizing, rate law, isothermal reactor design, collection and analysis of rate data, catalysis and catalytic reaction mechanism, and distributions of residence time for reactors.

Course Outcomes:
1. Ability to demonstrate the principles of chemical reaction engineering design for industrial reactors and related practical skills.
2. Ability to analyze and solve various problem related to reactor design, reaction process, and related practical skills.
3. Ability to evaluate the catalytic reaction mechanism, Residence Time Distribution (RTD) functions in reactors, and related practical skills.

KMK20403 MASS TRANSFER [PEMINDAHAN JISIM]

No of Credits: 3

Course Synopsis:
This course emphasizes the fundamental concepts and problem-solving techniques on mass transfer operations and principles. This course also provides the knowledge on mass transfer operations at basic to an intermediate level, which covers the theoretical and analytical background to solve the mass transfer operations problems.The concepts of diffusion and inter-phase mass transfer to the analysis of different mass transfer operations such as absorption, evaporation, and drying will be covered in this course.

Course Outcomes:
1. Ability to demonstrate the diffusion mass transfer principles and calculate the mass transfer coefficient
2. Ability to analyze mass transfer systems related to industry
3. Ability to apply the appropriate techniques in mass transfer related equipment individually and in teams.

KMK22004 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:
1. Ability to evaluate microbiological processes involved in fundamental microbiological methods.
2. Ability to evaluate applications production for industrial products and bioprocessing systems for industrial products by applying fundamentals of microbial classification, physiology and metabolisms.
3. Ability to demonstrate practical skills in fundamental microbiological methods.

KMK22104 BIOKIMIA & TEKNOLOGI ENZIM [BIOCHEMISTRY & ENZYME TECHNOLOGY]

No of Credits: 3

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:
1. Ability to differentiate basic structure, properties, functions and classification of biomolecules. Ability to distinguish techniques for enzymes isolation, purification and immobilization.
2. Ability to illustrate electron transport, citric acid cycle and photosynthesis..
3. Ability to distinguish properties and manipulate techniques for biomolecules determination.
4. Ability to assess the current and future trends of biomolecules applications in bio-analysis, biotechnology and industrial

KMK22203 BIOMOLEKULAR & KEJURUTERAAN GENETIK [BIOMOLECULAR & GENETIC ENGINEERING]

No of Credits: 3

Course Synopsis:
This course provides fundamental knowledge on molecular biology processes such as DNA replication, transcription, and translation. The course also covers the basic principle of genetic engineering that involves the manipulation of genetic materials, the regulations of their interactions, and the techniques employed in gene cloning and recombinant DNA technology. The students are expected to be able to perform simple DNA sequence analysis using the National Center for Biotechnology Information (NCBI) platform.

Course Outcomes:
1. Ability to perform and to discuss fundamental molecular biology laboratory techniques.
2. Ability to distinguish between the mechanisms of bacterial and eukaryotic DNA replication, DNA repair, transcription, and translation
3. Ability to assess the techniques used in the isolation, manipulation and cloning of heterologous DNA

KMK30002 KESELAMATAN & PENCEGAHAN KEHILANGAN [SAFETY & LOSS PREVENTION]

No of Credits: 2

Course Synopsis:
The course offers a detailed study on applications of engineering principles to process safety, hazards analysis and mitigation. It covers issues relevant to chemical process safety which include Occupational Safety and Health laws and regulations, methods and techniques for identifying, assessing and eliminating or controlling hazards to acceptable levels which are required on any process plant to ensure safe and efficient operation. The course also covers principle and guideline on safe design engineering and the design of relief system. The course also emphasizes on maintenance program, emergency response planning, occupational safety and health management system and relevant case studies. The course is concluded with the lesson in accident investigation.

Course Outcomes:
1. Ability to apply occupational safety and health management, planning and legal issues
2. Ability to evaluate suitable methods for prevention and control in occupational safety and health
3. Ability to propose safety element in engineering work

KMK30103 PROCESS CONTROL & DYNAMICS [KAWALAN PROSES DAN DINAMIK]

No of Credits: 3

Course Synopsis:
The course aims to introduce the concept of process control and dynamics which starts with the introduction to process control, theoretical models of chemical processes, Laplace transform, transfer function and dynamic behavior of the processes. In addition, complete control system includes the feedback controller, control system instrumentations will be also covered with understanding of dynamics behavior of the closed loop and apply the PID controller design and tuning.

Course Outcomes:
1. Ability to analyze basic concept of process control and theoretical model of chemical processes.
2. Ability to evaluate and performs the dynamics behaviour of chemical processes and feedback controller.
3. Ability to design and analyze feedback control system for chemical processes.

KMK30203 SEPARATION ENGINEERING [KEJURUTERAAN PEMISAHAN]

No of Credits: 3

Course Synopsis:
This course emphasizes the theory and basic principles of separation process 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. At the end of the course, the students are expected to be able to solve engineering problems related to separation in chemical processes.

Course Outcomes:
1. Ability to analyze the scientific and engineering technology principles to examine basic design/operation of liquid-liquid and solid-solid extraction process.
2. Ability to evaluate and apply the principles of mechanical-physical separation process.
3. Ability to apply principles and theory to develop basic design/operation of separation process involving vapor and liquid.

KMK30303 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:
1. Ability to evaluate the process of project management, develop work plans, do cost estimation and perform project evaluation
2. Ability to evaluate economic scenarios and apply decision making process to engineering project and business venture.

KMK30403 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:
1. Ability to compose problem statements and research objectives of the project based on the scientific information which follow the ethical principle in order to engage life-long learning on theory and practical knowledge.
2. Ability to describe and formulate research methodology incorporating clear fundamentals resources, 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.
3. Ability to present and defend research proposal with effective communication skills.

KMK32002 PENGURUSAN SISA & PENGGUNAAN [WASTE MANAGEMENT & UTILIZATION]

No of Credits: 2

Course Synopsis:
This course introduces the types of waste material, such as wastewater, solid waste, and hazardous waste generated by various industries, and discusses the utilization of the bioprocessing industrial waste and the treatments required before discharge to the environment. Topic cover includes classification of hazardous waste, physical, chemical and biological 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:
1. Ability to apply the basic principles of physical, chemical and, biological properties of waste, waste treatment, and management as well as management practices used in bioprocessing industries.
2. Ability to conduct an investigation and analyze the performance of waste treatment and disposal methods as well as utilization of waste to provide valid conclusions
3. Ability to apply appropriate techniques for treatment, disposal, and utilization of waste

KMK32103 SEL & TEKNOLOGI KULTUR TISU [CELL & TISSUE CELL CULTURE]

No of Credits: 3

Course Synopsis:
This course introduces the basic knowledge and principle of mammalian cell culture as well as plant tissue culture with the incorporation of cutting-edge technology. The topics that are covered in this course include aseptic techniques, media preparation and sterilisation methods pertaining to cell culture, and applications of the mammalian cell culture and plant tissue culture in various fields..

Course Outcomes:
1. Ability to apply knowledge and differentiate the basic unit of life and basic laboratory equipment for mammalian cell culture and plant tissue culture.
2. Ability to apply knowledge on different culture techniques and evaluate the importance of mammalian cell culture and plant tissue culture
3. Ability to apply appropriate technique for maintaining the mammalian cell culture and plant tissue culture in a group project.

KMK32204 TEKNOLOGI PEMPROSESAN HULUAN & HILIRAN [UPSTREAM & DOWNSTREAM PROCESSING]

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:
1. Ability to analyze the effect of media formulation on the microbial growth kinetics.
2. Ability to design the fermenter instrumentation and control based on specific parameters.
3. Ability to propose a suitable integrated recovery and purification system based on the product.
4. Ability to perform basic fermentation experiments and downstream processes

KMK32303 REKA BENTUK 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 (GMP), and documentation for validation of biotechnology facilities.

Course Outcomes:
1. Ability to analyze the biotechnology process facility design based on industrial regulatory demand
2. Ability to evaluate the basic instrumentations and utilities system design in biotechnology industry
3. Ability to develop and propose the validation scheme for systems and equipments facility to meet the regulatory compliance

KMK31503 PENINGKATAN & PROSES OPTIMASI [SCALE UP & PROCESS OPTIMIZATION]

No of Credits: 3

Course Synopsis:
To fulfil the increasing demand of experts in the industry when it comes to scale-up and process optimization of any manufacturing processes.

Course Outcomes:
1. Ability to apply principles of scale up and to analyze scale up methods in related chemical/biotechnological processes.
2. Ability to demonstrate theories of optimization and to analyze optimization methods in related chemical/biotechnological processes.
3. Ability to develop a solution to chemical/biotechnological related problems using selected scale up and optimization methods.

KMK32503 REKA BENTUK LOJI UNTUK BIOTEKNOLOGI INDUSTRI 1 [PLANT DESIGN FOR INDUSTRIAL BIOTECHNOLOGY 1]

No of Credits: 3

Course Synopsis:
This course contains the preliminary design of biotechnology 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:
1. Ability to analyze the research literature and key steps of a process synthesis including the sustainability and market survey analysis for industrial biotechnology process plant..
2. Ability to propose engineering equipment design with appropriate engineering codes.
3. Ability to demonstrate a process simulation of the propose plant using appropriate process simulator tools
4. Ability to organize teamwork and develop communication skill.
5. Ability to monitor project management, and appraise the needs and life-long learning in industrial biotechnology project design.

KMK32603 TEKNOLOGI BIOFARMASEUTIKAL [BIOPHARMACEUTICAL TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This course is designed to provide the students with the knowledge in the field of biopharmaceutical technology, its importance, the corresponding techniques and technologies in drug development, regulatory aspects for biopharmaceutical production and registration as well as manufacturing process and applications of important biopharmaceuticals in the current world.

Course Outcomes:
1. Ability to apply knowledge and differentiate biopharmaceutical regulatory compliance and illustrate the biopharmaceutical delivery.
2. Ability to apply knowledge, demonstrate and evaluate different biopharmaceutical formulation and production.
3. Ability to apply appropriate technique in processing, manufacturing, and evaluating biopharmaceuticals in a group project.

KMK32703 TEKNOLOGI PENGESTRAKAN SEBATIAN BIOAKTIF [BIOACTIVE COMPOUNDS 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 to liquid), high-pressure extraction, liquid to liquid extraction and adsorption besides its applications in related industries. Several analyses to obtain high-quality bioactive extracts and purified compounds are also discussed.

Course Outcomes:
1. Ability to examine variability of bioactive compounds.
2. Ability to suggest the extraction method for related problem.
3. Ability to evaluate various analysis to obtain high quality and purified compound.

KMK32803 TEKNOLOGI HIJAU LESTARI [SUSTAINABLE GREEN TECHNOLOGY]

No of Credits: 3

Course Synopsis:
The course provides students with various aspects of green technology and its application of products, equipment, and system to conserve the natural resources and environment, as well as to minimize or mitigate the negative impacts on the environment. This course includes renewable energy, energy efficiency, waste management, remediation, and pollution control. Green technology should meet the needs of society in ways that can continue indefinitely into the future without damaging or depleting natural resources. As the demand for global energy increases, alternative energy sources are needed to address the growing interest in how energy is produced, provided, and transported in sustainable ways. At the same time, a focus also lies on bioenergy technologies to convert waste biomass into biofuels, which also covers green solutions in the area of the biotechnology industry.

Course Outcomes:
1. Ability to apply knowledge of the concepts and principles of different types of green technologies and understand their role as alternative technologies.
2. Ability to analyze and explain the various aspects of green technologies and their application of products, equipment, and system to conserve natural resources and the environment.
3. Ability to analyze the issues about green technologies development and explain their potential impacts as green steps towards a sustainable environment.

KMK40005 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:
1. Ability to perform planning activities related to the objectives of the research project to be engage in independent and life-long theoretical and practical learning
2. Ability to assess and demonstrate techniques using modern tools to solve research problems.
3. Ability to follow ethical principles and evaluation of experimental data to draw good conclusions
4. Ability to perform and effectively communicate the findings through standard thesis and presentation.

KMK40103 ENGINEERING TECHNOLOGY IN SOCIETY] [JURUTERA TEKNOLOGI DALAM MASYARAKAT]

No of Credits: 3

Course Synopsis:
This course aims to explain the main concepts in engineering and technology ethics, risk management and occupational safety and health. Introduction the nature to enable engineering technologist to appreciate factors that have to be taken into account in decision-making. Examine and assess issues and challenges faced by engineering technologist relating to engineering and technology ethics, risk management and to understand the legal requirement related engineering and technology field.

Course Outcomes:
1. Ability to assess hazards, the function of risk management and occupational safety and health (OSHA).
2. Ability to evaluate the aspects and procedures of legal and ethics on engineering and technology issues.
3. Ability to intergrate and relate the issues and challenges of engineering and technology in community.

KMK42003 ISU & KOMERSIALISASI DALAM BIOTEKNOLOGI [ISSUES & COMMERCIALIZATION IN BIOTECHNOLGY]

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 technopreneurial skills that should be possesses by the students.

Course Outcomes:
1. Ability to assess the commercial aspects of biotechnology products
2. Ability to select a potential product and prepare a business plan for that particular product
3. Ability to appraise technopreneurial skills and cultures for success technopreneurâ™s business.

KMK42103 TEKNOLOGI PENGHASILAN TENAGA BIO [BIOENERGY PRODUCTION TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This course is designed to provide the students with the 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:
1. Ability to analyse the advantages of renewable and sustainable bioenergy.
2. Ability to appraise different bioenergy technologies, the process, principles and application of each technology
3. Ability to evaluate feasibility of new bioenergy technologies and relate the impact of bioenergy technology on economics and environmental policy

KMK41403 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:
1. Ability to apply the knowledge of the basic concepts and principles of food processing technology
2. Ability to evaluate the effects of processing on sensory and explain on the nutritional properties of food.
3. Ability to evaluate the problems involved in food production

KMK45203 REKA BENTUK LOJI UNTUK BIOTEKNOLOGI INDUSTRI 2 [PLANT DESIGN FOR INDUSTRIAL BIOTECHNOLOGY 2]

No of Credits: 3

Course Synopsis:
This course represents a capstone in the chemical engineering fundamental subjects. In this course students will have the opportunity to apply the basic concepts learned in previous courses to the design and analysis of a industrial process plant.

Course Outcomes:
1. Ability to develop piping and instrumentation diagram (P&ID) and control system for industrial biotechnology process plant by demonstrating an appropriate software tools.
2. Ability to evaluate costing and profitability analysis of industrial biotechnology process plant
3. Ability to propose a sustainable waste management system for environment needs and society safety.
4. Ability to organize teamwork and develop communication skill
5. Ability to monitor project management, and appraise the needs and life-long learning in industrial biotechnology project design.

KMK49912 INDUSTRIAL TRAINING [LATIHAN INDUSTRI]

No of Credits: 12

Course Synopsis:
This practical-based course exposes students to a company technical functions and organizational structure and operation such as departmental function, work procedure, safety procedure, communication, technical skills and project management. During this course, the students will apply knowledge learned in the university and increased the related skills required in their future profession.

Course Outcomes:
1. Ability to demonstrate technical knowledge and practical skills.
2. Ability to practice the health, safety, legal and cultural issues in working environment.
3. Ability to apply societal environmental and sustainable development in engineering problems.
4. Ability to demonstrate good work performance, work ethics during training period.
5. Ability to perform as individual, a member or leader in diverse technical teams.
6. Ability to communicate and operate assigned task given by host company.
7. Ability to engage in independent and lifelong learning in specialist technologies.

KMK23003 MIKROBIOLOGI MAKANAN [FOOD MICROBIOLOGY]

No of Credits: 3

Course Synopsis:

The early part of this course introduces the features of microorganisms typically involved in the 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, differentiation between beneficial use (fermentation) in the microorganism and foodborne diseases are established.

Course Outcomes:
1. Ability to apply the knowledge on characteristics of foodborne, waterborne, and spoilage microorganisms, as well as methods of their isolation, detection, and identification
2. Ability to analyze and responds to the intrinsic and extrinsic conditions affecting the growth, survival and death of microorganisms in foods.
3. Ability to explain and differentiate the beneficial use (fermentation) in microorganism and disease that are contracted from the consumption of food products.

KMK23103 BIOKIMIA MAKANAN [FOOD 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:
1. Ability to APPLY knowledge of basic principles of food science and biochemistry into real-world food science and nutrition studies.
2. Ability to EVALUATE the chemical structure and interactions of food components and CONSTRUCT analytical experiment with respect to the components interactions for food quality and safety.
3. Ability to ASSEMBLE different biochemical testing with appropriate methods to understand its chemical interactions between food components.

KMK23203 TEKNOLOGI LEPAS TUAI [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:
1. Ability to apply knowledge and analyse the factors during pre-harvest, harvesting and postharvest handlings that affect the quality of fresh produces.
2. Ability to perform appropriate analyses in determining the chemical and physical properties of agricultural products in order to apply the appropriate postharvest handling technology.
3. Ability to function effectively in a group / team to complete all the tasks in group activity and assignment on postharvest handling technology of different fresh produces.

KMK33003 ANALISIS DAN INSTRUMENTASI UNTUK TEKNOLOGI MAKANAN [ANALYSIS & INSTRUMENTATION FOR FOOD TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This course provides students with knowledge in the application of analytical procedures and instrumentations used for the physical and chemical characterization of foods. Physical properties of foods such as rheological properties, texture properties, colour determination, and viscosity are characterized using rheometer, texture analyzer, colour meter, and viscomer. Proximate compositions (moisture, ash, protein, fat content) of food are analyzed using oven, furnace, kjedahl, and soxhlet system. The course also covers analytical technique using high ends equipment such as spectrophotometry (UV-Vis, IR, AAS,NMR), chromatography (TLC,GC and HPLC), and calorimetric (Bomb calorimeter) for food compound determination, concentration, and characterization. These analytical procedures are important to ensure food safety and quality.

Course Outcomes:
1. Ability to DIFFERENTIATE the principle of food analysis between physical and chemical characterizations.
2. Ability to EVALUATE the type of instruments and methods used for specific food analysis
3. Ability to CONSTRUCT and DEMONSTRATE appropriate procedures of different food testing with suitable instruments in groups.

KMK33104 PEMPROSESAN DAN PENGAWETAN MAKANAN [FOOD PROCESSING & 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:
1. Ability to differentiate the principles and technology of food processing and preservation and analyse the effects of processing on food quality and shelf life.
2. Ability to perform the appropriate processing methods on selected food products and apply the appropriate measurement techniques to analyse the effects of processing on physico-chemical, sensory and nutritional properties of foods.
3. Ability to communicate effectively on the appropriate solution to the problems and issues involved in food processing and preservation through technical report and presentation.

KMK33203 TEKNOLOGI LEMAK DAN MINYAK [FATS & OILS 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, their sources, the corresponding techniques and technologies in fats and oils processing, analytical methods used to assess its physicochemical 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:
1. Ability to differentiate the major commercial sources of fats and oils as well as understanding their components and chemical composition.
2. Ability to evaluate the technology utilized for the processing of fats and oils, and the analytical procedures for quality assessment of fats and oils products.
3. Ability to propose and explain appropriate methods for handling and preservation of fats and oils product, and the potential applications based on their physical and chemical properties.

KMK33303 INGREDIEN MAKANAN [FOOD INGREDIENTS]

No of Credits: 3

Course Synopsis:
This course provides the knowledge in major food ingredients in various categories such as food coloring, food flavorings, acidulants, emulsifiers, stabilizers, specialty protein-based ingredients, enzymes and many other ingredients. 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:
1. Ability to analyze the mechanism of the techno-functionality or bio-functionality as well as physicochemical properties of food ingredients.
2. Ability to predict the effect of the interaction between ingredient and complex food matrix under different conditions.
3. Ability to propose and explain the right ingredients for food formulations in food manufacturing.

KMK33503 REKA BENTUK LOJI UNTUK TEKNOLOGI MAKANAN 1 [PLANT DESIGN FOR FOOD TECHNOLOGY 1]

No of Credits: 3

Course Synopsis:
This course contains the preliminary design of food technology processing plant. It focuses on the process synthesis of a typical food products gathering with process plant capacity based on market survey analysis. The calculation of material and energy balance, heat and mass transfer analysis and designing proper equipment. It is a team-based approach to provide capstone design experience emphasizing on the application of science, mathematics and fundamental of chemical engineering and food technology knowledge acquired in earlier courses.

Course Outcomes:
1. Ability to EXAMINE the key steps with consideration of environmental issue and economic analysis in carrying out a process synthesis of a typical food process plant.
2. Ability to PROPOSE chemical engineering design principle with appropriate engineering codes.
3. Ability to TROUBLE-SHOOT a process simulation of the proposed plant using appropriate process simulator tools
4. Ability to ORGANIZE teamwork and communication skill
5. Ability to STRUCTURE the project management and interpret the needs with the engagement in independent and life-long learning in food project design.

KMK33403 PENGURUSAN DAN PENGGUNAAN SISA MAKANAN [FOOD WASTE MANAGEMENT AND UTILIZATION]

No of Credits: 3

Course Synopsis:
This course covers waste management of industrial wastes including wastewater, solid and hazardous waste in order to minimize their effect on the environment which in compliance with Department of Environment (DOE). Treatment of industrial food wastes and its utilization in relation to pollution control and value-added commercial by products are also included.

Course Outcomes:
1. Ability to APPLY legislative act for waste management and treatment in industries
2. Ability to EVALUATE and CONDUCT appropriate waste treatment systems with sustainable approach
3. Ability to PROPOSE and PRACTICE the utilization of waste from food industries into value-added products

KMK33603 SISTEM PENGURUSAN KUALITI DAN KESELAMATAN DALAM PENGELUARAN MAKANAN [QUALITY & 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, sensory analysis, 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:
1. Ability to ANALYSE and CONSTRUCT the quality and safety of food in relation to contaminants and toxin in foods and sensory evaluation
2. Ability to PRESENT the importance of quality and safety management system in food production
3. Ability to ASSESS and MEASURE the quality and safety-based problems in food production

KMK33703 MAKANAN BERFUNGSI DAN NUTRASEUTIKAL [FUNCTIONAL FOODS & NUTRACEUTICALS]

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, bioavailability 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:
1. Ability to analyze the concepts and analytical methods related to functional foods and nutraceuticals.
2. Ability to evaluate the effect of processing on the bioactivity and bioavailability of functional and nutraceutical ingredients.
3. Ability to propose and explain the latest development of researches and markets in functional foods and nutraceuticals.

KMK33803 TEKNOLOGI TENUSU DAN DAGING [DAIRY & MEAT TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This course provides students with knowledge in milk and meat compositions, handling, 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:
1. Ability to apply the knowledge of basic composition and properties of meat and milk on the product processing, safety and quality requirements.
2. Ability to analyze processing techniques and technology for meat and dairy products and communicate effectively in the form of presentation
3. Ability to analyze the method used to maintain and assess the quality and safety of meat and dairy products.

KMK43503 REKA BENTUK LOJI UNTUK TEKNOLOGI MAKANAN 2 [PLANT DESIGN FOR FOOD TECHNOLOGY 2]

No of Credits: 3

Course Synopsis:
This course is a complementary course of Plant Design for Food Technology 1. This course covers the Piping and Instrumentation Diagram (P&ID) of the selected food plant processing using CAD tools in conjunction with the control system. The engineering economic evaluation topic in this course comprises the estimation of total capital cost investment, cost of manufacture, and profitability analysis. This course also covers food quality, safety, packaging, and food waste management system.

Course Outcomes:
1. Ability to design piping and instrumentation diagram (P&ID) using appropriate CAD tools and control system for the food process plant.
2. Ability to evaluate costing and profitability analysis of the food process plant.
3. Ability to propose a packaging system for quality assurance and design food waste management system for environmental sustainability.
4. Ability to complete the report task in the team and communicate effectively.
5. Ability to structure the project management and interpret the needs with the engagement in independent and life-long learning in food project design.

KMK43003 PEMBANGUNAN DAN PENGKOMERSILAN PRODUK MAKANAN [FOOD PRODUCT DEVELOPMENT & COMMERCIALIZATION]

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 the 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 involves the planning, management and assessment of a product from conceptualization to launch.

Course Outcomes:
1. Ability to evaluate the process in the development and commercialization of a new food product.
2. Ability to design appropriate processes and select appropriate techniques in the development of a new food product.
3. Ability to appraise management techniques and apply economic decision-making into the development of a new food product and communicate effectively in form of a presentation.

KMK43103 JURUTERA TEKNOLOGI DALAM MASYARAKAT [FOOD PACKAGING TECHNOLOGY]

No of Credits: 3

Course Synopsis:
The course introduces basic knowledge on food packaging materials, equipment, design and technology with an overview on the 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:
1. Ability to ANALYSE the understanding on the importance and functions of a packaging system in relation to food preservation.
2. Ability to ASSESS and EXPLAIN the manufacture, properties and economic use of packaging materials (glass, plastic, paper and aluminium).
3. Ability to PROPOSE how packaging materials interact with diverse food products in order to maximize quality and shelf-life of the products

KMK43203 TEKNOLOGI POLTRI DAN IKAN [POULTRY & 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 including the appropriate handling procedures that bound to the GHP, HACCP, Halal and food regulations standard. 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:
1. Ability to DEMONSTRATE the understanding on the chemical and biochemical constitution of poultry and fish of different species
2. 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
3. Ability to PROPOSE and EXPLAIN the appropriate methods of handling and preservation of poultry- and fish-based products.

KMK21303 PROSES DAN PRODUK OLEOKIMIA [OLEOCHEMICAL PROCESS & PRODUCTS]

No of Credits: 3

Course Synopsis:
This course emphasizes the palm oil and oleochemical industries in Malaysia, processes involved in palm oil mills, palm oil refineries and any related process towards the production of oil and fats from different sources. Besides that, this course also discusses the major oleochemical products in the industry and their applications, product formulation and analysis, and the quality management of oleochemical products.

Course Outcomes:
1. Ability to define and apply the oleochemical basic concept.
2. Ability to explain and differentiate the important processes in the oleochemical industry.
3. Ability to explain and analyse the oleochemical products, analysis and formulations

KMK21503 TEKNOLOGI PEMPROSESAN SUMBER BIO (BIORESOURCE 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:
1. Ability to EXPLAIN the need, principle and demand of bioresource industry as renewable resources.
2. Ability to EXPLAIN and DISTINGUISH the different types of bioresources processing technology.
3. Ability to EVALUATE the application and environmental impact and economic factor of this renewable resource.

KMK21602 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:
1. Ability to DESCRIBE the process involving water in a chemical plant.
2. Ability to DISTINGUISH the principle involving steam & non-steam heating
3. Ability to EVALUATE the principle involving air and refrigerant and its applications

KMK31303 TEKNOLOGI PEMPROSESAN PETROLEUM & GAS [PETROLEUM & GAS PROCESSING TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This course introduces the students to process 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, this subject also contains the field processing and treatment of natural gas as well as petroleum refinery process.

Course Outcomes:
1. Ability to recognize and explain background, formation and production of oil and gas.
2. Ability to describe and compare and select separation process of produced fluids and treatment process of crude oil and water.
3. Ability to demonstrate understanding and distinguish field Processing and treatment of natural gas.

KMK31903 REKA BENTUK LOJI UNTUK PROSES KIMIA INDUSTRI 1 [PLANT DESIGN FOR INDUSTRIAL CHEMICAL PROCESS 1]

No of Credits: 3

Course Synopsis:
This course contains the preliminary design of industrial chemical process plant. It focuses on process synthesis of a typical chemical process product with process plant capacity based on market survey analysis. The calculation includes material and energy balance, heat and mass transfer 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:
1. Ability to examine the key steps including profitability analysis in carrying out a process synthesis of a typical process plant.
2. Ability to propose chemical engineering design principle with appropriate engineering codes.
3. Ability to demonstrate a process simulation of the proposed plant using appropriate process simulator tools
4. Ability to organize teamwork and communication skill.
5. Ability to evaluate the needs with the engagement in independent and life-long learning in project design.

KMK31603 TEKNOLOGI PEMPROSESAN POLIMER [POLYMER PROCESSING TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This course intends to give students fair knowledge of fundamental of chemistry, synthesis mechanism of polymer and introduction of polymer composites. Polymer characteristics including chemical, thermal, physical and mechanical properties and rheology of polymer are included in this course. The course also focuses on polymer processing technology which comprises rubber, thermoplastic and thermoset processing such as mixing, extrusion, various types of moulding, hand lay-up, pultrusion etc. The laboratory session consists of polymer synthesis, characterisation of physical and mechanical properties, and polymer processing techniques.

Course Outcomes:
1. Ability to apply knowledge of basic concepts of polymer and polymer properties
2. Ability to evaluate the processing techniques for various polymer applications
3. Ability to apply analytical techniques and modern engineering tools for polymer characterization and polymer processing and works in a group.

KMK31703 TEKNOLOGI PEMPROSESAN FARMASEUTIKAL [PHARMACEUTICAL PROCESSING TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This course provides an overview of pharmaceutical manufacturing process such as formulation of solid, semisolid & liquid drugs, mixing of excipients, milling, granulation, drying, tableting, coating and packaging process. Drug development process, regulatory compliance and concept of pre-formulations and formulation are introduced to assist in formulation of a drug. At the end of this course, the students are expected to be able to formulate the solid, semisolid & liquid drugs and design types of equipment that involve in pharmaceutical processing technology

Course Outcomes:
1. Ability to analyse the pharmaceutical production and dose formulation.
2. Ability to demonstrate and assess pharmaceutical processing technique.
3. - Ability to design pharmaceutical production facilities and processes.

KMK31803 TEKNOLOGI MEMBRAN TERMAJU DAN APLIKASI [ADVANCED MEMBRANE TECHNOLOGY AND APPLICATION]

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 pervaporation and also for medical application such as hemodialysis, drug delivery and blood oxygenators.

Course Outcomes:
1. Ability to differentiate membrane types, membrane materials and membrane surface characterization.
2. Ability to evaluate the transport theory and concentration polarization in membrane processes.
3. Ability to evaluate and present the fundamental concept of application processes.

KMK31403 ELEKTROKIMIA INDUSTRI [INDUSTRIAL ELECTROCHEMISTRY]

No of Credits: 3

Course Synopsis:
This subject aims to provide students with the fundamental concepts of electrochemistry and electrode processes. This course will integrate the fundamental concepts with electrochemical applications such as metallurgy, electroplating, batteries, fuel cells, corrosion and electroanalysis. Examples of applications of electrochemistry are also presented.

Course Outcomes:
1. Ability to DEMONSTRATE the importance of knowledge of electrochemistry.
2. Ability to EVALUATE the fundamental concepts with electrochemical applications such as metallurgy, electroplating, batteries, fuel cells, corrosion and electroanalysis.
3. Ability to DESIGN the corrosion prevention methods and current electrochemical application.

KMK41903 REKA BENTUK LOJI UNTUK PROSES KIMIA INDUSTRI 2 [PLANT DESIGN FOR INDUSTRIAL CHEMICAL PROCESS 2]

No of Credits: 3

Course Synopsis:
This course is a complementary course of Plant Design for Industrial Chemical Process 1. It focused on the Piping and Instrumentation Diagram (P&ID) conjunction with the control system and engineering economic knowledge comprised of estimation of total capital cost investment, cost of manufacture, and profitability analysis. This course also covers waste management systems and safety precautions.

Course Outcomes:
1. Ability to develop piping and instrumentation diagram (P&ID) and control system for the process plant using the appropriate software tools.
2. Ability to evaluate costing and economic analysis of the process plant.
3. Ability to propose a sustainable waste management system for environmental needs and society's safety.
4. Ability to organize teamwork and communication skills.
5. Ability to evaluate the needs with the engagement in independent and life-long learning in project design.

KMK41102 JAMINAN KUALITI DAN KAWALAN DALAM KEJURUTERAAN KIMIA [QUALITY ASSURANCE AND CONTROL IN CHEMICAL ENGINEERING]

No of Credits: 3

Course Synopsis:
This course covers the principles of quality assurance and quality control that can be applied in related fields of chemical engineering. The course covers related process and standard commonly used in industry. The course also discuss on the statistical method and acceptance sampling as tools and techniques that broadly implemented in quality assurance and quality control.

Course Outcomes:
1. Ability to examine and apply the principles for quality assurance, quality control and management improvement.
2. Ability to understand the ethics, evaluate and present the processes in quality assurance and quality control with statistical method.
3. Ability to formulate the suitable sampling and testing procedure in quality assurance and quality control.

KMK41203 TEKNOLOGI PEMPROSESAN ZARAH [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 separation, storage and transporting of particles, mixing and segregation, as well as particle size reduction and enlargement.

Course Outcomes:
CO1 - Ability to analyze the fundamental of the particles, particulate systems and related practical skills.
CO2 - Ability to evaluate the mechanisms and unit operation used for particle processing, handling, and related practical skills
CO3 - Ability to develop a proficient use of mathematics and science skills in solving chemical engineering problems associated with particulate processes.

KMK21703 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:
1. Ability to EXPLAIN the principle and the environmental aspect of renewable energy.
2. Ability to explain and DISTINGUISH the different types of renewable energy resources.
3. Ability to EVALUATE and compare the biomass energy process in producing biofuels.

FACULTY OF CIVIL ENGINEERING TECHNOLOGY (FTKA)

Programmes Offered:

1. Bachelor of Civil Engineering with Honours
2. Bachelor of Enviromental Engineering with Honours
3. Bachelor of Civil Engineering Technology (Construction) with Honours
4. Bachelor of Technology in Building Construction with Honours

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ENGINEERING PROGRAMME

PROGRAMME OBJECTIVES (PEO)

The Programme Objectives for the entire ***Engineering Programme*** at Universiti Malaysia Perlis (UniMAP) is as follows:

PEO 1
Graduates who have demonstrated career advancement in the field of Electrical 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

*At the end of the **Engineering Programme**, the students are expected to attain the following attributes:*

PO 1
Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization respectively 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 consideration.

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 problem.

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 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
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.

PO12
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.

CURRICULUM STRUCTURE
UR6526001 BACHELOR OF CIVIL ENGINEERING WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD			FOURTH	
	I	II	III	IV	V	VI		VII	VIII
ENGINEERING CORE (107)		NMJ10903 Computer Programming	AMJ20103 Structural Theory[c]	AMJ20504 Soil Mechanics[e]	AMJ30104 Geotechnical Engineering[f]	AMJ30604 Highway & Transportation Engineering	AMJ39905 INDUSTRIAL TRAINING	AMJ40103 Industrialized Building System	
	AMJ10104 Mechanics and Material Engineering[a]	AMJ10404 Strength of Materials[b]	AMJ20204 Fluid Mechanics Engineering	AMJ20603 Water Supply Engineering	AMJ30203 Reinforced Concrete Structures Design I	AMJ30703 Steel Structure Design		AMJ40002 Final Year Project I	AMJ40004 Final Year Project II
	AMJ10202 Engineering Geology		AMJ20303 Building Material Engineering	AMJ20703 Structural Analysis I[d]	AMJ30303 Structural Analysis II	AMJ30804 Water & Wastewater Engineering		AMJ4XX03 Elective I	AMJ4XX03 Elective II
	AMJ10304 Geomatic Engineering	AMJ10503 Civil Engineering Skills	AMJ20403 Engineering Drawing	AMJ20803 Hydraulics	AMJ30403 Construction Management	AMJ30903 Reinforced Concrete Structures Design II		AMJ47103 Integrated Design Project I[g]	AMJ48103 Integrated Design Project II[h]
					AMJ30503 Hydrology & Water Resources Engineering			AMJ40203 Construction Contract, Estimating & Finance	AMJ40302 Professional Engineers
NON ENGINEERING (12)	SMQ10103 Engineering Mathematics I	SMQ10203 Engineering Mathematics II	SMQ20303 Engineering Mathematics III	SMQ27103 Engineering Statistics					
UNIVERSITY REQUIREMENT (18)	SMZXXX01 Co-curriculum	SMZXXX01 Co-curriculum				SMU12202 Skills and Technology in Communication		SMU13002 Philosophy and Current Issues	SMU13102 Appreciation of Ethic and Civilization
	SMU32202 Thinking Skills	SMB41002 University Malay Language or ***SMB11002 Basic Malay Language	SMU22402 Engineering Entrepreneurship						
	*SMB10102 Preparatory English	XXXXXX02 Option or **SMB20102 English for General Communication		SMB31202 English for Technical Communication					
137	16	18	18	18	16	16	5	16	14

TOTAL UNITS FOR GRADUATION IS 137

ELECTIVES COURSES:

Elective I: AMJ40603 Advanced Reinforced Concrete Structures Design, AMJ40703 Foundation Engineering, AMJ40803 Urban Stormwater Management, AMJ40903 Building Maintenance Information System

Elective II: AMJ41003 Advanced Structural Analysis, AMJ41103 Advanced Steel Design, AMJ41203 Construction Contract and Law, AMJ41303 Building Information Modelling, AMJ41403 Civil/Environmental Engineers for Society

*Uncredited. Compulsory to students with MUET Band 2 only. This course is prerequisite to SMB20102 English for General Communication.
**Compulsory to students with MUET Band 3 or less. This course is a prerequisite to SMB31202 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]
COURSE [e] IS A PRE-REQUISITE TO COURSE [f]

CURRICULUM STRUCTURE
UR6526002 BACHELOR OF ENVIRONMENTAL ENGINEERING WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD			FOURTH	
	I	II	III	IV	V	VI		VII	VIII
ENGINEERING CORE (107)	AMJ10604 Environmental Chemistry	NMJ10903 Computer Programming	AMJ20904 Fluid Mechanics and Hydraulics	AMJ21303 Hydrology	AMJ31004 Mass Transfer[b]	AMJ31403 Noise Pollution Engineering	AMJ39905 INDUSTRIAL TRAINING	AMJ4XX03 Elective I	AMJ4XX03 Elective II
	AMJ10104 Mechanics and Material Engineering	AMJ10704 Basic Ecology	AMJ21003 Thermodynamics[a]	AMJ21403 Environmental Law, Health and Safety	AMJ31103 Water Supply Engineering	AMJ31503 Public Health and Occupational Hygiene		AMJ40403 Engineering Project Management	AMJ48203[f] Integrated Environmental Engineering Design Project II
		AMJ10803 Fundamental of Chemical Processes	AMJ21103 Fundamental of Environmental Engineering	AMJ21503 Geo environmental Engineering	AMJ31203 Solid and Hazardous Waste Engineering	AMJ31603 Environmental Management System		AMJ40002 Final Year Project I	AMJ40004 Final Year Project II
		AMJ10503 Civil Engineering Skills	AMJ21203 Environmental Engineering Skills[c]	AMJ21603 Environmental Transport Processes	AMJ31303 Environmental Impact Assessment	AMJ31704 Wastewater Engineering		AMJ 40503 Environmental Remediation	
						AMJ31804 Air Pollution Engineering		AMJ47203[e] Integrated Environmental Engineering Design Project I	AMJ40302 Professional Engineers
NON-ENGINEERING (14)	SMQ10103 Engineering Mathematics I	SMQ10203 Engineering Mathematics II	SMQ20303 Engineering Mathematics III	SMQ27103 Engineering Statistics					
						SMU12202 Skills and Technology in Communication			
UNIVERSITY REQUIREMENTS (16)	SMU32202 Thinking Skills	SMZXXXX1 Co-curriculum		SMB31202 English for Technical Communication	SMB000X2 Option Subject			SMU13002 Philosophy and Current Issues	SMU13102 Appreciation Ethic and Civilization
	SMZXXXX1 Co-curriculum								
	SMB41002 University Malay Language or SMB11002 Basic Malay Language***								
	SMB10102 Preparatory English*	SMB20102 English for General Communication**		SMU22402 Engineering Entrepreneurship					
137	16	17	16	19	15	19	5	16	14

TOTAL UNITS FOR GRADUATION IS 137

ELECTIVE COURSES: Elective I: AMJ41503 Remote Sensing[d], AMJ41603 Environmental Process Control & Instrumentation, AMJ41703 Advanced Wastewater Engineering, AMJ40803 Urban Stormwater Management

Elective II: AMJ41803 Environmental Informatics, AMJ41903 Built Environment, AMJ42003 Sustainable Energy, AMJ42103 Environmental Risk Assessment AMJ41403 Civil/Environmental Engineer for Society

*Uncredited. Compulsory to students with MUET Band 2 only. This course is prerequisite to SMB20102 English for General Communication.
**Compulsory to students with MUET Band 3 or less. This course is a prerequisite to SMB31202 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]
COURSE [e] IS A PRE-REQUISITE TO COURSE [f]

ENGINEERING TECHNOLOGY PROGRAMME

PROGRAMME OBJECTIVES (PEO)

The Programme Objectives for the entire ***Engineering Technology Programme*** at Universiti Malaysia Perlis (UniMAP) is as follows:

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

*At the end of the **Engineering Technology Programme**, the students are expected to attain the following attributes:*

PO 1
Knowledge: Apply knowledge of mathematics, science, engineering fundamentals and engineering specialisation principles 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 specialization.

PO 3
Design/development of solutions: 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.

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 the effective reports and design documentation, make effective presentations, 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 and leader in a team and to manage projects in multidisciplinary environments.

PO12
Life-Long Learning: Recognize the need for and have the ability to engage in independent and lifelong learning in specialist technologies.

CURRICULUM STRUCTURE
UR6526003 BACHELOR OF CIVIL ENGINEERING TECHNOLOGY (CONSTRUCTION) WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEM	I	II	III	IV	V	VI	VII	VI
Discipline Core	AMK10102 Fundamental of Engineering Mechanics	AMK10503 Fundamental of Solid Mechanics	AMK 20102 Structural Theory	AMK20602 Structural Analysis	AMK30103 Structure Design I	AMK30703 Structural Design II	AMK40103 Industrialized Building Construction Technology	AMK49912 INDUSTRIAL TRAINING
	AMK10203 Physic Technology	AMK10603 Fundamental of Fluid Mechanics	AMK 20203 Hydraulic and Hydrology	AMK20703 Construction Project Management	AMK30203 Construction Technology I	AMK30803 Construction Technology II	AMK40204 Construction Technology Integrated Project	
	AMK10302 Introduction to Civil Engineering Technology	AMK10703 Geomatic	AMK20303 Soil Mechanics	AMK20803 Construction Value Estimation	AMK30303 Highway and Traffic Technology	AMK30004 Bachelor's Degree Project I	AMK40006 Bachelor's Degree Project II	
	AMK10402 Technical Drawing	AMK10802 Construction Drawing	AMK20403 Construction Material	AMK20903 Building Services II	AMK30402 Contract and Site Administration	AMK30903 Basic Environmental Engineering and Management		
			AMK20503 Building Services I	AMK21003 Management of Occupational Safety and Health	Elective 1/3	Elective 2/3	Elective 3/3	
				AMK21104 Geotechnics				
Common Core	SMQ11103 Mathematics for Engineering Technology I	SMQ11203 Mathematics for Engineering Technology II	SMQ21303 Mathematics for Engineering Technology III		AMK31203 Civil Engineering Technologist in Society			
University Required	SMU13002 Philosophy and Current Issues	SMB41002 University Malay Language			SMU22402 Engineering Entrepreneurship			
	*SMB10102 Preparatory English	SMB20102 English for General Communication OR	SMB31202 English for Technical Communication	SMU13102 Appreciation of Ethics and Civilization				
	SMU32202 Thinking Skills	***SMB1XX02 Option Subject (Foreign Language)						
	SMU12202 Skills & Technology in Communication							
	SMZXXX01 Co-Curricular Activity	SMZXXX01 Co-Curricular Activity						
CREDIT	19	19	19	20	19	16	16	12
Total Units for Graduation = 140								

Elective 1	Elective 2	Elective 3
A1. AMK30503 Financial & Human Resource Management	B1. AMK31003 Construction Tech. of Highway & Bridge	C1. AMK40303 Advanced Structural Design
A2. AMK30603 Building Survey	B2. AMK31103 Construction Risk Management	C2. AMK40403 Construction Technology of Highrise Building C3. AMK40503 Building Maintenance Information System

Notes:
MUET Band 2: SMB10102 Preparatory English > SMB20102 English for General Communication> SMB31202 English for Technical Communication, *Option Subject is NOT COMPULSORY
MUET Band 3: SMB20102 English for General Communication > SMB31202 English for Technical Communication, *Option Subject is NOT COMPULSORY
MUET Band 4 and above: SMB31202 English for Technical Communication, *Option Subject is COMPULSORY

TECHNOLOGY PROGRAMME

PROGRAMME OBJECTIVES (PEO)

The Programme Objectives for the entire ***Technology Programme*** at Universiti Malaysia Perlis (UniMAP) is as follows:

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

*At the end of the **Technology Programme**, the students are expected to attain the followingattributes:*

PO 1
Knowledge: Apply knowledge of technology fundamentals to broadly-defined procedures processes, systems and methodologies in Electrical System Maintenance.

PO 2
Practical Skills and High Technology: Able to suggest and apply latest tools and techniques to solve broadly-defined problems.

PO 3
Analytical, Critical Thinking and Scientific Approach: Demonstrate strong analytical and critical thinking skills to solve broadly-defined problems in Electrical System Maintenance.

PO 4
Communication Skills : Able to communicate and articulate effectively in both verbal and written among technologist communities and society at large.

PO 5
Social Responsibility in Society and Technologist Community: Demonstrate understanding of the societal related issues and the consequent responsibilities relevant to broadly-defined technology practices.

PO 6
Lifelong Learning and Information Management : Recognize the needs for professional development and to engage independent lifelong learning in specialist technologists.

PO 7
Technopreneurship and Management Skills: Demonstrate an awareness of management and technopreneurship practices in real perspective.

PO 8
Ethics and Professionalism: Demonstrate professionalism and social and ethical consideration.

PO 9
Teamwork and Leadership: Demonstrate leadership quality, mentoring and work effectively in diverse teams.

CURRICULUM STRUCTURE
UR6582001 BACHELOR OF TECHNOLOGY IN BUILDING CONSTRUCTION WITH HONOURS
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD			FIRST
SEM	I	II	III	IV	V	VI	VII	VIII
COMMON CORE	**AMT10106** Building Technology 1	**AMT10305** Building Technology 2	**AMT20106** Project Quality Management	**AMT20404** Human Resource and Professional Ethics	**AMT30106** Demolition Technique and Construction Waste Management	**AMT30405** Building Requirements and Law	**AMT30002** Final Year Project 2	**AMT40112** Industrial Training
	AMT10206 Building Services Technology 1	**AMT10405** Building Services Technology 2	**AMT20206** Construction Project Management	**AMT20504** Safety, Health And Environmental Management	**AMT30206** Building Information Modelling	**AMT30505** Building Assessment and Reporting		
		AMT10503 Industrial Revolutions	**AMT20303** Psychology in Industry	**AMT20604** Construction Value Estimation and Procurement	**AMT30304** Technopreneur Project 2	**AMT30001** Final Year Project 1		
				AMT20704 Technopreneur Project 1				
UNIVERSITY REQUIREMENT COURSES	**SMZXXX01** Co-Curriculum 1	**SMZXXX01** Co-Curriculum 2	***SMB11X02** Third Language	**SMU22402** Engineering Entrepreneurship	**SMU13102** Appreciation of Ethics and Civilization			
	SMB41002 University Malay Language	**SMU13002** Philosophy and Current Issue	**SMB31202** English for Technical Communication					
	***SMB10102** Preparatory English	****SMB20102** English for General Communication						
	SMU12202 Skills and Technology in Communication							
CREDIT	17	18	19	18	18	14	6	12
Total Units for Graduation = 122								

Notes:
* UVA101/2: Uncredited for graduation purpose.
* MUET Band 2: UVA 101/2 Preparatory English > UVW 201/2 English for General Communication> UVW 312/2 English for Technical Communication.
** MUET Band 3: UVW 201/2 English for General Communication > UVW 312/2 English for Technical Communication.
*** MUET Band 4 and above: UVW 312/2 English for Technical Communication; 2 courses of Third Language (CUMPOLSORY: Mandarin, Germany, Japanese, Korean).
Semester VII is a short semester.

LIST OF COURSES:

COURSE CODE	COURSE NAME
AMJ10104	Mekanik dan Kejuruteraan Bahan [Mechanics and Material Engineering]
AMJ10202	Geologi Kejuruteraan [Engineering Geology]
AMJ10304	Kejuruteraan Geomatik [Geomatic Engineering]
AMJ10404	Kekuatan Bahan [Strength of Materials]
AMJ10503	Kemahiran Kejuruteraan Awam [Civil Engineering Skills]
AMJ10604	Kimia Sekitaran [Environmental Chemistry]
AMJ10704	Ekologi Asas [Basic Ecology]
AMJ10803	Asas Proses Kimia [Fundamental of Chemical Processes]
AMJ20103	Teori Struktur [Structural Theory]
AMJ20204	Kejuruteraan Mekanik Bendalir [Fluid Mechanics Engineering]
AMJ20303	Kejuruteraan Bahan Bangunan [Building Materials Engineering]
AMJ20403	Lukisan Kejuruteraan [Engineering Drawing]
AMJ20504	Mekanik Tanah [Soil Mechanics]
AMJ20603	Kejuruteraan Bekalan Air [Water Supply Engineering]
AMJ20703	Analisis Struktur I [Structural Analysis I]
AMJ20803	Hidraulik [Hydraulics]
AMJ20904	Mekanik Bendalir dan Hidraulik [Fluid Mechanics and Hydraulic]
AMJ21003	Termodinamik [Thermodynamics]
AMJ21103	Asas Kejuruteraan Alam Sekitar [Fundamental Of Environmental Engineering]
AMJ21203	Kemahiran Kejuruteraan Alam Sekitar [Environmental Engineering Skill]
AMJ21303	Hidrologi [Hydrology]
AMJ21403	Perundangan Kesihatan Dan Keselamatan Persekitaran [Environmental Law, Health And Safety]
AMJ21503	Kejuruteraan Geopersekitaran [Geoenvironmental Engineering]
AMJ21603	Proses Pengangkutan Alam Sekitar [Environmental Transport Process]
AMJ30104	Kejuruteraan Geoteknik [Geotechnical Engineering]

LIST OF COURSES:

COURSE CODE	COURSE NAME
AMJ30203	Rekabentuk Struktur Konkrit Bertetulang I [Reinforced Concrete Structure Design I]
AMJ30303	Analisis Struktur II [Structural Analysis II]
AMJ30403	Pengurusan Pembinaan [Construction Management]
AMJ30503	Hidrologi dan Kejuruteraan Sumber Air [Hydrology and Water Resources Engineering]
AMJ30604	Kejuruteraan Lebuhraya dan Pengangkutan [Highway & Transportation Engineering]
AMJ30703	Rekabentuk Struktur Keluli [Steel Structure Design]
AMJ30804	Kejuruteraan Air & Air Sisa [Water & Wastewater Engineering]
AMJ30903	Rekabentuk Struktur Konkrit Bertetulang II [Reinforced Concrete Structure Design II]
AMJ31004	Pemindahan Jisim [Mass Transfer]
AMJ31103	Kejuruteraan Bekalan Air [Water Supply Engineering]
AMJ31203	Kejuruteraan Sisa Pepejal dan Sisa Berbahaya [Solid and Hazardous Waste Engineering]
AMJ31303	Penilaian Kesan Alam Sekitar [Environmental Impact Assesment]
AMJ31403	Kejuruteraan Pencemaran Hingar [Noise Pollution Engineering]
AMJ31503	Kesihatan Awam Dan Higin Pekerjaan [Public Health And Occupational Hygiene]
AMJ31603	Sistem Pengurusan Alam Sekitar [Environmental Management System]
AMJ31704	Kejuruteraan Air Sisa [Wastewater Engineering]
AMJ31804	Kejuruteraan Pencemaran Udara [Air Pollution Engineering]
AMJ39905	Latihan Industri [Industrial Training]
AMJ40002	Projek Tahun Akhir I [Final Year Project I]
AMJ40004	Projek Tahun Akhir II [Final Year Project II]
AMJ40103	Sistem Bangunan Berindustri [Industrialised Building System]
AMJ40203	Kontrak, Taksiran dan Kewangan Pembinaan [Construction Contract, Estimating & Finance]
AMJ40302	Jurutera Profesional [Professional Engineers]
AMJ40403	Pengurusan Projek Kejuruteraan [Engineering Project Management]
AMJ40503	Remediasi Sekitaran [Environmental Remediation]

LIST OF COURSES:

COURSE CODE	COURSE NAME
AMJ40603	Rekabentuk Struktur Konkrit Bertetulang Lanjutan [Advanced Reinforced Concrete Structures Design]
AMJ40703	Kejuruteraan Asas [Foundation Engineering]
AMJ40803	Pengurusan Air Ribut Bandar [Urban Storm Water Management]
AMJ40903	Sistem Maklumat Penyelenggaraan Bangunan [Building Maintenance Information System]
AMJ41003	Analisis Struktur Lanjutan [Advanced Structural Analysis]
AMJ41103	Rekabentuk Keluli Lanjutan [Advanced Steel Design]
AMJ41203	Kontrak & Perundangan Pembinaan [Construction Contract & Law]
AMJ41303	Pemodelan Maklumat Bangunan [Building Information Modelling]
AMJ41403	Jurutera Awam/Alam Sekitar Untuk Masyarakat [Civil / Environmental Engineers For Society]
AMJ41503	Penderiaan Jauh [Remote Sensing]
AMJ41603	Kawalan Proses Sekitaran dan Instrumentasi [Environmental Process Control And Instrumentation]
AMJ41703	Kejuruteraan Air Sisa Termaju [Advanced Wastewater Engineering]
AMJ41803	Informatik Sekitaran [Environmental Informatics]
AMJ41903	Alam Bina [Built Environment]
AMJ42003	Tenaga Lestari [Sustainable Energy]
AMJ42103	Penilaian Risiko Alam Sekeliling [Environmental Risk Assessment]
AMJ47103	Reka Bentuk Projek Berintegrasi I [Integrated Design Project I]
AMJ47203	Reka Bentuk Projek Kejuruteraan Alam Sekitar Berintegrasi I [Integrated Environmental Engineering Design Project I]
AMJ48103	Reka Bentuk Projek Berintegrasi II [Integrated Design Project II]
AMJ48203	Reka Bentuk Projek Kejuruteraan Alam Sekitar Berintegrasi II [Integrated Environmental Engineering Design Project II]
AMK10102	Asas Kejuruteraan Mekanik [Fundamental Of Engineering Mechanics]
AMK10203	Teknologi Fizik [Physic Technology]
AMK10302	Pengenalan Kepada Teknologi Kejuruteraan Awam [Introduction To Civil Engineering Technology]

LIST OF COURSES:

COURSE CODE	COURSE NAME
AMK10402	Lukisan Teknikal [Technical Drawing]
AMK10503	Asas Mekanik Pepejal [Fundamental Of Solid Mechanics]
AMK10603	Asas Mekanik Bendalir [Fundamental Of Fluid Mechanics]
AMK10703	Geomatik [Geomatic]
AMK10802	Lukisan Pembinaan [Construction Drawing]
AMK20102	Teori Struktur [Structural Theory]
AMK20203	Hidraulik Dan Hidrologi [Hydrology And Hidraulic]
AMK20303	Mekanik Tanah [Soil Mechanics]
AMK20403	Bahan Binaan [Construction Materials]
AMK20503	Khidmat Bangunan I[Building Service I]
AMK20602	Analisis Struktur [Structural Analysis]
AMK20703	Pengurusan Projek Pembinaan [Construction Project Management]
AMK20803	Angggaran Nilai Pembinaan [Construction Value Estimation]
AMK20903	Khidmat Bangunan Ii[Building Service Ii]
AMK21003	Pengurusan Keselamatan Dan Kesihatan Pekerjaan [Management Of Occupational Safety And Health]
AMK21104	Geoteknik [Geotechnics]
AMK30103	Rekabentuk Struktur I [Structural Design I]
AMK30203	Teknologi Pembinaan I [Construction Technology I]
AMK30303	Teknologi Lebuhraya Dan Lalulintas [Traffic And Highway Technology]
AMK30402	Pentadbiran Kontrak Dan Tapak [Contract And Site Administration]
AMK30503	Pengurusan Kewangan Dan Sumber Manusia [Financial And Human ResourceManagement]
AMK30603	Ukur Bangunan [Building Surveying]
AMK30703	Rekabentuk Struktur Ii [Structural Design Ii]
AMK30803	Teknologi Pembinaan Ii [Construction Technology Ii]
AMK30004	Projek Sarjana Muda I [Bachelor Degree Project I]

LIST OF COURSES:

COURSE CODE	COURSE NAME
AMK30903	Asas Kejuruteraan Dan Pengurusan Alam Sekitar [Basic Environmental Engineering And Management]
AMK31003	Teknologi Lebuhraya Dan Jambatan [Highway And Bridge Technology]
AMK31103	Pengurusan Risiko Pembinaan [Construction Risk Management]
AMK31203	Juruteknologi Kejuruteraan Awam Dalam Masyarakat [Civil Engineering Technologist In Society]
AMK40103	Teknologi Pembinaan Bangunan Berindustri [Industrial Building Construction Technology]
AMK40204	Teknologi Pembinaan Projek Bersepadu [Construction Technology Integrated Project]
AMK40006	Projek Sarjana Muda Ii [Bachelor Degree Project Ii]
AMK40303	Rekabentuk Struktur Termaju [Advanced Structure Design]
AMK40403	Teknologi Pembinaan Bangunan Tinggi [Constuction Technology Of Highrise Building]
AMK40503	Sistem Maklumat Penyelenggaraan Bangunan [Building Maintenance Information System]
AMK49912	Latihan Industri [Industrial Training]
AMT10106	Teknologi Bangunan I [Building Technology I]
AMT10206	Teknologi Perkhidmatan Bangunan I [Building Services Technology I]
AMT10305	Teknologi Bangunan II [Building Technology II]
AMT10405	Teknologi Perkhidmatan Bangunan II [Building Services Technology II]
AMT10503	Revolusi Industri [Industrial Revolutions]
AMT20106	Pengurusan Kualiti Projek [Project Quality Management]
AMT20206	Pengurusan Projek Pembinaan [Construction Project Management]
AMT20303	Psikologi Dalam Industri [Psychology in Industry]
AMT20404	Sumber Manusia dan Etika Profesional [Human Resource and Professional Ethics]
AMT20504	Pengurusan Keselamatan, Kesihatan Dan Alam Sekitar [Safety, Health And Environmental Management]
AMT20604	Taksiran dan Perolehan Nilai Pembinaan [Construction Value Estimation and Procurement]
AMT20704	Projek Teknousahawan I [Technopreneur Project I]
AMT30106	Teknik Pemusnahan dan Pengurusan Sisa Pembinaan [Demolition Technique and Construction Waste Management]

LIST OF COURSES:

COURSE CODE	COURSE NAME
AMT30304	Projek Teknousahawan II [Technopreneur Project II]
AMT30405	Keperluan dan Undang-undang Bangunan [Building Requirements and Law]
AMT30505	Penilaian dan Pelaporan Bangunan [Building Assessment and Reporting]
AMT30206	Building Information Modelling [Pemodelan Maklumat Bangunan]
AMT30001	Projek Tahun Akhir 1 [Final Year Project 1]
AMT30002	Projek Tahun Akhir 2 [Final Year Project 2]
AMT40112	Latihan Industri [Industrial Training]

AMJ10104 MEKANIK DAN KEJURUTERAAN BAHAN [MECHANICS AND MATERIAL ENGINEERING]

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, kinematics and kinetics of particle in dynamics portion. 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:
1. Ability to apply the knowledge of mechanics and materials engineering.
2. CO2 - Ability to analyse mechanics and materials engineering problems based on its properties and structures.
3. CO3 - Ability to assess the principles of mechanics and material engineering through laboratory experiments.

AMJ10202 GEOLOGI KEJURUTERAAN [ENGINEERING GEOLOGY]

No of Credits: 2

Course Synopsis:
This course introduces the basic knowledge of the geology engineering. The anatomy of the earth, the plate movement that caused the volcanoes and earthquakes, rock classification, weathering process, geological structure and strength, stresses and stabilization of rock mass were discussed in this course. At the end of the course, the students are expected to be able to understand the relationship between the behavior of earth and the geological process.

Course Outcomes:
1. Ability to analyze the knowledge of engineering geology.
2. Ability to evaluate the potential geologic hazards and the strength, stresses and stabilization of rock mass.

AMJ10304 KEJURUTERAAN GEOMATIK [GEOMATIC ENGINEERING]

No of Credits: 4

Course Synopsis:
In this course, student will be introduce basic surveying involved in engineering. Starting from linear measurement on plane. Student will do levelling after they learn two different data logging. With their knowledge in tapping and levelling, they have to do traversing and tachymetry. Lastly, student will be test in real work in geomatic camp.

Course Outcomes:
1. Ability to explain concept of geomatic engineering.
2. Ability to analyse data for surveying in geomatic engineering.
3. Ability to determine technique and procedure through integration of surveying data under some supervision.

AMJ10404 KEKUATAN BAHAN [STRENGTH OF MATERIALS]

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:
1. Ability to determine the stresses, strains and deformation of members in simple one-dimensional elastic system.
2. Ability to analyze torque-loaded member and evaluate the values and distribution of bending and shear stresses in beam section.
3. Ability to apply stress caused by combined loadings and buckling of column.
4. Ability to calculate stresses on inclined plane using Mohr's Circle.

AMJ10503 KEMAHIRAN KEJURUTERAAN AWAM [CIVIL ENGINEERING SKILLS]

No of Credits: 3

Course Synopsis:
This course is 100% coursework. This course contains modules which are architectural and engineering plans, a basic workshop for brickwork and reinforced concrete work, electrical wiring, aircond and lift, basic fire fighting and plumbing system, sampling and also safety and health at site. This course will expose students to the basic skills that will be used in the Civil and Environmental Engineering Program. This course requires an emphasis on practical training and teamwork where students can easily understand the course content effectively.

Course Outcomes:
1. Ability to analyse the fundamental theories and principles for different civil engineering applications.
2. Ability to perform the basic principles and theories in civil engineering practices through practical training.
3. Ability to work effectively in a group during the civil engineering practical works.

AMJ10604 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:
1. Ability to evaluate the knowledge related to fundamental chemistry involving water, soil and atmospheres.
2. Ability to solve problems related to fundamental chemistry involving water, soil and atmospheres
3. Ability to analyze experiments associated with appropriate methods related to water, soil and atmospheres

AMJ10704 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:
1. Able to evaluate the knowledge related basic concept of ecology, environment and the relationship among the organism in ecosystems.
2. Able to evaluate the solution in order to determine energy flow of ecosystems, biochemistry and metabolism pathways of microorganisms in soil, water and wastewater treatment

AMJ10803 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:
1. Able to calculate the basic process calculation and process system variables.
2. Able to assess material and energy balances on nonreactive processes and reactive multiple-unit processes.

AMJ20103 TEORI STRUKTUR [STRUCTURAL THEORY]

No of Credits: 3

Course Synopsis:
This course provides students with a clear and thorough presentation of the theory and application of structural analysis as it applies to beams, trusses and frames. It introduces an analysis of statically determinate structures for beams, trusses, and frames. Besides that, it also introduces deflections using the geometrical method for the beams and also the virtual work method for trusses, beams and frames. Cable and arches also will be discussed at the end of this course.

Course Outcomes:
1. Ability to apply the knowledge of structural theory in structural engineering.
2. Ability to analyse the structure component using various methods in the structural theory.

AMJ20204 KEJURUTERAAN MEKANIK BENDALIR [FLUID MECHANICS ENGINEERING]

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, the students will be expected to understand the basic characteristics of fluid mechanics and fluid statics, and to analyse the hydrostatics and basic hydrodynamics in the fluid. The students will also be able to analyse the flow in the pipe: Bernoulli's equation, Darcy-Weisbach equation, Moody diagram, and energy losses in pipelines.

Course Outcomes:
1. Ability to apply the knowledge of fluid mechanics engineering.Ability to evaluate civil engineering problems using fluid mechanics principles.
2. Ability to analyse experiments results and theories related to fluid mechanics engineering.

AMJ20303 KEJURUTERAAN BAHAN BANGUNAN [BUILDING MATERIAL ENGINEERING]

No of Credits: 3

Course Synopsis:
This course introduces the students to the materials used in building construction. It covers four main engineering materials such as cementious, metallic, organic and inorganic materials. The students also learn about compositions, properties, and modification of some of their properties with respect to environmental effects and their behaviour in service.

Course Outcomes:
1. Ability to compare various building materials and differentiate its influence to their properties.
2. Ability to discuss the materials used to make concrete and properties.
3. Ability to suggest new applications and/or new construction material for sustainable development.
4. Ability to propose the experiment associated with concrete and/or other building materials for building construction.

AMJ20403 LUKISAN KEJURUTERAAN [ENGINEERING DRAWING]

No of Credits: 3

Course Synopsis:
This course introduces students to the use of technical drawing in an effective way for communicating and integrating with engineering concepts. This course will also enlighten the student on the significant changes in the engineering and technical graphic due to the use of computer and basic Computer Aided Design (CAD) software. At the end of the course, students should be able to apply the skill and knowledge of engineering drawing to interpret design, using graphics methods such as geometric drawing, isometric, detailed drawing and bill of quantities.

Course Outcomes:
1. Ability to explain the knowledge of engineering drawing and bill of quantity.
2. Ability to solve engineering problems related to bill of quantity.
3. Ability to use techniques, skills and modern engineering tools for engineering activities.
4. Ability to presents effectively on engineering activities.

AMJ20504 MEKANIK TANAH [SOIL MECHANICS]

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:
1. Able to analyse the knowledge of soil mechanics.
2. Able to solve the calculation of soil mechanics problems.
3. Able to conduct the experiments associated with soil classification and parameters.

AMJ20603 KEJURUTERAAN BEKALAN AIR [WATER SUPPLY ENGINEERING]

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:
1. Able to describe water quality required in water supply system.
2. Able to solve calculation on water sources, consumption and water demand.
3. Able to design water treatment unit and water distribution system.
4. Able to use modern engineering tool for water distribution system.

AMJ20703 ANALISIS STRUKTUR I [STRUCTURAL ANALYSIS 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 AMJ20103 Structural Theory.

Course Outcomes:
1. Able to analyze the knowledge of structural analysis.
2. Able to solve the calculation of statically determinate and indeterminate structures.
3. Able to analyze structures using the displacement method of analysis.

AMJ20803 HIDRAULIK [HYDRAULICS]

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:
1. Able to apply the knowledge of hydraulics in a civil engineering field.
2. Able to analyse civil engineering problems using hydraulics theories and principles.
3. Able to investigate experiments associated with hydraulics in civil engineering.

AMJ20904 FLUIDS MECHANIC & HYDRAULICS [MEKANIK BENDALIR & HIDRAULIK]

No of Credits: 4

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:
1. Ability to apply the knowledge of fluid mechanics and hydraulic engineering
2. Ability to solve environmental engineering problems using fluid mechanics and hydraulic principles
3. Ability to analyse experiments associated with fluid mechanics and hydraulic engineering

AMJ21003 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.

Course Outcomes:
1. Able to use thermodynamic tables, charts and equation of state to obtain appropriate property data in solving thermodynamics problems.
2. Able to evaluate fundamental engineering problems in thermodynamics involving closed systems, open systems under steady state and transient conditions by applying the first and second laws of thermodynamics.
3. Able to apply second law analysis methods for thermodynamic systems.

AMJ21103 FUNDAMENTAL OF ENVIRONMENTAL ENGINEERING [ASAS KEJURUTERAAN ALAM SEKITAR]

No of Credits: 3

Course Synopsis:
This course focuses on fundamental concept of environmental engineering. Student will be exposed to the main component in environmental engineering that are water, air, solid and noise pollution. The basic principles, theories and legislation of water quality and wastewater, air pollution, noise pollution and solid and hazardous waste will be covered in this course.

Course Outcomes:
1. Ability to evaluate the basic principles, theories and legislation of water quality and wastewater, air pollution, noise pollution and solid and hazardous waste
2. Ability to analyze the problems on water quality and wastewater, air pollution, noise pollution and solid and hazardous waste
3. Ability to demonstrate and function effectively as an individual, and as a member or leader in the project on a specific scope of water quality and wastewater/ air pollution/ noise pollution or solid and hazardous waste

AMJ21203 ENVIRONMENTAL ENGINEERING SKILLS [KEMAHIRAN KEJURUTERAAN ALAM SEKITAR]

No of Credits: 3

Course Synopsis:
This course is divided into three topics that cover the basics of surveying, geographical information system (GIS) and engineering drawing. In the first topic, the students will learn how to conduct basic surveying works that include levelling, tacheometry and traversing. The second topic covers the basics of geographical information systems that include data capture and analysis. In this topic, the student will learn how to use the related software that will assist them in producing maps and data analysis from the maps. In the last topic, the student will be introduced to the basics of engineering drawing using AutoCAD software that will include 2D and 3D drawings. Most of this course will be conducted in the laboratory to familiarize the students with all the equipment and software while the theoretical part will be conducted in the class.

Course Outcomes:
1. Ability to apply the basic knowledge of surveying, mapping, and drawing toproduce maps and engineering drawings.
2. Ability to select the suitable method and/or technique of surveying, mapping, andengineering drawing in solving environmental related problems.
3. Ability to demonstrate the proper use of equipment and/or software in surveying,mapping, and engineering drawing

AMJ21303 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:
1. Able to demonstrate the scenario of hydrology
2. Able to solve the calculation of hydrology problems
3. Able to design basic stormwater management using prescribed manual

AMJ21403 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:
1. Ability to analyze the knowledge and ethical principles of Environmental, Health and Safety legislation in Malaysia
2. Able to obtain independently the knowledge by using the broadest context of technological change to evaluate issues and the need for Environmental, Health and Safety Legislation.

AMJ21503 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:
1. Ability to demonstrate basic principle of geoenvironmental engineering.
2. Ability to EVALUATE the basic principle of remediation technologies for contaminated land.

AMJ21603 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:
1. Ability to apply basic concept of transport phenomena toward in-depth understanding in environmental transport processes.
2. Ability to predict, propose and evaluate models of physical, chemical and biological transport process in the environment.
3. Ability to develop model of environmental transport process using modern tool.

AMJ30104 KEJURUTERAAN GEOTEKNIK [GEOTECHNICAL ENGINEERING]

No of Credits: 4

Course Synopsis:
This course provides further discussion and explanation related to geotechnical 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 the theory and practical to solve problem related to geotechnical engineering.

Course Outcomes:
1. Ability to explain the basic principles and concepts of geotechnical engineering to the issues in the geotechnical engineering.
2. Ability to justify the decision on sub-structures analysis using basic theories of geotechnical engineering.
3. Ability to examine the geotechnical engineering elements according to basic theories of geotechnical engineering.
4. Ability to perform the sub-structures modelling using appropriate computer software to analyse.

AMJ30203 REKA BENTUK STRUKTUR KONKRIT BERTETULANG I [REINFORCED CONCRETE STRUCTURE DESIGN 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 analyze 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, design staircase and design a column. The syllabus is cover ultimate and serviceability limit state. Design resistance typical structural element and detailing.

Course Outcomes:
1. Ability to design reinforced concrete structures.
2. Ability to check deflection and cracking.

AMJ30303 ANALISIS STRUKTUR II [STRUCTURAL ANALYSIS II]

No of Credits: 3

Course Synopsis:
This course is offered to provide an understanding of the methods of structural analysis for statically indeterminate structures using force (flexibility) and stiffness (displacement) matrix approaches. Non-prismatic members are also included in the analysis. Students will be introduced to the principles of basic understanding of civil engineering to solve realistic problems using the finite element method. Structural modelling and analysis using commercial structural analysis software are emphasized.

Course Outcomes:
1. Ability to analyse a variety of engineering problems using principles and concepts of structural analysis.
2. Ability to analyse structural analysis problems using finite element method and basic theories of structural analysis learned.
3. Ability to use appropriate computer software to analyse structures.

AMJ30403 PENGURUSAN PEMBINAAN [CONSTRUCTION MANAGEMENT]

No of Credits: 3

Course Synopsis:
This course is designed to provide students with knowledge in the scope of the ability to apply basic engineering knowledge in the management of construction by complying with government and local government procurement procedures and authorities. The syllabus of this construction management course covers more and emphasizes the knowledge of the initial stage of site project acceptance, the parties involved, and the responsibility of following the clauses of the contract terms. Techniques and equipment necessary in planning, controlling, and monitoring the relevant resources in this project. Authority requirements such as certificates of approval are required by the government before the project can be handed over to the customer for occupancy. At the end of this course, students have high confidence in managing the projects entrusted to them successfully.

Course Outcomes:
1. Ability to discuss various issues and processes in managing construction project.
2. Ability to evaluate construction documents for planning and management of construction processes.
3. Ability to develop project monitoring and handling over based on appropriate different methods.
4. Ability to communicate effectively in term of construction management process.

AMJ30503 HIDROLOGI DAN KEJURUTERAAN SUMBER AIR [HYDROLOGY AND WATER RESOURCES ENGINEERING]

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 storm water management. The students also will be exposed to the Urban Storm Water Management Manual for Malaysia (MSMA).

Course Outcomes:
1. Ability to demonstrate the scenario of hydrology and water resources engineering.
2. Ability to assess problems and theoretical aspects relevant to hydrology and water resources engineering.
3. Ability to design basic stormwater management using prescribed manual.

AMJ30604 KEJURUTERAAN LEBUHRAYA DAN PENGANGKUTAN [HIGHWAY AND TRANSPORTATION ENGINEERING]

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:
1. Able to apply the fundamental principle of traffic flow in traffic operational systems.
2. Able to explain the transportation planning process, forecast travel demand and pavement maintenance process.
3. Able to design highway drainage system, flexible pavement, and rigid pavement.
4. Able to conduct the experimental based on fundamental principles of traffic flow and design flexible pavement.

AMJ30703 REKA BENTUK STRUKTUR KELULI [STEEL STRUCTURE DESIGN]

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:
1. Ability to analyse complex engineering problem axially loaded member, flexural members and joints for steel structures.
2. Ability to design axially loaded member, flexural members and joints for steel structures.

AMJ30804 KEJURUTERAAN AIR AND AIR SISA [WATER AND WASTEWATER ENGINEERING]

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:
1. Able to analyse the scenario of wastewater engineering.
2. Able to demonstrate the component associated with wastewater for physical and biological parameter.
3. Able to design sewage treatment plant.
4. Able to conduct the experiment associated with wastewater for physical and biological parameter.

AMJ30903 REKA BENTUK STRUKTUR KONKRIT BERTETULANG II [REINFORCED CONCRETE STRUCTURE DESIGN 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:
1. Able to design reinforced concrete structures.
2. Able to determine shear, deflection and cracking.

AMJ31004 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:
1. Ability to analyze mass transfer problems involving molecular diffusion by applying the concept and principles of mass transfer processes for steady state or unsteady state conditions
2. Ability to estimate mass transfer coefficients and use them to determine mass transfer rates for various separation processes
3. Ability to design emission-controlled operations by applying fundamentals of mass transfer in separation processes
4. Ability to construct experimental works and assemble appropriate laboratory equipment to determine mass transfer coefficients and rates of separation process

AMJ31103 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:
1. Ability to analyze water sources, consumption and water demand, and classification of technology of water treatment processes.
2. Ability to evaluate water distribution system.
3. Ability to design water treatment unit and water distribution system.
4. Ability to construct water distribution system using modern engineering tool.

AMJ31203 SOLID & HAZARDOUS WASTE ENGINEERING [KEJURUTERAAN SISA PEPEJAL & BERBAHAYA]

No of Credits: 3

Course Synopsis:

Students will be introduced to elements of solid waste engineering which is municipal solid waste characterization, waste handling, generation rate, waste storage, collection and transport, waste treatment and disposal methods; including biological and chemical treatment, incineration, pyrolysis, landfill and site remediation, and waste minimization. Then, students will be enriched with characteristics of hazardous waste, waste handling, storage and collection, treatments and disposal methods, physicochemical and biological methods, stabilization and other disposal option such as solidification, incineration and secured landfill. Finally student will be able to design engineered final disposal facilities for solid and hazardous waste and analyze the sustainability in societal and environmental context.

Course Outcomes:

1. Ability to analyze the integrated solid and hazardous waste management and engineering.
2. Ability to analyze hazardous waste management and the concept of risk assessment.
3. Ability to design the engineered final disposal facilities for solid and hazardous waste.
4. Ability to analyze the sustainability in societal and environmental contexts and to have entrepreneurship skills.

AMJ31303 ENVIRONMENTAL IMPACT ASSESSMENTS [PENILAIAN KESAN ALAM SEKITAR]

No of Credits: 3

Course Synopsis:

This course will 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.

Course Outcomes:

1. Ability to examine the EIA requirement and to evaluate the potential adverse effects, mitigation measures and monitoring program associated with the prescribed activities.
2. Ability to evaluate the terms of reference in conducting EIA.
3. Ability to evaluate the environmental sustainability on the proposed project.

AMJ31403 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:

1. Ability to evaluate the basic principle and concept of noise pollution and noise control.
2. Ability to analyze and calculate the problems on noise pollution.
3. Ability to demonstrate and function effectively as an individual, and as a member or leader in the project on a noise pollution.

AMJ31503 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:
1. Ability to apply knowledge, and evaluate risks and control in management of hazards related to public health /occupational hygiene
2. Ability to appraise selected literature on public health /occupational hygiene
3. Ability to present the outcome of group work on related issues in public health /occupational hygiene
4. Ability to demonstrate and function effectively as an individual, and as a member or leader in group work on specific scope of public health /occupational hygiene

AMJ31603 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:
1. Able to apply the environmental management and the requirements on ISO 14001(environmental management system)
2. Able to justify the aspect and impact of a human work processes that may resulted to adverse effect
3. Ability to suggest mitigation measure and establish environmental policy in conserving the environment

AMJ31704 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:
1. Able to analyse the suitable unit process in wastewater engineering
2. Able to solve calculation of the unit process applied in wastewater treatment
3. Able to construct the overall unit operation in wastewater treatment plant and propose cost evaluation of the plant
4. Able to conduct experiment and adapt field trip observation associated with wastewater treatment process

AMJ31804 AIR POLLUTION ENGINEERING [KEJURUTERAAN PENCEMARAN UDARA]

No of Credits: 4

Course Synopsis:

This subject discusses 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:
1. Ability to identify and discuss the behaviour of meteorological condition and EVALUATE the air pollutant dispersion using the Gaussian Plume idea
2. Ability to calculate the removal and/or collection efficiency for a given pollutant and engineering control system and evaluate key parameters that affect the collection efficiency and operating cost
3. Ability to design the appropriate air pollution control system for a particular industrial air pollution problem
4. Ability to apply the knowledge to creatively utiize the equipment for air pollution measurement and control, and to discover the air pollution issues
5. Ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.

AMJ39905 LATIHAN INDUSTRI [INDUSTRIAL TRAINING]

No of Credits: 5

Course Synopsis:
The course will expose students to technical and practical application as well as other aspect such as the operation of the company, work culture, safety procedure, project management, communication, technical skills and presentation. Students are required to submit their logbook and written report at the end of the industrial training.

Course Outcomes:
1. Ability to demonstrate technical knowledge and practical skills.
2. Ability to adapt to health, safety, legal and cultural requirements in working environments.
3. Ability to perform tasks with professional ethics and responsibilities.
4. Ability to work independently, interact with co-workers and work in a team.
5. Ability to report and communicate verbally and in written form.

AMJ40002 PROJEK TAHUN AKHIR I [FINAL YEAR PROJECT I]

No of Credits: 2

Course Synopsis:
The Final Year Project (FYP) is a major component of the undergraduate degree course in Civil and Environmental Engineering Programs. The main objective is to develop problem solving, mathematical analysis, experimental tests, synthesis and evaluation skills, computer simulation, hard and/or software development in the field of Civil and Environmental Engineering. This is an individual research project in connection with a special engineering problems and under the academic staff guidance. While working on the project, the student would be able to develop personal and soft skills such as instance time management, self- confidence and interaction. The evaluation of the FYP indirectly provides the student with training in technical and communication skills.

Course Outcomes:
1. Ability to assess theoretical and practical knowledge in addressing complex engineering research problem.
2. Ability to evaluate complex research problem using knowledge of mathematics, natural sciences and engineering sciences.
3. Ability to propose solution for complex research problem using research-based knowledge and research methods.
4. Ability to value ethics and professional responsibility in conducting research activities.
5. Ability to practice effective communication skills in dissemination of research work with engineering community.

AMJ40004 PROJEK TAHUN AKHIR II [FINAL YEAR PROJECT 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:
1. Able to analyze the knowledge to identify evidence for a conclusion.
2. Able to collect the relevant information in a literature review to provide background of the project.
3. Able to construct the experimental design to solve the research problems.
4. Able to conduct the investigation using the various methods.
5. Able to manage the research activities with high ethic expressions.
6. Able to develop engineering principles with a sense of responsibility.
7. Able to adapt on the multi-displinary teams.
8. Able to display the effective communication skills on complex engineering activities with the engineering community.
9. Able to arrange research activities to the relevant information from the various source for the application on continuous learning.
10. Able to develop excellent project management.

AMJ40103 SISTEM BANGUNAN BERINDUSTRI [INDUSTRIALISED BUILDING SYSTEM]

No of Credits: 3

Course Synopsis:
This course is designed to give exposure to the students on the Industrialised Building System (IBS) concepts, which include the advantages and disadvantages of using IBS in construction, IBS roadmap and the applications of IBS. It also highlighted the principle of score calculation and submission, the principle of modular coordination in IBS and concepts of buildability.

Course Outcomes:
1. Ability to justify the concept of IBS modern construction technology.
2. Ability to suggest the principle of score calculation, submissions, and concept of modular coordination in IBS.
3. Ability to design a building using the concept of IBS according to Malaysian Standard.
4. Ability to demonstrate problem-solving in design the building using IBS.

AMJ40203 KONTRAK, TAKSIRAN DAN KEWANGAN PEMBINAAN [CONSTRUCTION CONTRACT, ESTIMATING AND FINANCE]

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 introduction to cost estimating based on the Standard Method of Measurement (SMM) for building works and Civil Engineering Standard Method of Measurement (CESMM), method of cost estimating and quantity measurement and build-up rate calculation. Finally, the third part covers economic and financial, including introduction to engineering economics, foundation of decision making in engineering economics and comparing alternative proposals; business financing and financial performance measurement.

Course Outcomes:
1. Ability to apply the basic knowledge regarding construction tender and contract.
2. Ability to evaluate the quantity and cost of building elements and civil engineering works.
3. Ability to create critical reasoning and make informed judgment in addressing economic and financial issues in construction practice.

AMJ40302 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:
1. Ability to identify and evaluate the issues and challenges of engineering ethics.
2. Ability to evaluate the sustainability issues and its impact in society and environmental context.
3. Ability to identify hazards and discuss the function of risk management, occupational safety, health (OSHA) and procedures of legal on engineering issues.

AMJ40403 ENGINEERING MANAGEMENT [PENGURUSAN KEJURUTERAAN]

No of Credits: 4

Course Synopsis:
This course will give exposure to project management knowledge from project management concept to project management process including project management skills together with exposure to decision making process involving engineering economics.

Course Outcomes:
1. Ability to analyze the process of engineering project management.
2. Ability to analyze engineering economic scenarios.
3. Ability to analyze and evaluate the process of project management and finance principle.

AMJ40503 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 behavior of subsurface contaminants, analysis of contaminants and remediation planning. Student will also be enriched with bioremediation technologies to recover the contaminants.

Course Outcomes:
1. Ability to apply the concepts of bioremediation in different states of environment.
2. Ability to compose the appropriate strategies in soil and groundwater remediation techniques
3. Able to construct the planning solutions for the environmental remediation.

AMJ40603 REKA BENTUK STRUKTUR KONKRIT BERTETULANG LANJUTAN [ADVANCED REINFORCED CONCRETE STRUCTURES DESIGN]

No of Credits: 3

Course Synopsis:
This course is the continuation of Reinforced Concrete Structures Design I and II. The topics include analysis and design of ribbed, waffle and flat slabs, water retaining structures and reinforced concrete wall. Design of elements for torsion and analysis and design of raft foundation are also covered.

Course Outcomes:
1. Ability to evaluate complex engineering problems for concrete slab, raft foundation, torsional moment element, wall and water retaining structures.
2. Ability to design reinforced concrete structures for concrete slab, raft foundation, torsional moment element, wall and water retaining structure.

AMJ40703 KEJURUTERAAN ASAS [FOUNDATION ENGINEERING]

No of Credits: 3

Course Synopsis:
This course provides further discussion and explanation related to foundation engineering. The topics covered in this course include 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 practice to solve problems related to foundation engineering.

Course Outcomes:
1. Ability to analyse sub-structure engineering problems.
2. Ability to design the foundations and retaining walls.
3. Ability to explain the principle of soil improvement methods and stability of sub-structure in foundation engineering.

AMJ40803 PENGURUSAN AIR RIBUT BANDAR [URBAN STORM WATER MANAGEMENT]

No of Credits: 3

Course Synopsis:
This course aims to equip students with in-depth knowledge in urban stormwater design and management. This course highlights the aspects of urban drainage management. The students are also exposed to environmentally friendly drainage systems, hydrological analysis, Best Management Practices (BMPs), and quantity and quality controls. Upon completing this course, the students should be able to analyse and determine viable project options, propose appropriate management strategies, and apply the proper techniques in urban stormwater planning and design.

Course Outcomes:
1. Ability to apply the aspects of urban drainage scheme which applies the concept of environmental friendly drainage in civil engineering.
2. Ability to evaluate urban drainage design alternative solutions based on the practices of the relevant authorities.
3. Ability to design urban drainage systems with regard to sustainable development.

AMJ40903 SISTEM MAKLUMAT PENYELENGGARAAN BANGUNAN [BUILDING MAINTENANCE INFORMATION SYSTEM]

No of Credits: 3

Course Synopsis:
This course is designed to introduce students to building maintenance and enhance their knowledge on management method that seems to become mislaid from time to time due to poor service delivery, inadequate finance, poor maintenance planning and maintenance backlogs. It will emphasize on the principles and practices relating to maintenance management in facilitating the assessment, planning and execution processes in relation to building facility. At the end of the course students should be able to apply, evaluate and develop the information system (i.e. database management) suitable for the building maintenance work on defect report and information transfer techniques with the aid of building information modelling technology.

Course Outcomes:
1. Ability to apply principles and practices relating to maintenance of building in construction engineering.
2. Ability to evaluate effective method for building maintenance information system.
3. Ability to construct complex maintenance information system with the aid of modern engineering tools.

AMJ41003 ANALISIS STRUKTUR LANJUTAN [ADVANCED STRUCTURAL ANALYSIS]

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:
1. Able to analyse the advanced structural analysis knowledge in-depth of technical competence to the solution of engineering problem.
2. Able to conduct structural engineering problem using modern engineering tools.

AMJ41103 REKA BENTUK KELULI LANJUTAN [ADVANCED STEEL DESIGN]

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:
1. Able to explain the advanced steel knowledge design in depth of technical competence to the solution of engineering problems.
2. Able to solve the advanced complex steel design in engineering problems.
3. Able to design solutions for complex engineering problems and design systems using technique, skills and modern engineering tools.

AMJ41203 KONTRAK AND PERUNDANGAN PEMBINAAN [CONSTRUCTION CONTRACT AND LAW]

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:
1. Able to apply construction law and contracts in construction practice.
2. Able to propose problem-solving skill and integrate knowledge gained in other core subject to problem emerged.
3. Able to evaluate in in laws and regulations related to the professional & ethical responsibilities and commitment to community.
4. Able to explain critical reasoning and informed judgement in addressing construction law and contract issues in construction practise.

AMJ41303 PEMODELAN MAKLUMAT BANGUNAN [BUILDING INFORMATION MODELLING]

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:
1. Able to describe contributions of BIM to civil engineering.
2. Able to design complex database of architecture and structure models for modelling libraries in BIM.
3. Able to present complex BIM model through integration of civil engineering database under some supervision.

AMJ41403 JURUTERA AWAM/ALAM SEKITAR UNTUK MASYARAKAT [CIVIL/ ENVIRONMENTAL ENGINEERS FOR SOCIETY]

No of Credits: 3

Course Synopsis:
The objective of this course is to improve student learning by integrating theory with practice in the society. This course is introduce to embed SULAM element align with KPM inspiration. Students will be placed in a community to hear their problem and then choose a problem related to their engineering field to be resolved. From this engagement, it will increase students soft skills as well as creating a collaborative environment between students, lecturers and communities. In addition, this course will providing opportunities for agencies, corporate and NGOs to contribute to the community through volunteering. At the end of the course, communities involved will get the benefit that will be maps based on Sustainable Development Goals (SDG) by UNESCO.

Course Outcomes:
1. Ability to integrate theory and practice in the society and the consequent responsibilities relevant to Civil/Environmental engineering practice and solutions to complex engineering problems.
2. Ability to function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.
3. Ability to display effective communication strategies with society for engineers.

AMJ41503 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:
1. Ability to understand basic concept of remote sensing.
2. Ability to convert and analyze environmental data by using digital image processing software.
3. Ability to characterized and utilizes the various system of remote sensing.

AMJ41603 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 have the conceptual understanding on Process Control and Instrumentation that 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:
1. Ability to analyze mathematical model of process control and instrumentation.
2. Ability to evaluate dynamics model of a process.
3. Ability to evaluate the automatic control system
4. Ability to formulate the process control strategies of typical chemical and biological process related to environmental engineering

AMJ41703 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:
1. Ability to analyse basic knowledge of process analysis and reactor design toward in-depth understanding in wastewater treatment plant design.
2. Ability to propose the biological reactor for the secondary treatment unit in wastewater treatment plant.
3. Ability to propose the design of tertiary treatment unit in wastewater treatment plant.

AMJ41803 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:
1. Ability to assess the element and principles of sampling techniques.
2. Ability to manipulate environmental data into decision making information by using statistical analysis.
3. Ability to adapt the understanding on design experiments and able to manipulate experimental data using statistical model.

AMJ41903 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:
1. Ability to apply the elements and principles of building designs and planning.
2. Ability to integrate tools and best practices within building planning that address the needs of energy efficiency.
3. Ability to demonstrate the critical planning solutions to built environment that promote healthier communities.

AMJ42003 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:
1. Ability to synthesize the function and conversion efficiency of a solar photovoltaic device and apply to a real-world project.
2. Ability to describe the fundamental of biomass and assess the potential of biomass conversion as an alternative energy.
3. Ability to define and assess the performance of the principal types of fuel cells and batteries.

AMJ42103 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:
1. Ability to understanding the principles and method of risk assessment.
2. Ability to investigate and assess human activity that influencing the distribution of chemicals in the environment.
3. Ability to assess and determine the magnitude of risk on humans associated with the exposure level.

AMJ47103 REKA BENTUK PROJEK BERINTEGRASI I [INTEGRATED DESIGN PROJECT I]

No of Credits: 3

Course Synopsis:
AMJ47103 Integrated Design Project I is an engineering capstone course for the civil engineering programme. This course enables students to design a real civil engineering project. In this course, students are required to integrate their knowledge of civil engineering disciplines such as geotechnical engineering, structural engineering, water supply engineering, and highway engineering. This course is an actual example of the implementation of complex problem solving and complex engineering activities, which incorporate various disciplines and consist of all phases of work, for example, project briefing, designing, sketching, and drawings. At the end of the semester, students are required to submit a conceptual report and present their findings.

Course Outcomes:
1. Ability to design solutions for complex civil engineering problems and design systems, components, or processes that meet specified needs.
2. Ability to use appropriate design software(s) to assist in complex civil engineering design projects.
3. Ability to evaluate the sustainability and impact of professional engineering work on the solution of complex civil engineering problems in societal and environmental contexts.
4. Ability to function effectively as an individual and as a member or leader in team.
5. Ability to demonstrate effective communication, verbal and written, in civil engineering design projects.

AMJ47203 INTEGRATED ENVIRONMENTAL ENGINEERING DESIGN PROJECT I [REKA BENTUK PROJEK KEJURUTERAAN ALAM SEKITAR BERINTEGRASI I]

No of Credits: 3

Course Synopsis:
AMJ47203 Integrated Environmental Engineering Design I is a capstone course designed to encourage students to conduct feasibility studies and preliminary design for real-world environmental engineering development projects. The feasibility study phase's objective is to identify the most optimal scheme from a technical, economic, environmental, and sustainability standpoint. The course enables students to design a typical environmental engineering project, and enhance the technical design, communication, and teamwork skills. At the end of this course, students will understand the critical nature of proposing a viable and workable development project and the value of integrating and synthesizing knowledge from various disciplines of environmental engineering.

Course Outcomes:
1. Ability to FORMULATE complex engineering problems reaching substantial conclusion using first principles of natural sciences and mathematics, engineering fundamental and engineering specialist.
2. Ability to ASSESS the specific design of complex unit process and unit operation in Environmental Engineering field.
3. Ability to APPLY the environmental and sustainability on the impact in the societal and environmental contexts.
4. Ability to FUNCTION as an individual and as a member or leader in diverse teams.
5. Ability to DEMONSTRATE communication effectively on engineering activities, verbally and written, with the engineering community and with society at large.

6. Ability to EVALUATE knowledge and understanding of engineering management principles and economics evaluation to manage environmental engineering design project.

AMJ48103 REKA BENTUK PROJEK BERINTEGRASI II [INTEGRATED DESIGN PROJECT II]

No of Credits: 3

Course Synopsis:
The AMJ48103 Integrated Design Project (IDP) 2 is a team based project undertaken by all final year students. It is a continual project from AMJ47103 in semester 1. The engineering capstone course aims to give students experience of the type of multi-disciplinary projects that are now common in industry. Students are expected to implement knowledge and skills obtained throughout the programme in solving specific engineering problem. Students are also required to practice proper ethics, professional responsibilities and entrepreneurship skills in providing a sustainable solution via functioning in a multidisciplinary team. Every student is required to plan and manage their project through the supervision of the IDP team. Solving the problem using proper knowledge and skills shall help the student to understand the need for life-long learning. Students also required to demonstrate their project during viva/presentation.

Course Outcomes:
1. Ability to compose complex engineering problems reaching substantial conclusions using first principles of natural sciences and mathematics, fundamental and civil engineering specialist.
2. Ability to analyze the societal, health, safety, legal and cultural issues as well as the responsibilities of professional engineering in solving the civil engineering design.
3. Ability to extend ethical principles and commit to professional ethics as well responsibilities and norms of civil engineering practice.
4. Ability to function effectively as an individual and as a member or leader in teams.
5. Ability to demonstrate communication effectively, verbal and written on civil engineering activities.
6. Ability to determine the need for and to engage in independent and life-long learning of the technological change in civil engineering.
7. Ability to evaluate knowledge and understanding of engineering management principles and economics evaluation to manage civil engineering design project.

AMJ48203 INTEGRATED ENVIRONMENTAL ENGINEERING DESIGN PROJECT II [REKA BENTUK PROJEK KEJURUTERAAN ALAM SEKITAR BERINTEGRASI II]

No of Credits: 3

Course Synopsis:

The AMJ48203 Integrated Environmental Engineering Design Project II is a team-based project that all final year students are required to complete. It is a continuation of the semester one project from AMJ47203 which will then be developed to the point of producing a detailed design that will be adopted during the final integrated design project phase, while considering environmental (sustainability), health and safety, ethics, and economic concerns. Students are expected to apply the knowledge and skills acquired throughout the course to the solution of a particular engineering problem. Additionally, students are expected to demonstrate proper ethics, professional responsibilities, and entrepreneurial abilities while collaborating on a multidisciplinary team to provide a sustainable solution. Finally, students will create the primary deliverables, which will include an explanation of design concepts, analysis and as well as design calculations. By the end of this course, students will understand the value of reviewing and selecting a feasible technical proposal, as well as the value of integrating and synthesizing knowledge from various disciplines of environmental engineering.

Course Outcomes:
1. Ability to design the specific complex unit process and unit operation in Environmental Engineering field.
2. Ability to use the design software(s) to assist the complex environmental engineering design work.
3. Ability to assess the societal and cultural issues as well as public health and safety responsibilities of a professional engineer practise in reporting the environmental engineering design
4. Ability to function as an individual and as a member or leader in diverse teams.
5. Ability to demonstrate communication effectively on engineering activities, verbally and written, with the engineering community and with society at large.
6. Ability to evaluate knowledge and understanding of engineering management principles and economics evaluation to manage environmental engineering design project

AMK10102 ASAS KEJURUTERAAN MEKANIK [FUNDAMENTAL OF ENGINEERING MECHANICS]

No of Credits: 2

Course Synopsis:

The aim of this course is to introduce the students to principals of engineering mechanics. Two portion of engineering mechanics (static and dynamic) will be covered in this course. Force Vector, Equilibrium of particle and rigid body, moment of inertia and kinematic of particle are some of the major topics which will be taught in this course.

Course Outcomes:

1. Ability to analyse and apply knowledge of engineering mechanics to solve problem related to stationary objects.
2. Ability to analyse and apply knowledge of engineering mechanics to solve problem related to object in motion.

AMK10203 TEKNOLOGI FIZIK [PHYSIC TECHNOLOGY]

No of Credit: 3

Course Synopsis:

This course equips students with basic concept on physics and its application especially in construction field. At the 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 be able to demonstrate the theory and its applications.

Course Outcomes:

1. Ability to DIFFERENTIATE the concept of magnetic field and electromagnetic force, Ohms law and Kirchhoffs law, basic mechanism of heat transfer and characteristic of sound.
2. Ability to EVALUATE the concept of magnetic field, electromagnetic force, interference of sound waves, Doppler effect, and the heat transfer by conduction through the flat the slab/wall, hollow cylinder, solid and so on.
3. Ability to PERFORM the experiment according to the fundamental of electricity Application of measuring instrument (Ohms law), series circuits, parallel circuits, heat transfer (Thermal conductivity, Measuring light intensity and acoustics, sound and wave).

AMK10302 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 challenges in construction industries.

Course Outcomes:

1. Ability to ANALYZE role of Civil Engineering technology and DISCUSS on function for each of Civil Engineering branches and constructions.
2. 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.
3. Ability to CONSTRUCT a house model consists of structural elements and infrastructure based on drawing in a group activity
4. Ability to orally DISCUSS sequence concept of construction work through presentation

AMK10402 LUKISAN TEKNIKAL [TECHNICAL DRAWING]

No of Credits: 2

Course Synopsis:

This course introduces student to the fundamental knowledge and skills on manual and computer aided drafting. Throughout the course, students will be exposed to the knowledge and techniques that relates to manual drafting on freehand sketching, lettering, geometry, projection, isometric and oblique drawing. Other than that, student will learnt on the fundamental techniques of using computer aided software in proving basic geometry and projection.

Course Outcomes:

1. Ability to CARRY OUT applicable techniques in completing the geometry drawing of manual drafting.
2. Ability to INTEGRATE the drawing information in completing the orthographic projection, isometric and oblique drawing of manual drafting
3. Ability to DEMONSTRATE the appropriate drafting techniques on preparing basic geometry and drawing projection by using computer aided software.

AMK10503 ASAS MEKANIK PEPEJAL [FUNDAMENTAL OF SOLID MECHANICS]

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:
1. Ability to EVALUATE the deformation, shear and bending moment, stress and strain reaction of structural member under axial load by using appropriate method.
2. 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.
3. Ability to COMMUNICATE verbally during laboratory interview session
4. Ability to COOPERATE in group activities for laboratory session

AMK10603 ASAS MEKANIK BENDALIR [FUNDAMENTAL OF FLUID MECHANICS]

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:
1. 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.
2. 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.
3. 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.
4. Ability to EXPLAIN to lecturer during presentation of mini project.

AMK10703 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 traverse 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 observation as well as the Electronic Distance Measurement (EDM). In addition, practical skills on the use and care of geomatic instruments are essential to experience the real working environment.

Course Outcomes:
1. 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
2. Ability to SOLVE in written, geomatic measurement problem by applying appropriate technique in geomat
3. Ability to CONDUCT survey using appropriate geomatics in-strument according to professional practice

AMK10802 LUKISAN PEMBINAAN [CONSTRUCTION DRAWING]

No of Credits: 2

Course Synopsis:

The course equips students with construction drawings skill either manually 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:
1. Ability to PREPARE manual drafting of construction drawing for a building
2. Ability to ADAPTS computer-aided drfating software in preparing construction drawing of a building

AMK20102 TEORI STRUKTUR [STRUCTURAL THEORY]

No of credits: 2

Course Synopsis:
This course provides students with a clear and thorough 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:
1. Ability to evaluate the internal member forces and deformations for determinate structural systems.
2. Ability to build a sustainable bridge model based on determinate structural system of trusses

AMK20203 HIDRAULIK DAN HIDROLOGI [HYDRAULIC AND HYDROLOGY]

No of credits: 2

Course Synopsis:
This course builds on the fundamentals given in Fluid Mechanics and reinforces students' understanding of the behavior 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. This course also will be introduced the hydrology theory derived from the natural process of the hydrological cycle. Hydrology introduces the application of hydrological theory to solve the problem in water resources engineering. Planning, development, management, and design of water resources projects require knowledge in hydrology.

Course Outcomes:
1. Ability to analyze the concept of hydrology based on MSMA 2 and water flow in open channels using the fundamental concept of hydraulic.
2. Ability to evaluate rainfall data using fundamental concept of hydrology based on MSMA 2 and water flow channels as well as closed conduit using the fundamental concept of hydraulic.
3. Ability to perform the experiment on hydrology and hydraulic according to appropriate standards and codes.

AMK20303 MEKANIK TANAH [SOIL MECHANICS]

No of credits: 3

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 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 relationship, compaction, permeability and seepage, stresses and effective stresses, shear strength and consolidation are also covered.

Course Outcomes:
1. Ability to analyse in written and verbal, fundamental concept consists in soil mechanics including soil characteristics, seepage, stress distribution, shear strength, compaction and consolidation.
2. Ability to evaluate engineering problems related to soil using appropriate method and principal of soil mechanics.
3. Ability to perform experiment related to soil testing according to BS1377

AMK20403 BAHAN BINAAN [CONSTRUCTION MATERIALS]

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 behaviour 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.

Course Outcomes:
1. Ability to DETERMINE & EVALUATE types of material used in concrete and their manufacturing process.
2. Ability to DETERMINE & EVALUATE, other construction material namely steel, timber, bricks, geopolymer and their properties.
3. Ability to PERFORM & MEASURES physical and mechanical properties of Construction Material by laboratorial testing.

AMK20503 KHIDMAT BANGUNAN I [BUILDING SERVICE I]

No of credits: 3

Course Synopsis:

An overview on overall building services system and understanding it functionalities in building operation is the main objective 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. Students also need to produce a simple mechanical and electrical design that's always been expected from a Building Technologist.

Course Outcomes:

1. Ability to EVALUATE mechanical and electrical (M&E) services i.e Plumbing and Sanitary system; fire protection system and in terms of operation and maintenance in modern building.
2. Ability to DEVELOP building services systems i.e. Building lighting system; Vibration and noise mitigation, and Electrical system in terms of operation and maintenance in modern building.
3. Ability to ARRANGE Electrical installation systems in modern buildings in terms of operation and maintenance.
4. Ability to DEMONSTRATES building services system i.e plumbing, single phase wiring installation and fire protection system in term of operation and maintenance in relation to building facilities.

AMK20602 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 deformations and moment distribution.

Course Outcomes:

1. Ability to ILLUSTRATE internal member forces diagram for indeterminate structural systems by using Method of Consistent Deformations
2. Ability to ASSESS the changes in internal member forces exerted for different types of structural system materials by using Moment Distribution Method
3. Ability to ANALYZE indeterminate structural system by using software/computer approach based on stiffness method

AMK20703 PENGURUSAN PROJEK PEMBINAAN [CONSTRUCTION PROJECT MANAGEMENT]

No of credits: 3

Course Synopsis:
This course aims to teach students on how to apply the project management 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:

1. Ability to discuss the process of project management, work plans of the construction cycle, construction procurement and project cost estimation.
2. Ability to demonstrate project management activities using appropriate tools (Microsoft Project)
3. Ability to adapt Project Management Tools for coordinating all activities in site construction.

AMK20803 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 construction 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:

1. 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.
2. 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).

3. 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.
4. Ability to UTILISE the procedure and the process by using the MS-Excel and Autodesk-Revit software or any relevant software available.

AMK20903 KHIDMAT BANGUNAN II [BUILDING SERVICE II]

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:
1. 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.
2. 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.
3. 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.
4. 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.
5. 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.

AMK21003 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:
1. 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.
2. Ability to STUDY the occupational hazards and evaluate associated risks at the workplace.
3. Ability to INVESTIGATE effective remedial or mitigation measures to control the hazards and risks at the workplace.
4. 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.

AMK21104 GEOTEKNIK [GEOTECHNICS]

No of credits: 2

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:
1. Ability to EXPLAIN main component in geotechnical engineering consist of site investigation, foundation, lateral earth pressure and slope stability.
2. Ability to ANALYZE soil bearing capacity, active and passive earth pressure and slope stability.
3. Ability to DESIGN foundation and earth retaining structure using principle of geotechnical engineering.
4. Ability to CONDUCT geotechnical laboratory test using appropriate instrument according to BS1377.

AMK30103 REKABENTUK STRUKTUR I [STRUCTURAL DESIGN I]

No of credits: 3

Course Synopsis:
This course introduces limit state design for reinforced concrete structure. The analyse of structure and section are introduced to assist in the design of reinforced concrete structure. At the end of the course, the students are expected to be able to design reinforced concrete structure according to Eurocode 2.

Course Outcomes:
1. Ability to analyse of structure and/or section at Limit State
2. Ability to design reinforced concrete structure according to Eurocode 2
3. Ability to perform in using modern tools for drawing, analysis and / or design of reinforced concrete structures

AMK30203 TEKNOLOGI PEMBINAAN I [CONSTRUCTION TECHNOLOGY I]

No of credits: 3

Course Synopsis:
Construction Technology I 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 and equipments in addition to Building Information Modelling (BIM).

Course Outcomes:
1. Ability to DISCUSS building construction technology (masonry, carpentry, substructure & superstructure, framed building, finishes, internal fixtures and fittings, insulation, roofing, services and plant & equipment practices and procedures).
2. Ability to DEMONSTRATE Building Information Modeling (BIM) using appropriate tool
3. Ability to ADAPT Building Information Modeling (BIM) tool for coordinating & interfacing work in construction

AMK30303 TEKNOLOGI LEBUHRAYA DAN LALULINTAS [TRAFFIC AND HIGHWAY TECHNOLOGY]

No of credits: 3

Course Synopsis:
The course introduces the student with the basic and background of traffic, road, and highway technologies. The sub-topic discussed in road and highway technologies are pavement material design and evaluations, pavement construction technologies, pavement structural thickness design, pavement evaluation, and pavement maintenance. For traffic technologies, major topic includes driver behavior and traffic interactions, fundamental theory of speed-flow-density relationship, road performance analysis, traffic data collection & analysis, design of traffic signal control system, and highway geometric design.

Course Outcomes:
1. Ability to DISCUSS main component in road/highway and traffic engineering technology using fundamental concept of design and construction for road/highway and traffic analysis.
2. Ability to DESIGN pavement structure and traffic signal-controlled system or road geometry using appropriate standard in Malaysia.
3. Ability to PERFORM the experiment on road/highway and traffic according to appropriate standard and codes.

AMK30402 PENTADBIRAN KONTRAK DAN TAPAK [CONTRACT AND SITE ADMINISTRATION]

No of credits: 2

Course Synopsis:
This course introduces the administration of a project including award of the contract, progress claims, instructions, variations, certificates, claims, cash flow and disputes resolution. At the end of the course, the students are expected to be able to identify the use of various construction documents including the administrative process with relate to practice of value engineering and use their knowledge in site administration to promote ethical and better image of the construction industry.

Course Outcomes:
1. Ability to ANALYZE the major types of contracts commonly adopted in the construction industry.
2. Ability to PLAN the use of various construction documents and the administrative process.
3. Ability to ORGANIZE the construction documents provided by a construction manager including the practice of value engineering & constructability.

AMK30503 PENGURUSAN KEWANGAN DAN SUMBER MANUSIA [FINANCIAL AND HUMAN RESOURCE MANAGEMENT]

No of credits: 3

Course Synopsis:

This course aims to provide knowledge on financial and human resources management techniques and skills that are in line with the construction industry needs of competent construction players. This course will enable students to be exposed to the concept and foundation of decision making in financial and engineering economics such as economic equivalence, interest formula, and methods of evaluation such as present worth, annual worth, and rate of return analysis. In addition, students will be exposed to the related disciplines in human resources management as guidance for managing people in an organization.

Course Outcomes:

1. Ability to UNDERSTAND the concepts of human resources management and organizational behavior needs.
2. Ability to APPLY the related disciplines needed in order to manage people in the construction project organization.
3. Ability to ANALYZE the project financial and engineering economics concept and principles in the construction project organization.
4. Ability to RESPOND effectively the functions of financial and human resources management in construction project organization planning.

AMK30603 UKUR BANGUNAN [BUILDING SURVEYING]

No of credits: 3

Course Synopsis:
In the present, practical guide in Building Surveying is important in construction industry. In this course, students will be taught to identify common defects in building structures, repairs which may be undertaken, methodology used 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.

Course Outcomes:

1. Ability to CLASSIFY the component in building surveying and EXPLAIN the method of measurement based on equipments and procedures.
2. Ability to ANALYSE the factors that will affect structural elements and IDENTIFY the diagnosis pattern of insect attact to timber elements.
3. 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.
4. Ability to PRESENT the building surveying defects analysis that relates to particular phenomenon.

AMK30703 REKABENTUK STRUKTUR II [STRUCTURAL DESIGN II]

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:

1. Ability to manually ANALYSE steel and timber structural elements subjected to permanent and variable actions as recommended by Eurocode 1
2. Ability to manually DESIGN steel and timber structural elements using Eurocode 3 and Eurocode 5
3. Ability to PRODUCE detail drawing by using computerized assisted software for steel and timber structural elements based on design calculation.

AMK30803 TEKNOLOGI PEMBINAAN II [CONSTRUCTION TECHNOLOGY II]

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:
1. Ability to DISTINGUISH Drainage, Water Reticulation and Sewerage System.
2. 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.
3. Ability to DEMONSTRATE about Instrumentation as well as Non-Destructive Tests (NDT) and Destructive Tests used in Repair and Rehabilitation Works.

AMK30004 PROJEK SARJANA MUDA I [BACHELOR DEGREE PROJECT I]

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:
1. Ability to CARRY OUT written research proposal and reports based on area of research specifications.
2. Ability to INITIATE analytical and critical thinking in identifying and solving problem that relates to area of specifications through written research proposal and report.
3. Ability to DESIGN suitable research method according to area of specification in the written research proposal and report.
4. Ability to ADAPTS engineering tools in preparing standard requirements of research writing.
5. Ability to DEFEND the research proposal and progress report.
6. Ability to ARRANGE systematically and independently the research project with professional ethics and norms based on standard proceeding and protocols.

AMK30903 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 engineering 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 Environmental 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:
1. 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.
2. Ability to CONDUCT lab work/ experiment by using lab manual
3. Ability to DEMONSTRATE the requirements in implementing an ISO 14001, EMS costing and audits
4. Ability to ANALYZE EIA and & EM process & methods in Malaysia based on Environmental Quality Act and Regulations

AMK31003 TEKNOLOGI LEBUHRAYA DAN JAMBATAN [HIGHWAY AND BRIDGE TECHNOLOGY]

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:
1. Ability to DIFFERENTIATE in detail current main components and established construction technique for highway and bridge.
2. Ability to PROPOSE sustainable solution in highway and bridge construction system using proven technology.
3. Ability to DISCUSS mini project assessment in highway and bridge construction technology

AMK31103 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:

1. Ability to UNDERSTAND and DESCRIBE the definition of risk management, objectives of risk management and risk management process.
2. Ability to EXPLAIN and analyze risk in development projects including risk management, risk of damage to the project and risks to the people
3. Ability to DISCUSS the risk assessment, risk analysis and risk identification.
4. Ability to EXPLAIN the risk reduction in construction stage including strategic planning and risk transfer.

AMK31203 TEKNOLOGIST KEJURUTERAAN AWAM DALAM MASYARAKAT [CIVIL ENGINEERING TECHNOLOGIST IN SOCIETY]

No of credits: 3

Course Synopsis:

This course aims to explain the main concepts in engineering and technology ethics and risk management as well as to expose the students to basic of law in the 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 requirements related engineering and technology field.

Course Outcomes:

1. Ability to EXAMINE the issues and challenges of engineering and technology ethics.
2. Ability to ASSESS hazards, the function of risk management and occupational safety and health (OSHA).
3. Ability to INTEGRATE professional Commitment aspects and procedures of legal in engineering and technology issues.

AMK40103 TEKNOLOGI PEMBINAAN BANGUNAN BERINDUSTRI [INDUSTRIAL 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 build ability. And also expose students the components and construction method of IBS. Student are also exposed to the IBS Pre-Cast Method which also involves the construction of high-rise buildings.

Course Outcomes:

1. Ability to CARRYING OUT the concept of IBS modern construction technology and several types of IBS structure
2. Ability to EVALUATE the component and construction method of IBS, Principle of Score calculation and Modular Coordination in IBS
3. Ability to IDENTIFY the impact of IBS concept related to sustainability development.

AMK40204 TEKNOLOGI PEMBINAAN PROJEK BERSEPADU [CONSTRUCTION TECHNOLOGY INTEGRATED PROJECT]

No of credits: 4

Course Synopsis:

This course introduces the project related to construction technology in grouping work. The given project task is based on real construction project. All knowledges and practical skills including design, project management, modelling, and construction process which have been exposed in previous course in this programme, will be applied in this course to accomplish the given project. At the end of this course, the project proposal will be evaluated for each stages involved in the project. This will help student to understand the real construction project work that suit to technologist with good knowledge and skill in construction industry.

Course Outcomes:

1. Ability to design civil and structural component using engineering fundamentals and principles by referring to relevant codes and standards.
2. Ability to propose construction project management related problem that required specific needs with appropriate consideration and techniques.
3. Ability to suggest construction related problem that required specific needs with appropriate consideration for safety, health, societal and cultural issues with appropriate techniques.
4. Ability to perform appropriate experiment related to the construction project according to relevant codes and standards.
5. Ability to complete the project management and model using modern construction tools.
6. Ability to practice responsibility as individual, team and leader to ensure project successfully accomplished.

AMK40006 PROJEK SARJANA MUDA II [BACHELOR DEGREE PROJECT II]

No of credits: 6

Course Synopsis:

This course is the continuity of Bachelor Degree Project 1. With the aid of guidance from the supervisor (academic staff), the students will continue their research project which has been planned during the Bachelor Degree Project 1. In this course, student also exposed to journal writing. At the end of the project, each student prepares thesis report, presents and demonstrates research findings.

Course Outcomes:

1. Ability to defend the research components during presentation session.
2. Ability to prepare the research project with discipline, standard procedures and protocols.
3. Ability to demonstrate an understanding of the impact of research project on sustainable development in terms of economic, social, technology and environment.
4. Ability to outline the significance of research project in terms of commercialization value in the thesis and during presentation session.
5. Ability to produce thesis and technical report at the end of the course.

AMK40303 REKABENTUK STRUKTUR TERMAJU [ADVANCED STRUCTURE DESIGN]

No of credits: 3

Course Synopsis:

This elective course provide additional knowledge on the effects of dynamic loads on structures, resonance, modal analysis, wind pressure, aerodynamic technologies, base shear force due to earthquake ground motions, response spectra, time history, structural damage classifications, energy dissipation for structures and structural health monitoring for structures under dynamic loads.

Course Outcomes:

1. Ability to REVISE the effects of dynamic loads on structures, resonance, modal analysis, wind pressure, aerodynamic technologies, base shear force due to earthquake ground motions, response spectra, time history, structural damage classifications, energy dissipation for structures and structural health monitoring for structures under dynamic loads.
2. Ability to DISSECT the structural performance analysis of structures under dynamic loads.
3. Ability to INTERPRET fundamental performance and behavior of buildings under dynamic loads.

AMK40403 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:

1. Ability to CATEGORISE the lateral system by considering wind and seismic loading applied on highrise building
2. Ability to RECOMMEND the construction process technology towards sustainable development for high-rise building
3. Ability to DEFEND the structural system/form through high-rise model in mini project assessment

AMK40503 SISTEM MAKLUMAT PENYELENGGARAAN BANGUNAN [BUILDING MAINTENANCE INFORMATION SYSTEM]

No of credits: 3

Course Synopsis:

This course is designed to introduce students to building maintenance and enhance their knowledge on management method that seems to become mislaid from time to time due to poor service delivery, inadequate finance, poor maintenance planning and maintenance backlogs. It will emphasize on the principles and practices relating to maintenance management in facilitating the assessment, planning and execution processes in relation to building facility. At the end of the course students should be able to apply, evaluate and develop the information system (i.e. database management) suitable for the building maintenance work on defect report and information transfer techniques with the aid of building information modelling technology.

Course Outcomes:

1. Ability to apply principles and practices relating to maintenance of building in construction engineering
2. Ability to evaluate effective method for building maintenance information system
3. Ability to build complex maintenance information system with the aid of modern engineering tools

AMK49912 LATIHAN INDUSTRI [INDUSTRIAL TRAINING]

No of credits: 12

Course Synopsis:

The practical-based course exposes students to a company technical functions and organizational structure and operation such as departmental function, work procedure, communication, technical skills and project management. During this course, the students will apply knowledge learned in the university and increased the related skills required in their future profession.

Course Outcomes:

1. Ability to combine technical knowledge and practical skills.
2. Ability to practice the health, safety, legal and cultural issues in working environment
3. Ability to interpret the impact of engineering technology solutions in societal and environmental context and display the need of sustainable development.
4. Ability to display good work performance and ethics during training period
5. Ability to perform as individual, a member or leader in diverse technical teams
6. Ability to display effective communication practice and operate assigned task given by host company
7. Ability to practice independent and lifelong learning in specialist technologies

AMT10106 BUILDING TECHNOLOGY 1 [TEKNOLOGI BANGUNAN 1]

No of Credits: 6

Course Synopsis:
Building Technology I, will introduce students the processes of construction and procedures. Students will learn about construction technology and construction materials. This course incorporates hands-on experience through labs that may be done on campus or at a building site. Students will learn the basics of technical drawing and plan reading, Standard specification of building works and building materials. Student also will be exposed to basic components of a building structure such as foundation, floors, walls, beams, columns, stair and roof.

Course Outcomes:

1. Ability to DESCRIBE basic procedure, methods, techniques, technology, and materials for building construction
2. Ability to PERFORM building technology skill in laboratory and various activities for building construction
3. Ability to DEMOSTRATES the idea and basic procedure, methods, techniques, technology, and materials for building construction

AMT10206 BUILDING SERVICES TECHNOLOGY 1 [TEKNOLOGI PERKHIDMATAN BANGUNAN 1]

No of Credits: 6

Course Synopsis:
Building services are the systems installed in buildings to make them comfortable, functional, efficient and safe. Aims of this course are to enrich Building Construction Technologist students with the responsibility for the design, installation, operation and monitoring of the technical services in buildings (including mechanical, electrical and public health systems, also known as MEP or HVAC), in order to ensure the safe, comfortable and environmentally friendly operation. This course will covers six main chapters which are: (i) Cold Water and Supply Systems, (ii)Hot Water Supply System, (iii) Electrical Systems, (iv) Fire Protection System, (v) Drainage Systems, Sewage Treatment and Refuse Disposal and (vi) Sanitary Fitments And Appliances: Discharge And Waste Systems.

Course Outcomes:
1. Ability to APPLY the solution due to various situation, problems and task given in building services system
2. Ability to COORDINATE building services systems in terms of operation and maintenance in various types of building services system according to task and problem given.
3. Ability to DESIGN the building services system in term of operation and maintenance in relation to building facilities
4. Ability to PERFORM commissioning of equipment in the modern building.

AMT10305 BUILDING TECHNOLOGY 2 [TEKNOLOGI BANGUNAN 2]

No of Credits: 5

Course Synopsis:
Building Technology 2 introduces students to construction processes and procedures. Students will learn about construction technology, construction materials and management, and project design. This course is designed to expose students to the concepts of modern method in construction and innovative techniques in construction which includes the advantages and disadvantage of using them. This subject highlighted Industrialized Building System (IBS) which been introduce by CIDB Malaysia. Students will learn about the concept of Score Calculation and submission, Principal of Modular Coordination in IBS and concepts of buildability. The course content is in line with Malaysia's national agenda to transform the construction industry, with the primary objective of transforming the construction industry towards becoming highly productive, environmentally sustainable, with globally competitive players and a focus on safety and quality standard.

Course Outcomes:
1. Ability to DESCRIBE and classify methods, procedure, techniques, advantages , disadvantages and technology in modern method of construction
2. Ability to APPLY modern method of construction skill in construction activity/project
3. Ability to EVALUATE the Principle of Score Calculation and its submissions
4. Ability to COMMUNICATE & present IBS concept in Malaysia, effectively.

AMT10405 BUILDING SERVICES TECHNOLOGY 2 [TEKNOLOGI PERKHIDMATAN BANGUNAN 2]

No of Credits: 5

Course Synopsis:
This course is extended from Building Services Technology 1. This course will cover four main chapters. The chapters are electrical supply system, mechanical system in buildings, mechanical and and electrical services coordination and current technologies in building services.

Course Outcomes:
1. Ability to DETERMINE the solution to the various situations, problems in building technology services
2. Ability to MODIFY building services systems in terms of operation and maintenance in various types of building according to task and problem given
3. Ability to DESIGN the building services system in term of operation and maintenance in relation to building facilities
4. Ability to EXPLAIN by presenting the function and electrical consideration in monitoring safety and rules of regulation

AMT10503 INDUSTRIAL REVOLUTIONS [REVOLUSI PERINDUSTRIAN]

No of Credits: 3

Course Synopsis:
This aim of this course is to describe the Construction 4.0 framework and consequently highlight the resultant processes and practices that allow us to plan, design, deliver, and operate built environment assets more effectively and efficiently by focusing on the physical-to-digital transformation and then digital-to-physical transformation. This course will enable students to be exposed with the technological transformations related with industrial production, cyber-physical and digital technologies which currently shape the construction industry.

Course Outcomes:
1. Ability to DRAW a logical conclusion from the presented information related to the technological revolution and its impact towards the construction industry.
2. Ability to RELATE the evolution of technology advancement with application in the construction practice.
3. Ability to DEMONSTRATE the ability to adapt with new skills on the use of current digital technologies that relates to the construction industry.

AMT20106 PROJECT QUALITY MANAGEMENT [PENGURUSAN KUALITI PROJEK]

No of Credits: 6

Course Synopsis:
This course emphasizes on project quality management which is a process of quality that managed and maintained throughout a project. The course focuses on the context that implied the quality that leading to a perfection. In this course, students will be exposed more about ensuring quality consistency throughout a project. Students should be able to acknowledge the fundamental of quality is beholden on what the customer or stakeholder needs from the project, which hold different criteria according to project basis.

Course Outcomes:
1. Ability to APPLY the fundamental and process of Project Quality Management
2. Ability to ANALYSE the problem based onproject quality management system with standard required in construction industry
3. Ability to DEMONSTRATE proficiency in using quality management tools that apply in construction industry.
4. Ability to ORGANISE a team in conducting project quality activities that relate to construction industry.

AMT20206 CONSTRUCTION PROJECT MANAGEMENT [PENGURUSAN PROJEK PEMBINAAN]

No of Credits: 6

Course Synopsis:
This course aims to provide the knowledge of construction project management skills that inline the industry needs of competent construction project managers. This course will enable students to be exposed to all disciplines and processes on construction project lifecycles such as project initiation, planning, execution, control, and monitoring, and also project closing as guidance for managing the successful construction project.

Course Outcomes:
1. Able to APPLY the all disciplines need to be considered in construction project management.
2. Able to ANALYSE the management process of construction project lifecycles.
3. Able to DEMOSTRATE the construction project management lifecycles activities.
4. Able to ORGANIZE the construction project management in handling project dispute.

AMT20303 PSYCHOLOGY IN INDUSTRY [PSIKOLOGI DALAM INDUSTRI]

No of Credits: 3

Course Synopsis:
This course is concerned on the understanding of psychology in the workplace. The learning content focuses on organisational background, attitudes, behavior, recruitment, issues, motivation, stress management, conflict, employee performance and healthy workplace. This course emphasized on people skills that encapsulated in between employers and employees that collaborating to improve healthy workplace and sustain the organisational productivity.

Course Outcomes:
1. Ability to ANALYSE the psychological issues that relate to organisational workplace in construction industry
2. Ability to ORGANISE psychological issues, organisational behavior, and managing peoples in construction workplace
3. Ability to EVALUATE the psychological issues in organisation to achieve healthy workplace environment

AMT20404 HUMAN RESOURCE AND PROFESSIONAL ETHICS [SUMBER MANUSIA DAN ETIKA PROFESIONAL]

No of Credits: 4

Course Synopsis:
This course aims are to provide the knowledge of human resource and professional ethics skills focusing in construction management perspective. This course will enable the students to be exposed on the theories, concept and process of human resource and professional ethics organization such as job analysis and design, staffing and recruitment, training and development and also managerial leadership as guidance to lead companies and organizations effectively.

Course Outcomes:
1. Ability to UNDERSTAND the theories and concepts of human resource management and professional ethics in the organization.
2. Ability to APPLY the process and procedure of human resources and professional ethics in the organization.
3. Ability to RESPOND to the roles and functions of human resources and ethical awareness and professionalism in an organization.
4. Ability to PERFORMS creativity and managing skills with professional ethics in human resource development.

AMT20504 SAFETY, HEALTH AND ENVIRONMENTAL MANAGEMENT [PENGURUSAN KESELAMATAN, KESIHATAN DAN ALAM SEKITAR

No of Credits: 4

Course Synopsis:
This course expose students to the knowledge and skills on the safety and health management that enable them to practice safety and health in the workplace. This course covered law, regulations and requirements taht relates to workplace safety and health, principles of safety and health management and the assessment of safety and health hazard in the workplace. At the end of course, students enable to conduct the hazard identification, risk assessment and risk control, interpret OSH legal requirements, explain the occupational safety and health management systems and plan the occupational safety and helath programme.

Course Outcomes:
1. Ability to DESIGN program for occupational safety and health.
2. Ability to PERFORM tasks based on recent and relevant acts of Occupational Safety and Health.
3. Ability to DETERMINE recent technique in reporting accidents/ incidents based on requirements of OSHA 1994, FMA 1967 atau JKKP.
4. Ability to PRACTICE an awareness of management and practices in real perspective in Occupational and Health.

AMT20604 CONSTRUCTION VALUE ESTIMATION AND PROCUREMENT [ANGGARAN NILAI PEMBINAAN DAN PEROLEHAN]

No of Credits: 4

Course Synopsis:
This course in focus on the estimating, contractual tendering and procurement method in building construction work. The concept of project bidding, preparing estimation and deciding the procurement approach according to case studies basis will be introduced in this course. The fundamental of estimating, contractual tendering and procurement are essential to improve the contractual matters in building construction (pre–determined) before the construction phase.

Course Outcomes:
1. Ability to APPLY the fundamental and proces of project estimating
2. Ability to ANALYSE the appropriate contractual matters in tendering and procurement related to construction industry basis
3. Ability to DEMONSTRATE the project quantification process using any relevant computer aided estimating software
4. Ability to ORGANISE the fow of project estimation, contractual tendering and procurement methods related to construction industry project

AMT20704 PROJECT TECHNOPRENEUR 1 [TEKNOUSAHAWAN PROJEK 1]

No of Credits: 4

Course Synopsis:
Technopreneur is one of the important courses in developing and managing a business venture related to the construction industry in order to gain profit by taking several risks in the corporate world. This course is a pre-requisuite course to AMT30304: Project Technopreneur 2. Students will be introducing to the theory of entrepreneurship and its practical implementation. It focuses on different stages related to the entrepreneurial process, including business model innovation, monetisation, small business management as well as strategies that improve performance of new business ventures.

Course Outcomes:
1. Ability to ANALISE potential business venture based on current business demand.
2. Ability to CONSTRUCT potential product or service business feasibility.
3. Ability to DEMONSTRATE of awareness of management and technopreneurship practices in real perspective.

AMT30106 DEMOLITION AND CONSTRUCTION WASTE MANAGEMENT [PENGURUSAN PEROBOHAN DAN SISA PEMBINAAN]

No of Credits: 6

Course Synopsis:
This course aims to provide the knowledge and insights on the building demolition and construction waste management. This course will enable the students to be exposed on the preparation, process, and management on building demolition work planning and execution, safety and risk measure on building demolition work and also with respect to environmental degradation resulting from demolition activities, one of the major concerns is the production of construction and demolition (C&D) wastes as guidance to managing whole process of demolition towards minimising waste and moving towards sustainable construction practices

Course Outcomes:

Ability to APPLY the knowledge on building demolition and construction waste management
Ability to ANALYSE the demolition process and construction waste management in the construction sites.
Ability to DEMONSTRATE the preparation of building demolition work planning and execution activities which respect to the Waste Management Plan (WMP).

Ability to PERFORMS the consciousness of management skills on the building demolition and construction waste management.

AMT30206 BUILDING INFORMATION MODELLING [PEMODELAN MAKLUMAT BANGUNAN]

No of Credits: 6

Course Synopsis:
Building Information Modelling (BIM) is modelling technology and associated set of processes to produce, communicate and analyse digital information models for construction project life cycle. As this course is a totally practice-based, students will be unveiled to the step by step of using BIM related software on Architectural and civil & structrual modelling as well as integreated modelling. At the end of the course it will prepare the students towards competency of using BIM related software.

Course Outcomes:
1. Ability to DIFFERENTIATE the fundamental between architectural and structural modeling
2. Ability to ASSEMBLE tools and technique to solve the problem using BIM software
3. Ability to PRACTICE schematic diagram in building services
4. Ability to ORGANISE responsibilities in mentoring building information system

AMT30304 PROJECT TECHNOPRENEUR 2 [TEKNOUSAHAWAN PROJEK 2]

No of Credits: 4

Course Synopsis:

This course is a continous course for AMT20704: Project Technopreneur 1. Students will be centered around a mixture of theoretical exploration as well as case studies of real-construction industry business examples and guest lectures, students will develop an understanding of successes, opportunities and risks of entrepreneurship. Students will also develop skills in written business communication and oral presentations that allow students to integrate entrepreneurship concepts and interact with construction industry experts.

Course Outcomes:
1. Ability to DEVELOP potential business venture based on current business demand
2. Ability to CONSTRUCT final product or service business feasibility
3. Ability to EXHIBIT internalising value by engaging all stakeholders through commercializing business product or services.

AMT30405 BUILDING REQUIREMENTS AND LAW [KEPERLUAN DAN UNDANG-UNDANG BANGUNAN

No of Credits: 5

Course Synopsis:
This course will be exposed the students with the overview of building requirements and law that have been practiced in relation to the building projects. During the Work Based Learning, students will be provided with real-life work experiences where they can apply knowledge of building laws and any available building requirements related to the current practice.

Course Outcomes:
1. Ability to DEMONSTRATE understanding on provision and relevant requirements regarding building construction projects.
2. Ability to ADOPT all the requirements required in building construction projects.
3. Ability to COMPLY with all laws, regulations and requirements enforced by statuary bodies in building construction projects.
4. Ability to ARRANGE a project submission for building construction projects approval by authoritie

AMT30505 BUILDING ASSESSMENT AND REPORTING [PENILAIAN DAN PELAPORAN BANGUNAN]

No of Credits: 5

Course Synopsis:
This course will be exposed the students on the Building Condition Assessment (BCA) implementation in area of building projects. The process of building auditing and evaluation in term of knowledge and procedure will be explained. Students will understand the concept of BCA and able to produce audit report on the corrective measures to ensure building meet the Malaysian Building Requirement Standard.

Course Outcomes:
1. Ability to APPLY the condition assessment standard based on stages of construction process
2. Ability to ANALYSE the building elements for Building Condition Assessment Rating Tools
3. Ability to OGRANISE Building Condition Assessment Rating Tools based on construction industry projects
4. Ability to PERFORM Building Condition Assessment Rating Tools based on construction industry manual

AMT30001 FINAL YEAR PROJECT 1 [PROJEK TAHUN AKHIR 1]

No of Credits: 4

Course Synopsis:
The Final Year Project is one of the capstone coures for this programme and a pre-requisuite course to AMT30002: Final Year Project 2. This course requires students to conduct a research that relates to building construction sector. The research either a real-life problem proposed or a research-oriented or a research that relates to industry-based project or software development. Students will be assisted by industry / academic supervisor in conducting the research but need to identify the problem boundaries, investigate and propose possible solutions, explore the appropriate methodology to deliver the research aims. In order to achieve the research aims, this course offers the students on the fundamental practice of stating the problem statements, forming the research objectives and literature searching as well as the techniques of research reporting and presentation.

Course Outcomes:
1. Ability to IDENTIFY issues or problems in construction industry and propose solutions
2. Ability to PROVIDES proposal for the implementation of Final Year Project
3. Ability to PRESENTS ideas related to research to panel evaluators systematically

AMT30002 FINAL YEAR PROJECT 2 [PROJEK TAHUN AKHIR 2]

No of Credits: 6

Course Synopsis:
This course is a continous course for AMT30001: Final Year Project 1 which offered in the previous semester. This course is to provide students an opportunity to undertake full end-to-end development of a substantial project by integrating and applying knowledge and skills they have acquired in their studies. In order to satisfy the project requirement, student with the assistant of industry / academic supervisor needs to solve a real-life problem proposed or take up a research-oriented project that focuses on direct research or carry on research that relate to industry-based project or conducting a research on software development in a particular research problem. As this is a continous course, students will be exposed to the research reporting and skills on the delivering the whole reserarch findings.

Course Outcomes:
1. Ability to CONDUCT the research according to an appropriate methodology
2. Ability to SOLVE a real-life problem proposed in Final Year Project 1
3. Ability to PRESENTS the research findings to panel evaluators systematically

AMT40112 INDUSTRIAL TRAINING [LATIHAN INDUSRTI]

No of Credits: 12

Course Synopsis:
This course will enable students to gain industrial experience about the real environment working in building construction field. Thus, the students will be acquired knowledge and practice on work culture, professionalism and ethic in the industry. In extence, this course able to develop students' technical knowledge and interpersonal skills as a preparation before embarking into the real building construction sector.

Course Outcomes:
1. Ability to APPLY productive work schedule
2. Ability to DEMONSTRATE good work performance, good communication skills, leadership and work ethics during training period
3. Ability to OPERATE assigned task given by host company.

FACULTY OF APPLIED AND HUMAN SCIENCES (FSGM)

Programmes Offered:

1. Bachelor of New Media Communication (Hons.)
2. Bachelor of Business (Honours) (International Business)
3. Bachelor of Business (Honours) (Engineering Entrepreneurship)

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Bachelor Of Business (Honours)(International Business)

PROGRAMME OBJECTIVES (PEO)

The Programme Objectives for the ***International Business Programme*** at Universiti Malaysia Perlis (UniMAP) is as follows:

PEO 1
Graduates who are managers

PEO 2
Graduates who are business leaders experienced in global/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

*At the end of the **International Business Programme**, the students are expected to attain the following attributes:*

PO 1
Ability to apply the theories and concepts of international business management in the work environment.

PO 2
Ability to analyse problems and enhance their problem solving and decision making skills.

PO 3
Ability to adapt business operation practices and principles currently used in professional business environment.

PO 4
Ability to collaborate professionally and ethically with multidisciplinary business teams.

PO 5
Ability to communicate effectively in business and work environment.

PO 6
Ability to use appropriate information and communication technology to engage in lifelong learning.

PO 7
Ability to propose solution for international business issues base on analysing numerical data and information.

PO 8
Ability to demonstrate leadership skills and responsibility in international business environments.

PO 9
Ability to identify international business opportunities by analysing global business trend.

PO 10
Ability to demonstrate professional entrepreneurship skills and innovativeness required for sustainable development.

PO 11
Ability to adopt professionally and ethically the social, cultural and environmental responsibilities and issues from a global perspective.

CURRICULUM STRUCTURE
UR6340001 BACHELOR OF BUSINESS (HONOURS) (INTERNATIONAL BUSINESS)
INTAKE 2021/2022

YEAR	FIRST			SECOND		Semester Break	THIRD	
SEMESTER	FIRST	SECOND		FIRST	SECOND		FIRST	SECOND
Business Program Core / Elective Courses	SMP10103 Principles of Economics	SMP15503 Business Ethics		SMP10703 Principles of Finance	SMP22103 Operations Management		SMP35106 Final Year Project	
	SMP10603 Principles of Accounting	SMP10803 Principles of Marketing		SMP22303 Human Resource Management	SMP22203 Managerial Accounting		SMP20403 International Finance	SMP33803 Strategic Management
	SMP10903 Principles of Management	SMP11603 Management Information System		SMP20203 International Business Management	SMP31803 Research Methodology		SMP20503 International Human Resource Management	SMP34403 Export Import Management
	SMP11503 Principles of Entrepreneurship	SMP11003 Organizational Behavior		SMP22403 Business Communication	SMP20303 International Economics		SMP33703 International Marketing	SMP31403 Cross-Cultural Management
	SMP11403 Business Quantitative Analysis	SMP21203 Business Franchising and Licensing		SMP22503 Digital Business	SMB4XX02 Foreign Language (Level4) **(Elective 1)**	**SMP29204 INDUSTRIAL TRAINING (8 weeks)**	SMP31603 Leadership in Organization	SMP34503 Global Economics Issues
	SMB1XX02 Foreign Language (Level 1) **(Elective 1)**	SMB2XX022 Foreign Language (Level 2) **(Elective 1)**		SMB3XX02 Foreign Language (Level 3) **(Elective 1)**	SMPXXX03 Elective **(Elective 2)**		SMPXXX03 Elective **(Elective 3)**	
University Required Courses and Foreign Language	SMU13002 Falsafah dan Isu Semasa	SMU32202 Kemahiran Berfikir		SMP11703 Time Management	SMB41002 Malay Language or SMB11002 Basic Malay		SMB31302 English for Academic Purposes (MUET ALL BANDS)	SMU13102 Penghayatan Etika dan Peradaban
	SMZ1XX01 Co-Curriculum (Uniformed Body)	SMZ2XX01 Co-Curriculum (Uniformed Body)						
120 units	**20**	**20**		**20**	**19**	**4**	**20**	**17**

Note:
1. Students who obtained MUET Band 1 and 2 have to take and pass SMB10102 Preparatory English course in Semester 1, year 1 and SMB20102 English for General Communication in semester 2, year 1, followed by SMB31302 English for Academic Purposes in semester 1, year 3.
2. Students who obtained MUET Band 3 and 3.5 have to take and pass SMB20102 English for Genaral Communcation in semester 2, year 1 followed by SMB31302 English for Academic Purposes in semester 1, year 3.
3. Student who obtained MUET band 4 and above will just need to take SMB31302 English for Academic Purposes in semester 1, year 3

Bachelor Of Business (Honours) (Engineering Entrepreneurship)

PROGRAMME OBJECTIVES (PEO)

The Programme Objectives for the ***Engineering Entrepreneurship Programme*** at Universiti Malaysia Perlis (UniMAP) is as follows:

PEO 1
Graduates who are managers

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

*At the end of the **Engineering Entrepreneurship Programme** , the students are expected to attain the following attributes:*

PO 1
Ability to apply the theories and concepts of engineering entrepreneurship in the work environment.

PO 2
Ability to analyse problems and enhance their problem solving and decision making skills.

PO 3
Ability to adapt business operation practices and principles currently used in professional business environment.

PO 4
Ability to collaborate professionally and ethically with multidisciplinary business teams.

PO 5
Ability to communicate effectively in business and work environment.

PO 6
Ability to use appropriate information and communication technology to engage in lifelong learning.

PO 7
Ability to propose solution for engineering entrepreneurship issues base on analysing numerical data and information.

PO 8
Ability to demonstrate leadership skills and responsibility in international business environments.

PO 9
Ability to identify international business opportunities by analysing global business trend.

PO 10
Ability to demonstrate professional entrepreneurship skills and innovativeness required for sustainable development.

PO 11
Ability to adopt professionally and ethically the social, cultural and environmental responsibilities and issues from a global perspective.

CURRICULUM STRUCTURE
UR6340002 BACHELOR OF BUSINESS (HONOURS) (ENGINEERING ENTREPRENEURSHIP)
INTAKE 2021/2022

YEAR	FIRST			SECOND		SEMESTER BREAK	THIRD	
SEMESTER	FIRST	SECOND		FIRST	SECOND		FIRST	SECOND
Business Program Core / Elective Courses	SMP10103 Principles of Economics	SMP10703 Principles of Finance	**SEMESTER BREAK**	SMP21303 Business Venture Management	SMP11603 Managing Information System	**SMP29104 INCUBATOR PROGRAM (8 WEEKS)**	SMP38103 Entrepreneurial Finance	SMP33803 Strategic Management
	SMP10603 Principles of Accounting	SMP10803 Principles of Marketing		SMP28103 Engineering Drawing	SMP21903 Product Design & Development		SMP15503 Business Ethics	SMP36203 Business Plan for Engineering Entrepreneurship Project
	SMP10903 Principles of Management	SMP11003 Organisational Behaviour		SMP22303 Human Resource Management	SMP22003 Technology Entrepreneurship		SMP22503 Digital Business	SMP22403 Business Communication
	SMP11403 Business Quantitative Analysis	SMP12103 Business Innovation		SMP31803 Research Methodology	SMP22103 Operations Management		SMP33903 Engineering System Design	SMP32603 Project Management
	SMP14203 Introduction to Engineering Technology	SMP11503 Principles of Entrepreneurship		SMP25203 Business Law	SMP22203 Managerial Accounting		SMP20203 International Business Management	Elective 3
				Elective 1	SMP25303 Entrepreneurial Marketing		Elective 2	Elective 4
University Required Courses and Foreign Language	SMU13002 Falsafah dan Isu Semasa	SMP16102 Contemporary Issues in Economics		SMU13102 Penghayatan Etika Dan Peradaban	SMB31302 English for Academic Purposes (MUET ALL BANDS)		SMU32202 Kemahiran Berfikir	
	SMZXXX01 Co-Curriculum (Uniformed Body)	SMZXXX01 Co-Curriculum (Uniformed Body)						
	SMB41002 Malay Language Or SMB11002 Basic Malay							
120 Units	**20**	**18**		**20**	**20**	**4**	**20**	**18**

NOTE:
1. Students who obtained MUET Band 1 and 2 have to take and pass SMB10102 Preparatory English course in Semester 2, year 1 and SMB20102 English for General Communication in semester 1, year 2, followed by SMB31302 English for Academic Purposes in semester 2, year 2.
2. Students who obtained MUET Band 3 and 3.5 have to take and pass SMB20102 English for Genaral Communcation in semester 1, year 2 followed by SMB31302 English for Academic Purposes in semester 2, year 2.
3. Student who obtained MUET band 4 and above will just need to take SMB31302 English for Academic Purposes in semester 2, year 2

Bachelor Of New Media Communication (Hons.)

PROGRAMME OBJECTIVES (PEO)

The Programme Objectives for the ***New Media Communication Programme*** at Universiti Malaysia Perlis (UniMAP) is as follows:

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

*At the end of the **New Media Communication Programme**, the students are expected to attain the following attributes:*

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
UR6321001 BACHELOR OF NEW MEDIA COMMUNICATION (HONS)
INTAKE 2021/2022

YEAR	FIRST		SECOND		THIRD	
SEMESTER	I	II	III	IV	V	VI
Discipline Core	SMM10103 Introduction to Communication Theory	SMM10603 Visual Communication	SMM20203 Digital Photography	SMM30303 Digital Marketing	SMM40103 Public Relations and New Media	SMM40803 Event Management
	SMM10203 Public Speaking	SMM20103 Organizational Communication	SMM20303 Graphic Design for New Media	SMM30403 Digital Video Production	SMM40203 Ethics and Law in New Media Communication	SMM40903 New Media Issues & Challenges
	SMM10303 Introduction to New Media		SMM20403 New Media Analysis	SMM30503 Web Design and Development	SMM40303 Animation for Integrated Media	
	SMM10403 Script Writing &Digital Storyboard		SMM30103 Media Psychology	SMM30603 New Media Arts	SMM40403 Creative Advertising	
	SMM10503 New Media Literacy					
Common Core		SMM10703 Innovative and Creative Skills	SMM20503 New Era Management	SMM30703 Data Reasoning	SMM31103 Electronic Entrepreneurship	SMM41003 Skills in Organizational Strategy and Performance Management
		SMM 10803 Introduction to Programming Languages	SMM30203 Research Method		SMM40502 Final Year Project 1	SMM41104 Final Year Project 2
						SMM49906 Industrial Training
Elective		SMM10903 Principles of Human Computer Interaction		SMM30803 3D Modelling for Beginners/ SMM30903 ContemporaryPhotography	SMM40603 Audio Design	
		SMM11003 Sociology in New Media		SMM31003 Industrial Psychology	SMM40703 Crisis Communication in New Media	
University Required	SMB0XX02 Foreign Language	*SMB10102 -Preparatory English (Band 2 & below) (Audit)	**SMB20102 - English for General Communication (For Student with MUET Band 3 & below) / (SMU12X02- Opsyen University) (For Student with MUET Band 4 & above)	SMB31302 English for Academic Purposes		
		SMU13102 Penghayatan Etika Dan Peradaban	SMU12X02- Opsyen University	SMU32202 Thinking Skills		
	SMU13002 Falsafah Dan Isu Semasa	SMB41002 Bahasa Melayu Universiti				
	SMZ1XX01 KO-K	SMZ1XX01 KO-K				
123	20	20	22	22	20	19
TOTAL UNITS FOR GRADUATION 123						

LIST OF COURSES:

COURSE CODE	COURSE NAME
SMM10103	Pengenalan Kepada Teori Komunikasi [Introduction To Communication Theory]
SMM10203	Perucapan Awam [Public Speaking]
SMM10303	Pengenalan Kepada Media Baharu [Introduction To New Media]
SMM10403	Penulisan Skrip Dan Papan Cerita Digital [Script Writing And Digital Storyboard]
SMM10503	Literasi Media Baharu [New Media Literacy]
SMM10603	Komunikasi Visual [Visual Communication]
SMM10703	Kemahiran Kreatif Dan Inovatif [Innovative And Creative Skills]
SMM10803	Pengenalan Kepada Bahasa Pengaturcaraan [Introduction To Programming Languages]
SMM10903	Prinsip- Prinsip Interaksi Manusia Komputer [Principles Of Human Computer Interaction]
SMM11003	Sosiologi Dalam Media Baharu [Sociology In New Media]
SMM20103	Komunikasi Organisasi [Organizational Communication]
SMM20203	Fotografi Digital [Digital Photography]
SMM20303	Rekabentuk Grafik Untuk Media Baharu [Graphic Design For New Media]
SMM20403	Analisis Media Baharu [New Media Analysis]
SMM20503	Pengurusan Era Baharu [New Era Management]
SMM30103	Psikologi Media [Media Psychology]
SMM30203	Kaedah Penyelidikan [Research Methodology]
SMM30303	Pemasaran Digital [Digital Marketing]
SMM30403	Penerbitan Video Digital [Digital Video Production]
SMM30503	Rekabentuk Dan Pembangunan Web [Web Design And Development]
SMM30603	Seni Media Baharu [New Media Arts]
SMM30703	Penaakulan Data [Data Reasoning]
SMM30803	Asas Pemodelan 3D [3D Modelling For Beginners]
SMM30903	Fotografi Komtemporari [Contemporaray Photography]
SMM20503	Pengurusan Era Baharu [New Era Management]

LIST OF COURSES:

COURSE CODE	COURSE NAME
SMM30103	Psikologi Media [Media Psychology]
SMM31003	Psikologi Industri [Industrial Psychology]
SMM31103	Keusahawanan Elektronik [Electronic Entrepreneurship]
SMM40103	Perhubungan Awam Dan Media Baharu [Public Relations And New Media]
SMM40203	Undang-Undang Dan Etika Dalam Komunikasi Media Baharu [Ethics And Law In New Media Communication]
SMM40303	Animation For Integrated Media
SMM40403	Pengiklanan Kreatif Digital [Digital Creative Advertising]
SMM40502	Projek Tahun Akhir I [Final Year Project I]
SMM40603	Rekabentuk Audio [Audio Design]
SMM40703	Komunikasi Krisis Dalam Media Baharu [Crisis Communication In New Media]
SMM40803	Pengurusan Acara [Event Management]
SMM40903	Isu Dan Cabaran Media Baharu [New Media Issues And Challenges]
SMM41003	Kemahiran Pengurusan Strategi Dan Prestasi Organisasi [Skills In Organizational Strategy And Performance Management]
SMM41104	Projek Tahun Akhir II [Final Year Project II]
SMM49906	Latihan Industri [Industrial Training]
SMQ10103	Matematik Kejuruteraan I [Engineering Mathematics I]
SMQ10203	Matematik Kejuruteraan II [Engineering Mathematics II]
SMQ11103	Matematik Untuk Teknologi Kejuruteraan I [Mathematics For Engineering Technology I]
SMQ11203	Matematik Untuk Teknologi Kejuruteraan II [Mathematics For Engineering Technology II]
SMQ20303	Matematik Kejuruteraan III [Engineering Mathematics III]
SMQ21303	Matematik Untuk Teknologi Kejuruteraan III [Mathematics For Engineering Technology III]
SMQ22103	Matematik Diskrit Dan Aljabar Linear [Discrete Mathematics And Linear Algebra]
SMQ27103	Statistik Kejuruteraan [Engineering Statistics]
SMQ27203	Kebarangkalian Dan Statistik [Probability And Statistics]

LIST OF COURSES:

COURSE CODE	COURSE NAME
SMQ27303	Statistik Untuk Matematik Kejuruteraan [Statistics For Engineering Technology]
SMU12102	Integriti Dan Anti Rasuah [Integrity And Anti Corruption]
SMU12202	Communication Skills And Technology [Kemahiran Komunikasi Dan Teknologi]
SMU12502	Komunikasi Korporat [Corporate Communication]
SMU12602	Psikologi Industri [Industrial Psychology]
SMU12702	Komunikasi Dan Pengurusan Konflik [Communication And Conflict Management]
SMU12802	Pengurusan Sumber Manusia [Human Resource Management]
SMU13002	Falsafah Dan Isu Semasa [Philosophy And Current Issues]
SMU13102	Penghayatan Etika Dan Peradaban [Appreciation Of Ethics And Civilization]
SMU22402	Keusahawanan Kejuruteraan [Engineering Entrepreneurship]
SMU32202	Kemahiran Berfikir [Thinking Skills]
SMB10102	Bahasa Inggeris Persediaan [Preparatory English]
SMB20102	Bahasa Inggeris Untuk Komunikasi Umum [English For General Communication]
SMB31202	Bahasa Inggeris Untuk Komunikasi Teknikal [English For Technical Communication]
SMB31302	Bahasa Inggeris Akademik [English For Academic Purposes]
SMB11002	Bahasa Melayu Asas [Basic Malay Language]
SMB41002	Bahasa Melayu Universiti [University Malay Language]
SMB01402	Bahasa Mandarin Permulaan [Mandarin Language For Beginners]
SMB11402	Bahasa Mandarin Persediaan [Preparatory Mandarin Language]
SMB21402	Bahasa Mandarin Asas I [Elementary Mandarin Language I]
SMB31402	Bahasa Mandarin Asas II [Elementary Mandarin Language II]
SMB41402	Bahasa Mandarin Pertengahan [Pre-Intermediate Mandarin Language]
SMB01502	Bahasa Thai Permulaan [Thai Language For Beginners]
SMB11502	Bahasa Thai Persediaan [Preparatory Thai Language]
SMB21502	Bahasa Thai Asas I [Elementary Thai Language I]

LIST OF COURSES:

COURSE CODE	COURSE NAME
SMB31502	Bahasa Thai Asas Ii [Elementary Thai Language Ii]
SMB41502	Bahasa Thai Pertengahan [Pre-Intermediate Thai Language]
SMB01602	Bahasa Arab Permulaan [Arabic Language For Beginners]
SMB11602	Bahasa Arab Persediaan [Preparatory Arabic Language]
SMB21602	Bahasa Arab Asas I [Elementary Arabic Language I]
SMB31602	Bahasa Arab Asas Ii [Elementary Arabic Language Ii]
SMB41602	Bahasa Arab Pertengahan [Pre-Intermediate Arabic Language]
SMB01702	Bahasa Jepun Permulaan [Japanese Language For Beginners]
SMB11702	Bahasa Jepun Persediaan [Preparatory Japanese Language]
SMB21702	Bahasa Jepun Asas I [Elementary Japanese Language I]
SMB31702	Bahasa Jepun Asas Ii [Elementary Japanese Language Ii]
SMB41702	Bahasa Jepun Pertengahan [Pre-Intermediate Japanese Language]
SMB01802	Bahasa Jerman Permulaan [German Language For Beginners]
SMB11802	Bahasa Jerman Persediaan [Preparatory German Language]
SMB21802	Bahasa Jerman Asas I [Elementary German Language I]
SMB31802	Bahasa Jerman Asas Ii [Elementary German Language Ii]
SMB41802	Bahasa Jerman Pertengahan [Pre-Intermediate German Language
SMB01902	Bahasa Korea Permulaan [Korean Language For Beginners]
SMB11902	Bahasa Korea Persediaan [Preparatory Korean Language]
SMB21902	Bahasa Korea Asas I [Elementary Korean Language]
SMB31902	Bahasa Korea Asas Ii [Pre-Intermediate Korean Language]
SMB41902	Bahasa Korea Untuk Perniagaan Asas [Basic Business Korean]
SMZ11001	Sukarelawanan Siswa/Siswi Koreksional Jabatan Penjara Malaysia I (KOR SISKOR) [Students Voluntary Correctional Malaysian Prison Department I (KOR SISKOR I)]
SMZ11101	Sukarelawanan Siswa/Siswi Koreksional Jabatan Penjara Malaysia II (KOR SISKOR) [Students Voluntary Correctional Malaysian Prison Department II (KOR SISKOR II)]

LIST OF COURSES:

COURSE CODE	COURSE NAME
SMZ21001	Sukarelawanan Siswa/Siswi Koreksional Jabatan Penjara Malaysia III (KOR SISKOR) [Students Voluntary Correctional Malaysian Prison Department III (KOR SISKOR III)]
SMZ21101	Sukarelawanan Siswa/Siswi Koreksional Jabatan Penjara Malaysia IV (KOR SISKOR) [Students Voluntary Correctional Malaysian Prison Department IV (KOR SISKOR IV)]
SMZ11201	Kumpulan Latihan Kelanasiswa Malaysia I (Udara) [Malaysian University Rover Training Group I (Air)]
SMZ11301	Kumpulan Latihan Kelanasiswa Malaysia II (Udara) [Malaysian University Rover Training Group II (Air)]
SMZ11401	Sukarelawan Muda Bantuan Perubatan Malaysia (MERCY MUDA 1) [Student Voluntary Malaysian Medical Relief Society [YOUNG MERCY 1]
SMZ11501	Sukarelawan Muda Bantuan Perubatan Malaysia (MERCY MUDA 2) [Student Voluntary Malaysian Medical Relief Society [YOUNG MERCY 2]
SMZ11601	Pasukan Kadet Maritim Malaysia I (PASKAM) [Malaysian Maritime Cadet I (PASKAM)]
SMZ11701	Pasukan Kadet Maritim Malaysia II (PASKAM) [Malaysian Maritime Cadet II (PASKAM)]
SMZ21601	Pasukan Kadet Maritim Malaysia III [Malaysian Maritime Cadet III (PASKAM)]
SMZ21701	Pasukan Kadet Maritim Malaysia IV (PASKAM) [Malaysian Maritime Cadet IV (PASKAM)]
SMZ12001	Briged Bomba dan Penyelamat I [Fire and Rescue Brigade I]
SMZ12101	Briged Bomba dan Penyelamat II [Fire and Rescue Brigade II]
SMZ12201	Pandu Puteri Klover I [Clover I]
SMZ12301	Pandu Puteri Klover II [Clover II]
SMZ12401	Kor St. John Ambulans Malaysia I [Malaysian St. John Ambulance I]
SMZ12501	Kor St. John Ambulans Malaysia II [Malaysian St. John Ambulance II]
SMZ22401	Kor St. John Ambulans Malaysia III [Malaysian St. John Ambulance III]
SMZ22501	Kor St. John Ambulans Malaysia IV [Malaysian St. John Ambulance IV]
SMZ12601	Kumpulan Latihan Kelanasiswa Malaysia I (Darat) [Malaysian University Rover Training Group I]
SMZ12701	Kumpulan Latihan Kelanasiswa Malaysia II (Darat) [Malaysian University Rover Training Group II]
SMZ12801	Kumpulan Latihan Kelanasiswa Malaysia I (Laut) [Malaysian University Rover Training Group I (Sea)]
SMZ12901	Kumpulan Latihan Kelanasiswa Malaysia II (Laut) [Malaysian University Rover Training Group II (Sea)]
SMZ15101	Asas Gamelan [Foundation of Gamelan]

LIST OF COURSES:

COURSE CODE	COURSE NAME
SMZ25101	Gamelan II [Gamelan II]
SMZ15201	Kumpulan Jazz I [Jazz Band I]
SMZ25201	Kumpulan Jazz II [Jazz Band II]
SMZ15301	Pancaragam I [Brass Band I]
SMZ25301	Pancaragam II [Brass Band II]
SMZ15401	Angklung I [Angklung I]
SMZ25401	Angklung II [Angklung II]
SMZ16001	Palapes Darat I [ROTU Army I]
SMZ16101	Palapes Darat II [ROTU Army II]
SMZ26001	Palapes Darat III [ROTU Army III]
SMZ26101	Palapes Darat IV [ROTU Army IV]
SMZ36001	Palapes Darat V [ROTU Army V]
SMZ36101	Palapes Darat VI [ROTU Army VI]
SMZ16201	Kor Siswa Siswi Pertahanan Awam I (Kor SISPA I) [Malaysia Civil Defence Department I]
SMZ16301	Kor Siswa Siswi Pertahanan Awam II (Kor SISPA II) [Malaysia Civil Defence Department II]
SMZ26201	Kor Siswa Siswi Pertahanan Awam III (Kor SISPA III) [Malaysia Civil Defence Department III]
SMZ26301	Kor Siswa Siswi Pertahanan Awam IV (Kor SISPA IV) [Malaysia Civil Defence Department IV]
SMZ36201	Kor Siswa Siswi Pertahanan Awam V (Kor SISPA V) [Malaysia Civil Defence Department V]
SMZ16401	Kursus Persijilan Bulan Sabit Merah Malaysia I [The Malaysian Red Crescent Certification Course I]
SMZ26401	Kursus Persijilan Bulan Sabit Merah Malaysia II [The Malaysian Red Crescent Certification Course II]
SMZ16601	Kor Sukarelawan Polis Siswa/Siswi 1 [SVPC-1 @ Students Voluntary Polis Corp 1]
SMZ16701	Kor Sukarelawan Polis Siswa/Siswi 2 [SVPC-2 @ Students Voluntary Polis Corp 2]
SMZ26601	SUKSIS-3 @ Kor Sukarelawan Polis Siswa/Siswi [SVPC-3 @ Students Voluntary Polis Corp 3]
SMZ26701	Kor Sukarelawan Polis Siswa/Siswi 4 [SVPC-4 @ Students Voluntary Polis Corp 4]
SMZ36601	SUKSIS-5 @ Kor Sukarelawan Polis Siswa/Siswi [SVPC-5 @ Students Voluntary Polis Corp 5]

LIST OF COURSES:

COURSE CODE	COURSE NAME
SMZ36701	Kor Sukarelawan Polis Siswa/Siswi 6 [SVPC-6 @ Students Voluntary Polis Corp 6]
SMZ16801	Briged RELA Siswa Siswi I [Malaysian People's Volunteer Corps I]
SMZ16901	Briged RELA Siswa Siswi II [Malaysian People's Volunteer Corps II]
SMZ26801	Briged RELA Siswa Siswi (RELASIS) III [Malaysian People's Volunteer Corps III]
SMZ26901	Briged RELA Siswa Siswi IV [Malaysian People's Volunteer Corps IV]
SMZ17101	Seni Silat Cekak I [Seni Silat Cekak I]
SMZ27101	Seni Silat Cekak II [Seni Silat Cekak II]
SMZ17201	Taekwon-Do GTF I [Taekwon-Do GTF I]
SMZ27201	Taekwon-Do GTF II [Taekwon-Do GTF II]
SMZ17301	Karate-Do I [Karate-Do I]
SMZ27301	Karate-Do II [Karate-Do II]
SMZ17601	Taekwon-Do WTF I [Taekwon-Do WTF I]
SMZ27601	Taekwon-Do WTF II [Taekwon-Do WTF II]
SMZ17701	Silat Olahraga I [Sport Silat I]
SMZ17801	Silat Olahraga II [Sport Silat II]
SMZ17501	Futsal [Futsal]
SMZ19301	Tajwid [Tajwid]
SMZ19601	Student In-Free Enterprise (SIFE) [Student In-Free Enterprise (SIFE)]
SMZ19801	Manusia dan Kelestarian Alam [People and Environmental Sustainability]
SMZ10101	Golf [Golf]
SMZ10201	Besbol [Baseball]
SMZ10301	Woodball [Woodball]
SMZ10401	Bola Sepak [Football]
SMZ10501	Bola Jaring [Netball]
SMZ10601	Tenis [Tennis]

LIST OF COURSES:

COURSE CODE	COURSE NAME
SMZ10901	Bola Tampar [Volleyball]
SMZ13201	Penerbitan Video [Video Publishing]
SMZ15501	Seni Pergerakan Kreatif [Arts of Creative Movement]
SMZ15601	Drama, Pementasan & Seni Lakon [Drama, Playwright & Acting]
SMZ15701	Seni Teater Bahasa Inggeris [English Theatre Arts]
SMZ18201	Petanque [Petanque]
SMZ17901	Olahraga [Athletic]
SMZ18401	Badminton [Badminton]
SMZ18501	Hoki [Hockey]
SMZ18701	Ragbi [Rugby]
SMZ18801	Memanah [Archery]
SMZ18601	Sepak Takraw [Sepak Takraw]
SMZ19001	Sukan Berbasikal [Cycling]
SMZ19101	Khidmat Masyarakat [Community Services]
SMZ19201	Daya Usaha & Inovasi [Initiative & Innovation]
SMZ19401	Pidato [Pidato]
SMZ19501	Radio Kampus [Campus Radio]
SMZ19701	Perhimpunan Pengucapan Awam [English Speaking Assembly]
SMZ19901	Tulisan Jawi [Jawi Orthography]
SMZ30101	Program Inbound-Outbound Mobiliti I [Mobility Inbound-Outbound Program I]
SMZ30201	Program Inbound-Outbound Mobiliti II [Mobility Inbound-Outbound Program II]
SMZ30301	Program Inbound-outbound Mobiliti III [Mobility Inbound-outbound Program III]

SMM10103 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 utilized to strengthen students' understanding.

Course Outcomes:
1. Ability to understand the concepts, models, elements, functions and contexts of communication.
2. Ability to apply the features, attributes and functions of theory in the context of new media communication.
3. Ability to evaluate the communication theories based on contexts.

SMM10203 PERUCAPAN AWAM [PUBLIC SPEAKING]

No of Credits: 3

Course Synopsis:
This course covers both the theoretical and practical aspects of public speaking. Students will learn how to adapt a speech for various circumstances and audiences, how to successfully support ideas, how to select and organise resources for a speech, and how to use multimedia technologies in presentations. Students should be able to demonstrate speaking and be effective communicators in academic contexts, the workplace, and the community by the end of this course.

Course Outcomes:
1. Ability to describe the vital ideas related to public speaking.
2. Ability to apply knowledge in the preparation of a speech.
3. Ability to perform a public speech in front of the audiences, according to the situation and the event.
4. Ability to evaluate and criticise speeches and presentations verbally.

SMM10303 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:
1. Ability to understand the concepts, functions and characteristics of new media.
2. Ability to distinguish computer hardware, software, communication media, its functions and characteristics.
3. Ability to analyse the new media tools used in producing/publishing new media content.

SMM10403 PENULISAN SKRIP DAN PAPAN CERITA DIGITAL [SCRIPT WRITING AND DIGITAL STORYBOARD]

No of Credits: 3

Course Synopsis:
The purpose of this course is to expose students to the writing skills and its methods in the new media publication. Students will learn the interactive pattern of online writing as compared to traditional writing. This course will help students to upgrade their understanding on the method of new media writing by appreciating the relevant concepts and will be able to apply them in the organizational situation.

Course Outcomes:
1. Ability to understand the concepts of new media script writing & digital storyboard.
2. Ability to demonstrate the script writing and storyboard development skills for the new media content.
3. Ability to justify creative ideas in new media writing and storyboard development

SMM10503 LITERASI MEDIA BAHARU [NEW MEDIA LITERACY]

No of Credits: 3

Course Synopsis:
This course aims to familiarise students with the fundamental concepts, issues, genres and technologies of new media. By taking something as fundamental as our experiences of space, at times our mobility has become severely restricted. Structural and visualisation design assignments are used to analyse these contemporary communication issues.

Course Outcomes:
1. Ability to understand the concepts of new media literacy and the technologies related to it.
2. Ability to apply basic media technologies in our society.
3. Ability to analyse the existing tools of media technologies with probable solutions that can accommodate future lifestyle.

SMM10603 KOMUNIKASI VISUAL [VISUAL COMMUNICATION]

No of Credits: 3

Course Synopsis:
This course will guide students to understand the basic principles of visual communication and relationship with publishing products. This course will guide students to produce visual projects based on various concepts of visual perspective, the history of visual communication and its development, its importance from the perspective of different cultures' understanding. It will help students to become more critical and sensitive in the use of color, layout, design and selection of tones in attracting attention and leaving a meaning to the audience.

Course Outcomes:
1. Ability to explain the concepts, theories and principles of visual communication with a suitable approach.
2. Ability to analyze the elements of visual communication of the product creation.
3. Ability to produce communication products that emphasize aspects of visual communication.

SMM10703 KEMAHIRAN KREATIF DAN INOVATIF [INNOVATIVE AND CREATIVE SKILLS]

No of Credits: 3

Course Synopsis:
This course aims to build students 'knowledge and understanding of theories and processes related to creative thinking and innovative skills. Ultimately, the course can make students think and act creatively and innovatively in problem solving to make them more competitive either as individuals or members of organizations.

Course Outcomes:
1. Ability to understand the basic concepts for thinking creatively and innovatively.
2. Ability to identify problems and solve them creatively and innovatively.
3. Ability to analyse innovation activities in different organizations and environments.

SMM10803 PENGENALAN KEPADA BAHASA PENGATURCARAAN [INTRODUCTION TO PROGRAMMING LANGUAGES]

No of Credits: 3

Course Synopsis:
This course aims to familiarise students with the various programming languages. It is also to provide some knowledge and necessary skills to develop basic programming/coding. Coding and debugging exercises are used to develop students' ease of learning and understanding; problem-solving skills; transferable skills across almost any industry; and opportunities for invention and innovation.

Course Outcomes:
1. Ability to describe the concepts of related programming languages (program style/formatting and self-documenting code, and familiar with the debugging process).
2. Ability to apply basic programming solutions in various contexts.
3. Ability to develop a simple application using related programming languages.

SMM10903 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) 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 relevance and usage for managerial usage and decision making.

Course Outcomes:
1. Ability to use the principles of human computer interaction to relate with today's activities.
2. Ability to analyze the application that related to principles of human computer interaction.
3. Ability to propose various human computer interaction features that can be used by society

SMM11003 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:

SMM20103 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:
1. Ability to understand organizational processes and experiences.
2. Ability to analyze communication problems and potential solutions within organizations.
3. Ability to share knowledge with others about organizational communication through a team-based term project and presentation.
4. Ability to demonstrate knowledge of organizational communication by explaining related organizational practice.

SMM20203 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 a number of projects students approach various subjects to create images that are personal and expressive.

Course Outcomes:
1. Ability to analyse the notion of digital photography as an art form.
2. Ability to practice camera techniques necessary for using digital photography as a creative tool.
3. Ability to demonstrate professional images editing software and apply proper digital workflow.

SMM20303 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 a 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:
1. Ability to analyze the key ideas related to Graphic Design.
2. Ability to demonstrate technical skills by using graphic software to produce creative projects.
3. Ability to perform the creative process and design strategies in solving design problem

SMM20403 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:
1. Ability to understand the process and technique of new media analysis.
2. Ability to analyze processes and techniques to create media works.
3. Ability to create media content for different contexts, audiences and purposes.

SMM20503 PENGURUSAN ERA BAHARU [NEW ERA MANAGEMENT]

No of Credits: 3

Course Synopsis:
This course aims to expose students to the basic concepts and skills for managing organizations in the new era. Specifically, the course focuses on managerial functions in organizations such as planning, organizing, leading, controlling and monitoring organizations either locally or globally based on new era management driven by the strength of information technology and innovation.

Course Outcomes:
1. Ability to understand the concepts related to new era management.
2. Ability to analyse the management aspects of the new era in local and international organizations.
3. Ability to propose solutions in managing the organizations facing contemporary challenges led by the power of innovation and information technology.

SMM30103 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 is 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 humans.

Course Outcomes:
1. Ability to understand the concepts related to media psychology.
2. Ability to evaluate issues related with interaction of human behavior and media technology.
3. Ability to propose solutions using psychology elements to solve problems on a media basis.

SMM30203 KAEDAH PENYELIDIKAN [RESEARCH METHODOLOGY]

No of Credits: 3

Course Synopsis:
This 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 focused 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:
1. Ability to understand the concepts and research processes in new media communication.
2. Ability to distinguish research design to conduct research in the field of new media and communication.
3. Ability to prepare a research proposal

SMM30303 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, E-mail 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:
1. Ability to explain the concepts used in Digital marketing.
2. Ability to evaluate digital marketing concepts in business.
3. Ability to develop effective digital marketing strategies in business.

SMM30403 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 analyze and respond critically to a variety of audio/visual productions.

Course Outcomes:
1. Ability to demonstrate various concepts in operating digital video production.
2. Ability to interpret audio/visual productions and respond critically.
3. Ability to evaluate technical and aesthetic qualities of digital video productions in the context of contemporary video making trends.

SMM30503 REKABENTUK DAN PEMBANGUNAN WEB [WEB DESIGN AND 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 their own web page over the course of the semester. Critical thinking will be encouraged through class interactions, projects, and online postings.

Course Outcomes:
1. Ability to develop HTML, CSS code and website designs.
2. Ability to demonstrate the skills of applying new media elements on websites.
3. Ability to design a functioning prototype website.

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SMM30603 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 creative media artwork in 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 postproduction. 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:
1. Ability to Interpret the key ideas related to the new media art
2. Ability to apply technical skills by using various graphic software to produce creative new media artwork
3. Ability to prepare and deliver coherent and structured both written and artwork development research reports.

SMM30703 PENAAKULAN DATA [DATA REASONING]

No of Credits: 3

Course Synopsis:
This course provides 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 learning to use data to make reasonable, useful conclusions and to write the results and reports in effective and convincing ways.

Course Outcomes:
1. Ability to identify the concepts related to the basics of statistical thinking with interesting questions and some data.
2. Ability to apply the correct statistical tools to answer questions of interest about own data, using available statistical software/transcribing manually.
3. Ability to write clearly and concisely about research topics so that the reader can easily understand the purpose and results of research.
4. Ability to interpret findings and develop a meaningful conclusion.

SMM30803 ASAS PEMODELAN 3D [3D MODELLING FOR BEGINNERS]

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:
1. Ability to design simple 3D models and environments
2. Ability to apply materials for 3D models (Texturing)
3. Ability to compose effective & rendering of 3D environments

SMM30903 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 discussion with their personal tutor and informed by peer discussions.

Course Outcomes:
1. Ability to demonstrate descriptive and analytical skills with reference to advanced visual analysis of photographic images.
2. Ability to demonstrate independent judgements with reference to the study of contemporary photography.
3. Ability to develop a multi-tasking and multi-skilled approach to professional practices.

SMM31003 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:
1. Ability to understand the science of human behavior is used to select, develop, and manage employees.
2. Ability to evaluate the major content areas and vital foundational components of Industrial Psychology
3. Ability to propose solutions to the problems relevant to Industrial Psychology.

SMM31103 KEUSAHAWANAN ELEKTRONIK [ELECTRONIC ENTREPRENEURSHIP]

No of Credits: 3

Course Synopsis:
Learn how entrepreneurial ventures use digital technology to design and offer new products and services, acquire and retain customers, analyze customer data, and provide satisfying user experiences online. Learn how to identify and exploit business opportunities online. Learn how to test new business ideas on real customers. Be able to exploit modern business technology trends and experimental business. Digital products and services will be the norm going forward for businesses. This course will help you begin to understand this new reality, and to develop the skills needed to deliver and manage digital business offerings.

Course Outcomes:
1. Ability to understand the theories and concepts that are relevant to electronics entrepreneurship.
2. Ability to analyse the process of electronics entrepreneurship in a real business environment.
3. Ability to develop and propose a business plan and demonstrate the main elements of digital business design.

SMM40103 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 Public Relations professionals to develop online strategies.

Course Outcomes:
1. Ability to understand the various ways, new and emerging media technologies are shaping and changing PR practices and activities.
2. Ability to analyze how social media and new media technologies are applied to PR practices and activities.
3. Ability to apply and demonstrate various new media technologies to PR practices and activities.
4. Ability to evaluate and recommend the solution to the PR issues in a new media context.

SMM40203 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 rinciples and philosophy that underlie the various aspects of communications. At the end of this course, students should be able to analyze the important law and ethical issues involved with the new media scenarios.

Course Outcomes:
1. Ability to understand the policies, laws and ethics that are relevant to the field of communications and new media.
2. Ability Interpret law and ethics related to communication and new media.
3. Ability to evaluate the law and ethics related to communication and new media issues

SMM40303 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 to 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:
1. Ability to apply the principles of animation in new media.
2. Ability to design animate vector graphic for new media.
3. Ability to design and compose themed animation for new media

SMM40403 PENGIKLANAN KREATIF DIGITAL [DIGITAL CREATIVE ADVERTISING]

No of Credits: 3

Course Synopsis:
This course focuses on creative thinking and exploration, creative strategy, realization and experience which encourages students to become independent learners with the ability to synthesize and reflect. It covers specialized courses of study in creative advertising in copywriting, art direction and practical that develops student's capability to articulate their learning to enter professional new media and advertising practice in the creative industry

Course Outcomes:
1. Ability to develop creative ideas and skills to communicate through media with audiences.
2. Ability to select methods and manage projects in response to well defined problems, communicating effectively in the discipline.
3. Ability to evaluate the capacity of producing work that follows the creative process from research through ideation to execution using a variety of media production technologies.

SMM40502 PROJEK TAHUN AKHIR I [FINAL YEAR PROJECT I]

No of Credits: 3

Course Synopsis:
This course comprises the first phase of the 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 before a full project execution in the next semester.

Course Outcomes:
1. Ability to formulate project planning, implementation and prepare a project proposal.
2. Ability to practice ethical and professional norms for the implementation of the projects.
3. Ability to present and justify the project's proposal.

SMM40603 REKABENTUK 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 learning.

Course Outcomes:
1. Ability to demonstrate proficiency of the skills basic to audio production, including recording and mixing.
2. Ability to create solutions, integrating technical knowledge and design principles for Audio products and projects.
3. Ability to revise digital audio projects through a three-step process of description, analysis and evaluation.

SMM40703 KOMUNIKASI KRISIS DALAM MEDIA BAHARU [CRISIS COMMUNICATION IN NEW MEDIA]

No of Credits: 3

Course Synopsis:
The potential risks in modern-day business are greater, more dynamic, and less predictable than ever before. the greatest exposure does not lie within these risks. Rather, it lies in having a team that is not prepared to anticipate, foresee, or respond to a rising threat, and its impact on your reputation, revenue, and relationships in real-time. 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 theoretical and hands-on approach to crisis communication and an understanding of how it relates to our daily world.

Course Outcomes:
1. Ability to critically analyze crisis communication in new media case studies
2. Ability to critically discuss crisis communication and management strategies and tactics for detection, prevention, preparation, containment, and recovery.
3. Ability to recommend the application of learned new media crisis communication and management skills to a real world context

SMM40803 PENGURUSAN ACARA [EVENT MANAGEMENT]

No of Credits: 3

Course Synopsis:
This course covers the various types and ranges of events, as well as the project nature of events and the unique set of skills required for a successful event project. This course combines theoretical and practical applications in the development of skills and knowledge in the administration of many types of event planning, both locally and globally. Students should be able to organise, implement, and conduct the real event by the end of this course.

Course Outcomes:
1. Ability to develop an enhanced understanding of professionalism in event management.
2. Ability to analyse and manage the risks of an event.
3. Ability to organize a full range of resources to ensure successful event management.
4. Ability to organize an event project.

SMM40903 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. 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:
1. Ability to determine the strategies to exploit information resources effectively, efficiently and ethically.
2. Ability to write appropriate information related to current new media issues and challenges
3. Ability to perform a sharing session by communicating intelligently with audiences, and to collaborate effectively.

SMM41003 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:
1. Ability to understand the concepts and elements related to organizational strategy and /or performance management
2. Ability to formulate the organizational strategy and performance Measures step by step
3. Ability to produce organizational strategic and performance plan document

SMM41104 PROJEK TAHUN AKHIR II [FINAL YEAR PROJECT II]

No of Credits: 4

Course Synopsis:
This course comprises the second phase of the 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 reports in a seminar.

Course Outcomes:
1. Ability to execute project and management of their selected project.
2. Ability to practice ethical and professional norms for the implementation of the projects.
3. Ability to present and justify the projects.

SMM49906 LATIHAN INDUSTRI [INDUSTRIAL TRAINING]

No of Credits: 6

Course Synopsis:
Students are required to undergo industrial training at a selected industry or organization for 12 weeks. During the training there will be a visit from the faculty panel to monitor their work progress and to get feedback from their industrial supervisor. This training will expose students to the technical and professional as well the skills such as communication, leadership and management. At the end of the training, students must prepare and submit a report regarding their work.

Course Outcomes:
1. Ability to display good work performance and adapt to the working environment during the training period.
2. Ability to demonstrate good communications and work ethics during training period.
3. Ability to perform assigned task given by host company.

SMQ10103 MATEMATIK KEJURUTERAAN I [ENGINEERING MATHEMATICS I]

No of Credits: 3

Course Synopsis:
This course introduces the fundamental principles and concepts in algebra and calculus which are essential tools in engineering. The topics discussed in algebra are the basics of complex numbers, matrices and vectors. In the calculus topic, several techniques will be introduced to solve the differentiation and integration for single variables. At the end study, the topic of partial derivatives will be discussed.

Course Outcomes:
1. Ability to relate relevant concepts and methods and evaluate solution of engineering problem in complex numbers, matrices and vectors.
2. Ability to relate concepts and methods and evaluate solution of engineering problem in differentiation and integration.
3. Ability to relate concepts and methods and evaluate solution of engineering problem in partial derivative.

SMQ10203 MATEMATIK KEJURUTERAAN II [ENGINEERING MATHEMATICS II]

No of Credits: 3

Course Synopsis:
In this course, students will be exposed to differential equations. Number of analytical methods will be introduced for solving the first and second order ordinary differential equations and also partial differential equations. Theory of Laplace transforms and its applications on solving ordinary differential equation will be taught. Fourier series of periodic function will be covered.

Course Outcomes:
1. Ability to solve and analyse first and second order ordinary differential equations, partial differential equations and certain physical problems that relate to differential equations.
2. Ability to apply the fundamental of Laplace properties and able to solve initial value problem that relate to first and second order ordinary differential equations.
3. Ability to apply the fundamental understanding of Fourier series and able to express Fourier series and Fourier series expansions of periodic function.

SMQ11103 MATEMATIK UNTUK TENOLOGI KEJURUTERAAN I [MATHEMATICS FOR ENGINEERING TECHNOLOGY I]

No of Credits: 3

Course Synopsis:
This course introduces the fundamental principles and concepts in algebra, calculus and statistics which is an essential tool in engineering technology. The topics discussed in algebra are the basics of complex numbers, matrices and vectors. In the calculus topic, several techniques will be introduced to solve the differentiation and integration. Regression and correlation techniques will be introduced in statistics topic, for investigating the relationship between two variables.

Course Outcomes:
1. Ability to apply the basic concepts of algebra and able to evaluate solutions of mathematical problems using complex numbers, matrices and vectors.
2. Ability to apply basic concepts of calculus and able to solve mathematical problems using differentiation and integration.
3. Ability to solve and evaluate statistical problems using data analysis.

SMQ11203 MATEMATIK UNTUK TENOLOGI 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:
1. Ability to solve and analyse first and second order ordinary differential equations and certain physical problems that related to differential equations.
2. Ability to apply the fundamental of Laplace properties and able to solve initial value problem that related to first and second order ordinary differential equations.
3. Ability to apply the fundamental understanding of Fourier series and able to express Fourier series and Fourier series expansions of periodic function.

SMQ20303 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 Stoke's theorems. In numerical methods topic, several numerical techniques will be introduced to solve nonlinear equations, interpolation, differentiation, integration, differential equations and also partial differential equations.

Course Outcomes:
1. Ability to apply vector calculus concepts to solve single, double or triple integrals.
2. Ability to apply the concept of differentiation and integration in vector calculus to solve and verify classical theorems in vector calculus.
3. Ability to select appropriate numerical methods to solve the mathematical problems.

SMQ21303 MATEMATIK UNTUK TENOLOGI KEJURUTERAAN III [MATHEMATICS FOR ENGINEERING TECHNOLOGY III]

No of Credits: 3

Course Synopsis:
This course will focus on understanding the concept of partial derivatives, vector calculus, and numerical methods. Students will be exposed to an introduction to fundamental theorems in vector calculus. At the end of the study, the topic of numerical methods will be discussed, which will introduce students to a variety of techniques for solving mathematical problems.

Course Outcomes:
1. Ability to solve mathematical problems by using the concepts of partial derivatives.
2. Ability to evaluate vector calculus problems and its applications using single, double or triple integrals.
3. Ability to select appropriate methods for numerical problems and its applications.

SMQ22103 MATEMATIK DISKRIT DAN ALJABAR LINEAR [DISCRETE MATHEMATICS AND 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:
1. Ability to apply the concepts of discrete mathematics in solving engineering problems.
2. Ability to apply the concept of linear algebra in solving engineering problems.
3. Ability to explain, create and solve engineering problems using the knowledge in discrete mathematics and linear algebra

SMQ27103 STATISTIK KEJURUTERAAN [ENGINEERING STATISTICS]

No of Credits: 3

Course Synopsis:
This course introduces learners to exploratory data analysis skills through data visualization and numerical summary. Discrete and continuous probability distributions are introduced to understand the role of probability in quantifying random phenomena. Statistical inference methods are also discussed. Lastly, simple linear regression to model the relationship between two quantitative variables.

Course Outcomes:
1. Ability to apply basic statistical data analysis, concepts of probability distributions and develop statistical reasoning skills.
2. Ability to formulate and design solutions using statistical inference methods for decision-making.
3. Ability to analyze the procedures of a simple linear regression model and evaluate the significance of the model for making predictions.

SMQ27203 KEBARANGKALIAN DAN STATISTIK [PROBABILITY AND 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:
1. Ability to apply the theory of probability and solve discrete and continuous random variables
2. Ability to understand and apply the concepts of probability distribution.
3. Ability to apply hypothesis testing and simple linear regression model to solve engineering problems.

SMQ27303 STATISTIK UNTUK MATEMATIK KEJURUTERAAN [STATISTICS FOR ENGINEERING TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This course begins with descriptive statistics, basic probability concepts, discrete and continuous probability distributions. Inferential methods using estimation and hypothesis test for single population and comparing two populations parameter. Lastly, analysis of variance (ANOVA) to compare more than two populations and linear regression to model relationship between two quantitative variables.

Course Outcomes:
1. Ability to describe basic statistical concepts, apply basic statistical skills and develop statistical reasoning skills.
2. Ability to apply, analyze and evaluate the suitable methods of statistical inference for a given statistical problem.
3. Ability to interpret, apply and analyze the procedures of simple linear regression model and making predictions.

SMU12102 INTEGRITI DAN ANTI RASUAH [INTEGRITY AND ANTI CORRUPTION]

No of Credits: 2

Course Synopsis:
This course covers basic concepts on the value of integrity, forms of corruption and abuse of power in daily life. This is not only happening in the society but also involving the existing organizations in the country. Therefore, methods to prevent corruption as well as identify real cases of corruption found in this life will be discussed in the learning session.

Course Outcomes:
1. Ability to identify and understand the value concepts of integrity and corruption.
2. Ability to analyse the value of integrity and corrupt behaviour in life and organizations.
3. Ability to discuss and evaluate integrity and acts of corruption through any type of media observation / case study / community service.

SMU12202 KEMAHIRAN KOMUNIKASI DAN TEKNOLOGI [COMMUNICATION SKILLS AND TECHNOLOGY]

No of Credits: 2

Course Synopsis:
This course introduces students to the basic concepts and theories of communication, the use of technology in communication and the basic principles of public speaking. The aim of this course is to expose students to relevant knowledge of concepts and theories of communication and the use of technology in communication within various contexts.

Course Outcomes:
1. Ability to comprehend the concepts and theories of communication and technology in communication in various contexts.
2. Ability to analyse the concepts and theories of communication and technology in communication in various contexts.
3. Ability to discuss the concepts and theories of communication and technology in communication in various contexts.

SMU12502 KOMUNIKASI KORPORAT [CORPORATE COMMUNICATION]

No of Credits: 2

Course Synopsis:
This course introduces the definition, theories and basic concepts of corporate communication. The aim of this course is to exposed to relevant knowledge of theories and concepts of corporate communication within internal and external of an organization.

Course Outcomes:
1. Ability to comprehend the concepts and theories of corporate communication.
2. Ability to analyse the suitable and appropriate concepts and theories of corporate communication within corporate communication contexts.
3. Ability to discuss the suitable and appropriate concepts and theories of corporate communication within corporate communication contexts.

SMU12602 PSIKOLOGI INDUSTRI [INDUSTRIAL PSYCHOLOGY]

No of Credits: 2

Course Synopsis:
This course introduces the definition, theories and basic concepts of industrial psychology. The aim of this course is to expose the relevant knowledge of industrial psychology in organization which include the understanding of human relations, human engineering, recruitment, selection and placement; development and training of personnel; and any issues pertaining to industrial psychology.

Course Outcomes:
1. Ability to comprehend the concepts, theories and process of industrial psychology.
2. Ability to analyse the suitable and appropriate concepts, theories and process of industrial psychology within any given contexts.
3. Ability to discuss the suitable and appropriate concepts, theories and process of industrial psychology within any given contexts.

SMU12702 KOMUNIKASI DAN PENGURUSAN KONFLIK [COMMUNICATION AND CONFLICT MANAGEMENT]

No of Credits: 2

Course Synopsis:
Students will be able to comprehend and analyze the definition, type of conflicts occurs, the approaches to deal and manage conflict and communication. Students will also be exposed to the knowledge of managing conflict with competence communication in the contexts of interpersonal conflict; organizational conflict and intercultural conflict.

Course Outcomes:
1. Ability to comprehend the concepts, theories, process and management of conflict and communication.
2. Ability to analyse the suitable and appropriate concepts, theories, process of communication in managing and resolving conflicts within any given contexts.
3. Ability to discuss the suitable and appropriate concepts, theories, process of communication in managing and resolving conflicts within any given contexts

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SMU12802 PENGURUSAN SUMBER MANUSIA [HUMAN RESOURCE MANAGEMENT]

No of Credits: 2

Course Synopsis:
Students will be exposed to the relevant knowledge of theories, concepts and practice of human resource management in organization. Students will be able to recognize, comprehend and analyze the issues in human resource management.

Course Outcomes:
1. Ability to comprehend the concepts, theories and process of human resource management
2. Ability to analyse the suitable and appropriate concepts, theories and process of human resource management within any given contexts.
3. Ability to discuss the suitable and appropriate concepts, theories and process of human resource management within any given contexts.

SMU13002 FALSAFAH DAN ISU SEMASA [PHILOSOPHY AND CURRENT ISSUES]

No of Credits: 2

Course Synopsis:
This course focuses on basic ideas and questions in philosophy which emphasizes on noble way of life within the intellectual thinking. The aim of this course is to give students a way to think more maturely in dealing with problems and issues in life. Students will be able to comprehend philosophy and its importance in building identity, moral responsibility, human relations and relationship with nature within the formation of Malaysian value systems.

Course Outcomes:
1. Ability to comprehend current issues base on philosophical knowledge and National Education Philosophy with "Rukunnegara".
2. Ability to explain current issues base on the main stream of various philosophical school of thoughts.
3. Ability to discuss current issues through comparison of philosophical perspectives to understand the integration of culture.

SMU13102 PENGHAYATAN ETIKA DAN PERADABAN [APPRECIATION OF ETHICS AND CIVILIZATION]

No of Credits: 2

Course Synopsis:
This course explains ethics from the perspective of different civilizations in Malaysia by identifying ethnic's system, level of development, progress, and culture in strengthening social cohesion. The goal of this course is to expose students to relevant knowledge in parsing and discussing contemporary issues related to economics, politics, social, culture, and the environment from a civilizational standpoint which hopefully will instill ethical perceptions and behaviour among students. The delivery of this course makes use of appropriate high-impact educational practices (HEIPs).

Course Outcomes:
1. Ability to comprehend the ethical concepts of different civilizations.
2. Ability to compare systems, levels of development, social and cultural progress across ethnic groups.
3. Ability to explain contemporary issues related to economics, politics, society, culture and the environment from an ethical and civilizational perspective.

SMU22402 KEUSAHAWANAN KEJURUTERAAN [ENGINEERING ENTREPRENEURSHIP]

No of Credits: 2

Course Synopsis:
This course introduces the basic concepts and theories of entrepreneurship. Students will be taught to develop a creative and innovative entrepreneurship ideas and business plan. The aim of this course is to instill entrepreneurial mindset among students in conducting daily activities.

Course Outcomes:
1. Ability to comprehend the theories and concepts of entrepreneurship.
2. Ability to explain entrepreneurial ideas creatively and innovatively.
3. Ability to write a business plan proposal for funding competently.

SMU32202 KEMAHIRAN BERFIKIR [THINKING SKILLS]

No of Credits: 2

Course Synopsis:
This course highlights the basic knowledge and understanding of thinking skills. Students will be able to understand and comprehend the related thinking skills philosophies, theories and concepts in local and western perspectives. Students will be able to choose, apply and discuss the appropriate and suitable thinking skill concepts and strategies in lateral and logical thinking in problem solving and decision making processes.

Course Outcomes:
1. Ability to comprehend the concepts, theories and processes of thinking skills.
2. Ability to analyse the suitable and appropriate concepts, theories and processes of thinking skills in any given contexts.
3. Ability to discuss the suitable and appropriate concepts, theories and processes of thinking skills in any given contexts.

SMB10102 BAHASA INGGERIS PERSEDIAAN [PREPARATORY ENGLISH]

No of Credits: - [Audit course]

Course Synopsis:
This course aims to enhance students' English Language proficiency level on a variety of familiar subjects within their fields of interest. The learning of productive and receptive language skills is integrated within communicative approaches.

Course Outcomes:
1. Ability to interpret texts on the subjects related to their field of interest.
2. Ability to express straightforward descriptions or opinions with reasons on a variety of familiar subjects within their field of interest.
3. Ability to write reflectively on a range of familiar subjects within their field of interest using targeted grammatical items correctly.

SMB20102 BAHASA INGGERIS UNTUK KOMUNIKASI UMUM [ENGLISH FOR GENERAL COMMUNICATION]

No of Credits: 2

Course Synopsis:
This course focuses on productive skills with some emphasis on receptive skills using semi-authentic and authentic content on a variety of subjects related to their field of interest. Students are exposed to evaluating information and arguments by applying appropriate grammatical items. This learner-centred course adopts language in context and skills-based approaches.

Course Outcomes:
1. Ability to identify the main ideas of complex texts in both concrete and abstract topics.
2. Ability to discuss clear and detailed presentations on a wide range of subjects related to their field of interest, expanding and supporting ideas with subsidiary points and relevant examples.
3. Ability to argue on a variety of subjects related to their field of interest; evaluating information and arguments by applying appropriate grammatical items.

SMB31202 BAHASA INGGERIS UNTUK KOMUNIKASI TEKNIKAL [ENGLISH FOR TECHNICAL COMMUNICATION]

No of Credits: 2

Course Synopsis:
This course is designed to build students' competency in technical writing. Various theories of technical communication will be introduced throughout this course. Students will learn how to write clearly and concisely. Students will also be exposed to primary and secondary research, techniques of analysing and interpreting information. At the end of the semester, students are required to participate in discussions on a given topic related to the technical discipline.

Course Outcomes:
1. Ability to understand the theories related to technical communication.
2. Ability to produce clear, well- structured technical document supported with relevant analysis of data and appropriate examples.
3. Ability to discuss critically within a group on a variety of topics related to the technical discipline, and express agreement and disagreement diplomatically.

SMB31302 BAHASA INGGERIS AKADEMIK [ENGLISH FOR ACADEMIC PURPOSES]

No of Credits: 2

Course Synopsis:
This course is aimed at preparing students to improve their general academic writing skills by familiarising them with the fundamentals of academic writing. Students will be expected to perform tasks in academic contexts on topics from various disciplines such as conducting primary and secondary research, writing a project paper, applying the correct form of APA style referencing in their writings, and critically analyse reading texts. This course also places some emphasis on reading and speaking skills.

Course Outcomes:
1. Ability to analyse complex academic texts critically from various disciplines.
2. Ability to produce well-structured academic writing by applying information gathered from primary and secondary sources using APA referencing.
3. Ability to argue in a discussion of topics from various disciplines convincingly.

SMB11002 BAHASA MELAYU ASAS [BASIC MALAY LANGUAGE]

No of Credits: 2

Course Synopsis:
Kursus ini dapat mengasah kemahiran berbahasa yang asas sehingga pelajar berkebolehan untuk menulis dan bertutur dalam bahasa Melayu. Kandungan kursus ini dapat memberi nilai tambah kepada kemahiran menulis dan bertutur dengan kosa kata asas dalam perbualan harian dan pembacaan teks mudah. Tatabahasa asas diterapkan untuk menyokong kemahiran berbahasa secara tepat.

Course Outcomes:
1. Kebolehan untuk memahami struktur asas tatabahasa dalam penulisan bahasa Melayu.
2. Kebolehan untuk mengaplikasi perkataan dan ayat mudah secara lisan dalam bahasa Melayu.
3. Kebolehan untuk menganalisis teks secara lisan dalam bahasa Melayu.

SMB41002 BAHASA MELAYU UNIVERSITI [UNIVERSITY MALAY LANGUAGE]

No of Credits: 2

Course Synopsis:
Secara amnya kursus ini menekankan empat elemen dalam berbahasa, iaitu kemahiran mendengar, bertutur, membaca dan menulis. Pelajar mendapat pendedahan tentang konsep pemilihan kata, kesantunan berbahasa, penggunaan laras bahasa dan bahasa sapaan. Topik perancangan bahasa menyentuh sistem ejaan dan pembentukan kata dalam konteks rasmi. Pelajar akan didedahkan dengan penggunaan bahasa tidak formal, terutamanya dalam dialek geografi dan dialek sosial. Tugasan penulisan memberikan peluang kepada pelajar mempelajari proses-proses analisis disiplin bahasa dari segi fonologi, morfologi, leksikal, semantik dan sintaksis melalui penghuraian idea secara lisan dan tulisan.

Course Outcomes:
1. Kebolehan untuk memahami aspek-aspek kemahiran berbahasa dalam lisan dan tulisan.
2. Kebolehan untuk menganalisis penggunaan bahasa dan tatabahasa mengikut konteks.
3. Kebolehan untuk berhujah dengan menggunakan bahasa yang kritis dan analitis.

SMB01402 BAHASA MANDARIN PERMULAAN [MANDARIN LANGUAGE FOR BEGINNERS]

No of Credits: 2

Course Synopsis:
This course is designed for beginners with no prior knowledge of Mandarin. This course focuses on developing the learner's basic listening, speaking and reading skills. Students will acquire the correct Mandarin pronunciation using Pinyin, to enable them to interact in various everyday situations. Simple conversations such as self-introduction, introducing one self to others, describing objects/people and expressing everyday activities are taught. In addition, students will be exposed to the basic elements of Chinese culture via the topics covered in the syllabus.

Course Outcomes:
1. Ability to identify basic simple words, phrases and short texts using Pinyin transliteration.
2. Ability to respond everyday expressions & activities dealing with everyday needs in very short, slow, and repeated speech.
3. Ability to describe personal information (e.g., name, age, nationality, spoken language) using short phrases and simple dialogues.

SMB11402 BAHASA MANDARIN PERSEDIAAN [PREPARATORY MANDARIN LANGUAGE]

No of Credits: 2

Course Synopsis:
This course is designed for students who have no prior background in Mandarin language. The course focuses on receptive and productive skills. Student will be introduced to Chinese Character and Pinyin, read and write short simple sentences using Chinese characters with reference to pin yin, and learn daily expressions.

Course Outcomes:
1. Ability to comprehend words and phrases in simple informational texts.
2. Ability to reproduce personal information and details using simple phrases and short sentences using Chinese characters with reference to pin yin.
3. Ability to respond to repeated speech in everyday expressions & activities dealing with daily needs.
4. Ability to describe themselves and personal information (e.g., name, age, nationality, spoken language) using short phrases and simple dialogues.

SMB21402 BAHASA MANDARIN ASAS I [ELEMENTARY MANDARIN LANGUAGE I]

No of Credits: 2

Course Synopsis:
At this Elementary 1 level, students will be introduced to grammatical structures used in common everyday language and related to the workplace. Students will also be able to read, understand and write longer sentences and conversations in different social contexts.

Course Outcomes:
1. Ability to understand short, simple texts written in common everyday language.
2. Ability to describe longer sentences, dialogues, basic descriptions of events and activities using Chinese characters.
3. Ability to identify essential information from short recorded passage dealing with everyday matters which are spoken slowly and clearly.
4. Ability to express simple aspects of their everyday life in a series of simple sentences, simple words and basic phrases.

SMB31402 BAHASA MANDARIN ASAS II [ELEMENTARY MANDARIN LANGUAGE II]

No of Credits: 2

Course Synopsis:
The objective of this course is the introduction to, and use of vocabulary related to personal experiences in different real-life formal and social contexts or situations. Students will also be able to read longer texts and learn to construct complex sentences to produce longer dialogues and essays.

Course Outcomes:
1. Ability to apply specific information in different social contexts.
2. Ability to write sentences using correct grammar to produce longer dialogues and essay relating to personal experience and social contexts.
3. Ability to interpret clear, standard speech on familiar matters in real life situation.
4. Ability to describe their plans and arrangements, activities and personal experiences.

SMB41402 BAHASA MANDARIN PERTENGAHAN [PRE-INTERMEDIATE MANDARIN LANGUAGE]

No of Credits: 2

Course Synopsis:
The objective of this course is the introduction to developing productive and reflective language skills which focuses more on job-related topics and contexts. Students will also be exposed to advanced communicative and grammatical structures.

Course Outcomes:
1. Ability to identify general information in formal and informal texts relating to a variety of workplace contexts.
2. Ability to write formal and informal texts and describe informative materials relating to work place contexts.
3. Ability to interpret information and conversations on topics and contexts related to workplace.
4. Ability to describe main information of experiences, events and opinions using descriptive language on workplace related topics and contexts.

SMB01502 BAHASA THAI PERMULAAN [THAI LANGUAGE FOR BEGINNERS]

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 basic listening, speaking and reading skills. Students will acquire the correct Thai language pronunciation using Thai transliteration, to enable them to interact in various everyday situations. Simple conversations such as self-introduction, introducing oneself to others, describing objects/people and expressing everyday activities are taught. In addition, students will be exposed to the basic elements of Thai culture via the topics covered in the syllabus.

Course Outcomes:
1. Ability to identify basic simple words, phrases and short texts using Thai transliteration.
2. Ability to respond to everyday expressions & activities dealing with everyday needs in very short, slow, and repeated speech.
3. Ability to describe personal information (e.g., name, age, nationality, spoken language) using short phrases and simple dialogues

SMB11502 BAHASA THAI PERSEDIAAN [PREPARATORY THAI LANGUAGE]

No of Credits: 2

Course Synopsis:
This course is designed for students who have no prior background in Thai language. The course focus on receptive and productive skills. Student will be introduced to Thai phonetic transcriptions, read and write short simple sentences using Thai Scripts, and learn daily expressions.

Course Outcomes:
1. Ability to comprehend words and phrases in simple informational texts.
2. Ability to reproduce personal information and details using simple phrases and short sentences.
3. Ability to respond to repeated speech in everyday expressions & activities dealing with daily needs.
4. Ability to describe themselves and personal information (e.g., name, age, nationality, spoken language) using short phrases and simple dialogues.

SMB21502 BAHASA THAI ASAS I [ELEMENTARY THAI LANGUAGE I]

No of Credits: 2

Course Synopsis:
At this Elementary 1 level, students will be introduced to grammatical structures used in common everyday language and related to the workplace. Students will also be able to read, understand and write longer sentences and conversations in different social contexts.

Course Outcomes:
1. Ability to understand short, simple texts written in common everyday language.
2. Ability to describe longer sentences, dialogues, basic descriptions of events and activities using Thai characters.
3. Ability to identify essential information from short recorded passage dealing with everyday matters which are spoken slowly and clearly.
4. Ability to express simple aspects of their everyday life in a series of simple sentences, simple words and basic phrases.

SMB31502 BAHASA THAI ASAS II [ELEMENTARY THAI LANGUAGE II]

No of Credits: 2

Course Synopsis:
The objective of this course is the introduction to, and use of vocabulary related to personal experiences in different real-life formal and social contexts or situations. Students will also be able to read longer texts and learn to construct complex sentences to produce longer dialogues and essays.

Course Outcomes:
1. Ability to apply specific information in different social contexts.
2. Ability to write sentences using correct grammar to produce longer dialogues and essay relating to personal experience and social contexts.
3. Ability to interpret clear, standard speech on familiar matters in real life situation.
4. Ability to describe their plans and arrangements, activities and personal experiences.

SMB41502 BAHASA THAI PERTENGAHAN [PRE-INTERMEDIATE THAI LANGUAGE]

No of Credits: 2

Course Synopsis:
The objective of this course is the introduction to developing productive and reflective language skills which focuses more on job-related topics and contexts. Students will also be exposed to advanced communicative and grammatical structures.

Course Outcomes:
1. Ability to identify general information in formal and informal texts relating to a variety of workplace contexts.
2. Ability to write formal and informal texts and describe informative materials relating to work place contexts.
3. Ability to interpret information and conversations on topics and contexts related to workplace.
4. Ability to describe main information of experiences, events and opinions using descriptive language on workplace related topics and contexts.

SMB01602 BAHASA ARAB PERMULAAN [ARABIC LANGUAGE FOR BEGINNERS]

No of Credits: 2

Course Synopsis:
This course is designed for beginners with no prior knowledge of Arabic language. This course focuses on developing the learner's basic listening, speaking and reading skills. Students will acquire the correct Arabic language pronunciation using Romanized transliteration, to enable them to interact in various everyday situations. Simple conversations such as self-introduction, introducing oneself to others, describing objects/people and expressing everyday activities are taught. In addition, students will be exposed to the basic elements of Arabic culture via the topics covered in the syllabus.

Course Outcomes:
1. Ability to identify basic simple words, phrases and short texts using Romanized transliteration.
2. Ability to respond to everyday expressions & activities dealing with everyday needs in very short, slow, and repeated speech.
3. Ability to describe personal information (e.g., name, age, nationality, spoken language) using short phrases and simple dialogues.

SMB11602 BAHASA ARAB PERSEDIAAN [PREPARATORY ARABIC LANGUAGE]

No of Credits: 2

Course Synopsis:
This course is designed for students who have no prior background in Arabic language. The course focuses on receptive and productive skills. Student will be introduced to Arabic phonetic transcriptions, read and write short simple sentences using Arabic transliterations, and learn daily expressions used in daily speaking. Students will acquire the correct Arabic language pronunciation using romanized transliteration, to enable them to interact in various everyday situations. Simple conversations such as self-introduction, introducing oneself to others, describing objects/people and expressing everyday activities are taught. In addition, students will be exposed to the basic elements of Arabic culture via the topics covered in the syllabus.

Course Outcomes:
1. Ability to respond to repeated speech. in everyday expressions & activities dealing with daily needs.
2. Ability to describe themselves and personal information (e.g., name, age, nationality, spoken language) using short phrases and simple dialogues.
3. Ability to comprehend words and phrases in simple informational texts.
4. Ability to reproduce personal information and details using simple phrases and short sentences.

SMB21602 BAHASA ARAB ASAS I [ELEMENTARY ARABIC LANGUAGE I]

No of Credits: 2

Course Synopsis:
At this Elementary 1 level, students will be introduced to grammatical structures used in common everyday language and related to the workplace. Students will also be able to read, understand and write longer sentences and conversations in different social contexts.

Course Outcomes:
1. Ability to understand short, simple texts written in common everyday language.
2. Ability to describe longer sentences, dialogues, basic descriptions of events and activities using Arabic words.
3. Ability to identify essential information from short recorded passage dealing with everyday matters which are spoken slowly and clearly.
4. Ability to express simple aspects of their everyday life in a series of simple sentences, simple words and basic phrases.

SMB31602 BAHASA ARAB ASAS II [ELEMENTARY ARABIC LANGUAGE II]

No of Credits: 2

Course Synopsis:
The objective of this course is the introduction to, and use of vocabulary related to personal experiences in different real-life formal and social contexts or situations. Students will also be able to read longer texts and learn to construct complex sentences to produce longer dialogues and essays.

Course Outcomes:
1. Ability to apply specific information in different social contexts.
2. Ability to write sentences using correct grammar to produce longer dialogues and essay relating to personal experience and social contexts.
3. Ability to interpret clear, standard speech on familiar matters in real life situation.
4. Ability to describe their plans and arrangements, activities and personal experiences

SMB41602 BAHASA ARAB PERTENGAHAN [PRE-INTERMEDIATE ARABIC LANGUAGE]

No of Credits: 2

Course Synopsis:
The objective of this course is the introduction to developing productive and reflective language skills which focuses more on job-related topics and contexts. Students will also be exposed to advanced communicative and grammatical structures.

Course Outcomes:
1. Ability to identify general information in formal and informal texts relating to a variety of workplace contexts.
2. Ability to write formal and informal texts and describe informative materials relating to work place contexts.
3. Ability to interpret information and conversations on topics and contexts related to workplace.
4. Ability to describe main information of experiences, events and opinions using descriptive language on workplace related topics and contexts.

SMB01702 BAHASA JEPUN PERMULAAN [JAPANESE LANGUAGE 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 basic listening, speaking and reading skills. Students will acquire the correct Japanese language pronunciation using Japanese Kana in Romaji, to enable them to interact in various everyday situations. Simple conversations such as self-introduction, introducing oneself to others, describing objects/people and expressing everyday activities are taught. In addition, students will be exposed to the basic elements of Japanese culture via the topics covered in the syllabus.

Course Outcomes:
1. Ability to identify basic simple words, phrases and short texts using Romaji transliteration.
2. Ability to respond to everyday expressions & activities dealing with everyday needs in very short, slow, and repeated speech.
3. Ability to describe personal information (e.g., name, age, nationality, spoken language) using short phrases and simple dialogues.

SMB11702 BAHASA JEPUN PERSEDIAAN [PREPARATORY JAPANESE LANGUAGE]

No of Credits: 2

Course Synopsis:
This course is designed for students who have no prior background in Japanese language. The course focus on receptive and productive skills. Student will be introduced to Japanese Writing System, read and write short sentences using Japanese characters and learn daily expressions.

Course Outcomes:
1. Ability to comprehend words and phrases in simple informational texts.
2. Ability to reproduce personal information and details using simple phrases and short sentences.
3. Ability to respond to repeated speech in everyday expressions & activities dealing with daily needs.
4. Ability to describe themselves and personal information (e.g., name, age, nationality, spoken language) using short phrases and simple dialogues.

SMB21702 BAHASA JEPUN ASAS I [ELEMENTARY JAPANESE LANGUAGE I]

No of Credits: 2

Course Synopsis:
At this Elementary 1 level, students will be introduced to grammatical structures used in common everyday language and related to the workplace. Students will also be able to read, understand and write longer sentences and conversations in different social contexts.

Course Outcomes:
1. Ability to understand short, simple texts written in common everyday language and related to my job.
2. Ability to describe longer sentences, dialogues, basic descriptions of events and activities using Japanese characters.
3. Ability to identify essential information from short recorded passage dealing with everyday matters which are spoken slowly and clearly.
4. Ability to express simple aspects of their everyday life in a series of simple sentences, simple words and basic phrases.

SMB31702 BAHASA JEPUN ASAS II [ELEMENTARY JAPANESE LANGUAGE II]

No of Credits: 2

Course Synopsis:
The objective of this course is the introduction to, and use of vocabulary related to personal experiences in different real-life formal and social contexts or situations. Students will also be able to read longer texts and learn to construct complex sentences to produce longer dialogues and essays.

Course Outcomes:
1. Ability to apply specific information in different social contexts.
2. Ability to write sentences using correct grammar to produce longer dialogues and essay relating to personal experience and social contexts.
3. Ability to interpret clear, standard speech on familiar matters in real life situation.
4. Ability to describe their plans and arrangements, activities and personal experiences.

SMB41702 BAHASA JEPUN PERTENGAHAN [PRE-INTERMEDIATE JAPANESE LANGUAGE]

No of Credits: 2

Course Synopsis:
The objective of this course is the introduction to developing productive and reflective language skills which focuses more on job-related topics and contexts. Students will also be exposed to advanced communicative and grammatical structures.

Course Outcomes:
1. Ability to identify general information in formal and informal texts relating to a variety of workplace contexts.
2. Ability to write formal and informal texts and describe informative materials relating to work place contexts.
3. Ability to interpret information and conversations on topics and contexts related to workplace.
4. Ability to describe main information of experiences, events and opinions using descriptive language on workplace related topics and contexts.

SMB01802 BAHASA JERMAN PERMULAAN [GERMAN LANGUAGE FOR BEGINNERS]

No of Credits: 2

Course Synopsis:
This course is designed for beginners with no prior knowledge of German language. This course focuses on developing the learner's basic listening, speaking and reading skills. Students will acquire the correct German language pronunciation, to enable them to interact in various everyday situations. Simple conversations such as self -introduction, introducing oneself to others, describing objects/people and expressing everyday activities are taught. In addition, students will be exposed to the basic elements of German culture via the topics covered in the syllabus.

Course Outcomes:
1. Ability to identify basic simple words, phrases and short texts using Romanized transliteration.
2. Ability to respond to everyday expressions & activities dealing with everyday needs in very short, slow, and repeated speech.
3. Ability to describe personal information (e.g., name, age, nationality, spoken language) using short phrases and simple dialogues.

SMB11802 BAHASA JERMAN PERSEDIAAN [PREPARATORY GERMAN LANGUAGE]

No of Credits: 2

Course Synopsis:
This course is designed for students who have no prior background in German language. The course focus on receptive and productive skills. Student will be introduced to German phonetic transcriptions, read and write short simple sentences and learn daily expressions.

Course Outcomes:
1. Ability to comprehend words and phrases in simple informational texts.
2. Ability to reproduce personal information and details using simple phrases and short sentences.
3. Ability to respond to repeated speech in everyday expressions & activities dealing with daily needs.
4. Ability to describe themselves and personal information (e.g., name, age, nationality, spoken language) using short phrases and simple dialogues.

SMB21802 BAHASA JERMAN ASAS I [ELEMENTARY GERMAN LANGUAGE I]

No of Credits: 2

Course Synopsis:
At this Elementary 1 level, students will be introduced to grammatical structures used in common everyday language and related to the workplace. Students will also be able to read, understand and write longer sentences and conversations in different social contexts.

Course Outcomes:
1. Ability to understand short, simple texts written in common everyday language and related to my job.
2. Ability to describe longer sentences, dialogues, basic descriptions of events and activities.
3. Ability to identify essential information from short recorded passage dealing with everyday matters which are spoken slowly and clearly.
4. Ability to express simple aspects of their everyday life in a series of simple sentences, simple words and basic phrases.

SMB31802 BAHASA JERMAN ASAS II [ELEMENTARY GERMAN LANGUAGE II]

No of Credits: 2

Course Synopsis:
The objective of this course is the introduction to, and use of vocabulary related to personal experiences in different real-life formal and social contexts or situations. Students will also be able to read longer texts and learn to construct complex sentences to produce longer dialogues and essays.

Course Outcomes:
1. Ability to apply specific information in different social contexts.
2. Ability to write sentences using correct grammar to produce longer dialogues and essay relating to personal experience and social contexts.
3. Ability to interpret clear, standard speech on familiar matters in real life situation.
4. Ability to describe their plans and arrangements, activities and personal experiences.

SMB41802 BAHASA JERMAN PERTENGAHAN [PRE-INTERMEDIATE GERMAN LANGUAGE]

No of Credits: 2

Course Synopsis:
The objective of this course is the introduction to developing productive and reflective language skills which focuses more on job-related topics and contexts. Students will also be exposed to advanced communicative and grammatical structures.

Course Outcomes:
1. Ability to identify general information in formal and informal texts relating to a variety of workplace contexts.
2. Ability to write formal and informal texts and describe informative materials relating to work place contexts.
3. Ability to interpret information and conversations on topics and contexts related to workplace.
4. Ability to describe main information of experiences, events and opinions using descriptive language on workplace related topics and contexts.

SMB01902 BAHASA KOREA PERMULAAN [KOREAN LANGUAGE FOR BEGINNERS]

No of Credits: 2

Course Synopsis:
This course is designed for beginners with no prior knowledge of Korean language. This course focuses on developing the learner's basic listening, speaking and reading skills. Students will acquire the correct Korean language pronunciation using Hangul, to enable them to interact in various everyday situations. Simple conversations such as self-introduction, introducing oneself to others, describing objects/people and expressing everyday activities are taught. In addition, students will be exposed to the basic elements of Korean culture via the topics covered in the syllabus.

Course Outcomes:
1. Ability to identify basic simple words, phrases and short texts using Hangul transliteration.
2. Ability to respond to everyday expressions & activities dealing with everyday needs in very short, slow, and repeated speech.
3. Ability to describe personal information (e.g., name, age, nationality, spoken language) using short phrases and simple dialogues.

SMB11902 BAHASA KOREA PERSEDIAAN [PREPARATORY KOREAN LANGUAGE]

No of Credits: 2

Course Synopsis:
This course is designed for students who have no prior background in Korean language.This course focuses on receptive and productive skills. Student will be introduced to Korean Character and pronunciation, read and write short simple sentences using Hangul, and learn daily expressions.

Course Outcomes:
1. Ability to comprehend words and phrases in simple informational texts
2. Ability to reproduce personal information and details using simple phrases and short sentences using Hangul.
3. Ability to respond to repeated speech. in everyday expressions & activities dealing with daily needs.
4. Ability to describe themselves and personal information (e.g., name, age, nationality, spoken language) using short phrases and simple dialogues.

SMB21902 BAHASA KOREA ASAS I [ELEMENTARY KOREAN LANGUAGE]

No of Credits: 2

Course Synopsis:
At this Elementary level, students will be introduced to grammatical structures used in common everyday language and related to the workplace. Students will also be able to read, understand and write longer sentences and conversations in different social contexts.

Course Outcomes:
1. Ability to apply specific information in different social contexts
2. Ability to write sentences using correct grammar to produce longer dialogues and essay relating to personal experience and social contexts.
3. Ability to identify essential information from short recorded passage dealing with everyday matters which are spoken slowly and clearly.
4. Ability to describe their plans and arrangements, activities and personal experiences.

SMB31902 BAHASA KOREA ASAS II [PRE-INTERMEDIATE KOREAN LANGUAGE]

No of Credits: 2

Course Synopsis:
The objective of this course is the introduction to developing productive and reflective language skills which focuses more on workplace-related topics and contexts. Students will also be exposed to advanced communicative and grammatical structures.

Course Outcomes:
1. Ability to identify general information in formal and informal texts relating to a variety of workplace contexts.
2. Ability to write formal texts and describe informative materials relating various social contexts.
3. Ability to interpret information and conversations on job-related topics and contexts.
4. Ability to describe main information of experiences, events and opinions using descriptive language on job related topics and contexts.

SMB41902 BAHASA KOREA UNTUK PERNIAGAAN ASAS [BASIC BUSINESS KOREAN]

No of Credits: 2

Course Synopsis:
The objective of this course is to teach students to communicate effectively in formal Korean in professional contexts. It aims to familiarize students with basic terminology and skills in business and workplace contexts to help them to communicate better in everyday professional situations.

Course Outcomes:
1. Ability to understand specific information in formal texts relating to a variety of workplace and business contexts.
2. Ability to analyse simple formal texts and write short report relating to a variety of workplace and business contexts.
3. Ability to interpret formal conversations relating to workplace and business contexts.
4. Ability to present information of products using formal language in workplace and business contexts.

SMZ11001 SUKARELAWAN SISWA/SISWI KOREKSIONAL JABATAN PENJARA MALAYSIA I [STUDENTS VOLUNTARY CORRECTIONAL MALAYSIAN PRISON DEPARTMENT]

No of Credits: 1

Course Synopsis:
Kursus ini adalah kursus awalan dalam siri kursus-kursus Pengurusan Kepenjaraan. Melalui kursus ini, para pelajar akan diperkenalkan dengan organisasi kepenjaraan, sejarah serta kepentingannya dalam pembangunan negara. Pelajar akan didedahkan dengan aktiviti, latihan dan tugasan tentang peranan Jabatan Penjara Malaysia. Di samping memberi pendedahan berkaitan Asas Kesukarelawanan, Akta Penjara 1995 Pindaan Tahun 2008, Peraturan-Peraturan Penjara Tahun 2000, United Nations Standard Minimum Rules (UNSMR) & latihan kawad kaki.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan dalam aktiviti SISKOR.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan sifat setia dan kecintaan pada keamanan dalam komuniti.

SMZ11101 SUKARELAWAN SISWA/SISWI KOREKSIONAL JABATAN PENJARA MALAYSIA II [STUDENTS VOLUNTARY CORRECTIONAL MALAYSIAN PRISON DEPARTMENT II]

No of Credits: 1

Course Synopsis:
Siswa Siswi Koreksional II (SISKOR II) adalah lanjutan daripada SISKOR I yang mana ia memberi penekanan terhadap pengurusan keselamatan, pengurusan penahanan, pengurusan layanan dan pengurusan pemulihan (PPI) di Jabatan Penjara Malaysia. Kursus in juga memberi penekanan kepada pembinaan kemahiran interpersonal dan sahsiah pelajar. Pelajar akan didedahkan dengan latihan kemahiran kawad, SENTAP dan pengendalian senjata api.

Course Outcomes:
1. Keupayaan untuk menunjuk cara kemahiran asas bela diri dalam kumpulan kecil.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasi aktiviti kepenjaraan yang bersesuaian dengan komuniti.

SMZ21001 SUKARELAWAN SISWA/SISWI KOREKSIONAL JABATAN PENJARA MALAYSIA III [STUDENTS VOLUNTARY CORRECTIONAL MALAYSIAN PRISON DEPARTMENT III]

No of Credits: 1

Course Synopsis:
Siswa Siswi Koreksional III (SISKOR III) adalah lanjutan daripada SISKOR II yang mana ia memberi penekanan kefahaman terhadap Dasar Kepenjaraan, Memasyarakatkan Penjara, Pemulihan dan Rumah Perantaraan (RP). Siswa Siswi juga diberi latihan luar serta kemahiran kawad kaki.

Course Outcomes:
1. Keupayaan untuk menunjukkan etika dan kepimpinan dalam acara berprotokol.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan.
3. Berkeupayaan untuk mengorganisasikan aktiviti rawatan pemulihan yang bersesuaian dalam komuniti.

SMZ21101 SUKARELAWAN SISWA/SISWI KOREKSIONAL JABATAN PENJARA MALAYSIA IV [STUDENTS VOLUNTARY CORRECTIONAL MALAYSIAN PRISON DEPARTMENT IV]

No of Credits: 1

Course Synopsis:
Siswa Siswi Koreksional IV (SISKOR IV) merupakan kursus lanjutan SISKOR III yang memberi penekanan terhadap Pengurusan Keselamatan dan Program Parol dan Perkhidmatan Komuniti di Institusi Penjara yang menjadi *core business* dalam perkhidmatan koreksional. Pelajar juga akan didedahkan dengan ilmu pengetahuan asas program pemulihan Pemasyarakatan, latihan teori & praktikal senjata api, Program Pemulihan & Unit Keselamatan Dalaman. Pelajar dikehendaki menjalankan aktiviti jalinan Universiti dan komuniti.

Course Outcomes:
1. Keupayaan untuk mengamalkan sikap profesional dan bertanggungjawab dalam menjalankan tugas.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan.
3. Berkeupayaan untuk menganjurkan program dan aktiviti pemulihan yang bersesuaian dalam komuniti.

SMZ11201 KUMPULAN LATIHAN KELANASISWA MALAYSIA I (UDARA) [MALAYSIAN UNIVERSITY ROVER TRAINING GROUP I (AIR)]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum badan beruniform Kumpulan Latihan Kelanasiswa Udara I ini merupakan satu unit baru yang ditubuhkan dalam kumpulan Kelana Siswa di Malaysia. UniMAP merupakan perintis kepada penubuhan Pengakap Kelana Udara di universiti-universiti di Malaysia. Pelajar akan didedahkan kepada Skim Latihan Pengakap Kelana Udara yang baru serta kursus Kepimpinan Manikayu. Pengakap Kelana Udara ini terdiri daripada remaja yang berumur dari 17 tahun sehingga 25 tahun. Kursus ini menawarkan pelbagai aktiviti dan latihan dalam membangunkan kemahiran modal insan individu secara langsung mahupun tidak langsung. Tumpuan juga diberikan pada pembangunan kesedaran diri yang menekankan aspek tanggungjawab terhadap diri sendiri, patuh kepada ketua, organisasi, masyarakat dan negara serta memberi perkhidmatan kesukarelaan kepada masyarakat, selaras dengan cogan kata Pengakap Kelana iaitu "Berkhidmat".

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan dalam aktiviti pengakap.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kaedah dan kemahiran yang bersesuaian dalam aktiviti pengakap dengan komuniti.

SMZ11301 KUMPULAN LATIHAN KELANASISWA MALAYSIA II (UDARA) [MALAYSIAN UNIVERSITY ROVER TRAINING GROUP II (AIR)]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum badan beruniform Kumpulan Latihan Kelanasiswa Udara II ini dengan nama lain Unit Pengakap Kelana merupakan satu unit baru yang ditubuhkan dalam kumpulan Kelana Siswa di Malaysia. UniMAP merupakan perintis kepada penubuhan Pengakap Kelana Udara. Ia merupakan satu-satunya Universiti di Malaysia yang mempunyai Pengakap Kelana Udara dan juga akan didedahkan kepada Skim Latihan Pengakap Kelana Udara yang baru serta kursus Kepimpinan Manikayu. Pengakap Kelana Udara ini terdiri daripada remaja yang berumur dari 17 tahun sehingga ke 25 tahun yang menawarkan pelbagai aktiviti dan latihan dalam membangunkan kemahiran modal insan individu secara langsung mahupun tidak langsung. Penumpuan juga diberikan kepada pembangunan kesedaran diri yang menekankan aspek tanggungjawab terhadap diri sendiri, patuh kepada ketua, organisasi, masyarakat dan Negara serta memberi perkhidmatan kesukarelaan kepada masyarakat, selaras dengan cogan kata Pengakap Kelana iaitu "Berkhidmat".

Course Outcomes:
1. Keupayaan untuk menunjuk cara kemahiran asas aktiviti pengakap dalam kumpulan kecil.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk menganjurkan program dan aktiviti pengakap bersama komuniti.

SMZ11401 SUKARELAWAN MUDA BANTUAN PERUBATAN MALAYSIA (MERCY MUDA 1) [STUDENT VOLUNTARY MALAYSIAN MEDICAL RELIEF SOCIETY [YOUNG MERCY 1]

No of Credits: 1

Course Synopsis:
Kursus MERCY merupakan salah satu kursus kokurikulum yang memberi pendedahan awal tentang kesukarelawanan. Kursus MERCY I ini menggabungkan pengetahuan asas aspek bantuan kemanusiaan dengan latihan praktikal. Pelajar akan menjalani Latihan Sukarelawan dan Misi Asas sebelum terlibat dalam merancang dan melaksanakan projek kemanusiaan.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan dalam aktiviti kesukarelawan
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan
3. Keupayaan untuk mempamerkan kemahiran teknikal dan kaedah yang bersesuaian dalam melaksanakan aktiviti kesukarelawan.

SMZ11501 SUKARELAWAN MUDA BANTUAN PERUBATAN MALAYSIA (MERCY MUDA 2) [STUDENT VOLUNTARY MALAYSIAN MEDICAL RELIEF SOCIETY [YOUNG MERCY 2]

No of Credits: 1

Course Synopsis:
The MERCY II course is a continuation from MERCY I where early exposure to volunteerism is instilled. The basic knowledge of the humanitarian relief aspect blended with practical exercise is integrated in this MERCY I course. The students will undergo a Basic Volunteer & Mission Training before getting involved in the planning & implementing a humanitarian project.

Course Outcomes:
1. Keupayaan untuk mengamalkan tanggungjawab sosial dalam melaksanakan aktiviti dan program kesukarelawan dalam kumpulan kecil.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk menganjurkan program dan aktiviti kesukarelawan bersama komuniti.

SMZ11601 PASUKAN KADET MARITIM MALAYSIA I (PASKAM) [MALAYSIAN MARITIME CADET I (PASKAM)]

No of Credits: 1

Course Synopsis:
Pasukan Kadet Maritim Malaysia I (PASKAM I) adalah kursus permulaan kepada para pelajar tentang pengurusan Agensi Penguatkuasaan Maritim Malaysia (APMM). Melalui kursus ini, para pelajar akan diperkenalkan kepada organisasi APMM, sejarah penubuhan serta kepentingan APMM kepada Negara. Pada peringkat awal, para pelajar akan didedahkan dengan aktiviti, latihan, tugasan dan silibus pelajaran tentang peranan APMM serta latihan kawad kaki.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan dalam aktiviti maritim.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi dengan berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kemahiran dan langkah-langkah asas aktiviti maritim yang bersesuaian dalam komuniti.

SMZ11701 PASUKAN KADET MARITIM MALAYSIA II (PASKAM) [MALAYSIAN MARITIME CADET II (PASKAM)]

No of Credits: 1

Course Synopsis:
Pasukan sukan Kadet Maritim Malaysia II (PASKAM II) merupakan sambungan kepada Pasukan Kadet Maritim Malaysia I. Melalui kursus ini, para pelajar akan diperkenalkan kepada Penguatkuasaan undang-undang di bawah Akta APMM, pendedahan ilmu mencari & menyelamat dan ilmu kelautan. Selain itu, para pelajar akan didedahkan dengan aktiviti, latihan, tugasan latihan kawad kaki.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan, disiplin dan etika dalam aktiviti maritim secara berkumpulan.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi dengan berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan teknik dan langkah-langkah aktiviti menyelamat dalam dunia maritim.

SMZ21601 PASUKAN KADET MARITIM MALAYSIA III (PASKAM) [MALAYSIAN MARITIME CADET III (PASKAM)]

No of Credits: 1

Course Synopsis:
Pasukan Kadet Maritim Malaysia III (PASKAM III) merupakan kursus peringkat ketiga Pasukan Kadet Maritim Malaysia. Melalui kursus ini, Pada peringkat ini, selain itu didedahkan dengan aktiviti latihan, tugasan dan latihan kawad kaki, para pelajar akan diperkenalkan kepada pengetahuan undang-undang yang lebih tinggi di bawah Akta APMM, asas tempur tanpa senjata, pengendalian senjata kecil, latihan menembak dan ilmu kelautan.

Course Outcomes:
1. Keupayaan untuk mengamalkan undang-undang, peraturan dan kerjasama dalam pasukan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Berkeupayaan untuk mengorganisasikan sesuatu aktiviti dalam pengendalian kapal.

SMZ21701 PASUKAN KADET MARITIM MALAYSIA IV (PASKAM) [MALAYSIAN MARITIME CADET IV (PASKAM)]

No of Credits: 1

Course Synopsis:
Pasukan Kadet Maritim Malaysia IV (PASKAM IV) merupakan peringkat akhir kursus Pasukan Kadet Maritim Malaysia (APMM). Pada peringkat ini, para pelajar akan didedahkan lebih lanjut berkaitan operasi mencari & menyelamat, latihan penembakan, dan kaedah komunikasi & navigasi. Para pelajar juga akan didedahkan dengan ilmu siasatan & forensik, kaedah-kaedah penggeledahan dan peranan pegawai pemerintah kapal.

Course Outcomes:
1. Keupayaan untuk mengamalkan sikap profesional, berdisiplin dan bertanggungjawab dalam kumpulan.
2. Keupayaan untuk menpraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Berkeupayaan untuk menganjurkan aktiviti dan program keselamatan maritim dengan komuniti

SMZ12001 BRIGED BOMBA DAN PENYELAMAT I [FIRE AND RESCUE BRIGADE I]

No of Credits: 1

Course Synopsis:
Kebakaran merupakan ancaman yang terdapat dalam masa aman, oleh itu kursus ini diharap dapat memupuk serta memberi kesedaran yang tinggi kepada mahasiswa serta warga UniMAP tentang bahaya kebakaran. Memberi pengetahuan, latihan, kemahiran kepada mahasiswa UniMAP sebagai langkah berjaga-jaga serta pencegahan. Meningkatkan semangat untuk berkhidmat kepada masyarakat dalam kalangan mahasiswa UniMAP terutama apabila berlaku sesuatu ancaman kebakaran.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan dalam aktiviti kebombaan.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi dengan berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kemahiran dan langkah-langkah asas aktiviti kebombaan yang bersesuaian dalam komuniti.

SMZ12101 BRIGED BOMBA DAN PENYELAMAT II [FIRE AND RESCUE BRIGADE II]

No of Credits: 1

Course Synopsis:
Kebakaran merupakan ancaman yang terdapat dalam masa aman, oleh itu kursus ini diharap dapat memupuk serta memberi kesedaran yang tinggi kepada mahasiswa serta warga UniMAP tentang bahaya kebakaran. Memberi pengetahuan, latihan, kemahiran kepada mahasiswa UniMAP sebagai langkah berjaga-jaga serta pencegahan. Meningkatkan semangat untuk berkhidmat kepada masyarakat dalam kalangan mahasiswa UniMAP terutama apabila berlaku sesuatu ancaman kebakaran.

Course Outcomes:
1. Keupayaan untuk menunjukkan cara kaedah dan langkah-langkah aktiviti memadam kebakaran dan menyelamat mangsa dalam kumpulan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan program dan aktiviti kebombaan dalam komuniti.

SMZ12201 PANDU PUTERI KLOVER I [CLOVER I]

No of Credits: 1

Course Synopsis:
Kursus Badan Beruniform Pandu Puteri Klover 1 ini dilaksanakan dengan tujuan untuk melahirkan graduan yang mempunyai kemahiran insaniah melalui Program Pandu Puteri Siswi terutamanya dari aspek pengetahuan dan kemahiran asas Pandu Puteri berteraskan kerja berpasukan yang boleh diaplikasikan dalam kerjaya yang diceburi.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan dalam aktiviti Pandu Puteri.
2. Keupayaan untuk mempraktik komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kemahiran asas kepanduan dalam aktiviti khidmat komuniti.

SMZ12301 PANDU PUTERI KLOVER II [CLOVER II]

No of Credits: 1

Course Synopsis:

Kursus Badan Beruniform Pandu Puteri ni dilaksanakan bertujuan melahirkan graduan yang mempunyai kemahiran insaniah melalui Program Pandu Puteri klover terutamanya dari aspek pengetahuan dan kemahiran asas Pandu Puteri berteraskan kerja berpasukan yang boleh diaplikasikan dalam kerjaya yang diceburi.

Course Outcomes:
1. Keupayaan untuk menunjuk cara kemahiran asas aktiviti pandu puteri dalam kumpulan kecil.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk menganjurkan program pandu puteri bersama komuniti.

SMZ12401 KOR ST. JOHN AMBULANS MALAYSIA I [MALAYSIAN ST. JOHN AMBULANCE I]

No of Credits: 1

Course Synopsis:
Kursus ini bertujuan memperkenalkan prinsip-prinsip asas serta matlamat pertolongan cemas. Pelajar akan didedahkan bagaimana memberi bantuan dalam sesuatu kecemasan. Mereka akan belajar kaedah pembalutan dan pembebatan, serta cara mengendali pendarahan luaran dan keadaan renjatan. Pelajar juga akan mengenali kepatahan tulang, terseliuh, dislokasi dan cara memberi rawatan kecemasan ke atas kes-kes tersebut.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan dalam aktiviti pertolongan cemas.
2. Keupayaan untuk mempraktik kemahiran berkomunikasi dengan berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk menunjukkan langkah-langkah pertolongan cemas dalam aktiviti menyelamat dengan komuniti.

SMZ12501 KOR ST. JOHN AMBULANS MALAYSIA II [MALAYSIAN ST. JOHN AMBULANCE II]

No of Credits: 1

Course Synopsis:
Kursus ini merupakan kesinambungan SMZ12401 Kor St. John Ambulans Malaysia I. Pelajar akan didedahkan bagaimana memberi bantuan dalam sesuatu kecemasan. Mereka akan belajar kaedah merawat keracunan, melecur akibat kebakaran, serangan sawan & jantung serta pengurusan ambulan. Pelajar juga akan didedahkan dengan pengurusan dan operasi bencana.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan, disiplin dan etika dalam aktiviti menyelamat dan pertolongan cemas secara berkumpulan.
2. Keupayaan untuk menpraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk menunjukkan kemahiran asas pertolongan cemas dalam aktiviti menyelamat dengan komuniti.

SMZ22401 KOR ST. JOHN AMBULANS MALAYSIA III [MALAYSIAN ST. JOHN AMBULANCE III]

No of Credits: 1

Course Synopsis:
Kursus ini merupakan kesinambungan kepada kursus St. John Ambulans II. Pelajar yang telah lulus Sijil Asas Pertolongan Cemas di dalam kursus SMZ12501 layak menjadi ahli berdaftar dalam Kor St. John Ambulans Malaysia UniMAP seterusnya melayakkan mereka menduduki Sijil Pertolongan Cemas Lanjutan. Dalam kursus ini, pelajar akan didedahkan dengan topik-topik pertolongan cemas dengan lebih mendalam dan menyediakan pelajar sebagai seorang jurulatih bertauliah dalam pertolongan cemas.

Course Outcomes:
1. Keupayaan untuk mengenal pasti tanda-tanda dan gejala korban dan menggunakan rawatan pertolongan cemas yang diperlukan dalam sebarang keadaan kecemasan.
2. Keupayaan untuk berkomunikasi, memimpin dan bekerja secara berkumpulan dengan berkesan.
3. Keupayaan untuk mengaplikasikan pengetahuan dan kemahiran asas BSMM dalam aktiviti kemasyarakatan.

SMZ22501 KOR ST. JOHN AMBULANS MALAYSIA IV [MALAYSIAN ST. JOHN AMBULANCE IV]

No of Credits: 1

Course Synopsis:
Kursus ini merupakan kesinambungan kepada kursus SMZ22401 Kor St. John Ambulans Malaysia III. Pelajar yang telah lulus Sijil pertolongan cemas lanjutan dalam kursus ini layak menduduki kursus kejurulatihan dan setelah tamat kursus ini layak untuk dilantik sebagai pegawai St. John Ambulans Malaysia yang berkebolehan sama ada di peringkat kor atau Kawasan, negeri dan kebangsaan. Di dalam kursus ini, pelajar akan didedahkan dengan disiplin-disiplin dan peraturan-peraturan bagi melayakkan pelajar menjadi seorang pegawai yang diiktiraf oleh Ibu pejabat St. John Kebangsaan Malaysia.

Course Outcomes:
1. Keupayaan untuk mengorganisasi unit / badan badan beruniform yang berkaitan dengan pertolongan cemas dan, perkhidmatan kepada masyarakat dan umat manusia.
2. Keupayaan untuk berkomunikasi, memimpin dan bekerja secara berkumpulan dengan berkesan.
3. Keupayaan untuk mengadaptasi langkah-langkah aktiviti menyelamat dan pertolongan cemas dalam komuniti.

SMZ12601 KUMPULAN LATIHAN KELANASISWA MALAYSIA I (DARAT) [MALAYSIAN UNIVERSITY ROVER TRAINING GROUP I]

No of Credits: 1

Course Synopsis:
KLKM merupakan badan beruniform bersifat antarabangsa yang membincangkan mengenai ilmu kemahiran hidup dan ikhtiar hidup. Para pelajar juga akan didedahkan dengan tatacara kehidupan yang beretika, saling membantu, hormat-menghormati, kasih sesama manusia dan alam sekitar melalui penghayatan Persetiaan dan Undang-Undang Pengakap.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan dalam aktiviti pengakap.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kemahiran yang bersesuaian dalam aktiviti pengakap.

SMZ12701 KUMPULAN LATIHAN KELANASISWA MALAYSIA II (DARAT) [MALAYSIAN UNIVERSITY ROVER TRAINING GROUP II]

No of Credits: 1

Course Synopsis:
KLKM merupakan badan beruniform bersifat antarabangsa yang membincangkan mengenai ilmu kemahiran hidup dan ikhtiar hidup. Para pelajar juga akan didedahkan dengan tatacara kehidupan yang beretika, saling membantu, hormat-menghormati, kasih sesama manusia dan alam sekitar melalui penghayatan Persetiaan dan Undang-Undang Pengakap.

Course Outcomes:
1. Keupayaan untuk menunjuk cara kemahiran asas aktiviti pengakap darat dalam kumpulan kecil.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk menganjurkan aktiviti dan program pengakap darat bersama komuniti.

SMZ12801 KUMPULAN LATIHAN KELANASISWA MALAYSIA I (LAUT) [MALAYSIAN UNIVERSITY ROVER TRAINING GROUP I (SEA)]

No of Credits: 1

Course Synopsis:
KLKM LAUT I merupakan kumpulan pengakap dewasa di bawah Persekutuan Pengakap Malaysia. Kumpulan ini ditubuhkan di bawah institusi-institusi pengajian tinggi tempatan. Disifatkan sebagai satu kumpulan di bawah unit KLKM (Negeri). Krew KLKM ditubuhkan dengan polisi unit KLKM. Ia juga sama seperti KLKM Darat dan Udara, tetapi KLKM Laut lebih menekankan unsur-unsur ilmu kelautan. Ilmu kemahiran, kepimpinan, ikhtiar hidup dan khidmat masyarakat ditekankan.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan dalam aktiviti pengakap.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kemahiran yang bersesuaian dalam aktiviti pengakap.

SMZ12901 KUMPULAN LATIHAN KELANASISWA MALAYSIA II (LAUT) [MALAYSIAN UNIVERSITY ROVER TRAINING GROUP II (SEA)]

No of Credits: 1

Course Synopsis:
KLKM merupakan badan beruniform bersifat antarabangsa yang membincangkan mengenai ilmu kemahiran hidup dan ikhtiar hidup. Para pelajar juga akan didedahkan dengan tatacara kehidupan yang beretika, saling membantu, hormat-menghormati, kasih sesama manusia dan alam sekitar melalui penghayatan Persetiaan dan Undang-Undang Pengakap.

Course Outcomes:
1. Keupayaan untuk menunjuk cara kemahiran asas aktiviti pengakap darat dalam kumpulan kecil.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk menganjurkan aktiviti dan program pengakap darat bersama komuniti.

SMZ16401 KURSUS PERSIJILAN BULAN SABIT MERAH MALAYSIA I [THE MALAYSIAN RED CRESCENT CERTIFICATION COURSE I]

No of Credits: 1

Course Synopsis:
Kursus ini bertujuan mendedahkan dan memberikan kefahaman pelajar kepada prinsip pertolongan cemas asas dan aspek-aspek memberi bantuan sukarela, latihan kawad asas dan khidmat masyarakat. Penekanan diberikan kepada setiap individu untuk mengetahui asas pertolongan cemas dan Pemulihan Cardiopulmonary atau CPR (Cardiopulmonary) bagi melahirkan seorang pembantu pertolongan cemas untuk kesejahteraan masyarakat.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran asas pertolongan cemas dalam aktiviti berkumpulan.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan.
3. Berkeupayaan untuk mempamerkan kemahiran dan langkah-langkah aktiviti menyelamat dan pertolongan cemas yang bersesuaian dalam komuniti.

SMZ26401 KURSUS PERSIJILAN BULAN SABIT MERAH MALAYSIA II [THE MALAYSIAN RED CRESCENT CERTIFICATION COURSE II]

No of Credits: 1

Course Synopsis:
Kursus ini bertujuan mendedahkan dan memberikan kefahaman pelajar kepada prinsip pertolongan cemas asas dan aspek-aspek memberi bantuan sukarela, latihan kawad asas dan khidmat masyarakat. Penekanan diberikan kepada setiap individu untuk mengetahui asas pertolongan cemas dan Pemulihan Cardiopulmonary atau CPR (Cardiopulmonary) bagi melahirkan seorang pembantu pertolongan cemas untuk kesejahteraan masyarakat.

Course Outcomes:
1. Keupayaan untuk mengamalkan sikap tanggungjawab dan berdisiplin dalam aktiviti menyelamat dan pertolongan cemas secara berkumpulan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengaplikasikan pengetahuan dan kemahiran asas BSMM dalam komuniti.

SMZ16201 KOR SISWA SISWI PERTAHANAN AWAM I [MALAYSIA CIVIL DEFENCE DEPARTMENT I]

No of Credits: 1

Course Synopsis:
Kursus ini menawarkan pengetahuan dan kemahiran asas kawad kaki, asas pertolongan cemas, sistem pendarahan tubuh manusia, rawatan lecur kebakaran, rawatan kecederaan tulang, sendi dan otot, rawatan gigitan serangga dan binatang berbisa, resusitasi kardiopulmonari, dan teknik ektrikasi. Para pelajar akan diajar secara teori dan praktikal berkenaan operasi menyelamat dan pertolongan cemas semasa kemalangan bagi meningkatkan pemahaman dan kesediaan mental dan fizikal semasa menghadapi sebarang isu kecemasan.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan pertahanan awam dalam aktiviti kumpulan kecil.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Berkeupayaan untuk mempamerkan kaedah dan kemahiran teknikal dalam melaksanakan aktiviti menyelamat dalam komuniti.

SMZ16301 KOR SISWA SISWI PERTAHANAN AWAM II [MALAYSIA CIVIL DEFENCE DEPARTMENT II]

No of Credits: 1

Course Synopsis:
Kursus ini menawarkan pengetahuan & kemahiran asas kawad kaki, teknik ektrikasi & mengeluarkan mangsa, kawad usungan, ikatan & simpulan tali, manual keselamatan operasi gergaji berantai, sains kebakaran & alatan pemadam api, teknik membaca peta & kompas, mengurus pusat bantuan kecemasan & keselamatan semasa bencana alam. Para pelajar akan diajar secara teori & praktikal berkenaan operasi menyelamat & pertolongan cemas semasa kemalangan bagi meningkatkan pemahaman & kesediaan mental & fizikal semasa menghadapi sebarang isu kecemasan.

Course Outcomes:
1. Keupayaan untuk mengamalkan sikap profesional dan bertanggungjawab dalam aktiviti menyelamat secara berkumpulan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kemahiran asas menyelamat mangsa bencana dalam komuniti.

SMZ26201 KOR SISWA SISWI PERTAHANAN AWAM III [MALAYSIA CIVIL DEFENCE DEPARTMENT III]

No of Credits: 1

Course Synopsis:
Kursus ini menawarkan pengetahuan & kemahiran asas kawad kaki, Pelan Integriti Nasional (PIN), penggunaan power cutter & peralatan hidraulik, peralatan & teknik ascending dan descending, teknik menyelamat dari tempat tinggi, pengenalan peralatan asas kebombaan, peralatan *Basic Trauma & Life Support* (BTLS) & pengenalan kepada peralatan ambulan. Para pelajar akan diajar secara teori & praktikal berkenaan operasi menyelamat & pertolongan cemas semasa kemalangan bagi meningkatkan pemahaman & kesediaan mental & fizikal semasa menghadapi sebarang isu kecemasan.

Course Outcomes:
1. Keupayaan untuk menunjuk cara langkah-langkah dan aktiviti menyelamat dalam kumpulan kecil
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Berkeupayaan untuk mengorganisasikan aktiviti bantuan dan operasi menyelamat yang bersesuaian dalam komuniti.

SMZ26301 KOR SISWA SISWI PERTAHANAN AWAM IV [MALAYSIA CIVIL DEFENCE DEPARTMENT IV]

No of Credits: 1

Course Synopsis:
Kursus ini pengetahuan dan kemahiran asas kawad kaki, Khidmat Kecemasan 999, pengurusan bencana dan krisis, kaedah pengurusan latihan, kaedah pengurusan pasukan, kursus kepimpinan dalam organisasi (PTB) dan kursus etiket dan protokol. Para pelajar akan diajar secara teori dan praktikal berkenaan operasi dan pentadbiran pasukan penyelamat Jabatan Pertahanan Awam bagi meningkatkan pemahaman para pelajar dengan struktur organisasi dan cara kerja Jabatan Pertahanan Awam Malaysia.

Course Outcomes:
1. Keupayaan untuk menunjukkan sikap profesional, kepimpinan, disiplin dan beretika dalam aktiviti Pertahanan Awam secara berkumpulan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk menganjurkan program dan aktiviti asas menyelamat dengan komuniti.

SMZ36201 KOR SISWA SISWI PERTAHANAN AWAM V [MALAYSIA CIVIL DEFENCE DEPARTMENT V]

No of Credits: 1

Course Synopsis:
Kursus ini pengetahuan dan kemahiran asas kawad kaki, pengendalian mesyuarat, sahsiah, etika pegawai dan kepimpinan, etiket dan protokol, latihan ketahanan diri, kursus kejurulatihan kemahiran dan kursus bakal pegawai. Para pelajar akan diajar secara teori dan praktikal berkenaan pengurusan dan pentadbiran pasukan Jabatan Pertahanan Awam Malaysia bagi meningkatkan kredibiliti dan kesiapsiagaan para pelajar dengan sebarang kemungkinan pada masa hadapan.

Course Outcomes:
1. Keupayaan untuk menunjukkan etika, etiket dan kepimpinan alam acara berprotokol.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan pengurusan majlis berprotokol.

SMZ16801 BRIGED RELA SISWA SISWI I [MALAYSIAN PEOPLE'S VOLUNTEER CORPS I]

No of Credits: 1

Course Synopsis:
Kursus ini memberi pendedahan kepada pelajar tentang pengenalan Ikatan Relawan Rakyat (RELA), perundangan RELA, penyatuan bangsa, konsep sukarela, latihan luar dan kawad kaki.

Course Outcomes:
1. Keupayaan untuk mengamalkan undang-undang, peraturan dan kerjasama dalam pasukan.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kaedah yang bersesuaian dalam aktiviti berpasukan.

SMZ16901 BRIGED RELA SISWA SISWI II [MALAYSIAN PEOPLE'S VOLUNTEER CORPS II]

No of Credits: 1

Course Synopsis:
Kursus ini memberi pendedahan kepada pelajar tentang operasi menyelamat, medan perang, kenegaraan, pengelolaan khidmat bakti siswa dan kawad rusuhan dan gempur.

Course Outcomes:
1. Keupayaan untuk mengamalkan sikap profesional dan bertanggungjawab dalam aktiviti secara berkumpulan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk menunjukkan kemahiran asas RELA dalam melaksanakan aktiviti khidmat komuniti.

SMZ26801 BRIGED RELA SISWA SISWI III [MALAYSIAN PEOPLE'S VOLUNTEER CORPS III]

No of Credits: 1

Course Synopsis:
Kursus ini memberi pendedahan kepada pelajar tentang operasi menyelamat, medan perang, kenegaraan, pengelolaan khidmat bakti siswa dan kawad rusuhan dan gempur.

Course Outcomes:
1. Keupayaan untuk menunjuk cara langkah-langkah dan aktiviti menyelamat dalam kumpulan kecil.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan aktiviti bantuan dan operasi menyelamat yang bersesuaian dalam komuniti.

SMZ26901 BRIGED RELA SISWA SISWI IV [MALAYSIAN PEOPLE'S VOLUNTEER CORPS IV]

No of Credits: 1

Course Synopsis:
Kursus ini memberi pendedahan kepada pelajar tentang seni silat RELA, operasi pencegahan jenayah, pengelolaan khidmat bakti siswa dan latihan kawad.

Course Outcomes:
1. Keupayaan untuk mengamalkan prinsip, undang-undang dan semangat kerja berpasukan dalam aktiviti khidmat masyarakat dan menyelamat.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk menganjurkan aktiviti dan program kesukarelawan dengan komuniti.

SMZ16001 PALAPES DARAT I [ROTU ARMY I]

No of Credits: 1

Course Synopsis:
Kursus ini bertujuan untuk mendedahkan pelajar kepada Latihan Asas Ketenteraan (Teori dan Praktikal) yang merangkumi aspek taktikal, latihan, persenjataan, kepimpinan, kerja berpasukan, membaca peta, tugas-tugas rejimen dan etika sosial serta pengetahuan am ketenteraan. Melalui latihan-latihan yang diberikan, potensi dan keupayaan pegawai kadet dapat dipertingkatkan dari segi pengetahuan, kepimpinan, disiplin, keyakinan diri dan semangat juang dan patriotisme yang tinggi.

Course Outcomes:
1. Keupayaan untuk mematuhi undang-undang dan peraturan dalam pasukan Palapes.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kemahiran yang bersesuaian dalam aktiviti Palapes.

SMZ16101 PALAPES DARAT II [ROTU ARMY II]

No of Credits: 1

Course Synopsis:
Kursus ini bertujuan untuk mendedahkan pelajar kepada Latihan Asas Ketenteraan (Teori dan Praktikal) yang merangkumi aspek taktikal, latihan, persenjataan, kepimpinan, kerja berpasukan, membaca peta, tugas-tugas rejimen dan etika sosial serta pengetahuan am ketenteraan. Melalui latihan-latihan yang diberikan, potensi dan keupayaan pegawai kadet dapat dipertingkatkan dari segi pengetahuan, kepimpinan, disiplin, keyakinan diri dan semangat juang dan patriotisme yang tinggi.

Course Outcomes:
1. Keupayaan untuk mematuhi undang-undang, berdisiplin dan bersemangat patriotik yang tinggi dalam aktiviti berkumpulan.
2. Keupayaan untuk mempraktikan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan sikap profesional dan tanggungjawab dalam pasukan.

SMZ26001 PALAPES DARAT III [ROTU ARMY III]

No of Credits: 1

Course Synopsis:
Kursus ini bertujuan untuk mendedahkan pelajar kepada Latihan Asas Ketenteraan (Teori dan Praktikal) yang merangkumi aspek taktikal, latihan, persenjataan, kepimpinan, kerja berpasukan, membaca peta, tugas-tugas rejimen dan etika sosial serta pengetahuan am ketenteraan. Melalui latihan-latihan yang diberikan, potensi dan keupayaan pegawai kadet dapat dipertingkatkan dari segi pengetahuan, kepimpinan, disiplin, keyakinan diri dan semangat juang dan patriotisme yang tinggi.

Course Outcomes:
1. Keupayaan untuk mengamalkan undang-undang dan peraturan Palapes dengan jelas dalam pasukan.
2. Berkeupayaan untuk menunjuk cara pengendalian senjata api secara berkumpulan.
3. Keupayaan untuk mempamerkan kemahiran yang bersesuaian dalam aktiviti ketenteraan.

SMZ26101 PALAPES DARAT IV [ROTU ARMY IV]

No of Credits: 1

Course Synopsis:
Kursus ini bertujuan untuk mendedahkan pelajar kepada Latihan Asas Ketenteraan (Teori dan Praktikal) yang merangkumi aspek taktikal, latihan, persenjataan, kepimpinan, kerja berpasukan, membaca peta, tugas-tugas rejimen dan etika sosial serta pengetahuan am ketenteraan. Melalui latihan-latihan yang diberikan, potensi dan keupayaan pegawai kadet dapat dipertingkatkan dari segi pengetahuan, kepimpinan, disiplin, keyakinan diri dan semangat juang dan patriotisme yang tinggi.

Course Outcomes:
1. Keupayaan untuk menunjuk cara kemahiran taktikal dan sikap profesional dalam membuat keputusan secara berkumpulan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan sikap profesional dan disiplin dalam formasi kawad yang bersesuaian dalam ketenteraan.

SMZ36001 PALAPES DARAT V [ROTU ARMY V]

No of Credits: 1

Course Synopsis:
Kursus ini bertujuan untuk mendedahkan pelajar kepada Latihan Asas Ketenteraan (Teori dan Praktikal) yang merangkumi aspek taktikal, latihan, persenjataan, kepimpinan, kerja berpasukan, membaca peta, tugas-tugas rejimen dan etika sosial serta pengetahuan am ketenteraan. Melalui latihan-latihan yang diberikan, potensi dan keupayaan pegawai kadet dapat dipertingkatkan dari segi pengetahuan, kepimpinan, disiplin, keyakinan diri dan semangat juang dan patriotisme yang tinggi.

Course Outcomes:
1. Berkeupayaan untuk menunjuk cara pengendalian senjata api berdasarkan SOP ATM.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan kaedah dan kemahiran yang bersesuaian dalam aktiviti ketenteraan.

SMZ36101 PALAPES DARAT VI [ROTU ARMY VI]

No of Credits: 1

Course Synopsis:
Kursus ini bertujuan untuk mendedahkan pelajar kepada Latihan Asas Ketenteraan (Teori dan Praktikal) yang merangkumi aspek taktikal, latihan, persenjataan, kepimpinan, kerja berpasukan, membaca peta, tugas-tugas rejimen dan etika sosial serta pengetahuan am ketenteraan. Melalui latihan-latihan yang diberikan, potensi dan keupayaan pegawai kadet dapat dipertingkatkan dari segi pengetahuan, kepimpinan, disiplin, keyakinan diri dan semangat juang dan patriotisme yang tinggi.

Course Outcomes:
1. Keupayaan untuk mengamalkan teori dan kemahiran ketenteraan dengan jelas berdasarkan undang-undang ketenteraan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengadaptasi kemahiran ketenteraan dalam komuniti

SMZ16601 KOR SUKARELAWAN POLIS SISWA/SISWI 1 [STUDENTS VOLUNTARY POLIS CORP 1]

No of Credits: 1

Course Synopsis:
Kursus ini bertujuan membentuk sahsiah dan pembangunan mahasiswa yang berilmu, berdisiplin dan patriotik serta mempunyai tahap pengetahuan kepolisian yang baik. Program latihan dan aktiviti Kor SUKSIS adalah mengikut program latihan dan aktiviti yang telah disediakan dan diluluskan oleh PDRM. Sejumlah 672 jam diperlukan untuk memenuhi keperluan latihan dan aktiviti Kor SUKSIS bagi tujuan pentauliahan. Oleh itu, 112 jam latihan diperlukan untuk tiap-tiap semester untuk memenuhi keperluan latihan dalam aspek Pentadbiran/Pengurusan, Latihan Luar dan Akademik. Tujuan penubuhan Kor SUKSIS adalah untuk melahirkan seorang Pegawai Kor SUKSIS Polis yang berpengetahuan undang-undang berkaitan, mempunyai sikap serta amalan disiplin (kepolisian) yang sesuai. Mampu memainkan peranan dan tanggungjawab dengan cekap dan berkesan sebagai seorang Pegawai Kor SUKSIS Polis. Mewujudkan kesedaran sivik dan hubungan baik polis dengan masyarakat dan memupuk ketahanan fizikal, mental serta personaliti yang kental untuk menghadapi cabaran.

Course Outcomes:
1. Keupayaan untuk mematuhi undang-undang dan peraturan dalam pasukan PDRM
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kaedah yang bersesuaian dalam aktiviti PDRM.

SMZ16701 KOR SUKARELAWAN POLIS SISWA/SISWI 2 [STUDENTS VOLUNTARY POLIS CORP 2]

No of Credits: 1

Course Synopsis:
Kursus ini merupakan lanjutan dari program yang dilaksanakan pada semester satu yang bertujuan membentuk sahsiah dan pembangunan mahasiswa yang berilmu, berdisiplin dan patriotik serta mempunyai tahap pengetahuan kepolisian yang baik. Program latihan dan aktiviti Kor SUKSIS adalah mengikut program latihan dan aktiviti yang telah disediakan dan diluluskan oleh PDRM.

Course Outcomes:
1. Berkeupayaan untuk menunjuk cara pengendalian senjata api secara berkumpulan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kaedah dan kemahiran yang bersesuaian dalam aktiviti PDRM.

SMZ26601 KOR SUKARELAWAN POLIS SISWA/SISWI 3 [STUDENTS VOLUNTARY POLIS CORP 3]

No of Credits: 1

Course Synopsis:
Kursus ini merupakan lanjutan dari program yang dilaksanakan pada semester dua yang bertujuan membentuk sahsiah & pembangunan mahasiswa yang berilmu, berdisiplin & patriotik serta mempunyai tahap pengetahuan kepolisian yang baik. Program latihan & aktiviti Kor SUKSIS adalah mengikut program latihan & aktiviti yang telah disediakan dan diluluskan oleh PDRM. Sejumlah 112 jam latihan diperlukan untuk memenuhi keperluan latihan dalam aspek Pentadbiran/Pengurusan, Latihan Luar & Akademik.

Course Outcomes:
1. Keupayaan untuk mengamalkan undang-undang dan peraturan persenjataan dengan jelas.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kaedah dan kemahiran yang bersesuaian dalam aktiviti PDRM.

SMZ26701 KOR SUKARELAWAN POLIS SISWA/SISWI 4 [STUDENTS VOLUNTARY POLIS CORP 4]

No of Credits: 1

Course Synopsis:
Kursus ini merupakan lanjutan dari program yang dilaksanakan pada semester tiga yang bertujuan membentuk sahsiah dan pembangunan mahasiswa yang berilmu, berdisiplin dan patriotic serta mempunyai tahap pengetahuan kepolisian yang baik. Program latihan dan aktiviti Kor SUKSIS adalah mengikut program latihan dan aktiviti yang telah disediakan dan diluluskan oleh PDRM. Sejumlah 112 jam latihan diperlukan untuk memenuhi keperluan latihan dalam aspek Pentadbiran/Pengurusan, Latihan Luar dan Akademik.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan, disiplin dan sikap profesional secara berkumpulan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan sikap profesional, integriti dan kemahiran asas PDRM dalam komuniti.

SMZ36601 KOR SUKARELAWAN POLIS SISWA/SISWI 5 [STUDENTS VOLUNTARY POLIS CORP 5]

No of Credits: 1

Course Synopsis:
Kursus ini merupakan lanjutan dari program yang dilaksanakan pada semester empat yang bertujuan membentuk sahsiah dan pembangunan mahasiswa yang berilmu, berdisiplin dan patriotic serta mempunyai tahap pengetahuan kepolisian yang baik. Program latihan dan aktiviti Kor SUKSIS adalah mengikut program latihan dan aktiviti yang telah disediakan dan diluluskan oleh PDRM. Sejumlah 112 jam latihan diperlukan untuk memenuhi keperluan latihan dalam aspek Pentadbiran/Pengurusan, Latihan Luar dan Akademik.

Course Outcomes:
1. Keupayaan untuk mensintesis akta dan undang-undang PDRM dengan jelas.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan kaedah dan kemahiran yang bersesuaian dalam aktiviti PDRM dalam komuniti.

SMZ36701 KOR SUKARELAWAN POLIS SISWA/SISWI 6 [STUDENTS VOLUNTARY POLIS CORP 6]

No of Credits: 1

Course Synopsis:
Kursus ini merupakan lanjutan dari program yang dilaksanakan pada semester lima yang bertujuan membentuk sahsiah dan pembangunan mahasiswa yang berilmu, berdisiplin dan patriotic serta mempunyai tahap pengetahuan kepolisian yang baik. Program latihan dan aktiviti Kor SUKSIS adalah mengikut program latihan dan aktiviti yang telah disediakan dan diluluskan oleh PDRM. Sejumlah 112 jam latihan diperlukan untuk memenuhi keperluan latihan dalam aspek Pentadbiran/Pengurusan, Latihan Luar dan Akademik.

Course Outcomes:
1. Keupayaan untuk mengamalkan teori dan ilmu kepolisian dengan jelas berdasarkan undang-undang PDRM.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengadaptasi kemahiran dan ilmu kepolisian dalam komuniti.

SMZ15101 ASAS GAMELAN [FOUNDATION OF GAMELAN]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar kepada ilmu seni asas tradisional gamelan dari segi kemahiran teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, terminologi, pengurusan diri dan lain-lain yang berkaitan dengan tradisional asas gamelan. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan amali dari segi kemahiran bermain gamelan.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan, disiplin dan etika dalam permainan muzik gamelan secara berkumpulan.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan alunan muzik melalui persembahan gamelan.

SMZ25101 GAMELAN II [GAMELAN II]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu seni asas tradisional gamelan dari segi kemahiran teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, terminologi, pengurusan diri dan lain-lain yang berkaitan dengan tradisional asas gamelan. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan amali (praktikal) dari segi kemahiran bermain gamelan.

Course Outcomes:
1. Keupayaan untuk menunjuk cara profesional dan kerja berpasukan dalam permainan muzik gamelan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk menganjurkan program atau aktiviti berkaitan muzik gamelan dengan komuniti.

SMZ15201 KUMPULAN JAZZ I [JAZZ BAND I]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu muzik jazz dari segi kemahiran teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, terminologi, pengurusan diri dan lain-lain yang berkaitan dengan seni muzik jazz. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan amali (practical) dari segi kemahiran bermain muzik jazz.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan, disiplin dan etika dalam permainan muzik jazz secara berkumpulan.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan alunan muzik melalui persembahan kumpulan jazz.

SMZ25201 KUMPULAN JAZZ II [JAZZ BAND II]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu muzik jazz dari segi kemahiran teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, terminologi, pengurusan diri dan lain-lain yang berkaitan dengan seni muzik jazz. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan amali (praktikal) dari segi kemahiran bermain muzik jazz.

Course Outcomes:
1. Keupayaan untuk menunjuk cara sikap profesional dan kerja berpasukan dalam permainan muzik jazz.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk menganjurkan program atau aktiviti berkaitan muzik kumpulan jazz dengan komuniti.

SMZ15301 PANCARAGAM I [BRASS BAND I]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu pancaragam dari segi kemahiran teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, pengurusan diri dan lain-lain yang berkaitan pancaragam. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan dari segi kemahiran bermain alatan pancaragam.

Course Outcomes:
1. Keupayaan menunjukkan kemahiran kepimpinan, disiplin dan etika dalam permainan muzik pancaragam secara berkumpulan.
2. Keupayaan untuk menpraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan alunan muzik melalui persembahan pancaragam.

SMZ25301 PANCARAGAM II [BRASS BAND II]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu Pancaragam II dari segi kemahiran teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, pengurusan diri dan lain-lain yang berkaitan Pancaragam II. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan dari segi kemahiran bermain alatan Pancaragam II.

Course Outcomes:
1. Keupayaan untuk menunjuk cara profesional dan kerja berpasukan dalam permainan pancaragam
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk menganjurkan program atau aktiviti pancaragam dengan komuniti.

SMZ15401 ANGKLUNG I [ANGKLUNG I]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada seni muzik tradisional angklung dari segi kemahiran teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, terminologi, pengurusan diri dan lain-lain yang berkaitan dengan seni muzik tradisional angklung. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan amali (praktikal) dari segi kemahiran bermain muzik angklung.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan, disiplin dan etika dalam permainan muzik angklung secara berkumpulan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan alunan muzik melalui persembahan angklung.

SMZ25401 ANGKLUNG II [ANGKLUNG II]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada seni muzik tradisional angklung dari segi kemahiran teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, terminologi, pengurusan diri dan lain-lain yang berkaitan dengan seni muzik tradisional angklung. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan amali (praktikal) dari segi kemahiran bermain muzik angklung.

Course Outcomes:
1. Keupayaan untuk menunjuk sikap profesional dan kerja berpasukan dalam permainan muzik angklung
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk menganjurkan program atau aktiviti berkaitan permainan muzik angklung dengan komuniti.

SMZ17101 SENI SILAT CEKAK I [SENI SILAT CEKAK I]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu Seni Silat Cekak dari segi kemahiran teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, pengurusan diri dan lain-lain yang berkaitan Seni Silat Cekak. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan dari segi kemahiran bermain Seni Silat Cekak.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan, disiplin dan etika dalam aktiviti silat dalam kumpulan kecil.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kaedah dan langkah yang bersesuaian dalam persembahan silat.

SMZ27101 SENI SILAT CEKAK II [SENI SILAT CEKAK II]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu Seni Silat Cekak II dari segi kemahiran teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, pengurusan diri dan lain-lain yang berkaitan Seni Silat Cekak II. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan dari segi kemahiran bermain Seni Silat Cekak II.

Course Outcomes:
1. Keupayaan untuk menunjuk cara kemahiran dan teknik silat secara berdisiplin dan bertanggungjawab dalam kumpulan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan program dan aktiviti silat dengan komuniti.

SMZ17201 TAEKWON-DO GTF I [TAEKWON-DO GTF I]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu Taekwon-Do dari segi kemahiran teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, pengurusan diri dan lain-lain yang berkaitan Taekwon-Do. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan dari segi kemahiran bermain Taekwon-Do.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan, disiplin dan peraturan dalam aktiviti taekwon-do.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kaedah dan teknik yang bersesuaian dalam persembahan taekwon-do.

SMZ27201 TAEKWON-DO GTF II [TAEKWON-DO GTF II]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu Taekwon-Do II dari segi kemahiran teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, pengurusan diri dan lain-lain yang berkaitan Taekwon-Do II. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan dari segi kemahiran bermain Taekwon-Do II.

Course Outcomes:
1. Keupayaan untuk menunjuk cara kemahiran teakwon-do secara berdisiplin dan bertanggungjawab.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. -Keupayaan untuk mengorganisasikan program dan aktiviti teakwon-do bersama komuniti.

SMZ17301 KARATE-DO I [KARATE-DO I]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu Karate-Do dari segi kemahiran teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, terminologi, pengurusan diri dan lain-lain yang berkaitan Karate-Do. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan dari segi kemahiran bermain Karate -Do.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan, disiplin dan peraturan dalam sesuatu aktiviti karate-do.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kaedah dan teknik yang bersesuaian dalam sesuatu persembahan karate-do.

SMZ27301 KARATE-DO II [KARATE-DO II]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu Karate-Do dari segi kemahiran teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, terminologi, pengurusan diri dan lain-lain yang berkaitan Karate -Do. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan dari segi kemahiran bermain Karate -Do.

Course Outcomes:
1. Keupayaan untuk menunjuk cara kemahiran karate-do secara berdisiplin dan bertanggungjawab.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan program dan aktiviti karate-do dengan komuniti.

SMZ17601 TAEKWON-DO WTF I [TAEKWON-DO WTF I]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum Taekwon-Do WTF I bertujuan memberi pendedahan kepada para pelajar mengenai seni mempertahankan diri Taekwon-Do WTF dari segi kemahiran teori dan kemahiran secara teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, terminologi, disiplin diri dan lain-lain berkaitan Taekwon-Do WTF. Manakala dari segi praktikal, kursus ini lebih menumpukan kepada latihan terhadap pergerakan serta koordinasi anggota badan melalui kemahiran-kemahiran tangan dan kaki dalam serangan dan pertahanan.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan, peraturan dan disiplin dalam aktiviti taekwon-do.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kaedah dan teknik yang bersesuaian dalam persembahan taekwon-do.

SMZ27601 TAEKWON-DO WTF II [TAEKWON-DO WTF II]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum Taekwon-Do WTF II adalah lanjutan kepada Taekwon-Do WTF I. Melalui kursus ini, penekanan diberikan kepada aspek teknikal dan taktikal yang berkaitan bagi setiap peringkat tali pinggang. Antara aspek yang akan disampaikan termasuk "*Teori of Power*", "*foot works*", "*free sparring*" dan sebagainya.

Course Outcomes:
1. Keupayaan untuk menunjuk cara kemahiran teakwon-do secara berdisiplin dan bertanggungjawab.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan
3. Keupayaan untuk mengorganisasikan program dan aktiviti teakwon-do bersama komuniti.

SMZ17701 SILAT OLAHRAGA I [SPORT SILAT I]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum Silat Olahraga ini memperkenalkan dan mendedahkan para pelajar berkaitan dengan seni silat daripada segi teori dan juga praktikal. Para pelajar akan mempelajari latar belakang, konsep dan kelengkapan serta peraturan-peraturan dalam silat olahraga dan seni silat. Aspek disiplin diri turut diberi penekanan. Selain itu, para pelajar akan mempelajari asas-asas gerakan seni silat, gabungan gerakan dan teknik asas dalam pencak silat.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan, disiplin dan peraturan silat dalam kumpulan kecil.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kaedah dan langkah yang tepat dalam pertandingan silat.

SMZ17801 SILAT OLAHRAGA II [SPORT SILAT II]

No of Credits: 1
Course Synopsis:
Kursus Kokurikulum Silat Olahraga ini adalah lanjutan daripada Silat Olahraga I. Dalam kursus ini, para pelajar akan mendalami Silat Olahraga dari segi teori, teknikal dan juga praktikal. Para pelajar akan diajar tentang seni ikatan tengkolok, seni ikatan sampan serta gerakan asas permainan silat olahraga dan seni silat. Pelajar juga akan diberi penekanan dalam aspek disiplin diri. Selain itu para pelajar akan mempelajari bengkel asas kejurulatihan silat olahraga dan seni silat.

Course Outcomes:
1. Keupayaan untuk menunjuk cara kemahiran seni silat olahraga secara berdisiplin, bertanggungjawab dan beretika.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk menganjurkan program dan aktiviti silat olahraga sebagai aktiviti sukan dalam komuniti.

SMZ17501 FUTSAL [FUTSAL]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu sukan futsal dari segi kemahiran, teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, terminologi, pengurusan diri dan lain-lain yang berkaitan dengan sukan futsal. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan amali dari segi kemahiran bermain sukan futsal.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan, disiplin dan peraturan dalam permainan futsal.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kemahiran dan teknik yang bersesuaian dalam perlawanan futsal.

SMZ19301 TAJWID [TAJWID]

No of Credits: 1

Course Synopsis:
Kursus ini merangkumi pengenalan kepada asas-asas ilmu tajwid, pengetahuan asas hukum-hakam bacaan Al-Quran yang tepat, dan seterusnya talaqi dan latihan bacaan Al-Quran secara mujawwad. Pelajar mengetahui asas-asas hukum tajwid, mengadakan perbincangan dalam sesi muzakarah, menjalani latihan bacaan Al-Quran, mengaplikasikan ilmu tajwid dan seterusnya menjalani talaqi musyafahah dan ujian untuk penilaian.

Course Outcomes:
1. Keupayaan untuk membezakan hukum-hukum tajwid dalam bacaan al-quran.
2. Keupayaan untuk membudayakan aktiviti bacaan al-Quran dalam kumpulan kecil.
3. Keupayaan untuk mengikuti aktiviti bacaan al-Quran dalam komuniti.

SMZ19601 STUDENT IN-FREE ENTERPRISE (SIFE) [STUDENT IN-FREE ENTERPRISE (SIFE)]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum SIFE ini adalah bagi membudayakan aktiviti keusahawanan dan memupuk semangat kemasyarakatan dalam kalangan pelajar. Di samping itu, kursus ini juga mempunyai tiga elemen terpenting yang diambil untuk memberi sumbangan kepada masyarakat, iaitu keusahawanan, pembelajaran dan persekitaran. Ia dilaksanakan agar para pelajar dapat membantu masyarakat untuk meningkatkan taraf hidup bagi mereka yang memerlukan.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan, disiplin dan etika dalam aktiviti keusahawan.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk memulakan perniagaan yang bersesuaian dalam komuniti.

SMZ19801 MANUSIA DAN KELESTARIAN ALAM [PEOPLE AND ENVIRONMENTAL SUSTAINABILITY]

No of Credits: 1

Course Synopsis:
Kursus ini bertujuan memupuk semangat kelestarian dalam kalangan pelajar. Ia juga membantu proses membentuk jaringan komunikasi dan membina intelek bagi menggiatkan diri menyumbang kepada kepentingan kelestarian alam. Pelajar dibimbing secara teori berkenaan isu-isu semasa kelestarian alam dan perkara-perkara seharian yang boleh dilakukan untuk mengurangkan kesan alam sekitar yang tidak diingini. Kemudian, mereka dibimbing kaedah merancang, melaksana, mengurus dan memantau projek. Seterusnya mereka mempraktikkan, secara berpasukan, apa yang telah dipelajari melalui perancangan, pelaksanaan, dan pemantauan sekurang-kurangnya satu projek yang mengandungi unsur kelestarian alam. Projek kelestarian yang dijalankan di dalam kampus untuk mencapai hasrat 'Kampus Lestari UniMAP' diberi keutamaan, namun pelaksanaan projek di luar kampus dan melibatkan masyarakat setempat juga digalakkan.

Course Outcomes:
1. Keupayaan untuk membudayakan konsep dan kaedah pelestarian alam dalam aktiviti berkumpulan.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan aktiviti kitar semula dalam komuniti.

SMZ10101 GOLF [GOLF]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu sukan golf dari segi kemahiran, teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, terminologi, pengurusan diri dan lain-lain yang berkaitan dengan golf. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan amali dari segi kemahiran bermain golf.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan, disiplin dan etika dalam sukan golf secara berkumpulan.
2. Keupayaan untuk mempraktik komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kemahiran dan teknik asas sukan golf dalam komuniti.

SMZ10201 BESBOL [BASEBALL]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu sukan besbol dari segi kemahiran, teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, terminologi, pengurusan diri dan lain-lain yang berkaitan dengan besbol. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan amali dari segi kemahiran bermain besbol.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan, disiplin dan etika dalam sukan besbol secara berkumpulan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kemahiran dan teknik asas sukan besbol dalam komuniti.

SMZ10301 WOODBALL [WOODBALL]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu sukan woodball dari segi kemahiran, teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, terminologi, pengurusan diri dan lain-lain yang berkaitan dengan woodball. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan amali dari segi kemahiran bermain woodball.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan, disiplin dan etika dalam sukan woodball secara berkumpulan.
2. Keupayaan untuk mempraktik komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan program berkaitan sukan woodball dengan komuniti.

SMZ10401 BOLA SEPAK [FOOTBALL]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu sukan bola sepak dari segi kemahiran, teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, terminologi, pengurusan diri dan lain-lain yang berkaitan dengan bola sepak. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan amali dari segi kemahiran bermain bola sepak.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan, disiplin dan etika dalam sukan bola sepak secara berkumpulan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan program berkaitan sukan bola sepak dengan komuniti.

SMZ10501 BOLA JARING [NETBALL]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu sukan bola jaring dari segi kemahiran, teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, terminologi, pengurusan diri dan lain-lain yang berkaitan dengan bola jaring. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan amali dari segi kemahiran bermain bola jaring.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan, disiplin dan etika sukan bola jaring dalam kumpulan.
2. Keupayaan untuk mempraktik komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk menganjurkan program berkaitan sukan bola jaring bersama komuniti.

SMZ10601 TENIS [TENNIS]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu sukan tenis dari segi kemahiran, teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, terminologi, pengurusan diri dan lain- lain yang berkaitan dengan tenis. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan amali dari segi kemahiran bermain tenis.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan, disiplin dan etika dalam sukan tenis secara berkumpulan.
2. Keupayaan untuk mempraktik komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kemahiran dan teknik asas sukan tenis dalam komuniti.

SMZ10901 BOLA TAMPAR [VOLLEYBALL]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu sukan bola tampar dari segi kemahiran, teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, terminologi, pengurusan diri dan lain-lain yang berkaitan dengan sukan bola tampar. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan amali dari segi kemahiran bermain sukan bola tampar.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan, disiplin dan etika dalam sukan bola tampar secara berkumpulan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan program berkaitan sukan bola tampar dengan komuniti.

SMZ13201 PENERBITAN VIDEO [VIDEO PUBLISHING]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu penerbitan video dari segi kemahiran teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, terminologi, pengurusan diri dan lain-lain yang berkaitan dengan penerbitan video. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan amali (practical) dari segi kemahiran bermain penerbitan video.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan, disiplin dan etika pembikinan video secara berkumpulan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk menghasilkan video berkualiti dan dikomersialkan dalam komuniti.

SMZ15501 SENI PERGERAKAN KREATIF [ARTS OF CREATIVE MOVEMENT]

No of Credits: 1

Course Synopsis:
Kursus kokurikulum Seni Pergerakan Kreatif memberi pendidikan asas seni tari kepada para pelajar serta meningkatkan ilmu pengetahuan tentang nilai-nilai kesenian bangsa sebagai teras pembentukan masyarakat berbudaya.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan, disiplin dan etika dalam persembahan seni tari secara berkumpulan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan persembahan seni tari dalam komuniti.

SMZ15601 DRAMA, PEMENTASAN & SENI LAKON [DRAMA, PLAYWRIGHT & ACTING]

No of Credits: 1

Course Synopsis:
Kursus Kursus kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu drama, pementasan dan seni lakon dari segi teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang terminologi, pengurusan diri dan lain-lain yang berkaitan dengan drama, pementasan dan seni lakon. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan amali dari segi kemahiran drama, pementasan dan seni lakon.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan, disiplin dan etika dalam persembahan drama/teater dalam kumpulan.
2. Keupayaan untuk mempraktik komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan persembahan drama/teater dalam komuniti.

SMZ15701 SENI TEATER BAHASA INGGERIS [ENGLISH THEATRE ARTS]

No of Credits: 1

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:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan dan disiplin dalam persembahan teater dalam kumpulan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan persembahan teater dalam komuniti.

SMZ18201 PETANQUE [PETANQUE]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu sukan petanque dari segi kemahiran, teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, terminologi, pengurusan diri dan lain-lain yang berkaitan dengan sukan petanque. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan amali dari segi kemahiran bermain sukan petanque.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan, disiplin dan etika dalam sukan petanque secara berkumpulan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kemahiran dan teknik asas petanque dalam komuniti.

SMZ17901 OLAHRAGA [ATHLETIC]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu Sukan Olahraga yang merupakan asas kepada semua jenis sukan.Dalam Sukan Olahraga terdapat pelbagai jenis acara seperti berlari,melompat,merejam dan melontar.Kursus ini merangkumi perancangan,perlaksanaan dan penilaian hasil kerja,kepimpinan dan kemahiran. Di samping itu juga pelajar-pelajar dapat mempelajari pengurusan dalam menganjurkan sesuatu Sukan Olahraga.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan dan disiplin dalam sukan olahraga secara berkumpulan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk menganjurkan program berkaitan sukan olahraga bersama komuniti.

SMZ18401 BADMINTON [BADMINTON]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu sukan badminton dari segi kemahiran, teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, terminologi, pengurusan diri dan lain-lain yang berkaitan dengan sukan badminton. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan amali dari segi kemahiran bermain sukan badminton.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan dan disiplin dalam sukan badminton secara berkumpulan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan program berkaitan sukan badminton dengan komuniti.

SMZ18501 HOKI [HOCKEY]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu sukan hoki dari segi kemahiran, teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, terminologi, pengurusan diri dan lain-lain yang berkaitan dengan sukan hoki. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan amali dari segi kemahiran bermain sukan hoki.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan dan disiplin dalam sukan hoki secara berkumpulan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kemahiran dan teknik asas sukan hoki dalam komuniti.

SMZ18801 MEMANAH [ARCHERY]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu sukan memanah dari segi kemahiran, teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, terminologi, pengurusan diri dan lain-lain yang berkaitan dengan sukan memanah. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan amali dari segi kemahiran bermain sukan memanah.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan dan disiplin aspek keselamatan dalam sukan memanah secara berkumpulan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kemahiran dan teknik asas sukan memanah dalam komuniti.

SMZ18601 SEPAK TAKRAW [SEPAK TAKRAW]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu sukan sepak takraw dari segi kemahiran, teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, terminologi, pengurusan diri dan lain-lain yang berkaitan dengan sukan sepak takraw. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan amali dari segi kemahiran bermain sukan sepak takraw.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan dan disiplin dalam sukan sepak takraw secara berkumpulan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk menganjurkan program berkaitan sukan sepak takraw bersama komuniti.

SMZ18701 RUGBI [RUGBY]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu sukan rugbi dari segi kemahiran, teori dan teknikal. Dari segi teori, kursus ini lebih menjurus kepada sejarah, latar belakang, terminologi, pengurusan diri dan lain-lain yang berkaitan dengan sukan rugbi. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan amali dari segi kemahiran bermain sukan rugbi.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan, disiplin dan peraturan dalam permainan ragbi.
2. Keupayaan untuk mempraktikkan kemahiran berkomunikasi yang berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kaedah dan teknik yang bersesuaian dalam perlawanan ragbi.

SMZ19001 SUKAN BERBASIKAL [CYCLING]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan untuk memberikan kemahiran dan ilmu berbasikal kepada para pelajar dari segi teori dan praktikal. Kursus ini merangkumi sejarah sukan berbasikal di Malaysia dan antarabangsa, pengenalan tentang jenis-jenis basikal dan kegunaannya, kemahiran dan teknik berbasikal yang betul, penjagaan basikal dan teknik-teknik asas berbasikal sebagai sukan atau pertandingan. Kursus ini juga memberi pendedahan tentang sukan berbasikal dan aspek-aspek keselamatan yang perlu diutamakan ketika berbasikal.

Course Outcomes:
1. Keupayaan untuk menunjukkan teknik kayuhan asas berbasikal dan penyelenggaraan basikal.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan aktiviti dan program berbasikal dengan komuniti.

SMZ19101 KHIDMAT MASYARAKAT [COMMUNITY SERVICES]

No of Credits: 1

Course Synopsis:
Kursus kokurikulum Khidmat Masyarakat adalah bagi memupuk semangat kemasyarakatan dan kesukarelawanan dalam kalangan para pelajar. Di samping itu, kursus ini juga membantu proses membentuk jaringan komunikasi dan membina intelek bagi menggiatkan diri dalam program khidmat masyarakat.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan, disiplin dan semangat kerjasama dalam aktiviti secara berkumpulan.
2. Keupayaan untuk menpraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk menganjurkan program dan aktiviti bersama komuniti.

SMZ19201 DAYA USAHA & INOVASI [INITIATIVE & INNOVATION]

No of Credits: 1

Course Synopsis:
Kursus ini bertujuan melatih pelajar untuk menguasai kemahiran asas seni reka dan kejuruteraan. Di samping itu juga, ianya member pendedahan kepada pelajar untuk mengetahui cara-cara menggunakan bahan-bahan kitar semula, mekanisma-mekanisma yang boleh digunakan dan seterusnya teknik-teknik mereka bentuk. Kursus ini dapat memberi peluang kepada pelajar untuk meluahkan idea-idea yang bernas serta mengaplikasikannya dalam bentuk produk, kerjasama yang tinggi, bertanggungjawab dan berkemampuan membentuk sahsiah pelajar yang cemerlang.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan dan disiplin dalam aktiviti secara berkumpulan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk menghasilkan produk inovasi yang boleh dikomersialkan dalam komuniti.

SMZ19401 PIDATO [PIDATO]

No of Credits: 1

Course Synopsis:
Kursus Kokurikulum Pidato mendedahkan kepada para pelajar berkaitan tujuan, teknik dan jenis-jenis pidato. Pidato menekankan kemahiran komunikasi interpersonal, keyakinan diri, motivasi, semangat dan maklumat yang tepat.

Course Outcomes:
1. Keupayaan untuk mengamalkan teknik, sikap profesional dan berdisiplin semasa berhujah dalam kumpulan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kemahiran berhujah secara kritis dan kreatif.

SMZ19501 RADIO KAMPUS [CAMPUS RADIO]

No of Credits: 1

Course Synopsis:
Radio merupakan salah satu medium penyebaran maklumat yang efektif dan paling meluas liputannya berbanding televisyen. Kursus Kokurikulum Radio Kampus akan mendedahkan kepada para pelajar berkenaan etika penyiaran, cara mengurus penyuntingan, membuat rakaman, siaran langsung dan dan atur cara program radio. Kursus ini membantu para pelajar untuk berkomunikasi dengan lebih baik dan beretika semasa menyampaikan maklumat kepada masyarakat.

Course Outcomes:
1. Keupayaan untuk menunjukkan kemahiran kepimpinan dan disiplin pengurusan radio secara berkumpulan.
2. Keupayaan untuk menpraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan pengurusan radio dalam komuniti.

SMZ19701 PERHIMPUNAN PENGUCAPAN AWAM [ENGLISH SPEAKING ASSEMBLY]

No of Credits: 1

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:
1. Keupayaan untuk mengamalkan teknik, sikap profesional dan berdisiplin semasa berhujah dalam kumpulan.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kemahiran berhujah secara kritis dan kreatif.

SMZ19901 TULISAN JAWI [JAWI ORTHOGRAPHY]

No of Credits: 1
Course Synopsis:
Kursus ini bertujuan untuk memberikan kemahiran membaca dan menulis Jawi mengikut sistem baharu. Pelajar juga akan mengetahui tentang sejarah perkembangan dan penyebaran tulisan jawi. Penekanan juga diberikan terhadap kemahiran membaca dan menulis jawi dan elemen-elemen penulisan Jawi seperti huruf Jawi dan padanannya dengan huruf rumi, bentuk tulisan Jawi, jenis ejaan Jawi, kaedah mengeja Jawi dan tulisan khat. Penawaran kursus juga merupakan usaha untuk mengekalkan elemen warisan dan kegemilangan sistem tulisan jawi.

Course Outcomes:
1. Keupayaan untuk menggunakan sistem ejaan yang baharu mengamalkan nilai, disiplin dan etika dalam pembelajaran.
2. Keupayaan untuk mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kemahiran penguasaan kaedah dan teknik membaca dan menulis tulisan jawi dalam pelbagai konteks,

SMZ30101 PROGRAM INBOUND-OUTBOUND MOBILITI I [MOBILITY INBOUND-OUTBOUND PROGRAM I]

No of Credits: 1

Course Synopsis:
Program Inbound-Outbound Mobiliti merupakan salah satu program melibatkan pergerakan pelajar UniMAP ke luar UniMAP (outbound) yang membolehkan pembentukan kemahiran insaniah, kebolehpasaran, personaliti unggul, kewibawaan, kemantapan ilmu dan keupayaan mencari ilmu dalam kalangan pelajar. Program inbound/outbound berasaskan kepada Jumlah Jam Pembelajaran Pelajar (JJP) yang mengambil kira kerja-kerja sebelum, semasa dan selepas program mobiliti. Pemberian satu (1) kredit adalah tertakluk kepada pelaksanaan 40 jam dan ke atas bagi program mobiliti berkredit. Program Inbound-Outbound Mobiliti ini, mempunyai ciri-ciri seperti berikut;
• Berinteraksi dengan masyarakat
• Aktiviti pembangunan masyarakat
• Penglibatan pelajar dalam aktiviti pemindahan ilmu kepada komuniti
• Penglibatan dalam pembelajaran secara tidak formal bagi meningkatkan

kemahiran insaniah
•Penglibatan pelajar dalam aktiviti pembelajaran, budaya masyarakat atau sejarah lokasi yang dilawati

Course Outcomes:

1. Mengaplikasikan ilmu yang dipelajari dalam aktiviti pemindahan ilmu kepada komuniti.
2. Keupayaan untuk berkomunikasi, memimpin dan bekerja dengan berkesan dalam satu pasukan.
3. Keupayaan untuk belajar, menyedari potensi, berfikir dan mengakses maklumat untuk membuat keputusan yang berkesan di samping memperkayakan pemahaman dalam dunia yang pelbagai.

SMZ30201 PROGRAM INBOUND-OUTBOUND MOBILITI II [MOBILITY INBOUND-OUTBOUND PROGRAM II]

No of Credits: 1

Course Synopsis:

Program Inbound-Outbound Mobiliti merupakan salah satu program melibatkan pergerakan pelajar UniMAP ke luar UniMAP (outbound) yang membolehkan pembentukan kemahiran insaniah, kebolehpasaran, personaliti unggul, kewibawaan, kemantapan ilmu dan keupayaan mencari ilmu dalam kalangan pelajar. Program inbound/outbound berasaskan kepada Jumlah Jam Pembelajaran Pelajar (JJP) yang mengambil kira kerja-kerja sebelum, semasa dan selepas program mobiliti. Pemberian dua (2) kredit adalah tertakluk kepada pelaksanaan 80 jam dan ke atas bagi program mobiliti berkredit. Program Inbound-Outbound Mobiliti ini, mempunyai ciri-ciri seperti berikut;

- Berinteraksi dengan masyarakat
- Aktiviti pembangunan masyarakat
- Penglibatan pelajar dalam aktiviti pemindahan ilmu kepada komuniti
- Penglibatan dalam pembelajaran secara tidak formal bagi meningkatkan kemahiran insaniah
- Penglibatan pelajar dalam aktiviti pembelajaran, budaya masyarakat atau sejarah lokasi yang dilawati

Course Outcomes:

1. Mengaplikasikan ilmu yang dipelajari dalam aktiviti pemindahan ilmu kepada komuniti.
2. Keupayaan untuk berkomunikasi, memimpin dan bekerja dengan berkesan dalam satu pasukan.
3. Keupayaan untuk belajar, menyedari potensi, berfikir dan mengakses maklumat untuk membuat keputusan yang berkesan di samping memperkayakan pemahaman dalam dunia yang pelbagai.

SMZ30301 PROGRAM INBOUND-OUTBOUND MOBILITI III [MOBILITY INBOUND-OUTBOUND PROGRAM III]

No of Credits: 1

Course Synopsis:

Program Inbound-Outbound Mobiliti merupakan salah satu program melibatkan pergerakan pelajar UniMAP ke luar UniMAP (outbound) yang membolehkan pembentukan kemahiran insaniah, kebolehpasaran, personaliti unggul, kewibawaan, kemantapan ilmu dan keupayaan mencari ilmu dalam kalangan pelajar. Program inbound/outbound berasaskan kepada Jumlah Jam Pembelajaran Pelajar (JJP) yang mengambil kira kerja-kerja sebelum, semasa dan selepas program mobiliti. Pemberian tiga (3) kredit adalah tertakluk kepada pelaksanaan 120 jam dan ke atas bagi program mobiliti berkredit. Program Inbound-Outbound Mobiliti ini, mempunyai ciri-ciri seperti berikut;

- Berinteraksi dengan masyarakat
- Aktiviti pembangunan masyarakat
- Penglibatan pelajar dalam aktiviti pemindahan ilmu kepada komuniti
- Penglibatan dalam pembelajaran secara tidak formal bagi meningkatkan kemahiran insaniah
- Penglibatan pelajar dalam aktiviti pembelajaran, budaya masyarakat atau sejarah lokasi yang dilawati

Course Outcomes:

1. Mengaplikasikan ilmu yang dipelajari dalam aktiviti pemindahan ilmu kepada komuniti.
2. Keupayaan untuk berkomunikasi, memimpin dan bekerja dengan berkesan dalam satu pasukan.
3. Keupayaan untuk belajar, menyedari potensi, berfikir dan mengakses maklumat untuk membuat keputusan yang berkesan di samping memperkayakan pemahaman dalam dunia yang pelbagai.


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