UNIVERSITI MALAYSIA PERLIS

ACADEMIC GUIDEBOOK

BACHELOR DEGREE PROGRAMME

ACADEMIC SESSION 2023/2024

#UniMAPMantap

Ilmu I Keikhlasan I Kecemerlangan

#UniversitiMalaysiaPerlis

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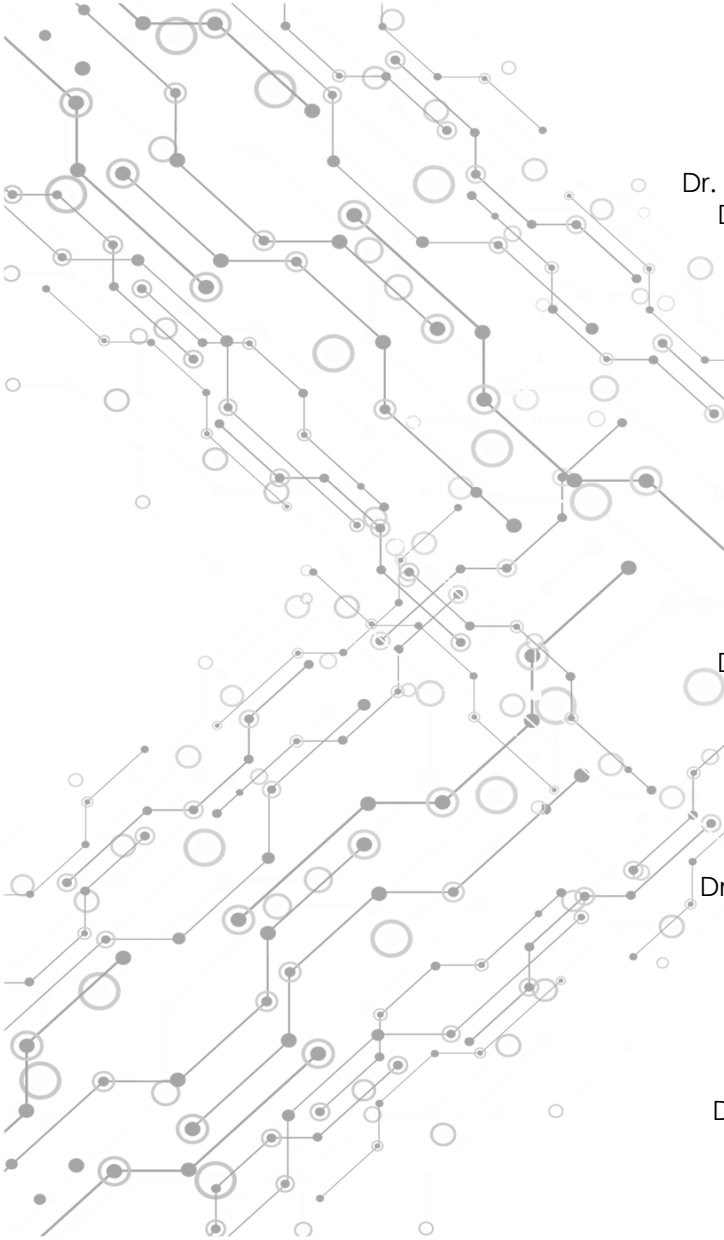

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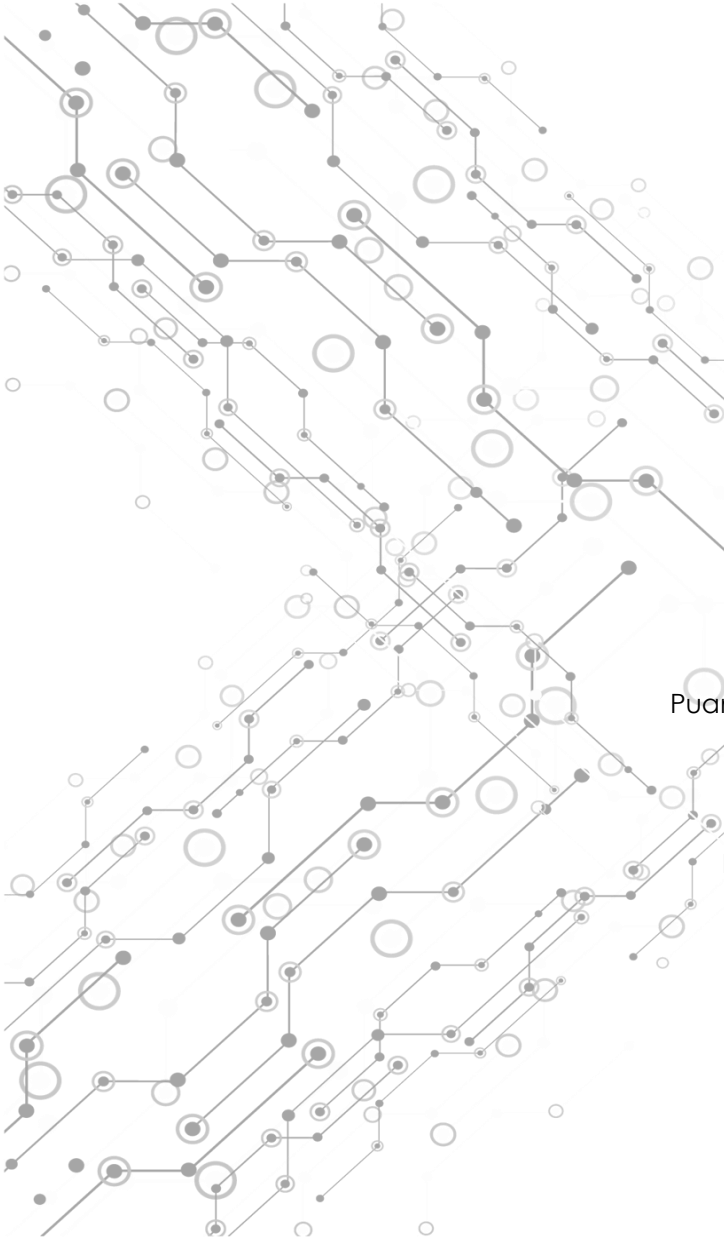

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dan/*and*

semua Dekan-dekan Fakulti dan Pengarah Pusat/Institut di Universiti Malaysia Perlis.
all Deans and Directors of Centres/Institute 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 baharu 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 Awam
6. Fakulti Perniagaan & Komunikasi
7. Institut Matematik Kejuruteraan
8. Pusat Kokurikulum

INTRODUCTION

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

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 & Technology*
5. *Faculty of Civil Engineering & Technology*
6. *Faculty of Business & Communication*
7. *Institute of Engineering Mathematic*
8. *Co-curriculum Centre*

Senarai Program Sarjana Muda / *List of Degree 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*

Senarai Program Sarjana Muda / *List of Degree Programmes:*

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*
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 Teknologi Penyelengaraan Sistem Elektrik / *Bachelor of Technology In Electrical System Maintenance with Honours*
29. Sarjana Muda Teknologi Automasi Elektronik Industri / *Bachelor of Technology In Industrial Electronic Automation with Honours*
30. Sarjana Muda Teknologi Automotif dengan Kepujian / *Bachelor of Technology in Automotive with Honours*
31. Sarjana Muda Teknologi Kimpalan dengan Kepujian / *Bachelor of Technology in Welding with Honours*
32. Sarjana Muda Teknologi Pemesinan Industri dengan Kepujian / *Bachelor of Technology in Industrial Machining with Honours*
33. Sarjana Muda Teknologi Pembinaan Bangunan dengan Kepujian / *Bachelor of Technology in Building Construction with Honours*
34. Sarjana Muda Perniagaan (Keusahawanan Kejuruteraan) dengan Kepujian / *Bachelor of Business (Entrepreneurial Engineering) with Honours*
35. Sarjana Muda Perniagaan (Perniagaan Antarabangsa) dengan Kepujian / *Bachelor of Business (International Business) with Honours*
36. Sarjana Muda Komunikasi Media Baharu dengan Kepujian / *Bachelor of New Media Communication with Honours*

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 industrial 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

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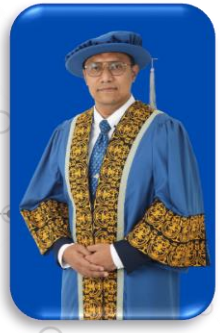

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Bendahari / Bursar

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Ketua Pustakawan / *Chief Librarian*

KALENDAR AKADEMIK SARJANA MUDA / *DEGREE ACADEMIC CALENDAR*
SIDANG AKADEMIK / *ACADEMIC SESSION* 2023/2024

AKTIVITI / *ACTIVITIES*	**SEMESTER PERTAMA / *FIRST SEMESTER*** 9 Oktober 2023 – 20 Februari 2024 (19 minggu / *weeks*)		
	JANGKA MASA / *DATE*	**TEMPOH / *DURATION***	**CATATAN / *NOTES***
Pendaftaran Pelajar Baharu & Minggu Suai Kenal / *New Student Registration & Orientation Week*	30 September – 8 Oktober 2023	1 minggu / *week*	-
Kuliah / *Lectures*	9 Oktober – 26 November 2023	7 minggu / *weeks*	**Hari Deepavali / *Deepavali*** 12 – 13.11.2023 [Ahad - Isnin / Sunday - *Monday*]
Cuti Pertengahan Semester / *Mid Semester Break*	27 November – 3 Disember 2023	1 minggu / *week*	-
Kuliah / *Lectures*	4 Disember 2023 – 21 Januari 2024	7 minggu / *weeks*	**Hari Krismas / *Christmas*** 25.12.2023 [Isnin / Monday]
Minggu Ulangkaji / *Revision Week*	22 – 28 Januari 2024	1 minggu / *week*	-
Peperiksaan / *Examination*	29 Januari – 20 Februari 2024	3 minggu / *weeks*	**Israk Mikraj** 8.02.2024 [Khamis / *Thursday*] **Tahun Baru Cina / *Chinese New Year*** 10 – 12.02.2024 [Sabtu - Isnin/ Saturday - Monday]
Cuti Antara Semester / *Mid Semester Break*	21 Februari – 17 Mac 2024	4 minggu / *weeks*	-

AKTIVITI / *ACTIVITIES*	**SEMESTER KEDUA / *SECOND SEMESTER*** 18 Mac 2024 – 4 Ogos 2024 (19 minggu / *weeks*)		
	JANGKA MASA / *DATE*	**TEMPOH / *DURATION***	**CATATAN / *NOTES***
Kuliah / *Lectures*	18 Mac – 7 April 2024	3 minggu / *weeks*	**Nuzul Al-Quran** 28.03.2024 [Khamis / Thursday]
Cuti Khas Perayaan / *Special Break*	8 – 14 April 2024	1 minggu / *week*	**Hari Raya Aidilfitri / *Eid-ul Fitr*** 10 - 11.04.2024 [Rabu – Khamis / *Wednesday - Thursday*]
Kuliah / *Lectures*	15 April – 12 Mei 2024	4 minggu / *weeks*	**Hari Pekerja / *Labour Day*** 1.05.2024 [Rabu / Wednesday]
Cuti Pertengahan Semester / *Mid Semester Break*	13 – 19 Mei 2024	1 minggu / *week*	**Hari Keputeraan Raja Perlis / *Birthday of DYMM Perlis*** 17.05.2024 [Jumaat Friday]
Kuliah / *Lectures*	20 Mei – 7 Julai 2023	7 minggu / *weeks*	**Hari Wesak / *Wesak Day*** 22.05.2024 [Rabu / Wednesday] **Hari Keputeraan YDP Agong/ *Birthday of YDP Agong*** 3.06.2024 [Isnin / *Monday*] **Hari Raya Haji / *Eid-ul Adha*** 17 - 18.06.2024 [Isnin - *Selasa/ Monday - Tuesday*]
Minggu Ulangkaji / *Revision Week*	8 – 14 Julai 2024	1 minggu / *week*	**Awal Muharram** 7 – 8.07.2024 [Ahad - Isnin / Sunday - Monday]
Peperiksaan / *Examination*	15 Julai – 4 Ogos 2024	3 minggu / *weeks*	-
Cuti Akhir Sidang Akademik / *End of Academic Year Break*	5 Ogos – 13 Oktober 2024	10 minggu / *weeks*	**Hari Kebangsaan / *National day*** 31.08.2024 [Sabtu / *Saturday*] **Hari Malaysia / *Malaysia Day*** 16.09.2024 [Isnin / *Monday*]

SISTEM AKADEMIK

Tahun Akademik Universiti dibahagikan kepada dua semester lazim 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.

PRA-PENDAFTARAN KURSUS

- Pra-pendaftaran kursus 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 adalah **DIWAJIBKAN** untuk melakukan pra-pendaftaran kursus ini.
- Pelajar **DIKEHENDAKI** mendaftar pada tarikh yang ditetapkan. Kursus yang perlu didaftarkan adalah kursus yang akan diambil pada semester akan datang (semua kursus termasuk kursus Ko-kurikulum). Pelajar digalakkan 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.

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.

PRE-REGISTRATION

- *Pre-registration enables student to pre-register their courses online for all the courses to be taken in the following semester at an earlier period. The pre-registration period is set before the semester break of each semester. All students are **REQUIRED** to perform the course pre-registration.*
- *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 Co-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.*

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. Selepas mendaftar, pelajar perlu membawa bersama slip pendaftaran kursus untuk disahkan oleh RPS dalam sistem pada sesi tersebut. Kursus-kursus yang didaftarkan tanpa mendapat pengesahan dari RPS adalah dianggap **TIDAK SAH**.
- Sekiranya berlaku perubahan pada pendaftaran kursus sama ada pelajar menambah 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.

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. After registration, students must bring the registration slip for verification by the RPS in the system during the discussion session. Course registration without RPS verification is considered **INVALID**.*
- *If there are any changes in student course registration, i.e. add, drop or withdraw courses within the prescribed period, the student must also obtain verification from the RPS.*
- *Students who fail to register within the prescribed period shall be subject to a penalty of RM50. Late registration must not exceed the 3rd week of the semester. Students must complete the HEA(B)-02[b] Late Registration Form and obtain approval from the Dean.*
- *New students will register online on the specified date during the orientation week according to their school. Students will be briefed by their school on their programme courses during the orientation week.*

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

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

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

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

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

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

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 (LI), Projek Tahun Akhir (FYP) dan pelajar Semester Akhir yang akan menamatkan pengajian. Pelajar yang ingin mendaftar melebihi 20 kredit perlu mendapatkan pengesahan daripada RPS dan kelulusan daripada Dekan Fakulti.

- Keterangan mengenai Pendaftaran Kursus pelajar berstatus Aktif diringkaskan seperti Jadual 1.

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 verification from their RPS and approval by the Dean.*

- *Table 1 summarises the credits that students can register for each semester based on their status.*

Jadual 1 : Ringkasan Pendaftaran Kursus Pelajar Berstatus Aktif
Table 1 : 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]

- Pelajar dengan status Percubaan tidak dibenarkan untuk mendaftar sendiri secara dalam talian (online). Pelajar ini perlu bertemu dengan RPS untuk mendapatkan nasihat dan 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 kredit yang dibenarkan untuk Pelajar Percubaan adalah seperti Jadual 2 dibawah:

ii. 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 discuss about the course registration and 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 2 below:*

Jadual 2 : Ringkasan Pendaftaran Kursus Pelajar Percubaan [P]
Table 2 : Summary of Credits for Probation Student [P]

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 kredit 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 credits 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 Wajib Universiti ialah kursus-kursus di luar pengkhususan pelajar. Kursus-kursus ini ditawarkan oleh Jabatan Bahasa & Pengajian Umum dan Pusat Ko-Kurikulum. Semua kursus ini wajib diambil dan pelajar perlu lulus dengan gred C sebagai syarat untuk pengijazahan.

Kursus-kursus Wajib Universiti bagi program Sarjana Muda ialah:

a) Keusahawanan Kejuruteraan (SMU22402) – (2 kredit)
Semua pelajar program Kejuruteraan dan Teknologi Kejuruteraan 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.

b) Falsafah dan Isu Semasa (SMU13002) – (2 kredit)
Semua pelajar wajib mengambil SMU13002 Falsafah dan Isu Semasa. Kursus ini ditawarkan kepada pelajar tempatan dan antarabangsa dengan mengikut kepada struktur kursus dalam penawaran kurikulum program masing-masing.

c) Integriti dan Anti Rasuah (SMU12102) – (2 kredit)
Semua pelajar wajib mengambil kursus SMU12102 Integriti dan Anti Rasuah. Kursus ini ditawarkan kepada pelajar warganegara dengan mengikut kepada struktur kursus dalam penawaran kurikulum program masing-masing

d) Pengajian Malaysia (SMU13202) – (2 kredit)
Semua pelajar antarabangsa wajib mengambil kursus SMU13202 Pengajian Malaysia untuk melengkapkan keperluan kredit. Kursus ini ditawarkan kepada pelajar antarabangsa dengan mengikut kepada struktur kursus dalam penawaran kurikulum program masing-masing.

TYPES OF COURSES

1. UNIVERSITY REQUIREMENT COURSES

The University Requirement Courses are courses that are offered outside the student's field of study. These courses are offered by the Languages & General Studies Department and the Co-Curriculum Centre. These courses are compulsory and students are required to pass them with a grade C or above in order to graduate.

The University Requirement Courses for Bachelor Degree programmes are:

a) Engineering Entrepreneurship (SMU22402) – (2 credits)
All students under Engineering Programme and Engineering Technology programme are required to take SMU22402 Engineering Entrepreneurship. This course is offered to local and international students by following the course structure of their respective programme.

b) Philosophy and Current Issues (SMU13002) – (2 credits)
All students are required to enrol SMU13002 Philosophy and Current Issues. This course is offered to local and international students. This course is offered to local and international students by following the course structure of their respective programme.

c) Integrity and Anti-Corruption (SMU12102) – (2 credits)
All students are required to enrol SMU12102 Integrity and Anti-Corruption. This course is offered to local students by following the course structure of their respective programme.

d) Malaysian Studies (SMU13202) – (2 credits)
All international students are required to enrol SMU13202 Malaysian Studies to complete the credit requirement. This course is offered to international students by following the course structure in the curriculum offerings of their respective programs.

e) Penghayatan Etika dan 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.

f) Kemahiran Berfikir (SMU32202) - (2 kredit)
Semua pelajar daripada program Komunikasi Media Baharu dan Perniagaan wajib mengambil kursus SMU32202 Kemahiran Berfikir. Kursus ini ditawarkan kepada pelajar warganegara dan antarabangsa dengan mengikut kepada struktur kursus dalam penawaran kurikulum program masing-masing.

g) Ko-kurikulum (SMZXXXXX) - (2 kredit)
Semua pelajar diwajibkan untuk mengumpul dua (2) kredit kursus kokurikulum sepanjang pengajian di UniMAP. Satu (1) kredit badan beruniform perlu diambil pada semester 1 tahun pertama pengajian. Manakala, satu (1) kredit 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 kredit, tidak perlu mengambil kursus kokurikulum bukan badan beruniform.

h) 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).

e) Appreciation Ethnic and Civilization (SMU13102) - (2 credits)
All students are required to enrol in this. This course is offered to local and international students. This course is offered to local and international students by following the course structure of their respective programme.

f) Thinking Skills (SMU32202) - (2 credits)
All students from New Media Communication and Business programmes are required to enrol SMU32202 Thinking Skills. This course is offered to local and international students by following the course structure of their respective programme.

g) Co-curriculum (SMZXXXXX) - (2 credits)
All students are required to collect two (2) credits for Co-Curriculum during their study at UniMAP. One (1) credit is to be collected from Uniformed Bodies, whereby the first credit needs to be taken in Semester I (in the First Year of study). Another one (1) credit 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 credits, it is not necessary to take the non-uniformed courses.

h) *University Malay Language (SMB41002) - (2 credits)*
This course is compulsory for all local students (including international students from countries where the Malay Language is either their national language or home language, e.g. students from Indonesia, Brunei and Singapore).

i) Bahasa Inggeris Persediaan (SMB10102) - (2 kredit)
Pelajar dengan salah SATU kriteria berikut perlu mendaftar kursus ini,

- Memperolehi keputusan MUET Band 1, Band 2 dan Band 2.5.
- Memperolehi keputusan MUET dibawah Band 3 / IELTS 4.0 ke bawah / TOEFL 4.5 ke bawah bagi Program Persediaan Pra-Universiti (untuk pelajar-pelajar antarabangsa sahaja).

j) Bahasa Inggeris untuk Komunikasi Umum (SMB20102) - (2 kredit)
Pelajar dengan salah SATU kriteria berikut perlu mendaftar kursus ini,

- Memperolehi keputusan MUET Band 3 dan Band 3.5.
- Lulus Bahasa Inggeris Persediaan (SMB10102) dengan minimum gred C.

k) 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 3.

i) *Preparatory English (SMB10102) - (2 credits)*
Studenits with ONE of the following criteria must register for this course,

- *Obtained either a Band 1, Band 2 and Band 2.5 for the Malaysian University English Test (MUET).*
- *Scored below a Band 3 for the Malaysian University English Test (MUET) / scored 4.0 and below for IELTS / scored 4.5 and below for TOEFL for Pre-University Preparatory Programme (EPPP) (applicable to international students only).*

j) English for General Communication (SMB20102) - (2 credits)
Students with ONE of the following criteria must register for this course.

- *Obtained a Band 3 and Band 3.5 for the Malaysian University English Test (MUET).*
- *Passed Preparatory English (SMB10102) with a minimum of grade C.*

k) 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 New Media Communication). However, depending on their MUET results, students are required to attend and pass prerequisite English language courses first before they are allowed to take English for Technical Communication or English for Academic Purposes, as illustrated in Table 3.*

- Pelajar yang memperolehi Band 1, Band 2 atau Band 2.5 dalam MUET diwajibkan terlebih dahulu mengambil Bahasa Inggeris Persediaan (Preparatory 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.

- Bagi pelajar yang memperolehi Band 3 dan Band 3.5 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 dan Band 3.5 dalam MUET tidak perlu mengambil kursus Bahasa Inggeris Persediaan (Preparatory English).

- Pelajar yang memperolehi Band 4 atau Band 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 Band 5+ dalam MUET tidak perlu mengambil Bahasa Inggeris Persediaan (Preparatory English) atau kursus Bahasa Inggeris Umum (English for General Communication

- *Students who obtained a Band 1, Band 2 or Band 2.5 in MUET, first and foremost, are required to take Preparatory English, which is a 2 credit non-accredited (audited) course, and pass with a minimum of grade C, before being allowed to continue and take 2 credits of English for General Communication and later another 2 credits of either English for Technical Communication or English for Academic Purposes. The minimum Passing Grade for all English language courses is grade C.*

- *Students who obtained a Band 3 and Band 3.5 in MUET are required to take and pass 2 credits of English for General Communication before being allowed to continue and take either English for Technical Communication or English for Academic Purposes. These students are not required to take the Preparatory English course.*

- *Students who obtained a Band 4 or Band 5+ in MUET are only required to take either English for Technical Communication or English for Academic Purposes. These students are not required to take both Preparatory English and English for General Communication.*

- Bagi pelajar yang mendapat Band 1, Band 2, Band 3 dan Band 3.5 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, Band 2, Band 3 dan Band 3.5 untuk memberi nilai tambah kepada pelajar. Walau bagaimanapun, jumlah kredit bergraduat bagi pelajar yang mendapat MUET Band 1, Band 2, Band 3 dan Band 3.5 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.

- *For students who obtained a Band 1, Band 2, Band 3 and Band 3.5, the two (2) credits obtained via English for General Communication will be included as part of Optional Courses. Other Optional Courses are also open to those who obtained a Band 1, Band 2, Band 3 and Band 3.5 in MUET for added value to students. As such, the number of credits required for graduation for students with a Band 1, Band 2, Band 3 and Band 3.5 in MUET who are taking Optional Courses (other than English for General Communication which is already taken into account as an Optional Course) are 139 units for Engineering programme and 144 units for Engineering Technology programme. Students who have obtained a Band 4 and Band 5+ in MUET must take any other Optional Courses offered.*

Jadual 3 : Kursus Wajib Bahasa Inggeris
Table 3: English Requirement Courses

MUET BAND	Kursus Wajib Bahasa Inggeris / *English Requirement Courses*			
	SMB10102 Bahasa Inggeris Persediaan / *Preparatory English* (Tidak Berkredit/ *Non-Accredited*)	SMB20102 Bahasa Inggeris Umum / *English For General Communication*	SMB31202 Bahasa Inggeris untuk Komunikasi Teknikal / *English for Technical Communication* ATAU/OR SMB31302 Bahasa Inggeris Akademik / *English for Academic Purposes*	Kursus-kursus Opsyen/ *Optional Courses* (Bahasa-bahasa Asing / *Foreign Languages*)
BAND 1, BAND 2, & BAND 2.5	/	/	/	Pendaftaran dibuka kepada pelajar / *Registration is open to students*
BAND 3 & BAND 3.5		/	/	
BAND 4, BAND 4.5, BAND 5.0, & BAND 5+			/	/

2. KURSUS TERAS

Kursus Teras 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

Kursus Elektif merupakan beberapa pilihan kursus daripada disiplin program pengajian yang boleh diikuti oleh pelajar bagi menyokong bidang pengkhususan pengajian.

4. KURSUS OPSYEN

Kursus Opsyen adalah kursus diluar bidang pengkhususan yang memberi nilai tambah kepada pelajar.

5. KURSUS AUDIT

Kursus audit merujuk kepada:

i. Kursus yang didaftarkan dalam program terdahulu pelajar yang berkaitan dengan program semasa tetapi tidak memenuhi syarat pemindahan kredit.
ii. Kursus yang didaftarkan dalam program terdahulu pelajar yang tidak berkaitan dengan program semasa pelajar.
iii. Kursus yang didaftarkan dan tidak mempunyai kredit.

2. 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

Elective courses are a number of course options from the discipline of the programme that student can follow to support their programme of study specialisation.

4. OPTIONAL COURSES

Optional Courses are courses outside students' field of specialization that provide added value to students.

4. AUDIT COURSES

Audit Courses refers to:

i. A course that is registered in student's previous programme of study which is related to their current programme but does not meet the credit transfer requirements.
ii. A course that is registered in student's previous programme of study which is not related to their current programme.
iii. A course that is registered but has no credit.

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 dan bengkel -** 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. **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.

iii. **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 and workshop 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. ***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*

iii. ***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

- Tempoh Latihan Industri ditentukan mengikut bidang pengajian seperti Jadual 4.

- *The period of Industrial Tranining is determined according to the field of study as in Table 4.*

Jadual 4 : Tempoh Latihan Industri
Table 4 : Industrial Training Period

Program Pengajian / *Programme*	**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 / *Bachelor of Business*	4	8 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*

TEMPOH PENGAJIAN MINIMUM DAN MAKSIMUM

Pelajar hendaklah menamatkan pengajian mengikut tempoh yang ditetapkan oleh universiti. Tempoh pengajian mengikut program pengajian universiti adalah seperti dalam Jadual 5. Tempoh pengajian adalah berbeza bagi pelajar yang memperolehi pengecualian kredit, penangguhan semester dan pelajar yang menduduki Semester Pendek.

MINIMUM AND MAXIMUM PERIOD OF STUDY

Students must graduate according to the time period as stipulated by the university. The duration of study according to each programme of study is as listed in Table 5. The duration of study is different for students who obtain credit exemption, postponed their semester and for students who sit for the Short Semester.

Jadual 5 : Tempoh minimum atau maksimum pengajian pelajar
Table 5 : 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. Pengesahan 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).

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. *Confirmation by the Rakan Pendamping Siswa (RPS),*
2. *Verification by the Dean of Faculty,*
3. *Verification by the Director of Academic Management, 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.*

PENAMATAN PENGAJIAN

- Fakulti perlu memberi peringatan secara bertulis kepada pelajar sekiranya pelajar didapati tidak mendaftar pada sesuatu semester tanpa membuat 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 dari Universiti.

- Fakulti perlu melengkapkan borang HEA(B)-09 yang mengandungi:.

  1. Butiran diri pelajar
  2. Butiran akademik pelajar (Sila sertakan rekod peribadi dan rekod akademik pelajar yang boleh didapati dalam sistem AMIS)
  3. Perakuan Dekan Fakulti

- Borang yang telah lengkap diisi bersama lampiran rekod peribadi dan akademik pelajar dan lampiran surat menyurat peringatan kepada pelajar perlu dikemukakan kepada Unit Kemasukan dan Rekod Pelajar, Bahagian Pengurusan Akademik.

- Borang penamatan pengajian perlu dikemukakan ke Pusat Pengurusan Akademik untuk perakuan.

TERMINATION OF STUDY

- *The Faculty must provide a written warning to the student if the student is found to be unregistered for the 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.*

- *Faculty must complete HEA(B)-09 form which contains:*

  1. *Student personal details*
  2. *Student academic details (Please include personal and academic records of students which are available in the AMIS system)*
  3. *Certification of Dean of the Faculty*

- *The completed form with the attachment of the student's personal and academic records and the attachment of other warning letters to the student must be submitted to the Student Admissions and Records Unit, Academic Management Division.*

- *The form will then be submitted to the Academic Management Centre for certification.*

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- Pihak Pusat Pengurusan Akademik akan meneliti dan mengesahkan status akademik pelajar berdasarkan rekod yang dikemukakan oleh Fakulti dan mendapatkan maklumat akhir daripada Jabatan Bendahari berkaitan status yuran dan lain-lain hutang tertunggak sebelum dikemukakan untuk pertimbangan kelulusan daripada Timbalan Naib Canselor (Akademik dan Antarabangsa).

- Setelah mendapat pertimbangan Naib Canselor / Timbalan Naib Canselor (Akademik & Antarabangsa), Unit Kemasukan dan Rekod Pelajar, Bahagian Pengurusan Akademik akan mengeluarkan surat rasmi kepada pelajar dan mengemaskini sistem AMIS mengikut tarikh kuatkuasa penamatan pengajian.

- Sekiranya pelajar mempunyai baki hutang tertunggak, jumlah tersebut akan dinyatakan di dalam surat rasmi dan pelajar akan diberikan tempoh masa untuk menjelaskan hutang sebelum sebarang tindakan undang-undang diambil.

- *The Centre for Academic Management will examine and confirm the academic status of students based on the records submitted by the Faculty and obtain final information from the Treasury Department regarding the status of fees and other outstanding debts before the submission for consideration by the Deputy Vice Chancellor (Academic and International).*

- *Upon consideration of the Vice Chancellor / Deputy Vice-Chancellor (Academic and International), Student Admissions and Records Unit, Academic Management Division will issue an official letter to students and update the AMIS system in accordance with the effective date of termination of the study.*

- *If a student has a balance of outstanding debts, the amount will be stated in the formal letter and the student will be given a period of time to pay off the debt before any legal action is taken.*

PEMINDAHAN KREDIT

- Pemindahan kredit ditakrifkan sebagai pengiktirafan sejumlah kredit yang telah diperoleh oleh seseorang pelajar dalam sesuatu program terdahulu ke program yang sedang diikuti di UniMAP. Terdapat 2 kategori pemindahan kredit iaitu:

1. **Pemindahan Kredit Vertikal atau Pengecualian Kredit**
   Pemindahan kredit daripada peringkat rendah ke peringkat yang lebih tinggi seperti Sijil ke Diploma ATAU Diploma ke Sarjana. Pemindahan Kredit yang dibenarkan adalah Pemindahan Kredit Tanpa Gred (Pengecualian Kredit).

2. **Pemindahan Kredit Horizontal**
   Pemindahan kredit daripada program pada tahap kelayakan yang sama seperti daripada Diploma ke Diploma ATAU Sarjana Muda ke Sarjana. Pemindahan Kredit yang dibenarkan adalah Pemindahan Kredit Dengan Gred atau Pemindahan Kredit Tanpa Gred (Pengecualian Kredit) berdasarkan situasi.

- Syarat umum pemindahan pemindahan kredit adalah:

i. Gred lulus – Gred lulus minimum bagi kursus yang layak dipertimbangkan untuk pemindahan kredit ialah Gred C atau nilai gred 2.00.
ii. Nilai kredit – nilai kredit bagi kursus yang layak dipertimbangkan untuk pemindahan kredit mestilah sama atau lebih tinggi daripada nilai kredit kursus yang dipohon.
iii. Kesetaraan kandungan kursus-kursus yang terlibat dengan pemindahan kredit mestilah tidak kurang daripada 80%.

CREDIT TRANSFER

- *Credit Credit transfer is defined as the accreditation of the credits accumulated by a student from his/her previous programme to the current programme pursued at UniMAP.*

1. ***Vertical Credit Transfer or Credit Exemption***
   Credit transfer from a lower to a higher level of qualification such as from Certificate to Diploma OR from Diploma to Bachelor's Degree. The credit transfer permitted is the Credit Transfer Without Grade (Credit Exemption).

2. ***Horizontal Credit Transfer***
   Credit transfer from one programme to another programme at the same academic level, i.e., from Diploma to Diploma OR Bachelor's Degree to Bachelor's Degree. The credit transfer permitted is either the Credit Transfer with Grades or Credit Transfer without Grades (Credit Exemption) based on the situation.

- *The general requirements for credit transfer are as follow:*

i. Passing Grade – Minimum passing grade of either a C grade or a 2.00 grade points for courses that are eligible for credit transfer.
ii. Credit value – credit value point of the equivalent course must be equal or higher than the credit value point of the course being applied.
iii. The content of the courses involved with credit transfer must be equal to or more than 80% with the course being applied.

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. 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 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. *Student engaged in industrial training during the Additional Semester are not allowed to attend the Additional Semester*

SISTEM PEPERIKSAAN DAN PENILAIAN

- Keputusan sesuatu kursus biasanya ditentukan berdasarkan komponen penilaian secara berterusan dan peperiksaan. Walau bagaimanapun, penilaian sesuatu kursus adalah tertakluk kepada keperluan kursus tersebut yang telah diluluskan oleh Senat.

- Peperiksaan akhir diadakan pada hujung semester. Setiap pelajar mestilah terlebih dahulu memenuhi syarat kehadiran ke kuliah, tutorial, amali dan sebagainya sebelum layak menduduki peperiksaan. Pelajar yang gagal memenuhi syarat kehadiran 80% boleh dihalang daripada menduduki peperiksaan akhir.

- Prestasi pelajar dalam sesuatu kursus dinilaikan oleh gred yang diperoleh. Hubungan antara gred dan mata nilai adalah seperti dalam Jadual 6 :

EXAMINATION AND EVALUATION SYSTEM

- *Student results in a course are usually determined based on the components of continuous assessment and examination. However, the assessment of a course is subject to the requirements of the course which have been approved by the Senate.*

- *The final exam is conducted at the end of the semester. Every student must first meet the attendance requirements for lectures, tutorials, practical and so on before being eligible to sit for the exam. Students who fail to meet the 80% attendance requirement may be barred from sitting the final exam.*

- *Student performance in a course is presented by the grades obtained. The relationship between grade and point value is as shown in Table 6 :*

Jadual 6 : Hubungan Antara Gred dan Mata Nilai
Table 6 : Relationship Between Grade and Point Value

Gred / *Grade*	Nilai Gred / *Point Value*
A	4.00
A-	3.75
B+	3.50
B	3.00
B-	2.75
C+	2.50
C	2.00
C-	1.75
D+	1.50
D	1.00
D-	0.75
F	0.00

- Gred LULUS untuk sesuatu kursus adalah seperti berikut:-

i. Gred LULUS bagi sesuatu kursus Wajib Universiti adalah Gred C dan ke atas (Gred A hingga C)
ii. Gred LULUS bagi sesuatu kursus Teras adalah Gred D+ dan ke atas (Gred A hingga D+).

- *Passing grades for a course are as follows;*

i. The grade for PASS for a University Requirement course is Grade C and above (Grade A to C)
ii. The grade for PASS for a Core course is Grade D+ and above (Grade A to D+)

Jadual 7: Pengiraan PNG dan PNGK:
Table 7: Calculation of GPA and CGPA

KURSUS/ *COURSE*	**KREDIT/ *CREDIT***	**NILAI GRED/ *GRADE VALUE* [NG]**	**GRED/ *GRADE* [G]**	**JUMLAH/ *TOTAL* NG**
QDQ10002	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				
QDQ20303	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. Kredit 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 10 days after the official result is announced. Students will have to fill in their details in two (2) copies, one of which is the student copy. Students will be charged RM50 per course for each course appealed.*

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.

Maklumat lanjut berkaitan peraturan-peraturan boleh dirujuk kepada Peraturan Akademik (Sarjana Muda & Diploma) yang terkini

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'.*

More information related to the regulations can be referred to the latest Academic Regulations (Bachelor Degree & Diploma).

Online Student Information

UniMAP Academic Guide

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 Pendidikan Fleksibel / *Flexible Education Division*	04-9414321
Bahagian Pengurusan Dasar TVET / Management Policy TVET Division	04-9414322
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 (FKTE)

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 Technology in Electrical Maintenance System with Honours
6. Diploma in Electrical Engineering
7. Diploma in Mechatronic Engineering

Address:

FACULTY OF ELECTRICAL ENGINEERING & TECHNOLOGY
Universiti Malaysia Perlis
Kampus Alam UniMAP Pauh Putra
02600 Arau Perlis
Tel: 04-988 5165/5168

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PROGRAMME CHAIRPERSON FOR POSTGRADUATE STUDIES
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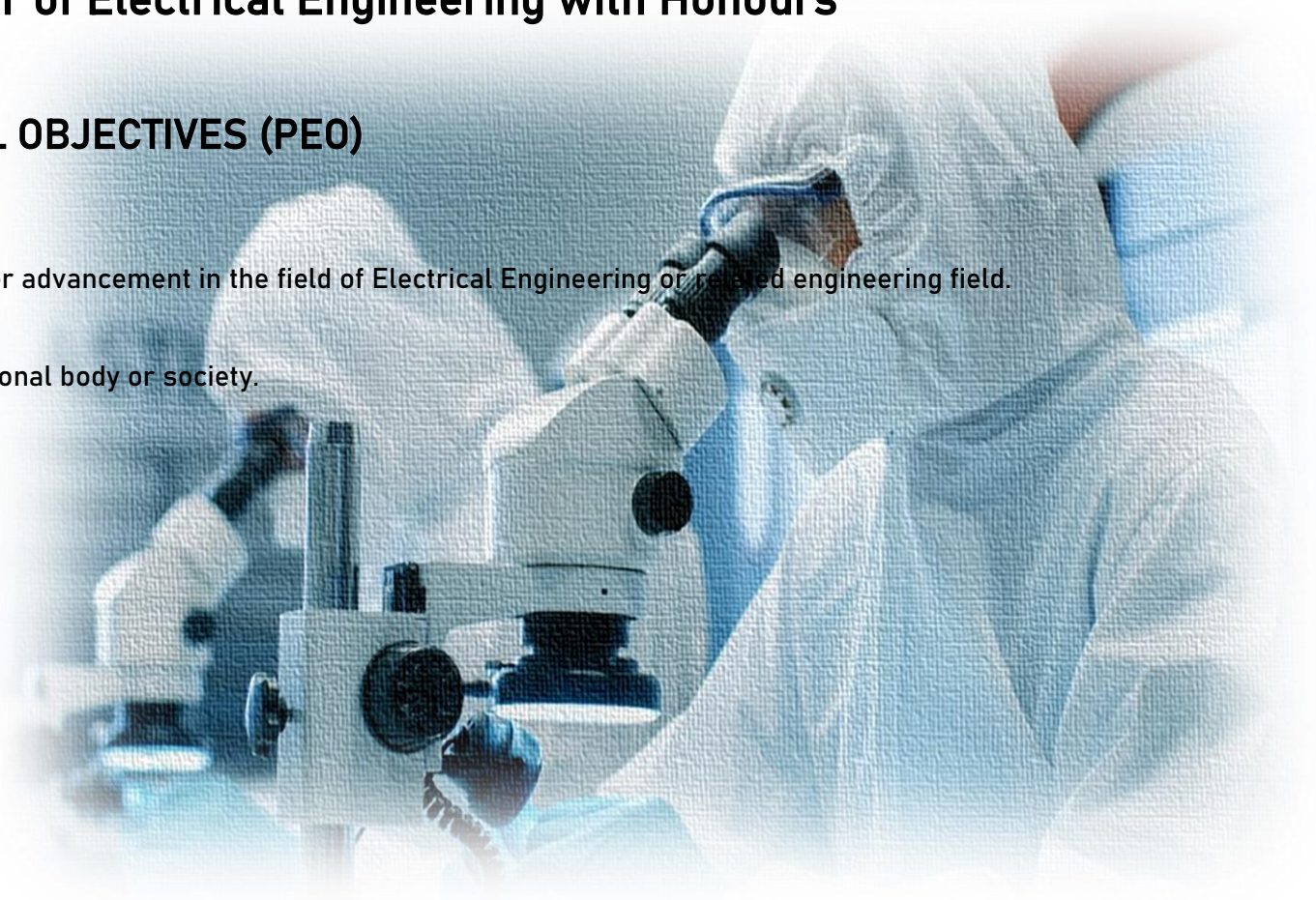
ENGINEERING PROGRAMME

UR6522001
Bachelor of Electrical Engineering with Honours



PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

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 (PO)

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

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

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

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

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

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

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

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

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

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

PO11
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 2023/2024

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	**1**	**2**	**3**	**4**	**5**	**6**	**BREAK**	**7**	**8**
DISCIPLINE CORE & ELECTIVE COURSES (102 CREDITS)	EMJ12002 Engineering Science	EMJ13003 Electronic Devices	EMJ22003 Instrumentation and Measurements	EMJ23204 Microcontroller SystemsDesign	EMJ32004 Power System Engineering	EMJ33003 Communication System Engineering	EMJ30105 Industrial Training	EMJ40002 Final Year Project I	***EMJ40004 Final Year Project II
	EMJ12103 Electric Circuit I	EMJ10003 Computer Programming	EMJ22204 Analog Electronics	EMJ23003 Electrical Power Technology	EMJ32103 Electromagnetic Theory	***EMJ33103 Power System Analysis		***EMJ42202 Electrical Installation Design II	EMJ43003 Electrical Drives
	EMJ12202 Introduction to Electrical Engineering	***EMJ13103 Electric Circuit II	EMJ22304 Digital Electronics	EMJ23103 Control Systems Engineering	EMJ32204 Electrical Machine	EMJ33303 Electrical Energy Utilization		EMJ42003 High Voltage Engineering	EMJ44X03 Elective III
		EMJ13203 Electrical Engineering Practices	EMJ22403 Signals and Systems		EMJ32304 Power Electronics I	EMJ33404 Electrical Installation Design I		EMJ44X03 Elective I	EMJ44X03 Elective IV
								EMJ44X03 Elective II	
COMMON CORE COURSES (17 CREDITS)	QMQ10103 Engineering Mathematics I	QMQ10203 Engineering Mathematics II	QMQ20303 Engineering Mathematics III	QMQ27103 Engineering Statistics				EMJ41003 Management for Engineers	EMJ41102 Professional Engineers
UNIVERSITY REQUIREMENT COURSES (16 CREDITS)	SMB10102 Preparatory English[1]	SMB20102 English for General Communication[2]		SMB31202 English for Technical Communication	SMB1XX02 Option				
	SMB41002 University Malay Language[4]								
	SMU13002 Philosophy and Current Issues			SMU12102 Integrity and Anti-Corruption [3]		SMU22402 Engineering Entrepreneurship			
	SMU13102 Appreciation of Ethics & Civilization								
	SMZ1XX01 Co-Curriculum I	SMZ2XX01 Co-Curriculum II							
TOTAL CREDITS (135 CREDITS)	**17**	**18**	**17**	**17**	**15**	**15**	**5**	**16**	**15**

List of Elective Courses

Field	Course Code	Elective Courses	Sem	Field	Course Code	Elective Courses	Sem
Electrical Power	EMJ44103	Power System Operation & Control	7	Renewable Energy and Control	EMJ44303	Power Electronics II	7
	EMJ44203	Electrical Machine Design			EMJ44403	Electrical Energy System	
	EMJ44603	Substation Design	8		EMJ44503	Industrial Electronic Control	8
	EMJ44803	Power System Protection			EMJ44703	Renewable Energy System	

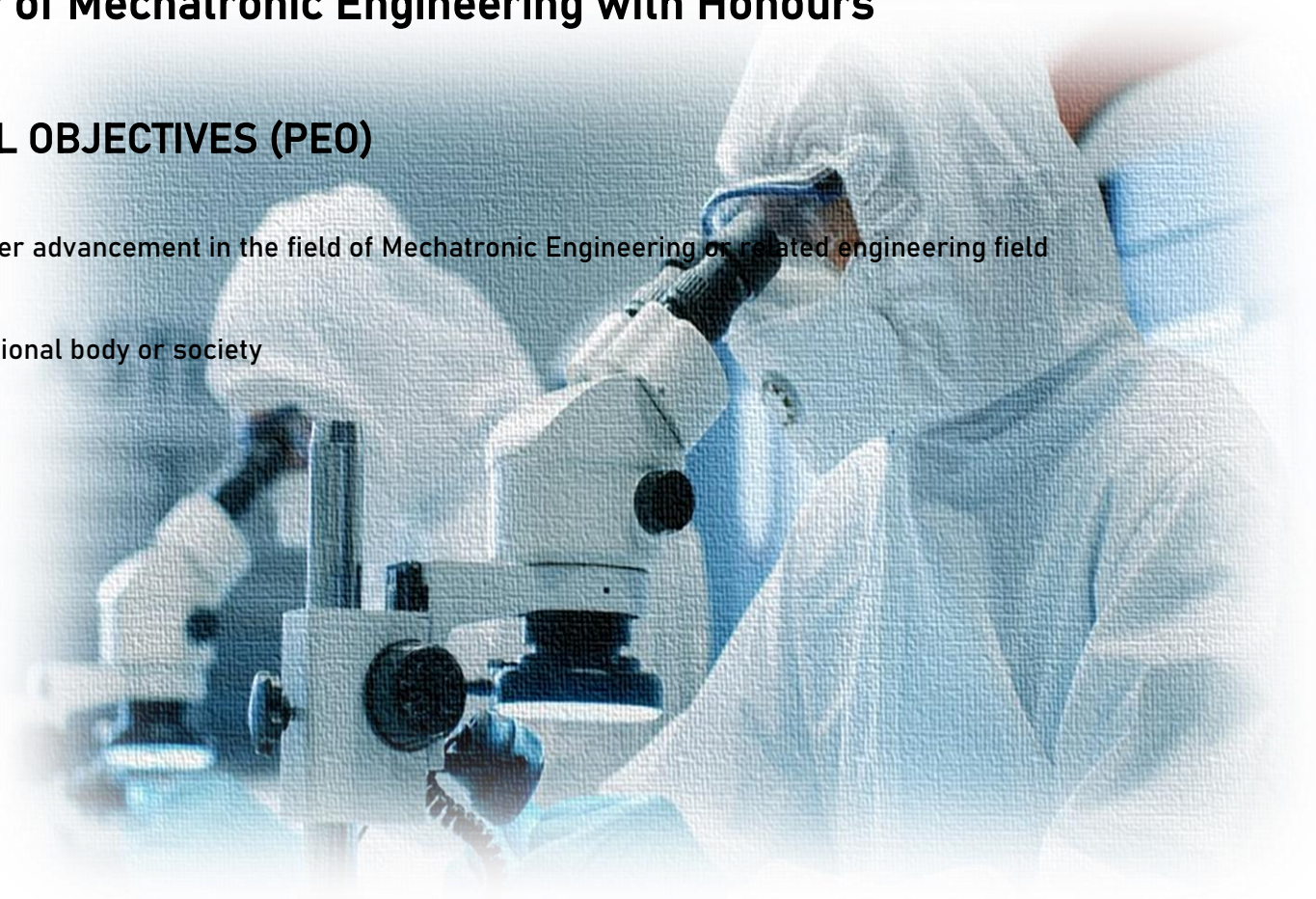
***Courses with prerequisite

Course	Prerequisite
EMJ13103	EMJ12103
EMJ42202	EMJ33404
EMJ40004	EMJ40002
EMJ33103	EMJ32004

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] International students should register SMU13202 Malaysian Studies.
[4] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course.

ENGINEERING PROGRAMME

UR6523003
Bachelor of Mechatronic Engineering with Honours



PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
Graduates who have demonstrated career advancement in the field of Mechatronic Engineering or related engineering field

PEO 2
Graduates who are involved in a professional body or society

PEO 3
Graduates who pursue lifelong learning

PROGRAMME OUTCOMES (PO)

PO 1
Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

PO 2
Identify, formulate, conduct research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO 3
Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

PO 4
Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

PO 5
Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations

PO 6
Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems.

PO 7
Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts including ability to have entrepreneurship skills.

PO 8
Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

PO 9
Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

PO 10
Communicate effectively on complex engineering activities with the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.

PO 11
Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work as a member and leader in a team, to manage projects and in multi-disciplinary environments.

PO 12
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
UR6523003 BACHELOR OF MECHATRONIC ENGINEERING WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	**1**	**2**	**3**	**4**	**5**	**6**	**BREAK**	**7**	**8**
DISCIPLINE CORE & ELECTIVE COURSES (103 CREDITS)	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	
	EMJ10003 Computer Programming	EMJ16403 Mechatronic Engineering Practices	EMJ26402 Principle of Engineering Thermofluids	EMJ27403 Network & Communication System	EMJ36404 Electrical Machines & Power Systems	EMJ37403 Artificial Intelligence for Mechatronic Engineering		EMJ4XX03 Elective I	EMJ4XX03 Elective II
			EMJ26703 Design of Machinery						
COMMON CORE COURSES (17 CREDITS)	QMQ10103 Engineering Mathematics I	QMQ10203 Engineering Mathematics II	QMQ20303 Engineering Mathematics III	QMQ27103 Engineering Statistics				EMJ41003 Management for Engineers	EMJ41102 Professional Engineers
UNIVERSITY REQUIREMENT COURSES (16 CREDITS)	SMZ1XX01 Co-Curriculum I	SMZ2XX01 Co-Curriculum II	SMU13102 Appreciation of Ethics & Civilization	SMB20102 English for General Communication[2]	SMU12102 Integrity and Anti Corruption[3]	SMU22402 Engineering Entrepreneurship			
	SMU13002 Philosophy and Current Issues				SMB31202 English for Technical Communication	SMB41002 University Malay Language[4]			
	SMB10102 Preparatory English[1]								
TOTAL CREDITS (136 CREDITS)	**17**	**17**	**19**	**18**	**17**	**16**	**5**	**16**	**11**

Elective I : EMJ47503 Advanced Control Engineering, EMJ47603 Autonomous Mobile Robots, EMJ47703 IoT & Data Analytics.
Elective II : EMJ48503 System Identification & Parameter Estimation, EMJ48603 Advanced PLC Systems, EMJ48703 Smart System Design.

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] International students should register SMU13202 Malaysian Studies.
[4] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course.

Students are also encouraged to take an optional course i.e. EMJ20002 Industrial Attachment course at any semester break to familiarize with industrial environments and experiences.

ENGINEERING TECHNOLOGY PROGRAMME

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

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
Engineering technology graduates engaged in the field of electrical engineering technology as demonstrated through career advancement.

PEO 2
Engineering technology graduates who are members and contribute to professional society.

PEO 3
Engineering technology graduates embracing in life-long learning or pursuing continuing education opportunities.

PEO 4
Engineering technology graduates who are technopreneurs.

PROGRAMME OUTCOMES (PO)

PO 1
Apply knowledge of mathematics, 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.

PO 11
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.

PO 12
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
UR6522002 BACHELOR OF ELECTRICAL ENGINEERING TECHNOLOGY (INDUSTRIAL POWER) WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEMESTER	1	2	3	4	5	6	7	8
DISCIPLINE CORE & ELECTIVE COURSES (114 CREDITS)	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	Elective II/3	
	EMK11103 Engineering Science	EMK10203 Engineering Skills II	EMK21003 Electromagnetic Field Theory	EMK21703 Communication System	EMK32203 Electrical Power System	Elective I/3	Elective III/3	
				EMK21803 Signal & Systems	EMK31103 Control System Technology	EMK31303 Engineering Technology Management	EMK41003 Technologist in Society	
					EMK30103 Design Project			
COMMON CORE COURSES (19 CREDITS)	QMQ11103 Mathematics for Engineering Technology I	QMQ11203 Mathematics for Engineering Technology II	QMQ21303 Mathematics for Engineering Technology III					
UNIVERSITY REQUIREMENT COURSES (16 CREDITS)	SMU32202 Thinking Skills	SMB10102 Preparatory English[1]	SMB20102 English for General Communication [2]	SMU22402 Engineering Entrepreneurship		SMU12102 Integrity and Anti-Corruption [3]		
	SMU13002 Philosophy and Current Issues	SMB41002 University Malay Language [4]		SMB31202 English for Technical Communication	SMU13102 Appreciation of Ethics and Civilization			
	SMZXXXX1 Co-Curriculum 1	SMZXXXX1 Co-Curriculum 2						
TOTAL CREDITS (141 CREDITS)	**19**	**18**	**17**	**19**	**20**	**18**	**18**	**12**

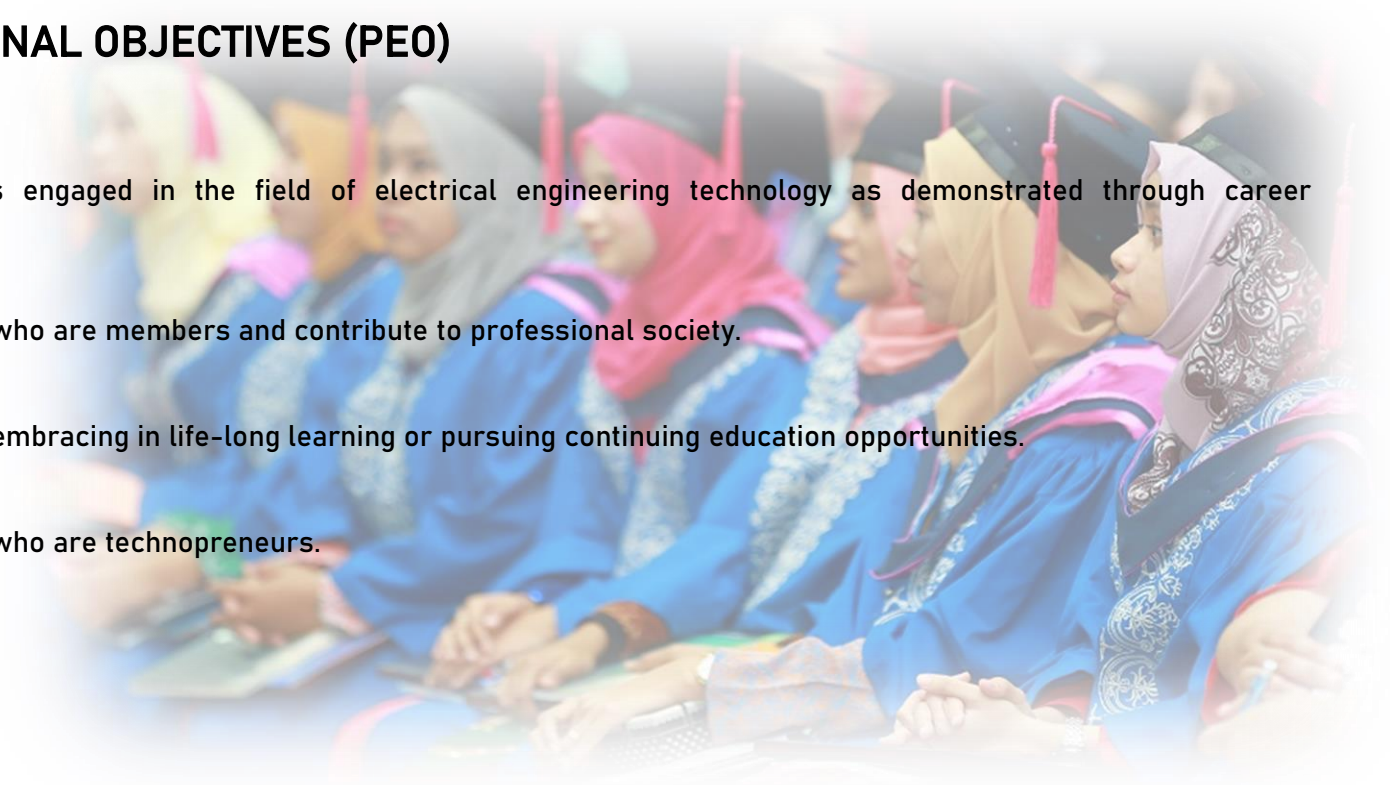
Elective I : EMK32403 Power Quality Elective A1, EMK32503 Substation Engineering Elective A2.
Elective II : EMK42103 Power Electronics & Drives Elective B1, EMK42203 Industrial Automation Elective B2.
Elective III : EMK42303 Energy Efficiency & Management Elective C1, EMK42403 High Voltage Technology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

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] International students should register SMU13202 Malaysian Studies.
[4] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course.

ENGINEERING TECHNOLOGY PROGRAMME

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

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)



PEO 1
Engineering technology graduates engaged in the field of electrical engineering technology as demonstrated through career advancement

PEO 2
Engineering technology graduates who are members and contribute to professional society.

PEO 3
Engineering technology graduates embracing in life-long learning or pursuing continuing education opportunities.

PEO 4
Engineering technology graduates who are technopreneurs.

PROGRAMME OUTCOMES (PO)

PO 1
Knowledge: Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialisation to defined and applied engineering procedures, processes, systems or methodologies.

PO 2
Problem analysis: Identify, formulate, research literature and analyse broadly-defined engineering problems reaching substantiated conclusions using analytical tools appropriate to their discipline or area of specialisation.

PO 3
Design/development of solutions: Design solutions for broadly-defined engineering technology problems and contribute to the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

PO 4
Investigation: Conduct investigations of broadly-defined problems; locate, search and select relevant data from codes, data-bases and literature, design and conduct experiments to provide valid conclusions.

PO 5
Modern Tool Usage: Select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to broadly-defined engineering problems, with an understanding of the limitations.

PO 6
The Engineer and Society: Demonstrate understanding of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technology practice and solutions to broadly-defined engineering problems.

PO 7
Environment and Sustainability: Understand the impact of engineering technology solutions of broadly-defined engineering problems in societal and environmental context and demonstrate knowledge of and need for sustainable development.

PO 8
Ethics: Understand and commit to professional ethics and responsibilities and norms of engineering technology practice.

PO 9
Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse technical teams.

PO 10
Communications: Communicate effectively on broadly defined engineering activities with the engineering community and with society at large, by being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11
Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member and leader in a team and to manage projects in multidisciplinary environments.

PO 12
Life-Long Learning: Recognize the need for, and have the ability to engage in independent and life-long learning in specialist technologies.

CURRICULUM STRUCTURE
UR6523006 BACHELOR OF ELECTRICAL ENGINEERING TECHNOLOGY (ROBOTIC AND AUTOMATION TECHNOLOGY) WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEMESTER	1	2	3	4	5	6	7	8
DISCIPLINE CORE & ELECTIVE COURSES (114 CREDITS)	EMK11003 Computer Programming	EMK11203 Electric Circuit Theory I	EMK21203 Electric Circuit Theory II	EMK21503 Microcontroller System	EMK31003 Drives & Actuators	EMK30004 Final Year Project I	EMK40006 Final Year Project II	EMK40112 Industrial Training
	EMK10002 Computer Aided Drawing	EMK11403 Digital Electronics	EMK21103 Measurement & Instrumentation	EMK21603 Power Electronics	EMK31103 Control System Technology	EMK31203 Programmable Logic Controller	EMK4XXX03 Elective II	
	EMK10103 Engineering Skills I	EMK11303 Electronics I	EMK21303 Electronics II	EMK21703 Communication System	EMK36103 Mechanics & Machine Design	EMK36403 Modern Control	EMK4XXX03 Elective III	
	EMK11103 Engineering Science	EMK10203 Engineering Skills II	EMK21003 Electromagnetic Field Theory	EMK21803 Signal & Systems	EMK30103 Design Project	EMK36203 Industrial Automation	EMK41003 Engineering Technologist in Society	
				EMK21403 Electrical Machines Technology I	EMK36003 Industrial Networking	EMK36303 Industrial Robotics		
					EMK31303 Engineering Technology Management	EMK3XXX03 Elective		
COMMON CORE COURSES (9 CREDITS)	QMQ11103 Mathematics for Engineering Technology I	QMQ11203 Mathematics for Engineering Technology II	QMQ21303 Mathematics for Engineering Technology III					
UNIVERSITY REQUIREMENT COURSES (18 CREDITS)	SMU13102 Appreciation Of Ethics & Civilization	SMB20102 English for General Communication[2]	SMB41002 University Malay Language[3]	SMU22402 Engineering Entrepreneurship	SMU12102 Integrity and Anti Corruption [4]		***SMB1XX02 Option Subject (Foreign Language)	
	SMU32202 Thinking Skills	SMU13102 Philosophy & Current Issues		SMB31202 English for Technical Communication				
	SMB10102 Preparatory English [1]	SMZXXX01 Co-Curriculum II						
	SMZXXX01 Co-Curriculum I							
TOTAL CREDIT (141 CREDITS)	**19**	**20**	**17**	**19**	**20**	**19**	**15**	**12**

Elective I : EMK36703 Artificial Intelligence, EMK36503 Robotics Control
Elective II : EMK46003 Material Handling & Identification, EMK46103 Automated Guided Vehicle
Elective III : EMK46203 Mechatronics Systems, EMK46303 Vision Systems

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] International students other than Indonesia, Singapore and Brunei need to register for the SMB11002 Basic Malay Language course.
[4] SMU12102 Integrity and Anti Corruption Malaysian students only. SMU13102 Malaysia Education International students only.

TECHNOLOGY PROGRAMME

UR6522003
Bachelor of Technology in Electrical Maintenance System with Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

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

PEO 2
To produce technopreneurs in electrical related technology.

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

PROGRAMME OUTCOMES (PO)

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

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

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

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

PLO 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.

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

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

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

PLO 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 2023/2024								
YEAR	**FIRST**		**SECOND**		**THIRD**			**FOURTH**
SEMESTER	**1**	**2**	**3**	**4**	**5**	**6**	**BREAK**	**8**
COMMON CORE (106 CREDITS)	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	EMT30710 Final Year Project		EMT40112 Industrial Training
	EMT10204 Technical Reporting	EMT10505 Switchboard Maintenance and Calibration	EMT20205 Renewable Energy System Maintenance	EMT20505 Energy Efficiency Optimization	EMT30205 Monitoring system Integration	EMT30504 Maintenance Management System (MMS)		
	EMT10305 Electrical System Measurement & Testing	EMT10603 Professional Practices	EMT20305 Generator System Maintenance	EMT20603 Collegiality Interaction and Management	EMT30304 Industrial Data Analysis	EMT30604 Project Planning and Execution		
				EMT20704 Technopreneur Project 1	EMT30404 Technopreneur Project 2			
UNIVERSITY REQUIREMENT COURSES (18 CREDITS)	SMZXXX01 Co-Curriculum I	SMU12102 Integrity and Anti-Corruption [4]	SMB11X02 Third Language [3]					
	SMB41002 University Malay Language [5]	SMZXXX01 Co-Curriculum II	SMB31202 English for Technical Communication	SMU22402 Engineering Entrepreneurship	SMU13102 Appreciation of Ethics and Civilization			
	SMU13002 Philosophy and Current Issue	SMB20102 English for General Communication [2]						
	SMB10102 Preparatory English [1]							
TOTAL CREDITS (124 CREDITS)	**18**	**18**	**19**	**19**	**20**	**8**	**10**	**12**

Notes:

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.

[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.

[3] SMB1XX02: Jerman, Mandarin, Japan or etc.

[4] International students should register SMU13202 Malaysian Studies.

[5] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course.

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]
EMJ20002	Industrial Attachment [Sangkutan Industri]
EMJ22003	Instrumentation and Measurements [Instrumentasi dan Pengukuran]
EMJ22204	Analog Electronics [Elektronik Analog]
EMJ22304	Digital Electronics [Elektronik Digit]
EMJ22403	Signals and Systems [Isyarat dan Sistem]

LIST OF COURSES:

COURSE CODE	COURSE NAME
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]
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]

LIST OF COURSES:

COURSE CODE	COURSE NAME
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]
EMJ40103	Management for Engineers [Pengurusan Untuk Jurutera]
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]

LIST OF COURSES:

COURSE CODE	COURSE NAME
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]
EMK20002	Industrial Attachment [Sangkutan Industri]
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]

LIST OF COURSES:

COURSE CODE	COURSE NAME
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]
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 & Peralatansuis Sistem Kuasa]
EMK42103	Power Electronics and Drives (Elective) [Elektronik Kuasa dan Pemacu]

LIST OF COURSES:

COURSE CODE	COURSE NAME
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]
EMT10104	Rangkaan Dan Simulasi Sistem Elektrik [Electrical System Drafting And Simulation]
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]
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]

LIST OF COURSES:

COURSE CODE	COURSE NAME
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 [PENGATURCARAAN KOMPUTER]

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 [SAINS KEJURUTERAAN]

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 [LITAR ELEKTRIK 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 [PENGENALAN KEPADA KEJURUTERAAN ELEKTRIK]

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 [PERANTI ELEKTRONIK]

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 [LITAR ELEKTRIK 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 [AMALAN-AMALAN KEJURUTERAAN ELEKTRIK]

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).

EMJ20002 INDUSTRIAL ATTACHMENT [SANGKUTAN INDUSTRI]

No of Credits: 2 (Optional)

Course Synopsis:
This course exposes the Bachelor of Engineering students with industrial experience, in addition to the compulsary industrial training. This course provides students with significant skills and practical knowledge, motivating them to become professional and successful engineers. The student will be exposed to the company's technical functions, organizational structures and operations, such as departmental function, work procedure, safefy procedure, communication, technical skills and project management. The student will gain theoritical and practical knowledge during the industrial attachment period. The attachment period can be as minimum as four weeks.

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

EMJ22003 INSTRUMENTATION AND MEASUREMENTS [INSTRUMENTASI DAN PENGUKURAN]

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 [ELEKTRONIK ANALOG]

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 [ELEKTRONIK DIGIT]

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 AND SYSTEMS [ISYARAT DAN SISTEM]

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 [REKABENTUK SISTEM MIKROPENGAWAL]

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. Ability to investigate and design a microcontroller based system application through simulation with valid approach.

EMJ23003 ELECTRICAL POWER TECHNOLOGY [TEKNOLOGI KUASA ELEKTRIK]

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 [KEJURUTERAAN SISTEM KAWALAN]

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 [KEJURUTERAAN SISTEM KUASA]

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 [TEORI ELEKTROMAGNETIK]

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 [MESIN ELEKTRIK]

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 [ELEKTRONIK KUASA 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 [KEJURUTERAAN SISTEM PERHUBUNGAN]

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 [ANALISA SISTEM KUASA]

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

EMJ33303 ELECTRICAL ENERGY UTILIZATION [PENGGUNAAN TENAGA ELEKTRIK]

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 [REKA BENTUK PEMASANGAN ELEKTRIK]

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
2. electrical installation system.
3. Ability to design solution to the electrical installation system that comply with the standard.
4. Ability to function constructively in a group and demonstrate effective communication through writing and oral assessments.

EMJ30105 INDUSTRIAL TRAINING [LATIHAN INDUSTRI]

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. Ability to adapt to health, safety, legal, cultural and sustainability requirements in working environment. Ability to execute tasks with professional ethics and responsibilities.
2. Ability to work independently, interact with co-workers and work in a team.
3. Ability to communicate effectively on the complex engineering activities performed in training.

EMJ42003 **HIGH VOLTAGE ENGINEERING [KEJURUTERAAN VOLTAN TINGGI]**

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 [PROJEK TAHUN AKHIR 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.

EMJ41003 MANAGEMENT FOR ENGINEERS [PENGURUSAN UNTUK JURUTERA]

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 [REKA BENTUK PEMASANGAN ELEKTRIK 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 [PEMACU ELEKTRIK]

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 [PROJEK TAHUN AKHIR 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.

EMJ41102 PROFESSIONAL ENGINEERS [JURUTERA PROFESSIONAL]

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 [OPERASI SISTEM KUASA DAN KAWALAN]

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 [REKABENTUK MESIN ELEKTRIK]

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 [ELEKTRONIK KUASA 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 [SISTEM TENAGA ELEKTRIK]

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 [KAWALAN ELEKTRONIK INDUSTRI]

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 [REKABENTUK PENCAWANG]

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 [SISTEM TENAGA BOLEH BAHARU]

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 [PERLINDUNGAN SISTEM KUASA]

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 [TEORI LITAR ELEKTRIK]

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 [STATIK KEJURUTERAAN]

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 [PRINSIP-PRINSIP BAHAN KEJURUTERAAN]

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 [AMALAN-AMALAN KEJURUTERAAN MEKATRONIK]

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 [ELEKTRONIK ANALOG]

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 [DINAMIK KEJURUTERAAN]

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 [LUKISAN TERBANTU KOMPUTER]

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 AND LINEAR SYSTEMS [ISYARAT DAN SISTEM LELURUS]

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 [LITAR LOGIK DIGIT]

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 AND MEASUREMENTS [INSTRUMENTASI DAN PENGUKURAN]

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 [PRINSIP-PRINSIP KEJURUTERAAN TERMOBENDALIR]

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 [REKABENTUK JENTERA]

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 [TEORI MEDAN ELEKTROMAGNETIK]

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.
4.

EMJ27204 EMBEDDED SYSTEM AND INTERFACING [SISTEM TERBENAM DAN PENGANTARAMUKA]

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 [ELEKTRONIK KUASA]

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 AND COMMUNICATION SYSTEM [SISTEM KOMUNIKASI DAN RANGKAIAN]

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.

EMJ36103 CONTROL ENGINEERING I [KEJURUTERAAN KAWALAN 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 [PENGLIHATAN MESIN]

No of Credits: 3

Course 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 [SISTEM KUASA BENDALIR]

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 [JENTERA ELEKTRIK DAN SISTEM KUASA]

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 [KEJURUTERAAN KAWALAN II]

No of Credits: 3

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 [REKABENTUK SISTEM MEKATRONIK 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 [SISTEM ROBOTIK]

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 [KECERDIKAN BUATAN UNTUK KEJURUTERAAN MEKATRONIK

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 [PENGELUARAN DAN KAWALAN KUALITI]

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 [AUTOMASI]

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 [REKABENTUK SISTEM MEKATRONIK 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 [KEJURUTERAAN KAWALAN LANJUTAN]

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 [ROBOT TERGERAK AUTOMATIK]

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 [IOT DAN ANALITIK DATA]

No of Credits: 3

Course Synopsis:
The course covers an introduction to the Internet-of-Things (IoT), IoT structures and its related environment including cloud platforms, data exploration and IoT data visualization. Furthermore, the students are introduced to data analysis within the IoT application environment such as statistic and probability theorem, hypothesis testing, regressions, dimensionality reduction and classification technique. At the end of the course, the students are expected to acquire new knowledge on IoT and data analytics and be able to apply the knowledge in real applications, particularly on the emerging IR4.0.

Course Outcomes:
1. Ability to apply knowledge of IoT structure and data analytics in engineering.
2. Ability to design IoT framework and evaluate the data structure within the designed IoT environment.
3. Ability to apply the appropriate framework to develop a functional IoT system.

EMJ48503 SYSTEM IDENTIFICATION & PARAMETER ESTIMATION [SISTEM IDENTIFIKASI DAN ANGGARAN PARAMETER]

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 [SISTEM PLC LANJUTAN]

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 [REKABENTUK SISTEM PINTAR]

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 [LUKISAN TERBANTU KOMPUTER]

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 [KEMAHIRAN KEJURUTERAAN 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 [PENGATURCARAAN KOMPUTER]

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 [SAINS KEJURUTERAAN]

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 [KEMAHIRAN KEJURUTERAAN 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 [TEORI LITAR ELEKTRIK 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 [ELEKTRONIK 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 [ELEKTRONIK DIGIT]

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 [TEORI MEDAN ELEKTROMAGNET]

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 [PENGUKURAN & PERALATAN]

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 [TEORI LITAR ELEKTRIK 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 [ELEKTRONIK 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 [TEKNOLOGI MESIN ELEKTRIK 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 MICROCONTROLLER SYSTEM [SISTEM MIKROPENGAWAL]

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 [ELEKTRONIK KUASA]

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 [SISTEM KOMUNIKASI]

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 [ISYARAT DAN SISTEM]

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.

EMK20002 INDUSTRIAL ATTACHMENT [SANGKUTAN INDUSTRI]

No of Credits: 2

Course Synopsis:
This course exposes the Bachelor of Engineering Technology degree students with industrial experience, in addition to the compulsory industrial training. This course provides students with significant skills and practical knowledge, motivating them to become professional and successful technologist. The student will be exposed to the company's technical functions, organizational structure and operations, such as departmental function, work procedure, safety procedure, communication, technical skills and project management. The students will gain theoretical and practical knowledge during the industrial attachment period. The attachment period can be as minimum as four weeks.

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

EMK30103 DESIGN PROJECT [PROJEK REKABENTUK]

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 [PEMACU & PENGGERAK]

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 [TEKNOLOGI SISTEM KAWALAN]

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.

EMK36003 INDUSTRIAL NETWORKING [RANGKAIAN PERINDUSTRIAN]

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 [REKABENTUK MEKANIK DAN MESIN]

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

EMK32003 ELECTRICAL MACHINES TECHNOLOGY II [TEKNOLOGI MESIN ELEKTRIK 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 [PEMASANGAN ELEKTRIK]

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 [SISTEM KUASA ELEKTRIK]

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:
Ability to analyze and solve the type and operation of power system generation.
1. Ability to select and apply appropriate engineering tools for generation, transmission and distribution systems.
2. Ability to investigate and evaluate the load characteristics and distribution system components in power systems.
3. Ability to communicate effectively on type and operation of power system generation through technical report and presentation.

EMK32303 RENEWABLE ENERGY SYSTEM [SISTEM BOLEH BAHARU]

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 [KUALI KUASA] (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 [KEJURUTERAAN PENCAWANG] (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.

EMK36203 INDUSTRIAL AUTOMATION [AUTOMASI INDUSTRI]

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 [ROBOTIK INDUSTRI]

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 CONTROL [KAWALAN MODEN

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

EMK31203 PROGRAMMABLE LOGIC CONTROLLER [PENGAWAL LOGIK BOLEHATURCARA]

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 [PENGURUSAN TEKNOLOGI KEJURUTERAAN]

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.

EMK36503 MODERN CONTROL [KAWALAN MODEN] (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) [KECERDIKAN BUATAN] (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.

EMK40006 FINAL YEAR PROJECT II [PROJEK TAHUN AKHIR II]

No of Credits: 6

Course Synopsis:
This course consists of lectures and independent study on the techniques of conducting laboratory and 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 [JURUTEKNOLOGI DALAM MASYARAKAT]

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.

EMK46003 MATERIAL HANDLING AND IDENTIFICATION (ELECTIVE) [PENGENDALIAN DAN PENGENALPASTIAN BAHAN] (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) [KENDERAAN BERPANDU AUTOMATIK]

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) [SISTEM MEKATRONIK] (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.

EMK42003 POWER SYSTEM PROTECTION AND SWITCHGEAR [PERLINDUNGAN & PERALATANSUIS SISTEM KUASA]

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) [ELEKTRONIK KUASA DAN PEMACU] (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) [AUTOMASI INDUSTRI] (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) [KECEKAPAN DAN PENGURUSAN TENAGA] (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) [TEKNOLOGI VOLTAN TINGGI] (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.

EMK46303 VISION SYSTEMS (ELECTIVE) [SISTEM PENGLIHATAN] (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

EMK40112 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. 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 specialist technologies

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.

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 (FKTEN)

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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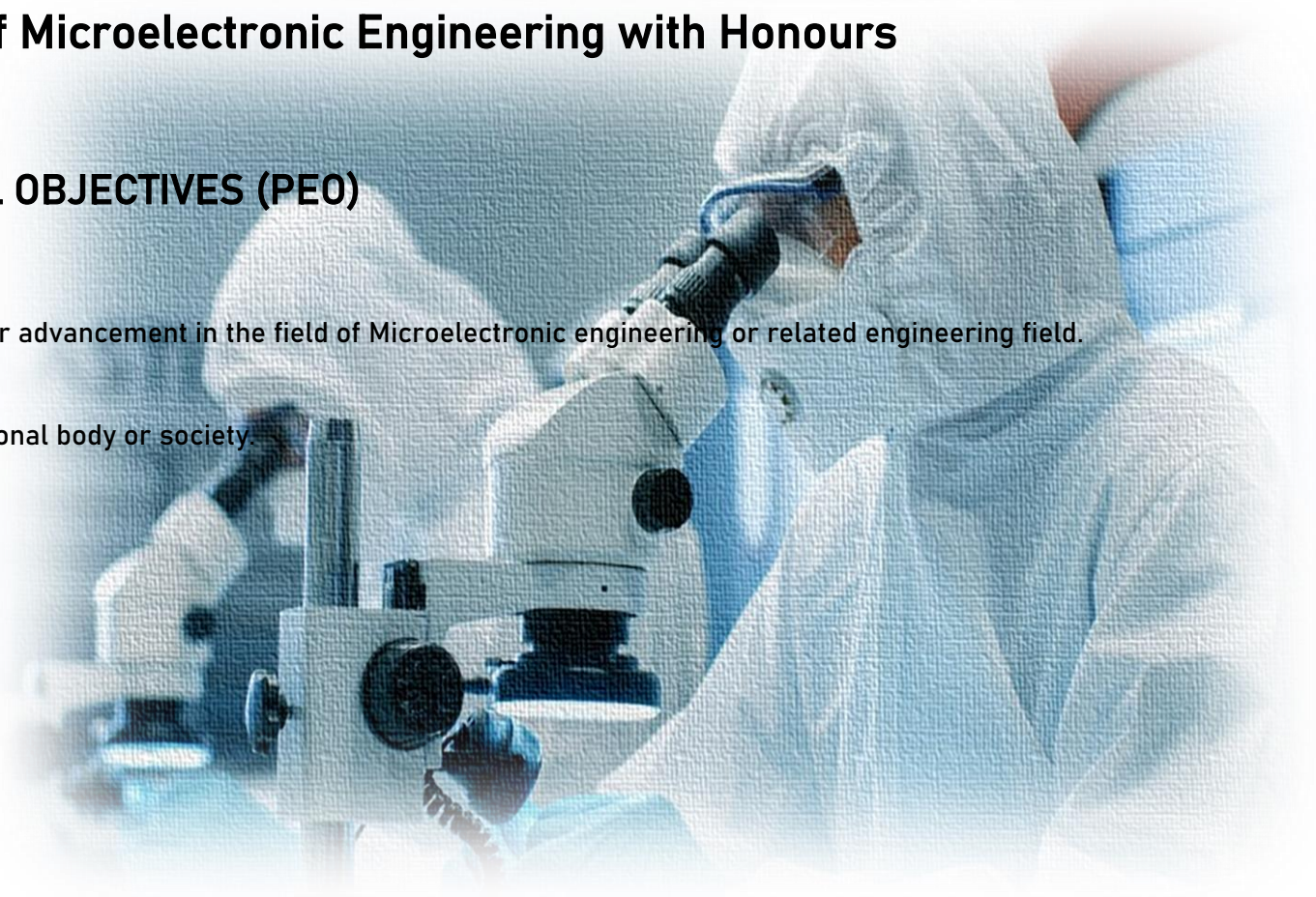
ENGINEERING PROGRAMME

UR6523001
Bachelor of Microelectronic Engineering with Honours



PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
Graduates who have demonstrated career advancement in the field of Microelectronic engineering or related engineering field.

PEO 2
Graduates who are involved in a professional body or society.

PEO 3
Graduates who pursue lifelong learning.

PROGRAMME OUTCOMES (PO)

PO 1
Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

PO 2
Identify, formulate, conduct research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences

PO 3
Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

PO 4
Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

PO 5
Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations.

PO 6
Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems.

PO 7
Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts including ability to have entrepreneurship skills.

PO 8
Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

PO 9
Function effectively as an individual, and as a member or leader in diverse teams and in multi disciplinary settings

PO 10
Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11
Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environment

PO 12
Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

CURRICULUM STRUCTURE
UR6523001 BACHELOR OF MICROELECTRONIC ENGINEERING WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	1	2	3	4	5	6	BREAK	7	8
DISCIPLINE CORE & ELECTIVE COURSES (102 CREDITS)	NMJ11303 Circuit Theory	NMJ11203 Electrical Power System	*NMJ20303 Analog Electronic II	NMJ21603 Integrated Circuit Design	NMJ32303 Digital Integrated Circuit Design	NMJ32603 Computer Architecture	NMJ30905 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 Electronics	NMJ10903 Computer Programming	NMJ20603 Semiconductor Physics	*NMJ21803 Electromagnetic Theory	NMJ32903 Communication Systems	NMJ31403 Digital Signal Processing		NMJXXXX3 Elective I	NMJXXXX3 Elective IV
	NMJ11103 Electronic Devices	NMJ10203 Analog Electronic I	NMJ20703 Signal and Systems	NMJ32703 Control Systems	NMJ30403 Instrumentation	NMJ32004 Integrated Design Project		NMJXXXX3 Elective II	
								NMJXXXX3 Elective III	
COMMON CORE COURSES (17 CREDITS)	QMQ10103 Engineering Mathematics I	QMQ10203 Engineering Mathematics II	QMQ20303 Engineering Mathematics III	QMQ27103 Engineering Statistics	NMJ31603 Management for Engineers	NMJ30602 Professional Engineers			
UNIVERSITY REQUIREMENT COURSES (16 CREDITS)	SMB41002 University Malay Language[4]	SMB10102 Preparatory English[1]	SMB20102 English for General Communication[2]	SMB31202 English for Technical Communication	SMU12102 Integrity and Anti-Corruption [3]	SMU22402 Engineering Entrepreneurship		SMU13102 Appreciation of Ethics and Civilization	SMU13002 Philosophy and Current Issues
	SMZXXX01 Co-Curriculum 1	SMZXXX01 Co-Curriculum 2							
TOTAL CREDITS (135 CREDITS)	**18**	**16**	**17**	**17**	**17**	**17**	**5**	**16**	**12**

Elective I, II, III (select any 3 courses) : NMJ30803 Reliability and Testability in Integrated Circuit Design, NMJ31703 Advanced Devices, NMJ40703 Micro-Electro-Mechanical Systems, NMJ40903 Optical Communication
Elective IV (select any 1 course) : NMJ40403 Nanoelectronic Engineering, NMJ42403 Optoelectronic System, NMJ40203 Data Analytics

*Courses with prerequisite

Courses	Prerequisite
NMJ20303	NMJ10203
NMJ20503	NMJ10303
NMJ21803	QMQ10103

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] International students should register SMU13202 Malaysian Studies.
[4] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course.

ENGINEERING PROGRAMME

UR6523002
Bachelor of Computer Engineering with Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
Graduates who have demonstrated career advancement in the field of Computer Engineering or related engineering field

PEO 2
Graduates who are contributed to a professional body or society

PEO 3
Graduates who have engaged in lifelong learning or pursuing continuing education opportunities

PROGRAMME OUTCOMES (PO)

PO 1
Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to the solution of complex engineering problems.

PO 2
Identify, formulate, research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences. (WK1 to WK4)

PO 3
Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations. (WK5)

PO 4
Conduct investigations of complex problems using research- based knowledge (WK8) and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

PO 5
Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations. (WK6)

PO 6
Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems. (WK7)

PO 7
Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts including ability to have entrepreneurship skills. (WK7)

PO 8
Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice. (WK7)

PO 9
Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

PO 10
Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11
Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environment.

PO 12
Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

CURRICULUM STRUCTURE
UR6523002 BACHELOR OF COMPUTER ENGINEERING WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	**1**	**2**	**3**	**4**	**5**	**6**	**BREAK**	**7**	**8**
DISCIPLINE CORE & ELECTIVE COURSES (102 CREDITS)	NMJ11303 Circuit Theory	NMJ10803 Circuit Theory II	NMJ20303 Analog Electronics II	NMJ21803 Electromagnetic Theory	NMJ30504 Electronic Instrumentation & Measurement	NMJ32404 Embedded System Design	NMJ30905 Industrial Training	NMJ41802 Final Year Project I	NMJ41904 Final Year Project II
	NMJ11004 Computer Programming	NMJ10203 Analog Electronics I	NMJ20404 Digital Electronics II	NMJ32703 Control Systems	NMJ32903 Communication Systems	NMJ31804 Principle of Computer Architecture		NMJ42503 Modern Operating System	NMJ42303 Real Time System
	NMJ11103 Electronic Devices	NMJ10303 Digital Electronics I	NMJ20003 Algorithm and Data Structures	NMJ21704 Microprocessor Systems	NMJ32203 Computer Networks	NMJ32004 Integrated Design Project		NM40603 Artificial Intelligence	Open Elective /3
		NMJ10503 Electrical Engineering	NMJ20703 Signals and Systems	NMJ21403 Object-oriented Programming	NMJ31403 Digital Signal Processing			Program Elective I /3	
								Program Elective II /3	
COMMON CORE COURSES (17 CREDITS)	QMQ10103 Engineering Mathematics I	QMQ10203 Engineering Mathematics II	QMQ22103 Discrete Mathematics and Linear Algebra	QMQ27203 Probability and Statistic	NMJ31603 Management for Engineers	NMJ30602 Professional Engineers			
UNIVERSITY REQUIREMENT COURSES (16 CREDITS)	SMZXXX01 Co-Curriculum 1	SMZXXX01 Co-curriculum 2	SMB20102 English for General Communication [2]	SMB41002 University Malay Language [3]	SMB31202 English for Technical Communication	SMU22402 Engineering Entrepreneurship			SMU12102 Integrity And Anti-Corruption [4]
	SMU13002 Philosophy and Current Issues	SMB10102 Preparatory English [1]							
	SMU13102 Appreciation of Ethics and Civilization								
TOTAL CREDITS (135 CREDITS)	**18**	**16**	**18**	**18**	**18**	**16**	**5**	**14**	**12**

Elective I & II (select any 2 courses) : NMJ41203 Image Processing, NMJ40503 Software Engineering, NMJ40803 Internet of Things, NMJ42603 Computer Security, NMJ42703 Cloud Computing
Open Elective (select 1 course) : NMJ41403 Network Programming, NMJ40203 Data Analytics, NMJ42803 FPGA Programming

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] International students other than Indonesia, Singapore and Brunei need to register the SMB11002 Basic Malay Language course.
[4] International students should register SMU13202 Malaysian Studies.

ENGINEERING PROGRAMME

UR6523004
Bachelor of Biomedical Electronic Engineering with Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
Graduates who have demonstrated career advancement in the field of Biomedical Electronic Engineering or related engineering field

PEO 2
Graduates who are involved in a professional body or society

PEO 3
Graduates who pursue life-long learning

PROGRAMME OUTCOMES (PO)

PO 1
Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to the solution of complex engineering problems.

PO 2
Identify, formulate, research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences. (WK1 to WK4)

PO 3
Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations. (WK5)

PO 4
Conduct investigations of complex problems using research- based knowledge (WK8) and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

PO 5
Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations. (WK6)

PO 6
Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems. (WK7)

PO 7
Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts including ability to have entrepreneurship skills. (WK7)

PO 8
Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice. (WK7)

PO 9
Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

PO 10
Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11
Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environment.

PO 12
Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

CURRICULUM STRUCTURE
UR6523004 BACHELOR OF BIOMEDICAL ELECTRONIC ENGINEERING WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	1	2	3	4	5	6	BREAK	7	8
DISCIPLINE CORE & ELECTIVE COURSES (102 CREDITS)	NMJ11303 Circuit Theory	NMJ10903 Computer Programming	NMJ21103 Engineering Mechanics	NMJ20103 Biomaterials	NMJ31003 Mechanics of Materials	NMJ32903 Communication System	NMJ30905 Industrial Training	NMJ41802 Final Year Project I	NMJ41904 Final Year Project II
	NMJ10603 Electronic Engineering Skills	NMJ11503 Analog Electronic	NMJ20303 Analog Electronics II	NMJ21803 Electromagnetic Theory	NMJ32804 Linear Control Systems	NMJ31103 Electrical Drives & Machines		NMJ40003 Bioinstrumentation II	NMJ41003 Artificial Organs
	NMJ10004 Anatomy & Physiology	NMJ10303 Digital Electronic I	NMJ20703 Signals & Systems	NMJ20203 Biomechanics	NMJ30703 Safety, Standards and Ethics In Biomedical Engineering	NMJ32004 Integrated Design Project		NMJ41503 Medical Imaging	NMJXXX03 Elective II
		NMJ10103 Biochemistry	NMJ21003 Computer Aided Design	NMJ21304 Microcontrollers & Interfaces	NMJ31303 Digital Signal Processing in Biomedical Applications	NMJ30003 Bioinstrumentation I		NMJXXX03 Elective I	
						NMJ33003 Thermofluids			
COMMON CORE COURSES (17 CREDITS)	QMQ10103 Engineering Mathematics I	QMQ10203 Engineering Mathematics II	QMQ20303 Engineering Mathematics III	QMQ27103 Engineering Statistics				NMJ31603 Management for Engineers	NMJ30602 Professional Engineers
UNIVERSITY REQUIREMENT COURSES (16 CREDITS)	SMZ1XX01 Co-Curriculum I	SMZ2XX01 Co-Curriculum II	SMU13102 Appreciation of Ethics & Civilization	SMB31202 English for Technical Communication	SMU22402 Engineering Entrepreneurship				
	SMU13002 Philosophy and Current Issues	SMB20102 English for General Communication [2]			SMB41002 University Malay Language [4]				
	SMU12102 Integrity and Anti-Corruption [3]								
	SMB10102 Preparatory English[1]								
TOTAL CREDITS (135 CREDITS)	18	18	17	18	17	16	5	14	12

Elective I : NMJ41303 Medical Image Processing, NMJ40103 Biosensor & BioMEMS.
Elective II : NMJ40603 Artificial Intelligence, NMJ41603 Medical Robotics.

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] International students should register SMU13202 Malaysian Studies.
[4] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course.

ENGINEERING PROGRAMME

UR6523005
Bachelor of Electronic Engineering with Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
Graduates who have demonstrated career advancement in the field of Electronic Engineering or related engineering field

PEO 2
Graduates who are involved in a professional body or society

PEO 3
Graduates who pursue lifelong learning

PROGRAMME OUTCOMES (PO)

PO 1
Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to the solution of complex engineering problems.

PO 2
Identify, formulate, research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences. (WK1 to WK4)

PO 3
Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations. (WK5)

PO 4
Conduct investigations of complex problems using research-based knowledge (WK8) and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

PO 5
Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations. (WK6)

PO 6
Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems. (WK7)

PO 7
Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts. (WK7)

PO 8
Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice. (WK7)

PO 9
Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

PO 10
Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions

PO 11
Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12
Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

CURRICULUM STRUCTURE
UR6523005 BACHELOR OF ELECTRONIC ENGINEERING WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	1	2	3	4	5	6	BREAK	7	8
DISCIPLINE CORE & ELECTIVE COURSES (103 CREDITS)	NMJ11303 Circuit Theory	NMJ11203 Electrical Power System	***NMJ20303 Analog Electronic II	NMJ21603 Integrated Circuit Design	NMJ32303 Digital Integrated Circuit Design	NMJ32603 Computer Architecture	NMJ30905 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	NMJ31403 Digital Signal Processing		NMJ42103 Analogue Integrated Circuit Design	NMJXXXXX Elective 2
	NMJ11103 Electronic Devices	NMJ10203 Analog Electronic I	NMJ20703 Signal and Systems	NMJ32703 Control Systems	NMJ30403 Instrumentation	NMJ32004 Integrated Design Project		NMJ30803 Reliability and Testability in Integrated Circuit Design	
								NMJXXXXX Elective 1	
COMMON CORE COURSES (17 CREDITS)	QMQ10103 Engineering Mathematics I	QMQ10203 Engineering Mathematics II	QMQ20303 Engineering Mathematics III	QMQ27103 Engineering Statistics	NMJ31603 Management for Engineers	NMJ30602 Professional Engineers			
UNIVERSITY REQUIREMENT COURSES (16 CREDITS)	SMB41002 University Malay Language [3]	SMB10102 Preparatory English[1]	SMB20102 English for General Communication [2]	SMB31202 English for Technical Communication	SMU12102 Integrity and Anti-Corruption [4]	SMU22402 Engineering Entrepreneurship		SMU13102 Appreciation of Ethics and Civilization	SMU13002 Philosophy and Current Issues
	SMZXXX01 Co-Curiculum 1	SMZXXX01 Co-Curiculum 2							
TOTAL CREDITS (135 CREDITS)	18	16	17	17	17	17	5	16	12

Elective 1 : NMJ42403 Optoelectronic System, NMJ31703 Advanced Devices
Elective 2 : NMJ40303 Reliability and Failure Analysis, NMJ40403 Nanoelectronic Engineering

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] International students other than Indonesia, Singapore and Brunei need to register the SMB11002 Basic Malay Language course.
[4] International students need to register for SMU13202 Malaysian Studies.

***Courses with prerequisite

Course	Prerequisite
NMJ20503	NMJ10303
NMJ20303	NMJ10203
NMJ21803	SMQ10103

ENGINEERING TECHNOLOGY PROGRAMME

UR6523007
Bachelor of Electronic Engineering Technology (Electronic System) with Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
Engineering technology graduates engaged in the field of electronic engineering technology as demonstrated through career advancement.

PEO 2
Engineering technology graduates who are members and contribute to professional society.

PEO 3
Engineering technology graduates embracing in life-long learning or pursuing continuing education opportunities

PEO 4
Engineering technology graduates who are technopreneurs.

PROGRAMME OUTCOMES (PO)

PO 1
Knowledge: Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to defined and applied engineering procedures, processes, systems or methodologies.

PO 2
Problem analysis: Identify, formulate, research literature and analyse broadly-defined engineering problems reaching substantiated conclusions using analytical tools appropriate to their discipline or area of specialisation.

PO 3
Design/development of solutions: Design solutions for broadly-defined engineering technology problems, and to design systems, components or processes to meet specified needs with appropriate consideration for public health and safety, as well as cultural, societal, environmental and sustainability concerns.

PO 4
Investigation: Plan and conduct experimental investigations of broadly-defined problems, using data from relevant sources.

PO 5
Modern Tool Usage: Select and apply appropriate techniques, resources and modern engineering tools, with an understanding of their limitations.

PO 6
The Engineer and Society: Demonstrate an awareness of and consideration for societal, health, safety, legal and cultural issues and their consequent responsibilities.

PO 7
Environment and Sustainability: Demonstrate an understanding of the impact of engineering practices, taking into account the need for sustainable development.

PO 8
Ethics: Demonstrate an understanding of professional ethics, responsibilities and norms of engineering technology practices.

PO 9
Individual and Teamwork: Function effectively as individuals, and as members or leaders in diverse technical teams.

PO 10
Communications: Communicate effectively with the engineering community and society at large.

PO 11
Project Management and Finance: Demonstrate an awareness of management, business practices and entrepreneurship.

PO 12
Life-Long Learning: Recognise the need for professional development and to engage in independent and lifelong learning.

CURRICULUM STRUCTURE
UR6523007 BACHELOR OF ELECTRONIC ENGINEERING TECHNOLOGY (ELECTRONIC SYSTEM) WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEMESTER	1	2	3	4	5	6	7	8
DISCIPLINE CORE & ELECTIVE COURSES (106 CREDITS)	NMK10103 Electric Circuits	NMK10503 Electrical Engineering Technology	NMK20103 Microprocessor	NMK20603 Computer Architecture	NMK30103 Communication Systems	NMK30004 Final Year Project I	NMK40006 Final Year Project II	NMK40412 Industrial Training
	NMK10203 Engineering Science	NMK10603 C Programming	NMK20203 Analog Electronic I	NMK21103 Electromagnetic Theory	NMK32003 Power Electronics	NMK31003 Digital Signal Processing	NMK42003 Instrumentation	
	NMK10403 Digital Electronics	NMK10702 Writing in Engineering Technology	NMK20503 Signals & Systems	NMK21303 Analog Electronic II	NMK32103 Digital Integrated Circuit Design	NMK31203 Modern Control System	Elective I	
	NMK11103 Electronic Engineering Skill	NMK10803 Digital Systems	NMK20703 Object-Oriented Programming	NMK22003 Integrated Circuit Design	NMK32203 Microcontroller	NMK31704 Design Project	Elective II	
	NMK12003 Engineering Materials					NMK32303 Verification on Chip		
COMMON CORE COURSES (18 CREDITS)	QMQ11103 Mathematics for Engineering Technology I	QMQ11203 Mathematics for Engineering Technology II	QMQ21303 Mathematics for Engineering Technology III	QMQ27303 Statistics for Engineering Technology	NMK34403 Management In Engineering Technology	NMK44403 Engineering Technologist in Society		
UNIVERSITY REQUIREMENT COURSES (16 CREDITS)	SMZXXX01 Co-Curriculum 1	SMB10102 Preparatory English[1]	SMB20102 English for General Communication[4]	SMU13002 Philosophy and Current Issues	SMB31202 English for Technical Communication			
		SMB41002 University Malay Language[2]	**SMB1XX02 Option Subject (Foreign Language)	SMU13102 Appreciation of Ethnics and Civilizations				
		SMU12102 Integrity and Anti-Corruption [3]	SMU22402 Engineering Entrepreneurship					
		SMZXXX01 Co-curriculum 2						
TOTAL CREDITS (140 CREDITS)	19	19	19	19	17	20	15	12

Elective Subject: NMK33003 Microelectronics Fabrication Technology, NMK33103 Nanoelectronics, NMK33203 Semiconductor Packaging, NMK33303 Reliability and Failure Analysis, NMK42103 Semiconductor Testing, NMK42203 Analog Integrated Circuit Design, NMK42403 IoT Technology, NMK43103 Optoelectronic System, NMK43003 MicroElectroMechanical System

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] International students other than Indonesia, Singapore and Brunei need to register the SMB11002 Basic Malay Language course.
[3] International students should register SMU13202 Malaysian Studies.
[4] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.

ENGINEERING TECHNOLOGY PROGRAMME

UR6523008
Bachelor of Electronic Engineering Technology (Electronic Telecommunication Design) with Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
Graduates who have demonstrated career advancement in the field of Electronic Engineering Technology or related engineering field

PEO 2
Engineering technology graduates who are members and contribute to professional society

PEO 3
Engineering technology graduates embracing in life-long learning or pursuing continuing education opportunities

PEO 4
Engineering technology graduates who are technopreneurs

PROGRAMME OUTCOMES (PO)

PO 1
Knowledge: Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to defined and applied engineering procedures, processes, systems or methodologies; (SK1 to SK4)

PO 2
Problem analysis: Identify, formulate, research literature and analyse broadly-defined engineering problems reaching substantiated conclusions using analytical tools appropriate to their discipline or area of specialization; (SK1 to SK4)

PO 3
Design/development of solutions: Design solutions for broadly-defined engineering technology problems and contribute to the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations; (SK5)

PO 4
Investigation: Conduct investigations of broadly-defined problems; locate, search and select relevant data from codes, data bases and literature, design and conduct experiments to provide valid conclusions; (SK8)

PO 5
Modern Tool Usage: Select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to broadly-defined engineering problems, with an understanding of the limitations; (SK6)

PO 6
The Engineer and Society: Demonstrate understanding of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technology practice and solutions to broadly-defined engineering problems; (SK7)

PO 7
Environment and Sustainability: Understand the impact of engineering technology solution of broadly-defined engineering problems in societal and environmental contexts and demonstrate knowledge of and need for sustainable development; (SK7)

PO 8
Ethics: Understand and commit to professional ethics and responsibilities and norms of engineering technology practice; (SK7)

PO 9
Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse technical teams.

PO 10
Communications: Communicate effectively on broadly-defined engineering activities with the engineering community and with society at large, by being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions;

PO 11
Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member or leader in a team and to manage projects in multidisciplinary environments;

PO 12
Life-Long Learning: Recognise the need for, and have the ability to engage in independent and life-long learning in specialist technologies.

CURRICULUM STRUCTURE UR6523008 BACHELOR OF ELECTRONIC TECHNOLOGY ENGINEERING (ELECTRONIC TELECOMMUNICATIONS DESIGN) WITH HONOURS INTAKE 2023/2024								
YEAR	**FIRST**		**SECOND**		**THIRD**		**FOURTH**	
SEMESTER	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
DISCIPLINE CORE & ELECTIVE COURSES (106 CREDITS)	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 Electronic 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	NMK31704 Design Project	Elective 3/3	
	NMK11203 Measurement & Instrumentation					Elective 1/2		
COMMON CORE COURSES (18 CREDITS)	QMQ11103 Mathematics for Engineering Technology I	QMQ11203 Mathematics for Engineering Technology II	QMQ21303 Mathematics for Engineering Technology III	QMQ27303 Statistics for Engineering Technology	NMK34403 Engineering Technology in Management	NMK44403 Engineering Technologist in Society		
UNIVERSITY REQUIREMENT COURSES (16 CREDITS)	SMZ1XX01 Co-Curriculum I	SMZ2XX01 Co-Curriculum II	SMU22402 Engineering Entrepreneurship	SMU13102 Appreciation of Ethics & Civilization	SMB31202 English for Technical Communication			
		SMB10102 Preparatory English[1]	SMB20102 English for General Communication[2]	SMU13002 Philosophy and Current Issues				
		SMU12102 Integrity and Anti-Corruption [3]	SMB1XX02 Option Subject (Foreign Language)[2]					
		SMB41002 University Malay Language[4]						
TOTAL CREDITS (140 CREDITS)	**19**	**19**	**19**	**19**	**17**	**20**	**15**	**12**

Elective I : NMK31603 Mobile and Wireless Communications, NMK42403 IoT Technology.
Elective II : NMK41103 Electronic and RF Circuit Design, NMK41203 Wireless Internetworking Technology.
Elective II : NMK40403 Artificial Intelligence, NMK41303 Data Communication and Network.

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] International students should register SMU13202 Malaysian Studies.
[4] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course.

ENGINEERING TECHNOLOGY PROGRAMME

UR6523009
Bachelor of Electronic Engineering Technology (Electronic Network Design) with Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
Engineering technology graduates engaged in the field of electronic engineering technology as demonstrated through career advancement

PEO 2
Engineering technology graduates who are members and contribute to professional society

PEO 3
Engineering technology graduates embracing in life-long learning or pursuing continuing education opportunities

PEO 4
Engineering technology graduates who are technopreneurs

PROGRAMME OUTCOMES (PO)

PO 1
Knowledge: Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to defined and applied engineering procedures, processes, systems or methodologies; (SK1 to SK4)

PO 2
Problem analysis: Identify, formulate, research literature and analyse broadly-defined engineering problems reaching substantiated conclusions using analytical tools appropriate to their discipline or area of specialization; (SK1 to SK4)

PO 3
Design/development of solutions: Design solutions for broadly-defined engineering technology problems and contribute to the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations; (SK5)

PO 4
Investigation: Conduct investigations of broadly-defined problems; locate, search and select relevant data from codes, data bases and literature, design and conduct experiments to provide valid conclusions; (SK8)

PO 5
Modern Tool Usage: Select and apply appropriate techniques, resources, and modern engineering and IT tools to broadly-defined engineering problems, with an understanding of the limitations; (SK6)

PO 6
The Engineer and Society: Demonstrate understanding of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technology practice and solutions to broadly-defined engineering problems; (SK7)

PO 7
Environment and Sustainability: Understand the impact of engineering technology solution of broadly-defined engineering problems in societal and environmental contexts and demonstrate knowledge of and need for sustainable development; (SK7)

PO 8
Ethics: Understand and commit to professional ethics and responsibilities and norms of engineering technology practice; (SK7)

PO 9
Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse technical teams

PO 10
Communications: Communicate effectively on broadly-defined engineering activities with the engineering community and with society at large, by being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions;

PO 11
Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member or leader in a team and to manage projects in multidisciplinary environments;

PO 12
Life-Long Learning: Recognise the need for, and have the ability to engage in independent and life-long learning in specialist technologies

CURRICULUM STRUCTURE
UR6523009 BACHELOR OF ELECTRONIC ENGINEERING TECHNOLOGY (ELECTRONIC NETWORK DESIGN) WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEMESTER	1	2	3	4	5	6	7	8
DISCIPLINE CORE & ELECTIVE COURSES (106 CREDITS)	NMK10003 Networking Technology	NMK10503 Electrical Engineering Technology	NMK20703 Object Oriented Programming	NMK20403 Internetworking Technology I	NMK30103 Communication System	NMK30004 Final Year Project I	NMK40006 Final Year Project II	NMK40412 Industrial Training
	NMK10103 Electric Circuit Principles	NMK10603 C Programming	NMK20103 Microprocessor	NMK20503 Signal & Systems	NMK30203 Embedded Software Technology	NMK30503 Network Management	NMK40103 Network Security Technology	
	NMK10203 Engineering Science	NMK10702 Writing in Engineering Technology	NMK20203 Analogue Electronics I	NMK20603 Computer Architecture	NMK30303 Operating Systems	NMK31704 Design Project	Elective II	
	NMK10403 Digital Electronics	NMK10803 Digital Systems	NMK20303 Database Management Systems	NMK20803 Data Structures	NMK30403 Internetworking Technology II	NMK30703 Programming for Networking	Elective III	
	NMK11103 Engineering Skills					Elective I		
COMMON CORE COURSES (18 CREDITS)	QMQ11103 Mathematics for Engineering Technology I	QMQ11203 Mathematics for Engineering Technology II	QMQ21303 Mathematics for Engineering Technology III	QMQ27303 Statistics for Engineering Technology	NMK34403 Engineering Technology Management	NMK44403 Engineering Technologist in Society		
UNIVERSITY REQUIREMENT COURSES (16 CREDITS)		SMB41002 University Malay Language [5]	SMU22402 Engineering Entrepreneurship	SMU13002 Philosophy and Current Issues				
		SMU12102 Integrity and Anti-Corruption [4]	SMB20102 English for General Communication [2]	SMU13102 Appreciation of Ethics and Civilization	SMB31202 English for Technical Communication			
		SMB10102 Preparatory English [1]	SMU XXX/2 Option Subject (Foreign Language)					
	SMZXXX/1 Co-Curriculum 1	SMZXXX/1 Co-Curriculum 2						
TOTAL CREDITS (140 CREDITS)	**19**	**19**	**19**	**19**	**17**	**20**	**15**	**12**

Elective I : NMK40203 Mobile Computing, NMK34003 Switching, Routing and Wireless Essentials.
Elective II : NMK40803 Enterprise Networking, Security and Automation, NMK40403 Artificial Intelligent.
Elective II : NMK30903 Cloud Infrastructure and Services, NMK42403 IOT Technology.

[1] MUET Band 2.5 and below: SMB10102 Preparatory English > SMB20102 English for General Purpose> SMB 31202 English for Technical Communication, *Optional course is NOT COMPULSORY.
[2] MUET Band 3 and Band 3.5: SMB20102 English for General Purpose> SMB31202 English for Technical Communication, * Optional course is NOT COMPULSORY.
[3] MUET Band 4 and above: SMB31202 English for Technical Communication, * Optional course is COMPULSORY.
[4] International students should register SMU13202 Malaysian Studies.
[5] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course

TECHNOLOGY PROGRAMME

UR6523011
Bachelor of Technology in Industrial Electronic Automation With Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
To produce industrial electronic automation technologist who can perform automation tasks and solve problems in automation work.

PEO 2
To produce technopreneurs in electronic related technology.

PEO 3
To produce relevant, respected and referred professionals in industrial electronic automation technology.

PROGRAMME OUTCOMES (PO)

PO1
Apply knowledge of technology fundamentals to broadly-defined procedures processes, systems and methodologies in industrial electronic automation.

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

PO3
Demonstrate strong analytical and critical thinking skills to solve broadly-defined problems in industrial electronic automation.

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

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

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

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

PO8
Demonstrate professionalism and social and ethical consideration.

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

CURRICULUM STRUCTURE UR6523011 BACHELOR OF TECHNOLOGY IN INDUSTRIAL ELECTRONIC AUTOMATION WITH HONOURS INTAKE 2023/2024								
YEAR	**FIRST**		**SECOND**		**THIRD**			**FOURTH**
SEMESTER	**1**	**2**	**3**	**4**	**5**	**6**	**BREAK**	**7**
DISCIPLINE CORE & ELECTIVE COURSES (108 CREDITS)	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	NMT32310 Final Year Project		NMT41112 Industrial Training
	NMT11205 Product Development Technology	NMT12202 Network, Switching and Routing	NMT21503 Professional Practices	NMT22202 System Optimization Technology I	NMT31204 Application System Development II	***Elective		
	NMT11505 Industrial Automation I	NMT12704 System Programming Technology II	NMT21305 Embedded System Programming Tool	NMT22302 Application System Development I	NMT32105 System Integration Design	NMT31304 Quality Management Technology		
	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				
UNIVERSITY REQUIREMENT COURSES (16 CREDITS)	SMZ1XX01 Co-Curriculum I	SMZ2XX01 Co-Curriculum II	SMB31202 English for Technical Communication	SMU22402 Engineering Entrepreneurship	SMU13102 Appreciation of Ethics and Civilization			
	SMB41002 University Malay Language [5]	SMU12102 Integrity and Anti-Corruption [3]	SMB1XX02 Third Language [4]					
	SMU13002 Philosophy and Current Issues	SMB20102 English for General Communication [2]						
	SMB10102 Preparatory English[1]							
TOTAL CREDITS (124 CREDITS)	**19**	**20**	**17**	**18**	**19**	**9**	**10**	**12**

Elective : NMT32205: Maintenance Management System

[1] Compulsory to students with MUET 2.5 and below (local students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] International students should register SMU13202 Malaysian Studies.
[4] SMB1XX02: Jerman, Mandarin or Japanese
[5] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course.

LIST OF COURSES:

COURSE CODE	COURSE NAME
NMJ11303	Teori Litar [Circuit Theory]
NMJ10603	Kemahiran Kejuruteraan Elektronik [Electronic Engineering Skills]
NMJ10403	Fizik untuk Elektronik [Physics for Electronic]
NMJ11103	Peranti Elektronik [Electronic Devices]
NMJ11203	Sistem Kuasa Elektrik [Electrical Power System]
NMJ10303	Electronik Digit I [Digital Electronic I]
NMJ10903	Pengaturcaraan Komputer [Computer Programming]
NMJ10203	Elektronik Analog I [Analog Electronic I]
NMJ20303	Elektronik Analog II [Analog Electronic II]
NMJ20503	Elektronik Digital II [Digital Electronic II]
NMJ20603	Fizik Semikonduktor [Semiconductor Physics]
NMJ20703	Isyarat Dan Sistem [Signal And Systems]
NMJ21603	Rekabentuk Litar Bersepadu [Integrated Circuit Design]
NMJ21203	Mikropemproses [Microprocessor]
NMJ21803	Teori Elektromagnet [Electromagnetic Theory]
NMJ32703	Sistem Kawalan [Control Systems]
NMJ32303	Rekabentuk Litar Bersepadu Digital [Digital Intergrated Circuit Design]
NMJ30203	Fabrikasi Mikroelektronik I [Microelectronic Fabrication I]
NMJ32903	Sistem Perhubungan [Communication Systems]

LIST OF COURSES:

COURSE CODE	COURSE NAME
NMJ30403	Instrumentasi [Instrumentation]
NMJ31603	Pengurusan Untuk Jurutera [Management For Engineers]
NMJ32603	Senibina Komputer [Computer Architecture]
NMJ30303	Fabrikasi Mikroelektronik II [Microelectronic Fabrication II]
NMJ31403	Pemprosesan Isyarat Digital [Digital Signal Processing]
NMJ32004	Projek Rekabentuk Bersepadu [Integrated Design Project]
NMJ30602	Jurutera Profesional [Professional Engineers]
NMJ41802	Projek Tahun Akhir I [Final Year Project I]
NMJ41103	Pembungkusan Semikonduktor [Semiconductor Packaging]
NMJ41904	Projek Tahun Akhir II [Final Year Project II]
NMJ40303	Kebolehharapan Dan Analisa Kegagalan [Reliability and Failure Analysis]
NMJ30803	Ketahanan dan Kebolehujian Dalam Rekabentuk Litar Bersepadu [Reliability and Testability In Integrated Circuir Design]
NMJ31703	Peranti-peranti Termanju [Advanced Devices]
NMJ40403	Kejuruteraan Nanoelektronik [Nanoelectronic Engineering]
NMJ42403	Sistem Optoelektronik [Optoelectronic System]
NMJ40703	Sistem Mikroelektromekanikal [Microelectromechanical System]
NMJ40903	Perhubungan Optik [Optical System]
NMJ40203	Data Analitik [Data Analytics]
NMJ11004	Pengaturcaraan Komputer [Computer Programming]

LIST OF COURSES:

COURSE CODE	COURSE NAME
NMJ10803	Litar Eletrik II [Circuit Theory II]
NMJ10503	Kejuruteraan Elektrik [Electrical Engineering]
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]
NMJ32404	Rekabentuk Sistem Terbenam [Embedded System Design]
NMJ31804	Prinsip Senibina Komputer [Principles Of Computer Architecture]
NMJ30905	Latihan Industri [Industrial Training]
NMJ42303	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]
NMJ42603	Computer Security [Keselamatan Komputer]
NMJ42703	Cloud Computing [Pengkomputeran Awan]

LIST OF COURSES:

COURSE CODE	COURSE NAME
NMJ41403	Pengaturcaraan Rangkaian [Network Programming]
NMJ42803	FPGA Pengaturcaraan [FPGA Programming]
NMJ10004	Anatomi dan Fisiologi [Anatomy & Physiology]
NMJ11503	Elektronik Analog [Analog Electronic]
NMJ10103	Biokimia [Biochemistry]
NMJ21103	Mekanik Kejuruteraan [Engineering Mechanics]
NMJ21003	Reka Bentuk Terbantu Komputer [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]
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 Drives and Machines]
NMJ30003	Bioinstrumentasi I [Bioinstrumentation I]
NMJ40003	Bioinstrumentasi II [Bioinstrumentations II]

LIST OF COURSES:

COURSE CODE	COURSE NAME
NMJ41503	Pengimejan Perubatan [Medical Imaging]
NMJ41303	Pemprosesan Imej Perubatan [Medical Image Processing]
NMJ40103	Biopenderia dan BioMEMS [Biosensors and BioMEMS]
NMJ41003	Organ Buatan [Artificial Organs]
NMJ41603	Perubatan Robotik [Medical Robotics]
NMJ30904	Latihan Industri [Industrial Training]
NMJ31203	Mikropengawal [Microcontroller]
NMJ31602	Pengurusan Untuk Jurutera [Management For Engineers]
NMJ32503	Rekabentuk VLSI [VLSI Design]
NMJ42003	Rekabentuk Dan Fabrikasi MEMS [MEMS Design And Fabrication]
NMJ42103	Rekabentuk Litar Bersepadu Analog [Analogue Integrated Circuit Design]
NMJ42203	Sistem Atas Cip [System on Chip]
NMK10103	Litar Elektrik [Electric Circuits]
NMK10203	Sains Kejuruteraan [Engineering Science]
NMK10403	Elektronik Digit [Digital Electronics]
NMK10503	Kemahiran Kejuruteraan Elektrik [Electrical Engineering Technology]
NMK10603	Pengaturcaraan C [C Programming]
NMK10702	Penulisan dalam Teknologi Kejuruteraan [Writing in Engineering Technology]
NMK10803	Sistem Digital [Digital Systems]

LIST OF COURSES:

COURSE CODE	COURSE NAME
NMK11103	Kemahiran Kejuruteraan [Engineering Skill]
NMK12003	Bahan Kejuruteraan [Engineering Materials]
NMK20103	Mikropemproses [Microprocessor]
NMK20203	Elektronik Analog I [Analog Electronic I]
NMK20503	Isyarat dan Sistem [Signals and Systems]
NMK20603	Senibina Komputer [Computer Architecture]
NMK20703	Object Oriented Programming [Pengaturcaraan Berasaskan Objek]
NMK21103	Teori Elektromagnetik [Electromagnetic Theory]
NMK21303	Litar Elektronik Analog II [Analog Electronic Circuit II]
NMK22003	Reka Bentuk Litar Bersepadu [Integrated Circuit Design]
NMK30004	Projek Tahun Akhir I [Final Year Project I]
NMK30103	Sistem Komunikasi [Communication Systems]
NMK31003	Pemprosesan Isyarat Digital [Digital Signal Processing]
NMK31203	Sistem Kawalan Moden [Modern Control System]
NMK31704	Projek Rekabentuk [Design Project]
NMK32003	Elektronik Kuasa [Power Electronics]
NMK32103	Rekabentuk Litar Bersepadu Digital [Digital Integrated Circuit Design]
NMK32203	Mikropengawal [Microcontroller]
NMK32303	Verifikasi Atas Cip [Verification on Chip]

LIST OF COURSES:

COURSE CODE	COURSE NAME
NMK33003	Teknologi Fabrikasi Mikroelektronik [Microelectronic Fabrication Technology]
NMK33103	Nanoelektronik [Nanoelectronics]
NMK33203	Pembungkusan Semikonduktor [Semiconductor Packaging]
NMK33303	Kebolehpercayaan Dan Analisis Kegagalan [Reliability and Failure Analysis]
NMK34403	Pengurusan dalam Teknologi Kejuruteraan [Engineering Technology in Management]
NMK40006	Projek Tahun Akhir II [Final Year Project II]
NMK40412	Latihan Industri [Industrial Training]
NMK42003	Instrumentasi [Instrumentation]
NMK42103	Pengujian Semikonduktor [Semiconductor Testing]
NMK42203	Rekabentuk Litar Terkamir Analog [Analog Integrated Circuit Design]
NMK42403	Teknologi IoT [IoT Technology]
NMK43103	Sistem Optoelektronik [Optoelectronic System]
NMK43003	Sistem Mikroelektromekanikal [Microelectromechanical System]
NMK44403	Jurutera Teknologis dalam Masyarakat [Engineering Technologist in Society]
NMK11203	Pengukuran dan Instrumentasi [Measurement and Instrumentation]
NMK31603	Komunikasi Tanpa Wayar Dan Mudah Alih [Mobile and Wireless Communication]
NMK31103	Antena Dan Perambatan [Antenna and Propagation]
NMK31303	Teknologi Komunikasi Digital [Digital Communication Technology]
NMK31403	Teknologi Optik [Optical Technology]

LIST OF COURSES:

COURSE CODE	COURSE NAME
NMK31503	Teknologi RF Dan Gelombang Mikro [RF and Microwave Technology]
NMK34403	Pengurusan dalam Teknologi Kejuruteraan [Engineering Technology in Management]
NMK40403	Kepintaran Buatan [Artificial Technology]
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	Komunikasi Data dan Rangkaian [Data Communication and Network]
NMK10003	Asas Rangkaian [Networking Fundamentals]
NMK10702	Penulisan dalam Teknologi Kejuruteraan [Writing in Engineering Technology]
NMK20303	Sistem Pengurusan Pangkalan Data [Database Management System]
NMK20403	Teknologi Antara Rangkaian 1 [Internetworking Technology 1]
NMK20803	Struktur Data [Data Structures]
NMK30203	Teknologi Perisian Terbenam [Embedded Software Technology]
NMK30303	Sistem Pengoperasian [Operating System]
NMK30403	Teknologi Antara Rangkaian 2 [Internetworking Technology 2]
NMK30503	Pengurusan Rangkaian [Network Management]
NMK30703	Pengaturcaraan Rangkaian [Programming for Network]
NMK30903	Infrastruktur Dan Perkhidmatan Awan [Cloud Infrastructure And Services]
NMK34003	Pensuisan, Penghalaan Dan Keperluan Tanpa Wayar [Routing And Wireless Essentials]

LIST OF COURSES:

COURSE CODE	COURSE NAME
NMK40103	Teknologi Keselamatan Rangkaian [Network Security Technology]
NMK40203	Pengkomputeran Mudah Alih [Mobile Computing]
NMK40403	Kepintaran Buatan [Artificial Technology]
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]
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]

LIST OF COURSES:

COURSE CODE	COURSE NAME
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]
NMT32205	Elektif [*Elective*] Sistem Pengurusan Penyelenggaraan [Maintenance Management System]
NMT32310	Projek Tahun Akhir [*Final Year Project*]
NMT41112	Latihan Industri [Industrial Training]

NMJ11303 TEORI LITAR [CIRCUIT THEORY]

No of Credits: 3

Course Synopsis:
This course introduce students the method of analysis for linear DC and AC circuits. Parts of DC circuit cover the fundamental laws, theorem and analytical technique. Parts of AC circuit introduces phasors, sinusoidal state analysis, under sinusoidal state excitation. RLC circuits, AC power calculations & power factor correction, RMS values & 3-phase balanced systems are included. At the end of the course, a student is able to to analyze linear electric circuits.

Course Outcomes:
1. Applying circuit theorems and laws to solve simple circuit problems.
2. Analyzing complex circuit problems by using various analysis techniques.

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 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 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

NMJ10403 FIZIK UNTUK ELEKTRONIK [PHYSICS FOR ELECTRONIC]

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:
1. Ability to apply concepts and principles of physics to solve engineering problems
2. Ability to analyze and solve engineering problems using concepts and principles of physics

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.

NMJ11203 SISTEM KUASA ELEKTRIK [ELECTRICAL POWER SYSTEM]

No of Credits: 3

Course Synopsis:
This course describes the generation, transmission and application of electrical power. It covers the principles of converting energy between mechanical and electrical forms in motors and generators, the principles of transformers which are used to change current and voltage levels, and the switch-mode circuit techniques for voltage conversion of energy from one voltage to another. Recent development in electrical power systems is also discussed in this course.

Course Outcomes:
1. Ability to apply the fundamental knowledge of power conversion and power system components
2. Ability to analyze the fundamental concepts of electrical transformer, AC machines and DC machines
3. Ability to analyze the need for environmental and sustainable development in electrical power systems.

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.

NMJ10903 PENGATURCARAAN KOMPUTER [COMPUTER PROGRAMMING]

No of Credits: 3

Course Synopsis:
This course introduces students the concept of computer programming with emphasis on engineering problems using C language. The aims are to provide students with programming and problem-solving skills. Coverage of the course includes the syntax, variables, data types, control flow, function, arrays, pointers, structures, and file processing. Throughout the course, students are expected to analyse and write a C programming for various applications.

Course Outcomes:
1. Ability to analyse programming concepts
2. Ability to develop a program for related problems
3. Ability to compile, execute and debug computer programs

NMJ10203 ELECTRONIK ANALOG I [ANALOG ELECTRONIC I]

No of Credits: 3

Course Synopsis:
This course exposes the students to the fundamental of Analog Circuits encompass the amplifier design based on bipolar junction and field effect transistor, for single as well as multistage designs, power amplifiers and frequency response of amplifiers. The course has been design to provide basic analog electronics skills covering theories, practicals and simulations.

Course Outcomes:
1. Ability to apply the circuit theory and fundamentals of electronic devices to amplifier circuits.
2. Ability to design amplifier circuits.
3. Ability to simulate and analyze experimentally amplifier circuits

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 and 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.

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

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.

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 electromagnetic wave propagation

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.

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.

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.

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.

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

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

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.

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.

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.

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.

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

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.

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

NMJ41103 PEMBUNGKUSAN SEMIKONDUKTOR [SEMICONDUCTOR PACKAGING]

No of Credits: 3

Course Synopsis:
This course will cover topics such as microsystems packaging, the general semiconductor process 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

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

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 electronbeam 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

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.

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.

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

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

NMJ10803 LITAR ELEKTRIK 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.

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

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 the course is to study the microprocessor architecture and knowledge that relate to the design of microprocessor-based systems. This includes the memory design, input, and output. The study of the microprocessor instruction set and various software development tools are also emphasized as knowledge is needed in the design process.

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 design and develop an application on a microprocessor-based 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.

NMJ32404 REKABENTUK SISTEM TERBENAM [EMBEDDED SYSTEM DESIGN]

No of Credits: 4

Course Synopsis:
Revisit of architecture foundation and system design of microprocessor-based system, microcontroller system, and other logic control system. It includes encountering the concept and requirement of the embedded system features. Also, a study of practical examples of embedded systems in terms of hardware and software for the system development. In addition, a study of programming languages such as assembly language and C language for the embedded system program. In practice, apply theories for embedded system design using microcontrollers.

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 communicate effectively in written and oral forms to defend and justify the completed embedded system design and solution

NMJ31804 PRINSIP SENIBINA KOMPUTER [PRINCIPLES OF COMPUTER ARCHITECTURE]

No of Credits: 4

Course Synopsis:
This course focuses on the computer system which involves with the design of interface techniques, organization and architecture. The syllabus coverage will be on the theory of basic computer system, format of instruction set, memory organization and arithmetic logic unit (ALU) as well as certain designing issues such as bus structure, parallel processing, pipelining and memory management. The students are required to design a simple CPU during their experiments. The lab sessions will complement the theories given in a class.

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

NMJ30905 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 apply reasoning in engineering practice with consideration of 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

NMJ42303 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 techniques in software engineering, management integration concept, methods or process and software metrics. In addition, this course exposes presentation and discussion on specific software engineering method, documentation and tools. 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 design software by developing related software engineering documentations
3. Ability to work in a team and communicate effectively in written and oral forms to defend and justify the designed software

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 apply basic principles, models and algorithms in artificial intelligence to solve complex problems
2. Ability to analyze the available artificial intelligence concepts and techniques for complex problem-solving
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 color, feature extraction and segmentation, and design image processing application

NMJ41403 PENGATURCARAAN RANGKAIAN [NETWORK PROGRAMMING]

No of Credits: 3

Course Synopsis
This course is to educate students to write programs that communicate with each other using an application program interface (API). The course covers the basic and advanced issues of TCP/IP networking programming such as multiple processes, I/O multiplexing, multi-threaded processes and secure network programming.

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.

NMJ21003 REKA BENTUK TERBANTU KOMPUTER [COMPUTER AIDED DESIGN]

No of Credits: 3

Course Synopsis:
This course provides a comprehensive introduction to 2D and 3D drawing and design, Finite Element Analysis (FEA), and 3D printing. Students will learn fundamental Computer Design Aided (CAD) concepts, techniques for creating precise 2D drawings, and advanced 3D modeling methods. The course also covers FEA principles for structural analysis and optimization. Additionally, students will explore the workflow of 3D printing, including printer types, materials, and design considerations. Assessment components include lab assessments, lab tests, and a mini-project. At the end of the course, students are able to create and analyze digital designs using CAD software and apply them in biomedical engineering scenarios.

Course Outcomes:
1. Ability to utilise computer aided design tools in drawing 2D and 3D objects.
2. Ability to design 3D model and solve biomedical engineering problems.
3. Ability to demonstrate effective collaboration skills in a mini-project.

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.

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
2. systems.
3. Ability to examine system response and stability in time domain.
4. Ability to examine system response and stability in frequency domain.
5. 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 students with knowledge on the characteristics of electrical machines and drives. Students then analyse and evaluate the design of electrical machines and drives which include different types of motors, generators, and transformers. At the end of this course, students are able to perform analysis, appraise and design suitable electrical machines for engineering applications.

Course Outcomes:
1. Ability to perform analysis on the characteristics of different types of electrical machines and drives
2. Ability to appraise the performance of the different types of electrical machines

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.

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.

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.

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

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.

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 LITAR ELEKTRIK [ELECTRIC CIRCUIT]

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
3. theorems and conversions, and RLC circuits.
4. 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: BooleanAlgebra, 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.

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 solvingwith 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.

NMK10702 PENULISAN DALAM TEKNOLOGI KEJURUTERAAN [WRITING IN ENGINEERING TECHNOLOGY]

No of Credits: 2

Course Synopsis:
This course introduces technical writing and communication related to engineering technology field. Students will be exposed to the methodology in accessing engineering technology information and common requirements and expectations to the formats, techniques and ethics in writing various types of engineering technology documents.

Course Outcomes:
1. Ability to produce engineering technology 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 differentiate and analyze technical documents related on the sources of information in engineering technology field.
3. Ability to perform group work involving presentations, reports and communication task.

NMK10803 SISTEM DIGITAL [DIGITAL SYSTEMS]

No of Credits: 3

Course Synopsis:
This course is a continuation of the digital electronic course. This course exposes students to enhancement knowledge in digital systems. Students can develop technical skills in design, analyze and verify digital systems. The topic covers combinational and sequential logic system design.

Course Outcomes:
1. Ability to analyze combinational and sequential ogic circuits for digital systems.
2. Ability to construct and analyze various types of sequential circuits and counter including interpret state table, state diagram (Finite State Machine – FSM) charts.
3. Ability to design a digital system.

NMK11103 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 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 MATERIALS]

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 and semiconductor) 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..

NMK20103 MIKROPEMPROSES [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.

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.

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 and development, 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.

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 LITAR ELEKTRONIK ANALOG II [ANALOG ELECTRONIC CIRCUIT 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 REKA BENTUK 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.

NMK30004 PROJEK TAHUN AKHIR I [FINAL YEAR PROJECT I]

No of Credits: 4

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 and progress.

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.

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 introduces 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.

NMK31704 PROJEK REKABENTUK [DESIGN PROJECT]

No of Credits: 4

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 evaluate the responsibility of a technologist in terms of societal, health, safety, legal and cultural issues in problem solving design. Ability to propose a sustainable plan to mitigate the negative impact of designed solution of engineering problem.
3. Ability to justify the designed solution of engineering problem in adherence to ethical conduct.
4. Ability to contribute in a collaborative task of multidisciplinary team.
5. Ability to perform effective communication in terms of technical report, presentation and task collaboration.

NMK32003 ELEKTRONIK KUASA [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. 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 – 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 introduces Power Electronics as a Multidisciplinary & Interdisciplinary Applications Orientated Technology emphasising 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 – simulation - laboratory.

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.

NMK32203 MIKROPENGAWAL [MICROCONTROLLER]

No of Credits: 3

Course Synopsis:
The aim or this course is to study the concept and requirement of embedded software development, single chip microcontroller and programming technique in assembly language and C, basic multitasking concept, developing and embedded system application.

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 construct and evaluate digital system using High-Level Synthesis.

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 include 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.

NMK33303 KEBOLEHPERCAYAAN DAN ANALISIS KEGAGALAN [RELIABILITY AND FAILURE ANALYSIS]

No of Credits: 3

Course Synopsis:
This course is basically divided into two areas: Reliability & Failure Analysis. In the first section of Reliability, students will learn the concept of Reliability, its terms & definitions, the different types of Reliability Distributions and also the different types of Reliability Prediction Techniques such as FMEA & FTA. In the second section of Failure Analysis, students will be exposed to the different types of FA techniques commonly conducted on a failed semiconductor device and the test instrumentation associated with each technique.

Course Outcomes:
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

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:
CO1 - Ability to evaluate the process of project management, develop work plans, do cost estimation and perform project evaluation
CO2 - Ability to evaluate economic scenarios and apply decision making process to engineering project and business venture
CO3 - Ability to demonstrate the needs of skills in economic and engineering project management

NMK40006 PROJEK TAHUN AKHIR II [FINAL YEAR PROJECT II]

No of Credits: 6

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

NMK40412 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. 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 specialist technologies.

NMK42003 INSTRUMENTASI [INSTRUMENTATION]

No of Credits: 3

Course Synopsis:
This course covers the fundamental of electronic instrumentation. The core of electronic instrumentation is the embedded controller, which controls sensors and actuators. The importance of the working principle, transduction properties of transducers and 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. The technique to send acquired data from the 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 analyse 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

NMK42203 REKABENTUK LITAR ANALOG BERSEPADU [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

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.

NMK43003 SISTEM MIKROELEKTROMEKANIKAL [MICROELECTROMECHANICAL SYSTEM]

No of Credits: 3

Course Synopsis:
This course will explore about Microelectromechanical System (MEMS) which focus on the introduction, micro fabrication 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.

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 demonstrate light properties, principle in optical fiber fundamental and optical component and passive device.
2. Ability to construct the concept, principles and operation of LEDs principles and operation of lasers concept.
3. Ability to design laser diode and photo detectors.
4. Ability to evaluate non-linear optics activity, acoustic optics and systems and applications for display.

NMK44403 JURUTERA TEKNOLOGIS DALAM MASYARAKAT [ENGINEERING TECHNOLOGIST IN SOCIETY]

No of Credits: 3

Course Synopsis:
This course aims to explain the main concepts in engineer and technology ethics, risk management and occupational safety and health as well as to expose the students to basic if law in the engineering and technology context. The course presents the introductory nature to enable technologists to appreciate factors that must be considered in decision-making. Examine and assess issues and challenges faced by technologist 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 Hazard, the function of risk management and occupational safety and health (OSHA)
3. Ability to evaluate aspect and procedures of legal on Engineering and Technologies Issues

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.

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.

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 characteristics including some examples of applications in this specific field. This subject conveys understanding and skill in several AI techniques. 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 present knowledge and develop solution for the given problems using appropriate AI techniques

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.

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.

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 KOMUNIKASI DATA DAN RANGKAIAN [DATA COMMUNICATION AND NETWORK]

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

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.

NMK20803 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 practical 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 [RANGKAIAN 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 system.
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.

NMK10702 PENULISAN DALAM TEKNOLOGI KEJURUTERAAN [WRITING IN ENGINEERING TECHNOLOGY]

No of Credits: 2

Course Synopsis: This course introduces technical writing and communication related to engineering technology field. Students will be exposed to the methodology in accessing engineering technology information and common requirements and expectations to the formats, techniques and ethics in writing various types of engineering technology documents.

Course Outcomes:
1. Ability to produce engineering technology 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 differentiate and analyze technical documents related on the sources of information in engineering technology field.
3. Ability to perform group work involving presentations, reports and communication task.

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, circuit simulation 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 other electronic 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 and integration 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 system in a correct order.
3. Ability to demonstrate and show relevant justification for performing programming into the PLC to match the 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 course brings students over the beginner's threshold to a basic understanding of the use, terminology and potential of digital electronic. The skills and concepts taught in this course are presented from an interdisciplinary approach which merges practices in sciences and technology.

Course Outcomes:
1. Ability to describe Boolean functions and logic circuit in digital applications.
2. Ability to construct simple logical operations using combinational and sequential logic 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 the fundamentals of networks, switching and routing. It covers topics such as the introduction of networking, type of network, network layer, type of network 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 current market'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 through PLC 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 conditioning and 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 to device consists of sensors and others.
3. Ability to justifies the working principles of measurement 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 health as 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. In addition, this course will also focus on how to program using language C. Meanwhile, the Resberry Pi or latest controller board will be used as a controller.

Course Outcomes:
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 cybersecurity 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 and applications.

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 of modern 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 and control.

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 current data network, measurement technique and network technology. System application, configuration and troubleshooting data communication network and electronic measurement is emphasized.

Course Outcomes:
1. Able to explain the theory and basic principle of data communication, network and electronic measurement.
2. Able to apply data communication tools and working principles of measurement to further 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 toapplication 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 and procedures.
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 Evaluation and 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 technology application. 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 the control 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 and implementation, 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 industrial processes 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 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 resource 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 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.

NMT31304 TEKNOLOGI PENGURUSAN KUALITI [QUALITY MANAGEMENT TECHNOLOGY]

No of Credits: 4

Course Synopsis:
This course provides the understanding and knowledge of total quality principles and the use of quality tools to enable students to apply the principles of management, design and production in Industrial Electronic Automation. This course covers the introduction to quality and the principles of total quality, its relationship to global competitiveness, ethics and culture in quality management, the 7 quality tools, quality function deployment, continuous improvements benchmarking and the implementation aspects of total quality. Finally, the students will be able to relate several quality management tools and decide the most suitable amongst them for certain issues/ problems.

Course Outcomes:
1. Ability to analyse quality problems effectively using the principles and tools of quality management in Industrial Electronic Automation.
2. Ability to manipulate quality control in measures for improving products and business performance.
3. Ability to relate values in several quality management tools to solve problems in quality management.

NMT32205 SISTEM PENGURUSAN PENYELENGGARAAN [MAINTAINANCE MANAGEMENT SYSTEM]

No of Credits: 5

Course Synopsis:
This course will introduce student to principle of maintenance management system. The topics to be covered including Introduction to Maintenance Management, Reliability performance of production plants, Total Productive Maintenance (TPM), Maintenance methods and techniques and Maintenance Software Application. Apart of the course implementation, there will be an industrial visit to related industries in order to expose student to the actual practices of maintenance management system.

Course Outcomes:
1. Ability to apply of contemporary maintenance management practices.
2. Ability to display competency in managing and developing industrial environment maintenance activities.
3. Ability to justify maintenance activities in a cost effective manner.

NMT32310 PROJEK TAHUN AKHIR [FINAL YEAR PROJECT]

No of Credits: 10

Course Synopsis:
This course is to fulfil students with knowledge in conducting research methods, particularly in the field of technical and vocational education in Malaysia. The main idea is to take the knowledge and
background that students have learnt throughout the semester and use it to propose new and creative project. It is important in providing human capital development equivalent with global developments.

Course Outcomes:
1. Ability to organize solution based on identified issues in industrial technology.
2. Ability to perform related tasks for the implementation of Final Year Project I.
3. Ability to communicate effectively related to the proposed solutions and progress.

NMT41112 LATIHAN INDUSTRI [INDUSTRIAL TRAINING]

No of Credits: 12

Course Synopsis:

The course will expose students to technical and practical application and other aspects such as the company operation, work culture, safety procedure, project management, communication, technical skills, and presentation to achieve appreciation and/or capability of carrying out technologist activities.

Course Outcomes:
1. Ability to correlate theory and practical with the knowledge gained from industrial training.
2. Ability to display/demonstrate related skills in industrial environment.
3. Ability to practice self-discipline and responsibility attitude working in a team.

FACULTY OF MECHANICAL ENGINEERING & TECHNOLOGY (FKTM)

Programmes Offered:

1. Bachelor of Mechanical Engineering with Honours
2. Bachelor of Manufacturing Engineering with Honours
3. Bachelor of Agricultural Engineering with Honours
4. Bachelor of Mechanical Engineering Technology (Machining) with Honours
5. Bachelor of Mechanical Engineering Technology (Agricultural Systems) with Honours
6. Bachelor of Mechanical Engineering Technology (Product Design) with Honours
7. Bachelor of Mechanical Engineering Technology (Materials Processing) with Honours
8. Bachelor of Technology in Industrial Machining with Honours
9. Bachelor of Technology in Automotive with Honours
10. Bachelor of Technology in Welding with Honours
11. Diploma in Manufacturing Engineering

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ENGINEERING PROGRAMME

UR6521001
Bachelor of Mechanical Engineering with Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
Graduates who have demonstrated career advancement in the field of Mechanical Engineering or related engineering field

PEO 2
Graduates who are involved in a professional body or society

PEO 3
Graduates who pursue lifelong learning

PROGRAMME OUTCOMES (PO)

PO1
Engineering Knowledge: Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to the solution of complex engineering problems

PO2
Problem Analysis: Identify, formulate, research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences. (WK1 to WK4)

PO3
Design/ development of solutions: Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations. (WK5)

PO4
Investigation: Conduct investigations of complex problems using research-based knowledge (WK8) and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

PO5
Modern Tool Usage: Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations. (WK6)

PO6
The Engineer and Society: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems. (WK7)

PO7
Environment and Sustainability: Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts. (WK7)

PO8
Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice. (WK7)

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

PO10
Communications: 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
Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12
Life-Long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

CURRICULUM STRUCTURE
UR6521001 BACHELOR OF MECHANICAL ENGINEERING WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	**1**	**2**	**3**	**4**	**5**	**6**	**BREAK**	**7**	**8**
DISCIPLINE CORE & ELECTIVE COURSES (107 CREDITS)	MMJ10103 Engineering Statics	MMJ10203 Engineering Dynamics	MMJ10303 Solid Mechanics I	MMJ22103 Solid Mechanics II	MMJ32103 Mechanisms & Machines	MMJ32903 Control Engineering	MMJ39905 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		MMJ40102 Professional Engineers	MMJ30103 Management for Engineers
COMMON CORE COURSES (12 CREDITS)	QMQ10103 Engineering Mathematics I	QMQ10203 Engineering Mathematics II	QMQ20303 Engineering Mathematics III	QMQ27103 Engineering Statistics					
UNIVERSITY REQUIREMENT COURSES (16 CREDITS)	SMU13102 Appreciation of Ethics and Civilization	SMB20102 English for General Communication [2]	SMU13002 Philosophy and Current Issues	SMB31202 English for Technical Communication	SMB41002 University Malay Language [4]	SMU12102 Integrity and Anti-Corruption [3]			
	SMB10102 Preparatory English[1]				SMU22402 Engineering Entrepreneurship				
	SMZXXXX1 Co-Curriculum 1	SMZXXXX1 Co-Curriculum 2							
TOTAL CREDITS (135 CREDITS)	**18**	**18**	**17**	**17**	**16**	**16**	**5**	**13**	**15**

Elective Courses : 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

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] International students should register SMU13202 Malaysian Studies.
[4] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course.

ENGINEERING PROGRAMME

UR6540001

Bachelor Of Manufacturing Engineering With Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
Graduates who have demonstrated career advancement in the field of Manufacturing Engineering or related engineering field.

PEO 2
Graduates who are involved in a professional body or society.

PEO 3
Graduates who pursue lifelong learning.

PROGRAMME OUTCOMES (PO)

PO 01
Engineering Knowledge: Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

PO 02
Problem Analysis: Identify, formulate, research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO 03
Design/ Development of Solutions: Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

PO 04
Investigation: Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

PO 05
Modern Tool Usage: Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations.

PO 06
The Engineer and Society: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems.

PO 07
Environment and Sustainability: Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts.

PO 08
Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

PO 09
Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

PO 10
Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11
Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12
Lifelong Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

CURRICULUM STRUCTURE
UR6540001 BACHELOR OF MANUFACTURING ENGINEERING WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	1	2	3	4	5	6	BREAK	7	8
DISCIPLINE CORE & ELECTIVE COURSES (102 CREDITS)	MMJ16103 Materials	MMJ10303 Solid Mechanics I	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 Mechanics of Machines And Vibration	MMJ37203 Industrial Ergonomics		MMJ47003 Manufacturing Integrated Design Project	MMJ4XXX2 Elective III*
	MMJ15103 Electrical Technology	MMJ15402 Computer Programming	MMJ25102 Instrumentation	MMJ26203 Machine Components Design	MMJ37103 Production Planning and Control	MMJ37403 Lean Manufacturing		MMJ4XXX2 Elective I*	
	MMJ17102 Manufacturing Process I	MMJ17203 Manufacturing Process II	MMJ27102 Computer-Aided Manufacturing	MMJ27403 Quality Engineering	MMJ37303 Advanced Manufacturing Technology	MMJ37603 Industrial Automation		MMJ4XXX2 Elective II*	
	MMJ17302 Engineering Workshop	MMJ16202 Engineering Design	MMJ26103 Design for Manufacture	MMJ27403 Industrial Engineering	MMJ37503 Pneumatic and Hydraulic System				
	MMJ17502 Engineering Drawing								
COMMON CORE COURSES (17 CREDITS)	QMQ10103 Engineering Mathematics I	QMQ10203 Engineering Mathematics II	QMQ20303 Engineering Mathematics III	QMQ27103 Engineering Statistics		MMJ30103 Management for Engineers			MMJ40102 Professional Engineers
UNIVERSITY REQUIREMENT COURSES (16 CREDITS)	SMZ1XX01 Co-Curriculum I	SMZ2XX01 Co-Curriculum II	SMB10102 Preparatory English[1]		SMB20102 English for General Communication[2]	SMB31202 English for Technical Communication		SMU13002 Philosophy and Current Issues	SMU22402 Engineering Entrepreneurship
			SMU12102 Integrity and Anti-Corruption [3]					SMU13102 Appreciation of Ethics & Civilization	SMB41002 University Malay Language[4]
TOTAL CREDITS (135 CREDITS)	19	17	18	18	16	17	5	13	12

Elective I : MMJ4XXX2 Elective A, MMJ4XXX2 Elective B, MMJ4XXX2 Elective C.
Elective II : MMJ4XXX2 Elective D, MMJ4XXX2 Elective E, MMJ4XXX2 Elective F.
Elective III : MMJ4XXX2 Elective G, MMJ4XXX2 Elective H, MMJ4XXX2 Elective I.

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] International students should register SMU13202 Malaysian Studies.
[4] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course.

ENGINEERING PROGRAMME

UR6524003

Bachelor of Agricultural Engineering with Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
Graduates who have demonstrated career advancement in the field of Agricultural Engineering or related engineering fields.

PEO 2
Graduates who are involved in a professional body or society.

PEO 3
Graduates who pursue lifelong learning.

PROGRAMME OUTCOMES (PO)

PO1
Engineering Knowledge: Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to the solution of complex engineering problems.

PO2
Problem Analysis: Identify, formulate, research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences. (WK1 to WK4)

PO3
Design/ development of solutions: Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations. (WK5)

PO4
Investigation: Conduct investigations of complex problems using research-based knowledge (WK8) and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

PO5
Modern Tool Usage: Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations. (WK6)

PO6
The Engineer and Society: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems. (WK7)

PO7
Environment and Sustainability: Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts. (WK7)

PO8
Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice. (WK7)

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

PO10
Communications: 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
Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12
Life-Long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

CURRICULUM STRUCTURE
UR6524003 BACHELOR OF AGRICULTURAL ENGINEERING WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	**1**	**2**	**3**	**4**	**5**	**6**	**BREAK**	**7**	**8**
DISCIPLINE CORE & ELECTIVE COURSES (102 CREDITS)	MMJ14003 Plant and Animal Sciences	MMJ10203 Engineering Dynamics	MMJ20103 Fluid Mechanics I	MMJ24303 Heat and Mass Transfer	MMJ34003 Soil Engineering	KMJ34503 Farm Machinery	MMJ39905 Industrial Training	MMJ40202 Final Year Project I	MMJ40304 Final Year Project II
	MMJ14102 Physical Science	MMJ10303 Solid Mechanics I	MMJ24003 Thermodynamics	MMJ24403 Irrigation and Drainage Engineering	MMJ34103 Farm Structural Design	MMJ34602 Agricultural Integrated Design Project I		MMJ44003 Agricultural Integrated Design Project II	MMJ44503 Controlled Environment Agriculture
	MMJ12102 Computer Aided Drafting	MMJ14203 Geomatics Engineering	MMJ24103 Electrical and Electronic Technology	MMJ24503 Engineering Properties of Biological Materials	MMJ34203 Instrumentation, Measurement and Control	KMJ34703 Unit Operation		MMJ44103 Precision Agriculture	MMJ4XX03 Elective II
	MMJ10103 Engineering Statics	MMJ14303 Agricultural Production Systems	MMJ24203 Hydrology and Water Resources Engineering	MMJ12503 Computer Programming	MMJ34303 Energy and Power	MMJ34803 Design of Automation Systems		MMJ4XX03 Elective I	
	MMJ12302 Mechanical Workshop				MMJ34403 Machine Design	MMJ34902 Modelling and Simulation			
COMMON CORE COURSES (17 CREDITS)	QMQ10103 Engineering Mathematics I	QMQ10203 Engineering Mathematics II	QMQ20303 Engineering Mathematics III	QMQ27103 Engineering Statistics		MMJ30103 Management for Engineers			MMJ40102 Professional Engineers
UNIVERSITY REQUIREMENT COURSES (16 CREDITS)	SMZXXX01 Co-Curriculum I	SMZXXX01 Co-Curriculum II	SMU13002 Philosophy and Current Issues	SMB31202 English for Technical Communication	SMU12102 Integrity and Anti-Corruption [4]			SMU22402 Engineering Entrepreneurship	
	SMU13102 Appreciation of Ethics and Civilization	SMB20102 English for General Communication [2]	SMB41002 University Malay Language [3]						
	SMB10102 Preparatory English [1]								
TOTAL CREDITS (135 CREDITS)	**18**	**18**	**19**	**17**	**17**	**16**	**5**	**13**	**12**

Elective I : MMJ44203 Remote Sensing, MMJ44303 Biowaste Management and Technology, MMJ44403 Bioproduct Manufacturing
Elective II : MMJ44603 Artificial Intelligence for Agriculture, MMJ43103 Renewable Energy, MMJ44703 Postharvest Engineering

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] International students other than Indonesia, Singapore and Brunei need to register the SMB11002 Basic Malay Language course.
[4] International students need to register for SMU13202 Malaysian Studies.

ENGINEERING TECHNOLOGY PROGRAMME

UR6521002

Bachelor of Mechanical Engineering Technology (Machining) With Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
Engineering technology graduates engaged in the field of mechanical engineering technology as demonstrated through career advancement.

PEO 2
Engineering technology graduates who are members and contribute to professional society.

PEO 3
Engineering technology graduates embracing in life-long learning or pursuing continuing education opportunities.

PEO 4
Engineering technology graduates who are technopreneurs.

PROGRAMME OUTCOMES (PO)

PO1
Knowledge: Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialisation to defined and applied engineering procedures, processes, systems or methodologies.

PO2
Problem Analysis: Identify, formulate, research literature and analyse broadly-defined engineering problems reaching substantiated conclusions using analytical tools appropriate to their discipline or area of specialisation.

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

PO4
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.

PO5
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.

PO6
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.

PO7
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.

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

PO9
Individual and Teamwork: Function effectively as an individual, and as a member or leader in diverse technical teams.

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

PO11
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
Lifelong learning: Recognize the need for, and have the ability to engage in independent and life-long learning in specialist technologies.

CURRICULUM STRUCTURE UR6521002 BACHELOR OF MECHANICAL ENGINEERING TECHNOLOGY (MACHINING) WITH HONOURS INTAKE 2023/2024								
YEAR	**FIRST**		**SECOND**		**THIRD**		**FOURTH**	
SEMESTER	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
DISCIPLINE CORE & ELECTIVE COURSES (109 CREDITS)	MMK10103 Material Science	MMK11203 Fluid Mechanics	MMK11603 Computer-Aided Design	MMK21103 Computer Aided Engineering	MMK32303 Geometric, Dimensioning & Tolerance	MMK31204 Final Year Project I	MMK41206 Final Year Project II	MMK49912 Industrial Training
	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	MMK32503 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		MMK22204 CNC Technology	MMK32103 Manufacturing Economics	Elective I		
COMMON CORE COURSES (15 CREDITS)	QMQ11103 Mathematics For Engineering Technology I	QMQ11203 Mathematics For Engineering Technology II	QMQ21303 Mathematics For Engineering Technology III				MMK31303 Engineering Technologist in Society	
							MMK30103 Engineering Technology Management	
UNIVERSITY REQUIREMENT COURSES (16 CREDITS)	SMU13002 Philosophy & Current Issues	SMB10102 Preparatory English[1]	SMB20102 English For General Communication [2]		SMU12102 Integrity and Anti-Corruption [4]			
	SMB41002 University Malay Language [3]			SMU22402 Engineering Entrepreneurship	SMU13102 Appreciation of Ethics and Civilization			
	SMZXXX01 Co-Curriculum 1	SMZXXXX01 Co-Curriculum 2		SMB31202 English For Technical Communication	SMB0XX02 Option Subject (Foreign Language)			
TOTAL CREDITS (140 CREDITS)	**19**	**18**	**18**	**19**	**19**	**17**	**18**	**12**

Elective I : MMK33103 Alloy & Metal Composite, MMK33203 Plastic Injection Moulding Simulation, MMK33303 Computational Fluid Dynamics.
Elective II : MMK43403 Modern Grinding Technology, MMK43503 Non-Destructive Testing, MMK43603 Noise and Vibration.
Elective II : MMK43703 Cutting Tool Technology, MMK43803 Advanced Characterization Process,

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course.
[4] International students should register SMU13202 Malaysian Studies.

ENGINEERING TECHNOLOGY PROGRAMME

UR6521003
Bachelor of Mechanical Engineering Technology (Agricultural Systems) with Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
Engineering technology graduates engaged in the field of mechanical engineering technology as demonstrated through career advancement.

PEO 2
Engineering technology graduates who are members and contribute to professional society.

PEO 3
Engineering technology graduates embracing in life-long learning or pursuing continuing education opportunities.

PEO 4
Engineering technology graduates who are technopreneurs.

PROGRAMME OUTCOMES (PO)

PO1
Knowledge: Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to defined and applied engineering procedures, processes, systems, or methodologies.

PO2
Problem Analysis: Identify, formulate, research literature and analyze broadly-defined engineering problems reaching substantiated conclusions using analytical tools appropriate to their discipline or area of specialization.

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

PO4
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.

PO5
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 their limitations.

PO6
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.

PO7
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.

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

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

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

PO11
Project Management and Finance: Demonstrate knowledge an 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 professional and have the ability to engage in independent and life-long learning in specialist technologist

CURRICULUM STRUCTURE
UR6521003 BACHELOR OF MECHANICAL ENGINEERING TECHNOLOGY (AGRICULTURAL SYSTEMS) WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEMESTER	1	2	3	4	5	6	7	8
DISCIPLINE CORE & ELECTIVE COURSES (109 CREDITS)	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	MMK49912 Industrial Training
	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	
	MMK15103 Applied Biology	MMK15202 Introduction to Agriculture	MMK25103 Plantation Crop Production Technology	MMK25303 Livestock and Aquaculture Production Technology				
				MMK25402 Food Crop Production Technology				
COMMON CORE COURSES (15 CREDITS)	QMQ11103 Mathematics for Engineering Technology I	QMQ11203 Mathematics for Engineering Technology II	QMQ21303 Mathematics for Engineering Technology III		MMK30103 Engineering Technology Management	MMK31303 Engineering Technologist in Society		
UNIVERSITY REQUIREMENT COURSES (16 CREDITS)	SMB41002 University Malay Language [4]	SMB20102 English for General Communication [2]	SMB31202 English for Technical Communication	SMU12102 Integrity and Anti-Corruption [3]	SMU13102 Appreciation of Ethics and Civilization	SMU13002 Philosophy and Current Issues		
	SMZXXXX1 Co-Curriculum 1	SMZXXXX1 Co-Curriculum 2		SMU22402 Engineering Entrepreneurship				
	SMB10102 Preparatory English[1]							
TOTAL CREDITS (140 CREDITS)	**20**	**19**	**19**	**20**	**17**	**18**	**15**	**12**

Elective I : MMK35203 Precision Farming Technology, MMK35303 Renewable Energy in Agriculture Systems
Elective II : MMK45203 Controlled Environment in Agriculture, MMK45303 Food Processing Engineering

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] International students should register SMU13202 Malaysian Studies.
[4] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course.

ENGINEERING TECHNOLOGY PROGRAMME

UR6521004
Bachelor of Mechanical Engineering Technology (Product Design) with Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
Engineering technology graduates engaged in the field of mechanical engineering technology as demonstrated through career advancement.

PEO 2
Engineering technology graduates who are members and contribute to professional society.

PEO 3
Engineering technology graduates embracing in life-long learning or pursuing continuing education opportunities.

PEO 4
Engineering technology graduates who are technopreneurs.

PROGRAMME OUTCOMES (PO)

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

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

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

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

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

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

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

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

PO9
Individual and Teamwork: Function effectively as an individual, and as a member or leader in diverse technical teams.

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

PO11
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
Lifelong learning: Recognize the need for, and have the ability to engage in independent and life-long learning in specialist technologies.

CURRICULUM STRUCTURE
UR6521004 BACHELOR OF MECHANICAL ENGINEERING TECHNOLOGY (PRODUCT DESIGN) WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEMESTER	1	2	3	4	5	6	7	8
DISCIPLINE CORE & ELECTIVE COURSES (109 CREDITS)	MMK10203 Statics and Dynamics	MMK10103 Material Science	MMK20203 Strength of Material	MMK21203 Heat Transfer	MMK11403 Project Management	MMK31204 Final Year Project I	MMK41206 Final year Project II	MMK49912 Industrial Training
	MMK10403 Engineering Graphics	MMK11603 Computer Aided Design (CAD)	MMK20103 Thermodynamics	MMK21103 Computer Aided Engineering (CAE)	MMK36003 Computer Aided Engineering II (CAE II)	MMK31103 Ergonomic and Safety I	MMK47703 Design for Manufacture & Assembly	
	MMK10303 Basic Electric and Electronic	MMK11203 Fluid Mechanics	MMK26003 Computer Aided Design II (CAD II)	MMK11302 Computer Programming	MMK37403 Innovation Management & Product Development	Elective I-3		
	MMK10502 Workshop Technology	MMK11103 Quality Control	MMK26203 Prototyping and Model Making	MMK26103 Reverse Engineering & Additive Manufacturing	MMK36503 Industrial Revolution	Elective II-3		
	MMK11502 Manufacturing Technology	MMK17103 Design Visualization	MMK27303 Design Studio I	MMK27203 Design Integration	MMK36403 Design Studio II			
	MMK17003 Basic Industrial Design							
COMMON CORE COURSES (15 CREDITS)	QMQ11103 Mathematics for Engineering Technology I	QMQ11203 Mathematics for Engineering Technology II	QMQ21303 Mathematics for Engineering Technology III			MMK30103 Engineering Technology Management	MMK31303 Engineering Technologist in Society	
UNIVERSITY REQUIREMENT COURSES (16 CREDITS)		SMB10102 Preparatory English[1]	SMB20102 English for General Communication[2]	SMU22402 Engineering Entrepreneurship	SMB31202 English for Technical Communication	SMU13002 Philosophy and Current Issues		
			***SMB0XX02 Option Course (Foreign Language)	SMU12102 Integrity and Anti-Corruption [3]		SMB13102 Appreciation of Ethics and Civilization		
	SMZXXX01 Co-Curriculum 1	SMZXXX01 Co-Curriculum 2		SMB41002 University Malay Language [4]				
TOTAL CREDITS (140 CREDITS)	**20**	**19**	**20**	**20**	**17**	**20**	**12**	**12**

Elective I : MMK37503 Production Management for Designers, MMK37603 Product Study & Professional Practice
Elective II : MMK37703 Design Visualization II, MMK37803 Design for Medical Device.

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] International students should register SMU13202 Malaysian Studies.
[4] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course.

ENGINEERING TECHNOLOGY PROGRAMME

UR6543001
Bachelor of Mechanical Engineering Technology (Material Processing) with Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
Engineering technology graduates engaged in the field of mechanical engineering technology as demonstrated through career advancement.

PEO 2
Engineering technology graduates who are members and contribute to professional society.

PEO 3
Engineering technology graduates embracing in life-long learning or pursuing continuing education opportunities.

PEO 4
Engineering technology graduates who are technopreneurs.

PROGRAMME OUTCOMES (PO)

PO1
Knowledge: Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialisation to defined and applied engineering procedures, processes, systems or methodologies.

PO2
Problem Analysis: Identify, formulate, research literature and analyse broadly-defined engineering problems reaching substantiated conclusions using analytical tools appropriate to their discipline or area of specialisation.

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

PO4
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.

PO5
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.

PO6
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

PO7
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.

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

PO9
Individual and Teamwork: Function effectively as an individual, and as a member or leader in diverse technical teams.

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

PO11
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
Lifelong learning: Recognize the need for, and have the ability to engage in independent and life-long learning in specialist technologies.

CURRICULUM STRUCTURE
UR6543001 BACHELOR OF MECHANICAL ENGINEERING TECHNOLOGY (MATERIAL PROCESSING) WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEMESTER	1	2	3	4	5	6	7	8
DISCIPLINE CORE & ELECTIVE COURSES (109 CREDITS)	MMK10103 Material Science	MMK11203 Fluid Mechanics	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 & Dynamics	MMK11502 Manufacturing Technology	MMK20203 Strength of Materials	MMK21203 Heat Transfer	MMK38303 Metal Fabrication Technology	MMK31103 Ergonomic & Safety	MMK48103 Material for Energy and Sustainability	
	MMK10403 Engineering Graphics	MMK11103 Quality Control	MMK20103 Thermodynamics	MMK28303 Whiteware Ceramic Processing	MMK33203 Plastic Injection Molding Simulation	MMK38503 Materials Selection and Design	Elective III	
	MMK10502 Workshop Technology	MMK11403 Project Management	MMK28103 Materials Testing	MMK28403 Metal Extraction Technology	MMK38403 Composite Materials Processing	Elective II		
	MMK10303 Basic Electrical & Electronics	MMK11302 Computer Programming	MMK28203 Materials Characterization	MMK28503 Plastic Processing	Elective I			
COMMON CORE COURSES (15 CREDITS)	QMQ11103 Mathematics For Engineering Technology I	QMQ11203 Mathematics For Engineering Technology II	QMQ21303 Mathematics For Engineering Technology III			MMK30103 Engineering Technology Management	MMK31303 Engineering Technologist in Society	
UNIVERSITY REQUIREMENT COURSES (16 CREDITS)	SMU13002 Philosophy & Current Issues	SMB10102 Preparatory English [1]	SMB20102 English For General Communication					
			SMB0XX02 Option Subject (Foreign Language)	SMU22402 Engineering Entrepreneurship	SMB41002 University Malay Language [3]	SMU12102 Integrity and Anti-Corruption [4]		
	SMZXXX01 Co-Curriculum 1	SMZXXXX01 Co-Curriculum 2		SMU13102 Appreciation of Ethics and Civilization		SMB31202 English for Technical Communication		
TOTAL CREDITS (140 CREDITS)	**20**	**17**	**20**	**19**	**17**	**20**	**15**	**12**

Elective I : MMK39103 Polymer Adhesive and Coatings, MMK39203 Rubber and Latex Technology.
Elective II : MMK39303 Advanced Metallurgy, MMK39403 Geopolymer Materials Technology.
Elective III : MMK49103 Technical Ceramic Technology, MMK49203 Glass Technology.

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course.
[4] International students should register SMU13202 Malaysian Studies

TECHNOLOGY PROGRAMME

UR6521006
Bachelor of Technology in Industrial Machining with Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
To produce machining technologist that perform related work including machinist, design, manufacturer, maintenance, facility manager and production manager.

PEO 2
To produce technopreneurs in machining related technology.

PEO 3
To produce relevant, respected and referred professionals in machining technology

PROGRAMME OUTCOMES (PO)

PO1
Knowledge: Apply knowledge of technology fundamentals to broadly-defined procedures processes, systems and methodologies in machining technology.

PO2
Practical Skills and High Technology: Able to suggest and apply latest tools and techniques to solve broadly-defined problems.

PO3
Analytical, Critical Thinking and Scientific Approach: Demonstrate strong analytical and critical thinking skills to solve broadly-defined problems in machining technology.

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

PO5
Social Responsibility in Society and Technologist Community: Demonstrate understanding of the societal related issues and the consequent responsibilities relevant to broadly-defined technology practices.

PO6
Lifelong Learning and Information Management: Recognize the needs for professional development and to engage independent lifelong learning in specialist technologists.

PO7
Technopreneurship and Management Skills: Demonstrate an awareness of management and technopreneurship practices in real perspective.

PO8
Ethics and Professionalism: Demonstrate professionalism and social and ethical consideration.

PO9
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 2023/2024								
YEAR	**FIRST**		**SECOND**		**THIRD**			**FOURTH**
SEMESTER	**1**	**2**	**3**	**4**	**5**	**6**	**BREAK**	**7**
DISCIPLINE CORE & ELECTIVE COURSES (104 CREDITS)	MMT15003 Product Drafting and Specification	MMT15404 Tool Setup and Refurbishment	MMT25004 Precision and Finishing in CNC Technology	MMT25404 Multi Axis Machining	MMT35004 Assembly Method	MMT31510 Final Year Project		MMT49912 Industrial Training
	MMT15103 Standard Product Precision	MMT15503 Sustainable Machining	MMT25103 Precision and Finishing in EDM and Grinding Technology	MMT25503 Complex CADCAM Product	MMTXXX04 Electives	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 REQUIREMENT COURSES (18 CREDITS)	SMZXXX01 Co-Curriculum 1	SMZXXX01 Co-Curriculum 2	SMB1XX02 Third Language [4]	SMU22402 Engineering Entrepreneurship	SMU13102 Appreciation of Ethics and Civilizations			
	SMB41002 University Malay Language [1]	SMU13002 Philosophy and Current Issues	SMB31202 English for Technical Communication					
	SMU12102 Integrity and Anti-Corruption [2]	SMB20102 English for General Communication						
	SMB10102 Preparatory English [3]							
TOTAL CREDITS (122 CREDITS)	**17**	**18**	**19**	**16**	**18**	**16**	**6**	**12**

Electives : MMT35604 Tool and Die Making, MMT35704 Aerospace Machining, MMT35804 Rapid Machining, MMT35903 Human Factor Technology, MMT36004 Production Planning in Machining

[1] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course.
[2] International students should register SMU13202 Malaysian Studies.
[3] Compulsory to students with MUET 2.5 (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[4] Germany, Mandarin or Japanese

TECHNOLOGY PROGRAMME

UR6525001
Bachelor of Technology in Automotive with Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

:

PEO 1
To produce automotive technologists that perform automotive related work including diagnostic specialist and retrofit specialist.

PEO 2
To produce technopreneurs in automotive related technology.

PEO 3
To produce relevant respected referred professionals in automotive technology.

PROGRAMME OUTCOMES (PO)

PO1
Knowledge: Apply knowledge of technology fundamentals to broadly-defined procedures, processes, systems, and methodologies in the field of automotive study.

PO2
Practical Skills/ Modern Tools Usage: Able to suggest and apply latest tools and techniques to solve broadly-defined problems.

PO3
Analytical, Critical Thinking and Scientific Approach: Demonstrate strong analytical and critical thinking skills to solve broadly-defined problems in automotive study.

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

PO5
Social and responsibility in society and Technologist community: Demonstrate understanding of the societal related issues and the consequent responsibilities relevant to broadly-defined technology practices

PO6
Life Long Learning and Information Management: Recognize the needs for professional development and to engage independent lifelong learning in specialist technologists.

PO7
Entrepreneurs and Management skills: Demonstrate an awareness of management and technopreneurship practices in real perspective.

PO8
Ethics and Professionalism: Demonstrate professionalism and social and ethical consideration.

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

CURRICULUM STRUCTURE
UR6525001 BACHELOR OF TECHNOLOGY IN AUTOMOTIVE WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		THIRD			FOURTH
SEMESTER	1	2	3	4	5	6	BREAK	7
DISCIPLINE CORE & ELECTIVE COURSES (104 CREDITS)	MMT11004 Automotive Industry & Technology	MMT11303 Shop floor Supervision	MMT21003 Project Management	MMT21204 Powertrain System Service	MMT31003 Automotive Legislation	MMT31510 Final Year Project		MMT49912 Industrial Training
	MMT11103 Automotive Drafting	MMT11404 Automotive Component Design & Assembly	MMT21104 Autotronic System Service	MMT21304 Technopreneur Project 1	MMT31104 Technopreneur Project 2	MMT31306 Quality Management		
	MMT11204 Automotive Workshop Practice	MMT11504 Automotive Component Fabrication	MMTXXX04 Elective I	MMTXXX04 Elective III	MMTXXX04 Elective V	MMT31403 Risk Assessment		
			MMTXXX04 Elective II	MMTXXX04 Elective IV	MMTXXX04 Elective VI	MMT31603 Asset & Inventory Management		
					MMT31202 Vehicle Marketing			
UNIVERSITY REQUIREMENT COURSES (18 CREDITS)	SMZ1XX01 Co-Curriculum I	SMZ2XX01 Co-Curriculum II	SMB1XX02 Third Language [3]	SMU22402 Engineering Entrepreneurship	SMU13102 Appreciation of Ethics and Civilizations			
	SMB41002 University Malay Language [5]	SMU13002 Philosophy and Current Issues	SMB31202 English for Technical Communication					
	SMU12102 Integrity and Anti-Corruption [4]	SMB20102 English for General Communication [2]						
	SMB10102 Preparatory English [1]							
TOTAL CREDITS (122 CREDITS)	16	16	19	18	19	16	6	12

Elective I : MMT 21404 Commercial Vehicle Servicing / MMT21504 Surface Design
Elective II : MMT21604 Drivetrain Maintenance / MMT21704 Automotive Modelling
Elective III : MMT21804 Vehicle Performance Analysis / MMT21904 Exterior Design
Elective IV : MMT22004 Vehicle Fault Diagnosis / MMT22104 Component Remanufacturing
Elective V : MMT31704 Hybrid Servicing / MMT31804 Interior Design
Elective VI : MMT31904 Electric Vehicle Service / MMT32004 Painting

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] SMB1XX02: Jerman, Mandarin, Japan or etc.
[4] International students should register SMU13202 Malaysian Studies.
[5] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course.

TECHNOLOGY PROGRAMME

UR6521005
Bachelor of Technology in Welding with Honours

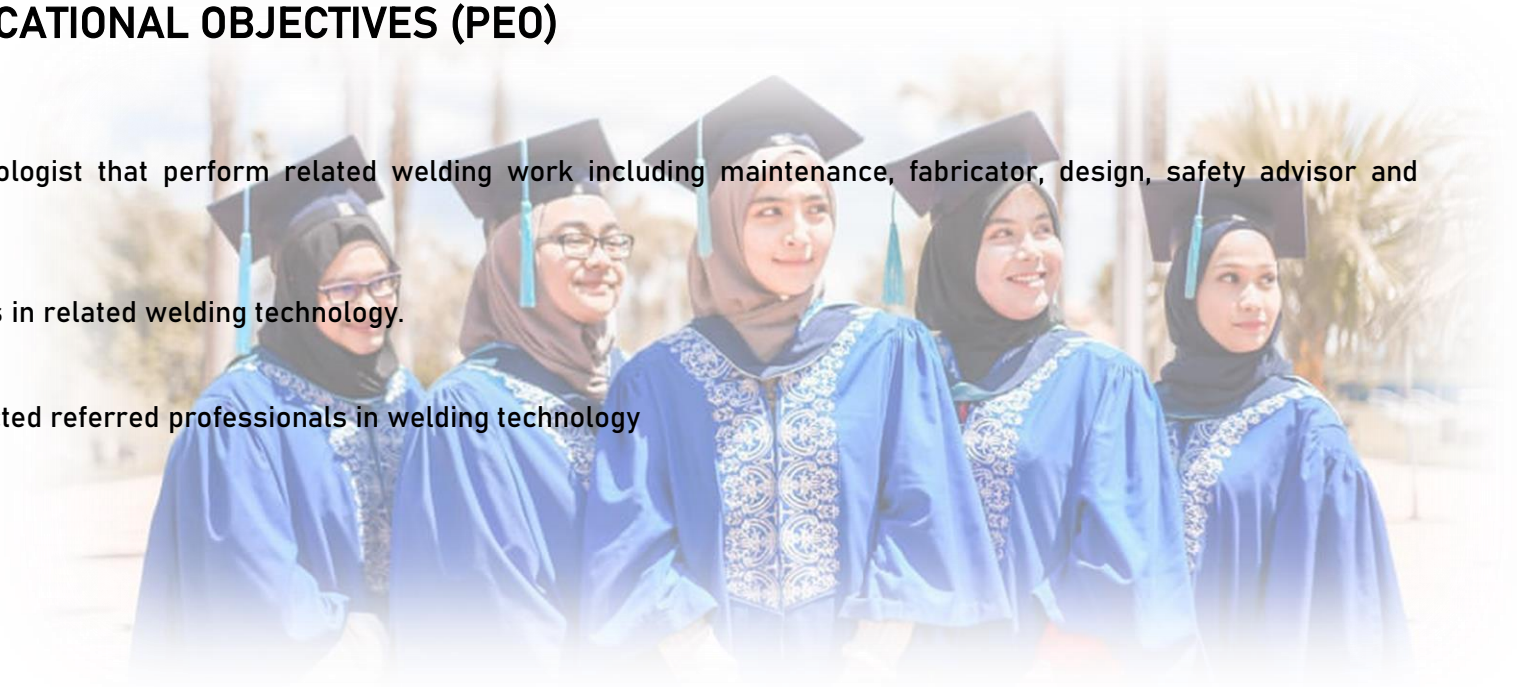
PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

:

PEO 1
To produce welding technologist that perform related welding work including maintenance, fabricator, design, safety advisor and production manager.

PEO 2
To produce technopreneurs in related welding technology.

PEO 3
To produce relevant respected referred professionals in welding technology



PROGRAMME OUTCOMES (PO)

PO1
Knowledge: Apply knowledge of technology fundamentals to **broadly-defined** procedures processes, systems and methodologies in **welding technology.**

PO2
Practical Skills/ Modern Tools Usage: Able to suggest and apply latest tools and techniques to solve **broadly-defined** problems.

PO3
Analytical, Critical Thinking and Scientific Approach: Demonstrate strong analytical and critical thinking skills to solve broadly-defined problems in welding technology.

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

PO5
Social and responsibility in society and Technologist community: Demonstrate understanding of the societal related issues and the consequent responsibilities relevant to **broadly-defined** technology practices

PO6
Life Long Learning and Information Management: Recognize the needs for professional development and to engage independent lifelong learning in **specialist technologists**.

PO7
Entrepreneurs and Management skills: Demonstrate an awareness of management and technopreneurship practices in real perspective

PO8
Ethics and Professionalism: Demonstrate professionalism and social and ethical consideration.

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

CURRICULUM STRUCTURE
UR6521005 BACHELOR OF TECHNOLOGY IN WELDING WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		THIRD			FOURTH
SEMESTER	1	2	3	4	5	6	BREAK	7
DISCIPLINE CORE & ELECTIVE COURSES (104 CREDITS)	MMT13004 CAD and Welding Graphic	MMT13303 Product Design in Welding	MMT23004 Material Behaviour in Welding	MMT23604 Computer Aided Analysis	MMT33004 Welding Quality Assurance	MMT31510 Final Year Project		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 I*	MMT23904 Technopreneur Project 1	MMT33304 Technopreneur Project 2	MMT33604 Managing Production Supervisory		
UNIVERSITY REQUIREMENT COURSES (18 CREDITS)	SMZ1XX01 Co-Curriculum I	SMZ2XX01 Co-Curriculum II	SMB1XX02 Third Language [5]	SMB31202 English Technical for Communication	SMU13102 Appreciation of Ethics and Civilization			
	SMB41002 University Malay Language [4]	SMU13002 Philosophy and Current Issues						
	SMU12102 Integrity and Anti-Corruption [3]	SMB20102 English for General Communication [2]						
	SMB10102 Preparatory English [1]	SMU22402 Engineering Entrepreneurship						
TOTAL CREDITS (122 CREDITS)	**17**	**18**	**18**	**18**	**18**	**15**	**6**	**12**

Elective I : MMT23304 Welding Technology / MMT23404 NDT Professional / MMT23504 Welding Inspection

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) but need to replace the course by registering a two credits Optional Course.
[3] International students should register SMU13202 Malaysian Studies.
[4] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course.
[5] SMB1XX02: Jerman, Mandarin, Japan or etc.

LIST OF COURSES:

COURSE CODE	COURSE NAME
MMJ16103	Bahan [Materials]
MMJ10103	Statik Kejuruteraan [Engineering Statics]
MMJ15103	Teknologi Elektrik [Electrical Technology]
MMJ17102	Proses-Proses Pembuatan I [Manufacturing Process I]
MMJ17302	Bengkel Kejuruteraan [Engineering Workshop]
MMJ17502	Lukisan Kejuruteraan [Engineering Drawing]
MMJ10303	Mekanik Pepejal I [Solid Mechanics I]
MMJ15203	Elektronik [Electronics]
MMJ15402	Pengaturcaraan Komputer [Computer Programming]
MMJ17203	Proses-Proses Pembuatan II [Manufacturing Process II]
MMJ16202	Reka Bentuk Kejuruteraan [Engineering Design]
MMJ10203	Dinamik Kejuruteraan [Engineering Dynamics]
MMJ10403	Temodinamik I [Thermodynamics I]
MMJ25102	Pengukuran [Instrumentation]
MMJ27102	Pembuatan Berbantu-Komputer [Computer Aided-Manufacturing]
MMJ26103	Reka Bentuk Untuk Pembuatan [Design for Manufacturing]
MMJ20103	Mekanik Bendalir I [Fluid Mechanics I]
MMJ25203	Sistem Kawalan [Control Systems]
MMJ26203	Reka Bentuk Komponen Mesin [Machine Components Design]

LIST OF COURSES:

COURSE CODE	COURSE NAME
MMJ27203	Kejuruteraan Kualiti [Quality Engineering]
MMJ27403	Kejuruteraan Industri [Industrial Engineering]
MMJ36102	Pemindahan Haba [Heat Transfer]
MMJ36303	Mekanik Mesin Dan Getaran [Mechanics of Machines and Vibration]
MMJ37103	Perancangan Pengeluaran dan Kawalan [Production Planning and Control]
MMJ37303	Teknologi Pembuatan Termaju [Advanced Manufacturing Technology]
MMJ37503	Sistem Pneumatik dan Hidraulik [Pneumatic and Hydraulic System]
MMJ36203	Kejuruteraan Berbantu-Komputer [Computer-Aided Engineering]
MMJ37203	Ergonomik Industri [Industrial Ergonomics]
MMJ37403	Pembuatan Lean [Lean Manufacturing]
MMJ37603	Automasi Industri [Industrial Automation]
MMJ30103	Pengurusan untuk Jurutera [Management for Engineers]
MMJ39905	Latihan Industri [Industrial Training]
MMJ40202	Projek Tahun Akhir I [Final Year Project I]
MMJ47003	Projek Reka Bentuk Bersepadu Pembuatan [Manufacturing Integrated Design Project]
MMJ40304	Projek Tahun Akhir II [Final Year Project II]
MMJ40102	Jurutera Professional [Professional Engineers]
MMJ12102	Lukisan Terbantu Komputer [Computer Aided Drafting]
MMJ12302	Bengkel Mekanikal [Mechanical Workshop]

LIST OF COURSES:

COURSE CODE	COURSE NAME
MMJ12503	Pengaturcaraan Komputer [Computer Programming]
MMJ14003	Sains Tumbuhan Dan Haiwan [Plant And Animal Sciences]
MMJ14102	Sains Fizikal [Physical Science]
MMJ14203	Kejuruteraan Geomatik [Geomatic Engineering]
MMJ14303	Sistem Pengeluaran Pertanian [Agricultural Production Systems]
MMJ24003	Termodinamik [Thermodynamics]
MMJ24103	Teknologi Elektrik Dan Elektronik [Electrical And Electronic Technology]
MMJ24203	Kejuruteraan Hidrologi Dan Sumber Air [Hydrology And Water Resources Engineering]
MMJ24303	Pemindahan Haba Dan Jisim [Heat And Mass Transfer]
MMJ24403	Kejuruteraan Pengairan Dan Saliran [Irrigation And Drainage Engineering]
MMJ24503	Sifat Kejuruteraan Bahan Biologi [Engineering Properties Of Biological Materials]
MMJ34003	Kejuruteraan Tanah [Soil Engineering]
MMJ34103	Reka Bentuk Struktur Ladang [Farm Structural Design]
MMJ34203	Peralatan, Pengukuran Dan Kawalan [Instrumentation, Measurement And Control]
MMJ34303	Tenaga Dan Kuasa [Energy And Power]
MMJ34403	Reka Bentuk Mesin [Machine Design]
MMJ34503	Jentera Ladang [Farm Machinery]
MMJ34602	Reka Bentuk Kejuruteraan Pertanian I [Agricultural Integrated Design Project I]
MMJ34703	Operasi Unit [Unit Operation]

LIST OF COURSES:

COURSE CODE	COURSE NAME
MMJ34803	Reka Bentuk Sistem Automasi [Design Of Automation Systems]
MMJ34902	Modelling And Simulation [Pemodelan Dan Simulasi]
MMJ43103	Tenaga Diperbaharui [Renewable Energy]
MMJ44003	Reka Bentuk Kejuruteraan Pertanian II [Agricultural Integrated Design Project II]
MMJ44103	Pertanian Persis [Precision Agriculture]
MMJ44203	Penderiaan Jauh [Remote Sensing]
MMJ44303	Pengurusan Biosisa Dan Teknologi [Biowaste Management And Technology]
MMJ44403	Pembuatan Bioproduk [Bioproduct Manufacturing]
MMJ44503	Controlled Environment Engineering [Kejuruteraan Persekitaran Terkawal]
MMJ44603	Kecerdasan Tiruan Untuk Pertanian [Artificial Intelligence For Agriculture]
MMJ44703	Kejuruteraan Lepas Tuai [Postharvest Engineering]
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]
MMK11103	Kawalan Kualiti [Quality Control]
MMK11203	Mekanik Bendalir [Fluid Mechanics]
MMK11302	Pengaturcaraan Komputer [Computer Programming]

LIST OF COURSES:

COURSE CODE	COURSE NAME
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 [Conventional Machining]
MMK22204	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]
MMK32503	Pemesinan Mapan [Sustainable Machining]
MMK32603	Pembuatan Berbantu Komputer [Computer Aided Manufacturing]

LIST OF COURSES:

COURSE CODE	COURSE NAME
MMK32703	Teknologi Pemesinan Termaju [Advanced Machining Technology]
MMK33103	Aloi dan Komposit Logam [Alloy & Metal Composite]
MMK33203	Simulasi Suntikan Acuan Plastik [Plastic Injection Moulding Simulation]
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]
MMK36003	Computer Aided Engineering II (CAE II)
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	Prototaip dan Pembuatan Model [Reverse Engineering & Additive Manufacturing]
MMK26203	Prototaip dan Pembuatan Model [Prototyping and Model Making]
MMK27203	Reka Bentuk Integrasi [Design Integration]

LIST OF COURSES:

COURSE CODE	COURSE NAME
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]
MMK37703	Persembahan Digital [Digital Rendering]
MMK37803	Reka bentuk Untuk Peranti Perubatan [Design for Medical Device]
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]
MMK38103	Kawalan Proses [Process Control]
MMK38303	Teknologi Fabrikasi Logam [Metal Fabrication Technology]
MMK38403	Pemprosesan Bahan Komposit [Composite Materials Processing]
MMK38503	Pemilihan Bahan dan Rekabentuk [Materials Selection and Design]
MMK48103	Bahan untuk Tenaga dan Kemampanan Alam Sekitar [Material for Energy and Environmental Sustainability]

LIST OF COURSES:

COURSE CODE	COURSE NAME
MMK38504	Pemilihan Bahan Dan Rekabentuk [Material Selection And Design]
MMK39103	Perekat Polimer Dan Penglitup [Polymer Adhesives And Coatings]
MMK39203	Teknologi Getah Dan Lateks [Rubber And Latex Technology]
MMK39303	Metalurgi Termaju [Advanced Metallurgy]
MMK39403	Teknologi Bahan Geopolimer [Geopolymer Materials Technology]
MMK48103	Bahan Untuk Tenaga Dan Kemampanan Alamsekitar [Material For Energy And Environmental Sustainability]
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]
MMT23104	Pengurusan Keselamatan [Safety Management]
MMT23504	Pemeriksaan Kimpalan Untuk Profesional [Welding Inspection For Professionals]
MMT23204	Analisis Rekabentuk Kimpalan [Welding Design Analysis]
MMT23304	Teknologi Kimpalan Untuk Profesional [Welding Technology for Professional]
MMT23404	Ujian Tanpa Musnah Untuk Profesional [NDT15402 For Professional]
MMT23604	Analisis Berbantu Komputer [Computer Aided Analysis]

LIST OF COURSES:

COURSE CODE	COURSE NAME
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]
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]
MMT33004	Jaminan Kualiti Kimpalan [Welding Quality Assurance]
MMT31510	Projek Tahun Akhir [Final Year Project]
MMT33403	Sistem Fizikal Siber Dalam Kimpalan [Cyber Physical System In Welding]
MMT33504	Pemulihan Dalam Kimpalan [Reclamation In Welding]
MMT33604	Pengurusan Pengeluaran Dan Pengawasan [Managing Production And Supervision]
MMT49912	Latihan Industri [Industrial Training]

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.

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.

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

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).

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 D (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.

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 analyze engineering problems using fundamental theory of solid mechanics and produce stress strain transformation analysis

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 the 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

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:
1. Ability to analyze the mechanics of cutting process and CNC process.
2. Ability to design machining programs for CNC turning, milling and drilling procedures using complex cutting paths and tool setting.
3. Ability to analyse processes for abrasive machining and surface treatment method.

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 based on engineering criteria.

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.

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 according 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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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

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.

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

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.

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.

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

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.

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.

MMJ14003 SAINS TUMBUHAN DAN HAIWAN [PLANT AND ANIMAL SCIENCES]

No of Credits: 3

Course Synopsis:
The course is dealing with the basic biological sciences of plant and animal such as morphology, anatomy and physiology aspects. The second aspect deals with various mechanisms in plant and animal systems. The third aspect comprises applied sciences of plant and animal, in relation to agricultural production systems.

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, environmental practices and engineering aspects to improve plant and animal productivity.
4. Ability to communicate effectively in writing and oral presentation on the biological and morphological mechanism in plant and animal.

MMJ14102 SAINS FIZIKAL [PHYSICAL SCIENCE]

No of Credits: 3

Course Synopsis:
The course is designed to provide students with a comprehensive understanding of the fundamental principles and concepts that underpin engineering. This includes an in-depth exploration of key units of measurement such as length, time, mass, force, temperature, electric current, energy, and power. Through a combination of lectures, demonstrations, and practical exercises, students will gain a solid grounding in how these concepts are used in engineering design and analysis. In addition, students will learn about the various tools and techniques used in engineering, as well as the ethical and social considerations involved in the field. By the end of the course, students will have the knowledge and skills needed to tackle a wide range of engineering challenges.

Course Outcomes:
1. Ability to analyze problems related to units of measurement, scalar and vector quantities, and apply appropriate mathematical and analytical tools to solve them.
2. Ability to analyze the motion of particles and apply appropriate mathematical and analytical tools to calculate position, force

MMJ14203 KEJURUTERAAN GEOMATIK [GEOMATIC 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.
3. Ability to evaluate the data from various types of geomatics surveying.
4. Ability to relate the component in precision farming and geospatial data interpretation using geographical information systems (GIS).

MMJ24003 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.

MMJ24103 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 electrical laws and theorem in the complex series-parallel Direct Current (DC) and Alternating Current (AC) circuit.
2. Ability to analyse the concept of magnetism and electromagnetism in magnetic circuit, transformer, Direct Current (DC) and Alternating Current (AC) machine systems.
3. Ability to analyse the type of active filters, n-type and p-type semiconductor and diodes in rectifiers and operational amplifier circuit.
4. Ability to design complex digital logic circuit using Boolean algebra and Karnaugh maps for combinational and sequential logic circuits.

MMJ24203 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, streamflow hydrograph, and flood routing. The course also covers applications of hydrologic and frequency analysis with respect to basic water management design procedures 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 analyse the components of the hydrologic cycle and concept of the watershed in solving problems in agricultural engineering.
2. Ability to assess hydrological data to solve problems in water budget and hydrological gain and loss.
3. Ability to design solutions on problems based on hydrology for unit hydrograph, frequency analysis, flood routing, flood management and irrigation.
4. Ability to use the hydrologic analyses techniques in hydrological components measurement.

MMJ24303 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 analyse appropriate mathematical equation, problems related to various heat and mass transfer mechanisms.
2. Ability to 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.

MMJ24503 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 rheological attributes and properties of biological materials.
2. Ability to analyze the engineering problems related to thermal and electromagnetic properties of biological materials
3. Ability to evaluate solutions for engineering problems related to water activity of biological materials for handling, storage and effective moisture management.
4. Ability to perform investigation as well as analyze and interpret data for engineering properties of biological materials using modern technology and equipment.

MMJ34003 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 analvze the soil textural classification and physical characteristics in relation to irrigation/drainage and foundation design.
2. Ability to evaluate mechanical properties of soil in relation to soil foundation design under the static condition (building) and dynamic condition (machine) using the standard.
3. Ability to synthesis the soil dynamics behaviour in relation to soil-machine-traction design for agricultural production.

MMJ34103 REKA BENTUK STRUKTUR LADANG [FARM STRUCTURAL DESIGN]

No of Credits: 3

Course Synopsis:
This course covers the design and planning of farm layout, and engineering structural analysis, structural design together with a materials cost estimation of farm structures including greenhouses, structures for livestock husbandry, and other related agricultural structures. This course also covers in-depth analysis of structural analysis by structural elements for shear forces, bending moments, and deflection of beams, columns, slabs, and foundations. The structural design used Eurocodes for reinforced concrete, stainless steel, and timber by considering safety, ethics, environmental and sustainability aspects of the design.

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 reflect understanding of professional and ethical responsibilities to community.
4. Ability to analyse the construction cost of farm structures in selecting the construction materials by understanding the impact of environment and sustainability.

MMJ34203 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 distinguish 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.
4. Ability to analyse complex engineering problems related to application of instrumentation in various agricultural engineering applications, write effective reports and deliver effective presentations.

MMJ34303 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 role of engineer to the society on the application of renewable energy and power generations.
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 lifelong-learning component on the production of energy and power harvest from solar panels, also the processing of biofuels, biodiesel and biogas from biological materials.

MMJ34403 REKA BENTUK MESIN [MACHINE DESIGN]

No of Credits: 3

Course Synopsis:
This course covers the concepts and principles of mechanical components design to the students. Students should have ability to design mechanical components encompassing agricultural engineering machine elements. The course begins with understanding of design fundamental and followed with the component's selection, stress analysis, failure theories, and designing the mechanical components. It consists of screws and fasteners, mechanical springs, bearings, gears, clutches, brakes and flexible mechanical elements. The knowledge of mechanical design will be implemented in a mini project by utilizing the suitable 3D software.

Course Outcomes:
1. Ability to apply the fundamental of engineering design solutions on principle of design and failure prevention with respect to agricultural engineering applications.
2. Ability to design solutions of complex engineering problems in gears, mechanical, fasteners, joints, shaft and bearing for agricultural engineering applications.
3. Ability to use modern engineering tools necessary for agricultural engineering applications and practices.
4. Ability to function in multi-disciplinary teams upon completion of mini project report and presentation related to agricultural engineering element design.

MMJ34503 JENTERA LADANG [FARM MACHINERY]

No of Credits: 3

Course Synopsis:
This course intends to give students fair knowledge of farm machineries and off-road vehicles, their working principles, selection and management for use in agricultural operations. The topics includes tractorization, tillage, machineries for chemical applications, irrigation, planting and also harvesting. The topics also include application of agricultural machinery for optimal selection, operation and performance, and management of farm machinery such as tractors, tillage, seeding, chemical application, biomass and grain/fruit harvesting and postharvest handling in food (grain, vegetable) and industrial/tree crops production (fruits, oil palm) systems.

Course Outcomes:
1. Ability to evaluate specialized components and mechanized systems for production, handling and processing of biological materials.
2. Ability to compare machine components in a variety of situations for specific operations in agricultural operations and management of machineries.
3. Ability to assess safety & health of farm operator and machinery & systems and propose appropriate solutions as professional engineer's responsibilities.

MMJ34602 REKA BENTUK KEJURUTERAAN PERTANIAN I [AGRICULTURAL INTEGRATED DESIGN PROJECT I]

No of Credits: 2

Course Synopsis:
Agricultural Integrated Design Project I is a 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.

Course Outcomes:
1. Ability to compose engineering problems and alternative solutions and formulate a sound proposal in agricultural engineering project using systematic design process.
2. Ability to assess the impact of sustainable design and engineering solutions on society and environment.
3. Ability to differentiate between ethical and legal issues and relate these issues to design projects in agricultural engineering field.
4. Ability to demonstrate teamwork through group weekly meetings, and class presentation.
5. Ability to evaluate economic feasibility study and project planning and management of a design project in agricultural engineering field.

MMJ34703 OPERASI UNIT [UNIT OPERATION]

No of Credits: 3

Course Synopsis:
This course intends to give students fair knowledge of unit operations in food and agro-based processing industries. The topics in this course includes basic knowledge of engineering in material and energy balances for selected unit operations in the industries. The other topics covers on drying, evaporation, size reduction, mixing and mechanical separations.

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 agro-based industries.
4. Ability to evaluate gas absorption, distillation and mechanical separation operations and equipment of each process.

MMJ34803 REKA BENTUK SISTEM AUTOMASI [DESIGN OF AUTOMATION SYSTEMS]

No of Credits: 3

Course Synopsis:
This course covers the principle of automation and sensor technology applied in agricultural and biological systems. It also includes the components of automation systems such as sensor, controller and actuator and drive systems. Student will also be introduced to design of automation system using microcontroller programming to control sensors and actuators. Concept of IoT and IR 4.0 will also be discussed.

Course Outcomes:
1. Ability to apply principle of automation and sensor technology for life-long learning in agricultural and biological engineering.
2. Ability to analyze complex engineering problem of the actuator and drive systems in the agricultural and biological engineering.
3. Ability to design solution for applications of an automation systems in agricultural and biological engineering using microcontroller programming.
4. Ability to display teamwork and ability to communicate effectively in writing and oral presentation on complex engineering activities.

MMJ34902 MODELLING AND SIMULATION [PEMODELAN DAN SIMULASI]

No of Credits: 2

Course Synopsis:
The course advances students on concepts of systems analysis, modeling and computer simulation of agricultural and biological systems. Primary focus is on developing knowledge and skills to construct mathematical models, perform sensitivity analysis, parameter estimation and model evaluation. Review, analysis, and application of models in agricultural and biological systems emphasizing crops, animals, and environment are also covered. Laboratory work using MATLAB and LabVIEW enhances student ability in simulating biological systems. A group project culminates the course.

Course Outcomes:
1. Ability to formulate mathematical models governing biological and physical behaviors of agricultural or biological systems.
2. Ability to construct computer programming to model and/or simulate agricultural or biological systems behaviors and responses.
3. Ability to compose a modeling and/or simulation report on an agricultural or biological systems problem working in a team.

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.

MMJ44003 REKA BENTUK KEJURUTERAAN PERTANIAN II [AGRICULTURAL INTEGRATED DESIGN PROJECT II]

No of Credits: 3

Course Synopsis:
This course covers topics 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, sustainable agriculture, and cutting across several important food and industrial crops. The scope of the class is to design components, equipment, process, plant, and systems to meet desired project needs within realistic constraints 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, troubleshooting 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 solutions for complex engineering problems.

Course Outcomes:
1. Ability to analyze complex engineering problems using principles and tools of mathematics and science to solve multi-faceted design project to produce credible conclusions.
2. Ability to formulate 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 Agricultural Engineering using engineering tools and design software(s).
4. Ability to write project report that conforms to engineering professional standard and to perform verbal.
5. Ability to gather and evaluate knowledge in the broadest context in the design of systems or process or components in Agricultural Engineering involving the multi-faceted sources of information including knowledge repository.

MMJ44103 PERTANIAN PERSIS [PRECISION AGRICULTURE]

No of Credits: 3

Course Synopsis:
This course focuses on the concepts of precision agriculture. This course discusses the Global Positioning System (GPS), Geographic Information System (GIS), and remote sensing technologies as the backbone of precision agriculture. This course elaborates on the sensing technology specific for sensing natural soil properties for effective variable rate fertilizing, crop properties for nutrients intake and uptake, site-specific weed control, and yield recording and monitoring. Using various information from the sensing technologies, map overlay and management zone is derived for site specific precision agriculture using GIS software.

Course Outcomes:
1. Ability to analyse the concept of precision agriculture, GIS, GPS and remote sensing for sustainable production.
2. Ability to assess the importance of the management zone in precision agriculture from the sensing elements including soil, crop, yield, weed, and disease in the context of safety, health, and cultural issues.
3. Ability to propose solutions by investigating and analysing data using precision agriculture software/hardware technologies.

MMJ44403 PEMBUATAN BIOPRODUK [BIOPRODUCT MANUFACTURING]

No of Credits: 3

Course Synopsis:
The course discusses components and facilities required for manufacturing and production of biological products activities. The course also covers process development and pilot plant facilities as well as the application of biological products production processes. At the end of the course, students capable to design and propose process for the development and manufacture of biological products (food and agricultural) .

Course Outcomes:
1. Ability to select the process of innovation and the need for sustainable development for the production and manufacturing of bio-based and agricultural products.
2. Ability to design the process related to the manufacturing production of food and agricultural products.
3. Ability to evaluate the importance of standards in bioproduct manufacturing in accordance with good practises and ethics.

MMJ44503 CONTROLLED ENVIRONMENT ENGINEERING [KEJURUTERAAN PERSEKITARAN TERKAWAL]

No of Credits: 3

Course Synopsis:
The course covers thermal and environmental engineering design and analyses appropriate for controlled environment agricultural related production facilities for plants, animals and aquaculture. Major topics include psychrometric, heat and mass transfer, ventilation, cooling and heating, air distribution within controlled environment buildings.

Course Outcomes:
1. Ability to analyze knowledge of heat and mass transfer in plant, animal, and aquaculture structures.
2. Ability to design natural and force ventilation, cooling and/or heating systems for plants, animals, and aquaculture structures.
3. Ability to appraise and value the existing design and operations of controlled environment agricultural production systems with respect to engineering, economics, as well as management by means of a groupwork project.

MMJ44703 KEJURUTERAAN LEPAS TUAI [POSTHARVEST ENGINEERING]

No of Credits: 3

Course Synopsis:
This course focuses on postharvest management and processes involved after harvesting highly perishable agricultural produces as well as grains. 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. This course covers the importance of moisture content in agricultural products, the principle of drying, the method and mechanisms of drying, and the drying curve. The course also elaborates on different types of dryers, their performances, energy utilization, and efficiency in relation to drying and dehydration of agricultural products. Finally, the course discusses the transportation method based on the cold chain network of refrigerated agricultural produce for fresh and longer shelf life products.

Course Outcomes:
1. Ability to analyse the postharvest treatments and spoilage mechanism for safe handlings of highly perishable agricultural produce.
2. Ability to evaluate the refrigeration capacity in maintaining the quality of agricultural produce for transportation.
3. Ability to propose the appropriate conditioning based on the drying principles for highly perishable agricultural produce.

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 KEJURUTERAAN [ENGINEERING GRAPHICS]

No. of Credits: 3

Course Synopsis:
This course provides the skills to students the basics of Engineering Drawing, Computer Aided Drafting (CAD) and their engineering applications. The course covers the detail of Engineering Drawing for beginners followed with projection systems, oblique and isometric sketches. The course also introduced the Computer Aided Drafting using dedicated software, AUTOCAD, which focuses on product design in 2D and 3D environment. Fundamental knowledge in dimensioning and geometrical tolerance (GDT) enhances student's ability in interpreting and assessing information from basic raw data of an engineering drawing.

Course 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 organise 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.

1. **Course Outcome:**
2. Ability to apply knowledge on theories and concepts of Geometric Dimensioning and Tolerancing using symbols, terms, and rules.
3. Ability to investigate datums, position, concentricity and symmetricity applied to the type of forms, orientation, profile, and runout of Geometric Dimensioning and Tolerancing.
4. 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.

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.

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.

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 technologie

MMK17003 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 Outcome:
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 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 Outcome:
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 COMPUTER AIDED DESIGN II (CAD)

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 Outcome:
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 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 Outcome:
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 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 Outcome:
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 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 Outcome:
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.

MMK36003 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 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.

MMK36503 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 Outcome:
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.

MMK36403 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 Outcome:
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.

Elective I

MMK37503 PRODUCTION 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 Outcome:
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 PRODUCT STUDY & 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 Outcome:
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

Elective II

MMK37703 DESIGN VISUALIZATION II

No of Credits: 3

Course Synopsis:
This course aims to introduce skills and knowledge related to computer graphics and work that can be implemented in the field of artificial product design. Students will be able to understand of computer hardware technology, software phenomena as well as creative field majors. This course covers personal computer construction work and the configuration, installation and implementation of software compatibility testing.

Course Outcome:
1. Ability to construct basic hardwares and softwares assembly and installation.
2. Ability to build computer graphics geometry data using CSG and NURBS.
3. Ability to compose still images and motions sequences output.
4. Ability to COMPOSE Virtual Reality geometry codes and Augmented Reality coding.

Elective II

MMK37803 DESIGN FOR MEDICAL DEVICE

Course Synopsis:
This course addresses major concepts, research and applications based on orthopaedic and joint implants/prosthetics design and development. The theory of bone growth and fracture provides the students with a fundamental understanding of bone behaviour. The course also exposes students to understand the major joint biomechanics and kinematics. Nevertheless, the regulations and medical device standards are also covered in this course to provide a broader picture to the authority bodies.

Course Outcome:
1. Ability to understand bone and major joints behaviour, biomechanics, and fracture
2. Ability to evaluate implant design problems from relevant data or literature to propose a valid design solution
3. Ability to evaluate customer needs with consideration to patents/ codes/ standards/ for a design safety/ cultural/ societal/ environmental and human.

MMK47703 DESIGN FOR MANUFACTURE AND ASSEMBLY (DFMA)

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 Outcome:
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.

MMK 28103 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

MMK 28203 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 (SEM, SPM), Thermal Analysis (DSC, DTA), Phase Analysis (as well as Spectroscopy Analysis (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

MMK 28303 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. Ableto 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, electrorecovery and electropurification of the ore and ore treatment at hightemperatures.

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 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.

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 material using conventional advanced processing.

Course Outcome:
1. Ability to analyse and relate the knowledge of science and engineering specialization to the solution compositematerialsprocessing problems.
2. Ability to appraise science and engineering technology principles to the solution of composite materials.
3. Able to indicate problems and followa suitable fabrication technique of composite materials develop better composite system.
4. Able to perform failure test of behavior and strengthening mechanism of composite materials.

MMK38504 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 developa 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 are as of engineering technology and material processing and into a practical design project designed to train students 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 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 ADHESIVES 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 polymericmaterial. 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 industry.
4. Able to evaluate the adhesive 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 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 type of rubber and late 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 of metallurgy.
2. Able To Evaluate On Phase Diagram Of Metals (ferrous non-ferrous)and its alloys.
3. CO3 Able to demonstrate the principles of phase transformation on the microstructures and mechanical properties of metals and apply appropriate techniques in process 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 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 specific types of ceramic products,including selection specific equipment used.
3. Able to justify technical ceramics problems from existing knowledge technology science.
4. Able to design the solutions for complex technical ceramics problems to meet specific needs.

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. Construct technical drawing using manual sketches and computer aided design.
2. Analyze engineering drawings, including welding symbols and standard codes.
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 the working area.
2. Explain the welding risk control by various procedures in the working environment.
3. Identifies control methods or procedures to minimize or remove the impact of possible hazards in the working environment.

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 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 specific types of ceramic products,including selection specific equipment used.
3. Able to justify technical ceramics problems from existing knowledge technology science.
4. Able to design the solutions for complex technical ceramics problems to meet specific needs.

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. Construct technical drawing using manual sketches and computer aided design.
2. Analyze engineering drawings, including welding symbols and standard codes.
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 the working area.
2. Explain the welding risk control by various procedures in the working environment.
3. Identifies control methods or procedures to minimize or remove the impact of possible hazards 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 the 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 course 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. Ability to apply an appropriate design method of developing a practical solution of product design problem.
2. Ability to display welding product as a practical design solution of a through a systematic investigation of the product design problem.
3. Ability to 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 regarding 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. Ability to apply welding procedure qualification and welder qualification Interpret various type of drawing design and symbol in welding according to related standard.
2. Ability to construct various type of drawing design and symbol in welding according to related standard.
3. Ability to 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 students with welding processes that are not commonly used in the current industries that can be categorized as new or advanced welding technology. Students will be exposed to all welding processes and required should be able to perform process selection when dealing with the special and complex demand of welding work.

Course Outcomes:
1. Ability to manipulate types of joining processes applied in the manufacturing sector.
2. Ability to appreciate the characteristics of joining in terms of process, equipment, and setup.
3. Ability to 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. Ability to understand the behaviour of structural in fusion welding and testing of materials welded joints.
3. Ability to 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:
This course covers the design of welded joints requirements according to the mechanical and physical properties of the service application and environment. Also, evaluating the effects these properties may have on the design of weldments. Such properties can include strength, ductility, toughness, fatigue resistance, and corrosion resistance, among others.

Course Outcomes:
1. Ability to describe basic concepts and fundamental principles of mechanical applications.
2. Ability to apply basic concepts and fundamental principles to solve design for welding applications.
3. Ability to analyse 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. Ability to design a WPS and WPQT using according to specifications and standards.
2. Ability to develop the welding procedure based on knowledge related to weld techniques and position.
3. Ability to apply creative thinking in problem solving to solve the problems associated with welding qualification.

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 element of technology preparation, operation, planning, data collection and interpretation, and maintenance are being provided.

Course Outcomes:
1. Ability to construct testing instruction and work planning.
2. Ability to analyze the NDT data for evaluating the condition of the tested materials.
3. Ability to recommend the maintenance and calibration of the NDT equipment.

MMT23504 PEMERIKSAAN KIMPALAN UNTUK PROFESIONAL [WELDING INSPECTION FOR PROFESSIONAL]

No of Credits: 4

Course Synopsis:
This course describes the professional practices in welding inspection. The content of the course covers welding inspection and certification, standards and terminology, visual inspection, welding metallurgy, materials and their weldability, welding processes inspection, residual stress and distortion, fracture modes and welding defects, destructive and non-destructive testing, welding equation and calibration.

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 the different techniques for creating solid models and surface with emphasis on design intent. The students also will be exposed to the introduction to Finite Element Analysis, structural stress analysis, modelling of the assembly and dynamic response analysis. The course includes hands-on exercises and practice methods about weld products for students during drafting stage, part, assembly, Finite Element Analysis and modelling.

Course Outcomes:
1. Ability to carry out structural stress analysis of welded joints.
2. Ability to model the parts and assemblies.
3. Ability to produce document design intent of parts and assemblies.

MMT23704 PENGUJIAN DAN KETIDAKSEMPURNAAN DALAM KIMPALAN [IMPERFECTION IN WELDING AND TESTING]

No of Credits: 4

Course Synopsis:
This course is designed to bridge the gap between theory and practice of testing to analyze the imperfection of welding. It is presented in a highly practical manner to encourage students to grasp the techniques for testing and analyzing welding imperfections to improve better quality productions.
A comprehensive overview of the field, this course covers three principal areas of interest:
i. Procedures for testing and analysis,
ii. Root-caused,
iii. Mechanisms, and
iv. Recommendation to prevent future welding imperfections
The students are exposed to hands-on experience from beginning to end of particular case studies that generally happen in industries at laboratory and workshop. Students are also exposed to technical report writing techniques through Project-based Learning (PBL).

Course Outcomes:
1. Ability to apply critical testing and inspection methods to examine the welding integrity.
2. Ability to conduct general procedures, techniques, and precautions in root cause analysis of welding imperfection.
3. Ability to recommend preventative and corrective actions to eliminate welding imperfection.

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. Ability to examine the physical phenomena occurring in the arc and the types of forces and metal transfer in the arc based on measurements of power sources characteristics.
2. Ability to demonstrate 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. Ability to integrate the welding current, voltage, temperature, load, and displacement using equipment such as clamp meter, linear variable differential transformer (LVDT), arc welding analyser, and resistance for welding quality monitoring.

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 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.
2. Ability to integrate effective project management and technopreneur skills in solving given problems.
3. Ability to integrate the welding current, voltage, temperature, load, and displacement using equipment such as clamp meter, linear variable differential transformer (LVDT), arc welding analyser, and resistance for welding quality monitoring.

MMT31510 PROJEK TAHUN AKHIR [FINAL YEAR PROJECT]

No of Credits: 10

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. Ability to DEMONSTRATE strong analytical and critical thinking skills to solve broadly defined problem.
2. Ability to EMPLOY suitable tools and techniques to resolve broadly defined problem in related technical tasks in industry.
3. Ability to COMMUNICATE effectively related to the proposed outcomes.
4. Ability to ENGAGE independent lifelong learning in a specialist technology project.

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. Ability to propose a plan for quality assurance and control in welding manufacturing process using according to specifications and standards.
2. Ability to demonstrate the procedure and inspection techniques related to welding assurance and control.
3. Ability to 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 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. Ability to explain the importance of effective costing and the factors influencing welding costs..
2. Ability to calculate welding costs that include machine, material and labour.
3. Ability to record of transactions in journals 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 technique. The advantages, limitations and main application of each NDT technique are also provided.

Course Outcomes:
1. Ability to explain the current basic and some advanced principles of Non-Destructive Testing (NDT) techniques to satisfy complex engineering problems.
2. Ability to perform suitable NDT techniques based on their analysis of engineering problems that fulfill the standard practice.
3. Ability to communicate effectively using available resources to disseminate knowledge of NDT techniques in relation to industrial problems.

MMT33304 PROJEK KEUSAHAWANAN TEKNOLOGI 2 [TECHNOPRENEUR PROJECT 2]

No of Credits: 4

Course Synopsis:
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 an effective business plan to attract venture capital investment. When an enterprise starts to take shape and grow, more people will be hired, and 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 among employees, and approaches to building strong teams. Human resource 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 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.

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. Ability to explain the added value that can be achieved through application of CPS in welding process.
2. Ability to demonstrate effectively the appropriate CPS tools in acquiring process variables in real time.
3. Ability to criticise the logged data acquired from conventional and non conventional welding techniques.

MMT33504 PEMULIHAN DALAM KIMPALAN [RECLAMATION IN WELDING]

No of Credits: 4

Course Synopsis:
The aim of this subject is 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. Ability to repair quality of welding which will benefit the industry in terms of productivity and savings.
2. Ability to develop the skills to carry out practical feasible repair techniques maintaining low cost.
3. Ability to 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 a manager's responsibility to allocate the resources required to achieve cost-effectiveness in welding processes. Furthermore , this subject 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. Ability to identify and standardize the welding procedure.
2. Ability to identify required maintenance of equipment and record.
3. Ability to explain supervisor scope to minimize reject, scrap and rework reduce rework analyze the quality management system.

MMT49912 LATIHAN INDUSTRI [INDUSTRIAL TRAINING]

No of Credits: 12

Course Synopsis:
Industrial training is a compulsory component for degree program students at Universiti Malaysia Perlis (UniMAP). 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 be involved 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 equipment, product testing and quality control.

Course Outcomes:
1. Ability to DEMONSTRATE technical expertise that is relevant to an industrial environment while undergoing industrial training.
2. Ability to PRESENT effective presentations pertaining to industrial training related aspects like work responsibilities and improvement.
3. Ability to PRACTICE knowledge and skills during industrial training as a means of fulfilling social responsibility towards the community.
4. Ability to PRACTICE ethical principles when dealing with issues and challenges associated with industrial training.
5. Ability to PRACTICE effective teamwork to accomplish industrial training related tasks.

FACULTY OF CHEMICAL ENGINEERING & TECHNOLOGY (FKTK)

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 Chemical Engineering Technology (Food Technology) with Honours
5. Bachelor of Chemical Engineering Technology (Industrial Chemical Process) with Honours
6. Bachelor of Chemical Engineering Technology (Industrial Biotechnology) with Honours
7. Diploma in Metallurgical Engineering

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ENGINEERING PROGRAMME

UR6527001
Bachelor of Materials Engineering with Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
Graduates who have demonstrated career advancement in the field of Materials Engineering or related engineering field

PEO 2
Graduates who are involved in a professional body or society

PEO 3
Graduates who pursue life-long learning.

PROGRAMME OUTCOMES (PO)

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

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

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

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

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

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

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

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

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

PO10
Communications: 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
Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12
Life-Long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

CURRICULUM STRUCTURE
UR6527001 BACHELOR OF MATERIALS ENGINEERING WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	**1**	**2**	**3**	**4**	**5**	**6**	**BREAK**	**7**	**8**
DISCIPLINE CORE & ELECTIVE COURSES (102 CREDITS)	KMJ15603 Engineering Drawing	KMJ10003 Engineering Skills	KMJ20003 Materials Physical Chemistry	KMJ20103 Analytical Chemistry	KMJ30303 Surface Engineering	KMJ30002 Materials Selection and Design I	KMJ39905 Industrial Training	KMJ40003 Materials Selection and Design II	KMJ40103 Corrosion Engineering
	KMJ15303 Electrical Technology	KMJ16203 Statics	KMJ20303 Strength of Materials	KMJ20203 Dynamics	KMJ30203 Fluid Mechanics	KMJ4XXX03 Elective I		KMJ4XXX03 Elective II	KMJ40203 Non Destructive Testing
	KMJ16803 Introduction to Computer Programming	KMJ10103 Engineering Quality Control	KMJ20004 Materials Structure & Properties	KMJ20403 Transport Phenomena in Materials Engineering	KMJ30004 Polymer Properties	KMJ30003 Polymer Processing		KMJ49802 Final Year Project I	KMJ49904 Final Year Project II
			KMJ20104 Physical Metallurgy	KMJ20204 Whiteware, Glass and Glass-Ceramic	KMJ30104 Materials Characterization	KMJ30103 Process Control		KMJ40303 Technical Ceramic	
					KMJ30503 Electronic Materials Engineering	KMJ30403 Materials Thermodynamics			
COMMON CORE COURSES (17 CREDITS)	QMQ10103 Engineering Mathematics I	QMQ10203 Engineering Mathematics II	QMQ20303 Engineering Mathematics III	QMQ27103 Engineering Statistics		KMJ45802 Professional Engineers			
				KMJ42403 Engineering Management					
UNIVERSITY REQUIREMENT COURSES (16 CREDITS)	SMU12102 Integrity and Anti-Corruption [3]	SMB10102 Preparatory English[1]	SMB20102 English for General Communication[2]		SMU22402 Engineering Entrepreneurship	SMB31202 English for Technical Communication			
	SMU13002 Philosophy and Current Issues	SMU13102 Appreciation of Ethics & Civilization							
	SMZ1XX01 Co-Curriculum I	SMZ2XX01 Co-Curriculum II							
		SMB41002 University Malay Language[4]							
TOTAL CREDITS (135 CREDITS)	**17**	**17**	**19**	**19**	**19**	**18**	**5**	**11**	**10**

Elective I : KMJ40403 Composite Materials, KMJ40503 Construction Materials, KMJ40603 Joining of Materials and Structures.
Elective II : KMJ40703 Advanced Material Engineering, KMJ40803 Advanced Electronic Packaging, KMJ40903 Materials for Energy Application, KMJ41003 Materials Failure Analysis.

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] International students should register SMU13202 Malaysian Studies.
[4] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course.

ENGINEERING PROGRAMME

UR6524001
Bachelor of Chemical Engineering with Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
Engineering graduates engaged in the field of chemical engineering as demonstrated through career advancement

PEO 2
Engineering graduates who are members and contribute to professional society

PEO 3
Engineering graduates embracing in life-long learning or pursuing continuing education opportunities.

PROGRAMME OUTCOMES (PO)

PO1
Knowledge: Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialisation to defined and applied engineering procedures, processes, systems or methodologies.

PO2
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.

PO3
Design/development of solutions: Design solutions for broadly-defined engineering problems, and to design systems, components or processes to meet specified needs with appropriate consideration for public health and safety, as well as cultural, societal, environmental and sustainability concerns.

PO4
Investigation: Conduct investigations of broadly-defined problems; locate, search and select relevant data from codes, databases and literature, design and conduct experiments to provide valid conclusions.

PO5
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.

PO6
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.

PO7
Environment and Sustainability: Understand the impact of engineering solutions of broadly-defined engineering problems in societal and environmental context and demonstrate knowledge of and need for sustainable development.

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

PO9
Individual and Teamwork: Function effectively as an individual, and as a member or leader in diverse technical teams.

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

PO11
Life-Long Learning: Recognize the need for, and have the ability to engage in independent and life-long learning in specialist technologies. Demonstrate knowledge and understanding of engineering

PO12
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

CURRICULUM STRUCTURE
UR6524001 BACHELOR OF CHEMICAL ENGINEERING WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	1	2	3	4	5	6	BREAK	7	8
DISCIPLINE CORE & ELECTIVE COURSES (102 CREDITS)	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
	KMJ12303 Introduction to Sustainability	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
	KMJ12102 Organic Chemistry I	KMJ12602 Thermodynamics	KMJ22204 Material and Energy Balance	KMJ22403 Heat Transfer	KMJ32203 Separation process	KMJ32603 Safety & Loss Prevention		KMJ42203 Good Manufacturing Practice	KMJ4XXX3 Elective 3
	KMJ12203 Introduction to Biological and Chemical Science Principles	KMJ12802 Process Instrumentations	KMJ22303 Analytical Chemistry	KMJ22601 Transport Phenomena Application	KMJ32301 Skills in Separation Process	KMJ32702 Simulation for Chemical Engineering		KMJ42303 Industrial Waste Treatment	
		KMJ12702 Organic Chemistry II				KMJ3XXX3 Elective 1		KMJ4XXX3 Elective 2	
		KMJ12501 Biochemical Science							
COMMON CORE COURSES (17 CREDITS)	QMQ10103 Engineering Mathematics I	QMQ10203 Engineering Mathematics II	QMQ20303 Engineering Mathematics III	QMQ27103 Engineering Statistics	KMJ42403 Engineering Management	KMJ45802 Professional Engineers			
UNIVERSITY REQUIREMENT COURSES (16 CREDITS)	SMZ1XX01 Co-Curriculum I	SMZ2XX01 Co-Curriculum II	SMU13002 Philosophy and Current Issues	SMB31202 English for Technical Communication	SMUXXXX2*** Option Subjects	SMU22402 Engineering Entrepreneurship			
	SMB41002 University Malay Language[4]	SMB20102 English for General Communication[2]		SMU12102 Integrity and Anti-Corruption [3]	SMU13102 Appreciation of Ethics & Civilization				
	SMB10102 Preparatory English[1]								
TOTAL CREDITS (135 CREDITS)	17	17	18	17	18	18	5	14	11

* Please refer to additional NOTE.	PROCESS ENGINEERING	BIOCHEMICAL ENGINEERING	SUSTAINABILITY
Elective I:	KMJ32903 Colloidal and Biomaterials Processing	KMJ33003 Halal Processing	KMJ33103 Sustainable Energy
Elective II:	KMJ43203 Energy and Process Utility Engineering	KMJ42503 Food Engineering	KMJ42603 Biomass Utilization
Elective III:	KMJ42903 Petrochemical Process	KMJ43003 Pharma and Nutraceutical Engineering	KMJ43103 Fuel Cells

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.

[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.

[3] International students should register SMU13202 Malaysian Studies.

[4] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course.

*** 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 enough credit for graduation

ENGINEERING PROGRAMME

UR6524002
Bachelor of Polymer Engineering with Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

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

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

PEO 3
To raise graduates who pursue education opportunities continually.

PROGRAMME OUTCOMES (PO)

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

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

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

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

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

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

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

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

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

PO10
Communications: 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
Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12
Life-Long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

CURRICULUM STRUCTURE UR6524002 BACHELOR OF POLYMER ENGINEERING WITH HONOURS SESSION 2023/2024									
YEAR	**FIRST**		**SECOND**		**THIRD**			**FOURTH**	
SEMESTER	**1**	**2**	**3**	**4**	**5**	**6**	**BREAK**	**7**	**8**
DICIPLINE CORE & ELECTIVE (102 CREDITS)	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	KMJ45XX3 Elective II
	KMJ15303 Electrical Technology	KMJ15403 Engineering Mechanics	KMJ24003 Plastic Materials	KMJ25304 Polymer Synthesis	KMJ34803 Polymer Testing & Characterization	KMJ35203 Polymer Engineering Design		KMJ44003 Polymer Composites	KMJ45603 Polymer in Electronic Application
	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	KMJ49904 Final Year Project II
		KMJ15603 Engineering Drawing		KMJ25503 Thermodynamics for Polymer Engineering	KMJ34004 Plastic Processing	KMJ34504 Latex Processing		KMJ49802 Final Year Project I	
						KMJ35XX2 Elective I			
COMMON CORE COURSES (17 CREDITS)	QMQ10103 Engineering Mathematics I	QMQ10203 Engineering Mathematics II	QMQ20303 Engineering Mathematics III	QMQ27103 Engineering Statistics		KMJ42403 Engineering Management			KMJ45802 Professional Engineer
UNIVERSITY REQUIREMENT COURSES (16 CREDITS)	SMU12102 Integrity and Anti-Corruption [3]	SMB10102 Preparatory English [1]	SMU13102 Appreciation of Ethics and Civilization					SMU13002 Philosophy & Current Issues	
		SMB41002 University Malay Language [4]	SMB20102 English for General Communication [2]		SMB31202 English for Technical Communication			SMU22402 Engineering Entrepreneurship	
	SMZXXX01 Co-Curriculum I	SMZXXX01 Co-Curriculum II							
TOTAL CREDIT (135 CREDITS)	**16**	**18**	**16**	**17**	**16**	**19**	**5**	**16**	**12**

Elective I : KMJ35402 Polymers in Biomedical Applications OR KMJ35502 Photoluminescent Polymers
Elective II : KMJ45403 Polymer Adhesive & Coating OR KMJ45503 Environmental Friendly Polymer

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] International students should register SMU13202 Malaysian Studies.
[4] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course.

UR6524004
Bachelor of Chemical Engineering Technology (Food Technology) with Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
Engineering technology graduates engaged in the field of chemical engineering technology as demonstrated through career advancement.

PEO 2
Engineering technology graduates who are members and contribute to professional society.

PEO 3
Engineering technology graduates embracing in life-long learning or pursuing continuing education opportunities.

PEO 4
Engineering technology graduates who are technopreneurs.

PROGRAMME OUTCOMES (PO)

PO1
Knowledge: Apply knowledge of mathematics, science, engineering fundamentals and engineering specialisation principles to defined and applied engineering procedures, processes, systems or methodologies

PO2
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.

PO3
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.

PO4
Investigation: Conduct investigations of broadly-defined problems; locate,search and select relevant data from codes, databases and literature, design and conduct experiments to provide valid conclusions.

PO5
Modern Tool Usage: Select and apply appropriate techniques, resources and modern engineering and IT tools, including prediction and modeling, to broadly-defined engineering problems, with an understanding of the limitations

PO6
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.

PO7
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.

PO8
Ethics: Understand and commit to professional ethics and responsibilities and norms of engineering technology practice

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

PO10
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 2023/2024

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEMESTER	1	2	3	4	5	6	7	8
DISCIPLINE CORE & ELECTIVE COURSES (109 CREDITS)	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 I	KMK43503 Plant Design for Food Technology II	
	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	KMK33604 Quality and Safety Management System in Food Production		
	KMK10403 Electrical Technology				KMK33104 Food Processing and Preservation			
					Elective I	Elective II	Elective III	
COMMON CORE COURSES (15 CREDITS)	QMQ11103 Mathematics for Engineering Technology I	QMQ11203 Mathematics for Engineering Technology II	QMQ21303 Mathematics for Engineering Technology III			KMK30303 Engineering Technology Management	KMK40103 Engineering Technologist in Society	
UNIVERSITY REQUIREMENT COURSES (16 CREDITS)	SMB10102 Preparatory English [1]	SMB20102 English for General Communication [2]	SMB31202 English for Technical Communication	SMU13102 Appreciation of Ethics and Civilization				
	SMZXXX01 Co-Curriculum 1	SMU13002 Philosophy and Current Issues	SMB41002 University Malay Language [4]	SMU12102 Integrity and Anti-Corruption [3]				
		SMZXXX01 Co-Curriculum 2		SMU22402 Engineering Entrepreneurship				
TOTAL CREDITS (140 CREDITS)	18	19	19	18	18	19	17	12

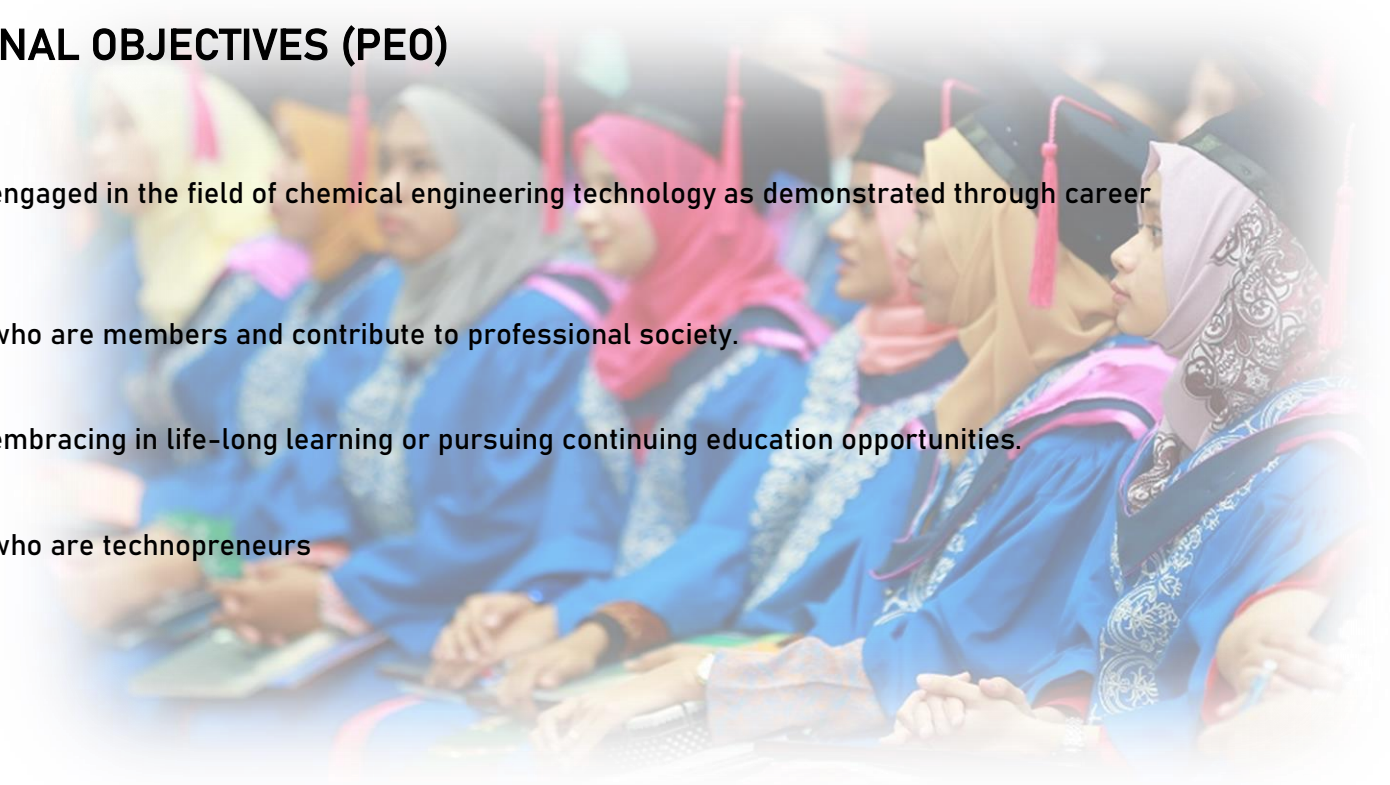
Elective I : KMK33203 Fats and Oils Technology / KMK33303 Food Ingredients
Elective II : KMK33703 Functional Foods and Nutraceuticals / KMK33803 Dairy and Meat Technology
Elective III : KMK43103 Food Packaging Technology / KMK43203 Poultry and Fish Technology

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] International students should register SMU13202 Malaysian Studies.
[4] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course.

ENGINEERING TECHNOLOGY PROGRAMME

UR6524005
Bachelor of Chemical Engineering Technology (Industrial Chemical Process) with Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)



PEO 1
Engineering technology graduates engaged in the field of chemical engineering technology as demonstrated through career advancement.

PEO 2
Engineering technology graduates who are members and contribute to professional society.

PEO 3
Engineering technology graduates embracing in life-long learning or pursuing continuing education opportunities.

PEO 4
Engineering technology graduates who are technopreneurs

PROGRAMME OUTCOMES (PO)

PO1
Knowledge: Apply knowledge of mathematics, science, engineering fundamentals and engineering specialisation principles to defined and applied engineering procedures, processes, systems or methodologies

PO2
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.

PO3
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.

PO4
Investigation: Conduct investigations of broadly-defined problems; locate, search and select relevant data from codes, databases and literature, design and conduct experiments to provide valid conclusions.

PO5
Modern Tool Usage: Select and apply appropriate techniques, resources and modern engineering and IT tools, including prediction and modeling, to broadly-defined engineering problems, with an understanding of the limitations.

PO6
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

PO7
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.

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

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

PO10
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
UR6524005 BACHELOR OF CHEMICAL ENGINEERING TECHNOLOGY (INDUSTRIAL CHEMICAL PROCESS) WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEMESTER	1	2	3	4	5	6	7	8
DISCIPLINE CORE & ELECTIVE COURSES (109 CREDITS)	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 1	KMK40005 Final Year Project II	KMK49912 Industrial Training
	KMK10403 Electrical Technology	KMK10802 Introduction toProcess Instrumentation	KMK20103 Fluid Mechanics	KMK20303 Reaction Engineering	KMK30203 SeparationEngineering	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 AnalyticalChemistry	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	
COMMON CORE COURSES (15 CREDITS)	QMQ11103 Mathematics For Engineering Technology I	QMQ11203 Mathematics For Engineering Technology II	QMQ21303 Mathematics For Engineering Technology III			KMK30303 Engineering Technology Management	KMK40103 Engineering Technologist in Society	
UNIVERSITY REQUIREMENT COURSES (16 CREDITS)	SMZXXX01 Co-Curriculum 1	SMZXXXX01 Co-Curriculum 2	SMU22402 Engineering Entrepreneurship	SMB31202 English For Technical Communication	SMU12102 Integrity and Anti-Corruption [4]			
	SMB41002 University Malay Language [3]	SMB0XX02 Option Subject (Foreign Language)		SMU13102 Appreciation of Ethics and Civilization				
	SMB10102 Preparatory English[1]	SMU13002 Philosophy & Current Issues						
		SMB20102 English For General Communication [2]						
TOTAL CREDITS (141 CREDITS)	19	20	17	18	17	19	19	12

Elective I : A1. KMK31403 Industrial Electrochemistry; A2. KMK31503 Scale up & Optimization
Elective 2 : B1. KMK31703 Pharmaceutical Processing Technology; B2. KMK31803 Advanced Membrane Technology & Application
Elective 3 : C1. KMK32703 Bioactive Compounds Extraction Technology; C2. KMK41403 Food Processing Technology

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course.
[4] International students should register SMU13202 Malaysian Studies.

ENGINEERING TECHNOLOGY PROGRAMME

UR6524006
Bachelor of Chemical Engineering Technology (Industrial Biotechnology) with Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
Engineering technology graduates engaged in the field of chemical engineering technology as demonstrated through career advancement..

PEO 2
Engineering technology graduates who are members and contribute to professional society.

PEO 3
Engineering technology graduates embracing in life-long learning or pursuing continuing education opportunities.

PEO 4
Engineering technology graduates who are technopreneurs.

PROGRAMME OUTCOMES (PO)

PO1
Knowledge: Apply knowledge of mathematics, science, engineering fundamentals and engineering specialisation principles to defined and applied engineering procedures, processes, systems or methodologies

PO2
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.

PO3
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.

PO4
Investigation: Conduct investigations of broadly-defined problems; locate, search and select relevant data from codes, databases and literature, design and conduct experiments to provide valid conclusions.

PO5
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.

PO6
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.

PO7
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.

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

PO9
Individual and Teamwork: Function effectively as an individual, and as a member or leader in diverse technical teams.

PO10
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
UR6524006 BACHELOR OF CHEMICAL ENGINEERING TECHNOLOGY (INDUSTRIAL BIOTECHNOLOGY) WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEMESTER	1	2	3	4	5	6	7	8
DISCIPLINE CORE & ELECTIVE COURSES (108 CREDITS)	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	KMK49912 Industrial Training
	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 COURSES (15 CREDITS)	QMQ11103 Mathematics for Engineering Technology I	QMQ11203 Mathematics for Engineering Technology II	QMQ21303 Mathematics for Engineering Technology III			KMK30303 Engineering Technology Management	KMK40103 Engineering Technologist in Society	
UNIVERSITY REQUIREMENT COURSES (16 CREDITS)	SMU13002 Philosophy and Current Issues	SMB10102 Preparatory English[1]	SMB20102 English for General Communication [2]	SMB31202 English for Technical Communication				
	SMZXXXX1 Co-Curriculum 1	SMB41002 University Malay Language [4]	SMU12102 Integrity and Anti-Corruption [3]	SMU22402 Engineering Entrepreneurship				
		SMU13102 Appreciation of Ethics and Civilization	SMB1XX02 Option Subject					
		SMZXXXX1 Co-Curriculum 2						
TOTAL CREDITS (140 CREDITS)	**19**	**20**	**20**	**17**	**17**	**18**	**17**	**12**

Elective I : (A1) KMK32303 Biotechnology Facility Design, (A2) KMK31503 Scale up & Process Optimization
Elective II : (B1) KMK32703 Bioactive Compounds Extraction Technology, (B2) KMK32803 Sustainable Green Technology
Elective III : (C1) KMK42103 Bioenergy Production Technology, (C2) KMK41403 Food Processing Technology

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits
[3] International students should register SMU13202 Malaysian Studies.
[4] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course.

LIST OF COURSES:

COURSE CODE	COURSE NAME
KMJ10103	Engineering Quality Control [Kawalan Mutu Kejuruteraan]
KMJ16203	Statics [Statik]
KMJ15303	Electrical Technology [Teknologi Elektrik]
KMJ15603	Engineering Drawing [Lukisan Kejuruteraan]
KMJ10003	Engineering Skill [Kemahiran Kejuruteraan]
KMJ16803	Introduction to Computer Programming [Pengenalan kepada Pengaturcaraan Komputer]
KMJ20004	Materials Structure & Properties [Struktur & Sifat-sifat Bahan]
KMJ20104	Physical Metallurgy [Metalurgi Fizikal]
KMJ20203	Dynamics [Dinamik]
KMJ20204	Whiteware, Glass and Glass-Ceramic [Tembikar Putih, Kaca dan Kaca-Seramik]
KMJ20003	Materials Physical Chemistry [Kimia Fizikal Bahan]
KMJ20303	Strength Of Materials [Kekuatan Bahan]
KMJ20103	Analytical Chemistry [Kimia Analitik]
KMJ20403	Transport Phenomena in Materials Engineering [Fenomena Pengangkutan dalam Kejuruteraan Bahan]
KMJ30103	Process Control [Kawalan Proses]
KMJ30203	Fluid Mechanics [Mekanik Bendalir]
KMJ30303	Surface Engineering [Kejuruteraan Permukaan]
KMJ30104	Materials Characterization [Pencirian Bahan]
KMJ30403	Materials Thermodynamics [Termodinamik Bahan]

LIST OF COURSES:

COURSE CODE	COURSE NAME
KMJ30004	Polymer Properties [Sifat-sifat Polimer]
KMJ30003	Polymer Processing [Pemprosesan Polimer]
KMJ30503	Electronic Materials Engineering [Bahan Elektronik Kejuruteraan]
KMJ30002	Materials Selection & Design I [Pemilihan Bahan dan Reka Bentuk I]
KMJ40103	Corrosion Engineering [Kejuruteraan Kakisan]
KMJ40203	Non Destructive Testing [Ujian Tanpa Musnah]
KMJ40703	Advanced Material Engineering [Kejuruteraan Bahan Termaju]
KMJ40503	Construction Materials [Bahan Binaan]
KMJ40303	Technical Ceramic [Seramik Teknikal]
KMJ40403	Composite Materials [Bahan Komposit]
KMJ41003	Materials Failure Analysis [Analisis Kegagalan Bahan]
KMJ40903	Materials For Energy Application [Bahan Untuk Aplikasi Tenaga]
KMJ40803	Advanced Electronic Packaging [Pembungkusan Elektronik Termaju]
KMJ40603	Joining of Materials and Structures [Penyambungan Bahan dan Struktur]
KMJ49802	Final Year Project I [Projek Tahun Akhir I]
KMJ49904	Final Year Project II [Projek Tahun Akhir II]
KMJ40003	Materials Selection & Design II [Pemilihan Bahan dan Reka Bentuk II]
KMJ39905	Industrial Training [Latihan Industri]
KMJ45802	Professional Engineer [Jurutera Profesional]

LIST OF COURSES:

COURSE CODE	COURSE NAME
KMJ42403	Engineering Management [Pengurusan Kejuruteraan]
KMJ15204	Kimia Organik (Organic Chemistry)
KMJ15403	Mekanik Kejuruteraan (Engineering Mechanics)
KMJ15503	Pengenalan Kepada Polimer (Introduction To Polymer)
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)
KMJ34004	Pemprosesan Plastik (Plastic Processing)
KMJ34404	Pemprosesan Getah (Rubber Processing)
KMJ34504	Pemprosesan Lateks (Latex Processing)
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)
KMJ44003	Komposit Polimer (Polymer Composites)

LIST OF COURSES:

COURSE CODE	COURSE NAME
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)
KMK10003	Kejuruteraan Bahan [Material Engineering]
KMK10103	Kimia Organik [Organic Chemistry]
KMK10202	Kejuruteraan Grafik untuk Kejuruteraan Kimia [Engineering Graphics for Chemical Engineering]
KMK10303	Engineering Skills [Kemahiran Kejuruteraan]
KMK10403	Teknologi Elektrik [Electrical Technology]
KMK10502	Kimia Fizikal [Physical Chemistry]
KMK10603	Kimia Analitikal [Analytical Chemistry]
KMK10704	Prinsip-prinsip Proses Kimia [Principles of Chemical Process]
KMK10802	Pengenalan kepada Proses Instrumentasi [Introduction to Process Instrumentation]
KMK20003	Termodinamik untuk Kejuruteraan Kimia [Thermodynamics for Chemical Engineering]
KMK20103	Mekanik Bendalir [Fluid Mechanics]
KMK20203	Pemindahan Haba untuk Kejuruteraan Kimia [Heat Transfer for Chemical Engineering]
KMK23003	Mikrobiologi Makanan [Food Microbiology]
KMK20303	Kejuruteraan Tindakbalas [Reaction Engineering]

LIST OF COURSES:

COURSE CODE	COURSE NAME
KMK20403	Pemindahan Jisim [Mass Transfer]
KMK23103	Biokimia Makanan [Food Biochemistry]
KMK23203	Teknologi Lepastuai [Postharvest Technology]
KMK30002	Keselamatan & Pencegahan Kehilangan [Safety & Loss Prevention]
KMK30103	Kawalan Proses & Dinamik [Process Control & Dynamics]
KMK30203	Kejuruteraan Pemisahan [Separation Engineering]
KMK33003	Analisis dan Instrumentasi untuk Teknologi Makanan [Analysis and Instrumentation for Food Technology]
KMK33104	Pemprosesan dan Pengawetan Makanan [Food Processing and Preservation
KMK30403	Projek Tahun Akhir I [Final Year Project I]
KMK33403	Pengurusan Sisa & Penggunaan Makanan [Food Waste Management & Utilization]
KMK33503	Reka Bentuk Loji untuk Teknologi Makanan 1 [Plant Design for Food Technology 1]
KMK33604	Sistem Pengurusan Kualiti dan Keselamatan dalam Penghasilan Makanan [Quality and Safety Management System in Food Production]
KMK30303	Pengurusan Teknologi Kejuruteraan [Engineering Technology Management]
KMK40005	Projek Tahun Akhir II [Final Year Project II]
KMK43003	Pembangunan dan Pengkomersilan Produk Makanan [Food Product Developement and Commercialization]
KMK43503	Reka Bentuk Loji untuk Teknologi Makanan 2 [Plant Design for Food Technology 2]
KMK40103	Jurutera Teknologi dalam Masyarakat [Engineering Technology In Society]
KMK33203	Teknologi Lemak dan Minyak [Fats and Oils Technology]

LIST OF COURSES:

COURSE CODE	COURSE NAME
KMK33303	Ingredien Makanan [Food Ingredients]
KMK33703	Makanan Berfungsi dan Neutraseutikal [Functional Foods and Nutraceuticals]
KMK33803	Teknologi Tenusu dand Dagin [Dairy and Meat Technology]
KMK43103	Teknologi Pembungkusan Makanan [Food Packaging Technology]
KMK43202	Teknologi Poltri dan Ikan [Poultry and Fish Technology]
KMK49912	Latihan Industri [Industrial Training]
KMK21503	Teknologi Pemprosesan Sumber Bio [Bioresource Processing Technology]
KMK21303	Proses dan Produk Oleokimia [Oleochemical Process and Products]
KMK21602	Utiliti Loji [Plant Utilities]
KMK21703	Tenaga Boleh Baharu [Renewable Enegery]
KMK31203	Kejuruteraan Alam Sekitar [Environmentall Engineering]
KMK31303	Teknologi Pemprosesan Petroleum & Gas [Petroleum & Gas Processing Technology]
KMK31603	Teknologi Pemprosesan Polimer [Polymer Processing Technology]
KMK31403	Elektrokimia Industri [Industrial Electrochemistry]
KMK31503	Peningkatan & Proses Optimasi [Scale Up & Process Optimization]
KMK31903	Projek Reka Bentuk Loji untuk Proses Kimia Industri I [Plant Design for Industrial Chemical Process I]
KMK31703	Teknologi Pemprosesan Farmaseutikal [Pharmaceutical Processing Technology]
KMK31803	Teknologi Membran Termaju dan Aplikasi [Advance Membrance Technology and Applications]
KMK32703	Teknologi Pengestrakan Sebatian Bioaktif [Bioactive Compounds Extraction Technology]

LIST OF COURSES:

COURSE CODE	COURSE NAME
KMK35002	Penyelesaian Masalah Process Loji [Process Plant Troubleshooting]
KMK41102	Jaminan Kualiti dan Kawalan dalam Kejuruteraan Kimia [Quality Assurance & Control in Chemical Engineering]
KMK41203	Teknologi Pemprosesan Polimer [Polymer Processing Technology]
KMK41403	Teknologi Pemprosesan Makanan [Food Processing Technology]
KMK41903	Projek Reka Bentuk Loji untuk Proses Kimia Industri I [Plant Design for Industrial Chemical Process II]
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]
KMK32204	Sel & Teknologi Kultur Tisu [Cell & Tissue Cell Culture]
KMK32103	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]

KMJ10103 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 problems.

KMJ10003 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 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 equations of equilibrium.

KMJ15303 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 ENGINEERING DRAWING

No of Credits: 3

Course Synopsis:
This course will introduce student to Engineering Drawing including; Basic Drafting Skills - Lines and Lettering, Circles and Arcs, Basic Dimensioning, 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 MATERIALS STRUCTURE & 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 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 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 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 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 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 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 pro**blem**

KMJ20403 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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:

1. Ability to identify engineering problems and compose research literature to reach substantiated conclusions for research projects.
2. Ability to propose research methodology incorporating clear fundamentals, theories and benchmarked against standard practices governing the research project.
3. Ability to apply health, safety and the consequence responsibilities relevant to professional engineering practice and solutions.
4. Ability to value the ethical principle to professional ethics and show responsibilities in research projects.
5. 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.
6. Ability to demonstrate clear project management in research activities planning to meet the required research objectives and deadlines.
7. Ability to perform research independently and engage in long-life learning in the broadest context of technological change

KMJ49904 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 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 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 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 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 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 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 information, using modern softwares.
3. Ability to evaluate the solutions of engineering problems related to the application of biochemistry and microbiology in the 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 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.

KMJ12501 SAINS BIOKIMIA [BIOCHEMICAL SCIENCE]

No of Credits: 1

Course Synopsis:
This course combines the study of biochemistry with microbiology. This course describes the synthesis and characterization of carbohydrates, proteins, lipids, and amino acids. This course introduces basic techniques in microbiological testing, sample preparation and analysis. This course allows students individually or in a group, to test or apply the hypotheses, collect data and take measurements accurately in the experimental tasks, analyze and interpret the results, and also evaluate and conclude the results.

Course Outcomes:
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 processes 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 sulfide 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 problems.
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 problems.

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 fundamentals of industrial valves. Basic knowledge of pumps, fans, blowers and compressors are also covered. Students are taught about ISA symbology, where they are exposed to 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 to reading and developing process flow diagrams (PFD) and also piping and instrumentation diagrams (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.

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 solutions 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.

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 gravimetry 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

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 a 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 a 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 concepts and solve 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 given in a system to provide a solution combining material and energy balance.

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 the theoretical and analytical background to solve the mass transfer operations problems. Moreover, the course introduces numerical methods to solve molecular diffusion systems.

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 solutions 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 analyse transport phenomena problems individually and can communicate in a team.

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.

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 environments.

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 to an integrated project in 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 analyze complex engineering problems in microbial systems 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.

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 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 on the development of safe working practices during laboratory exercises.
3. Ability to write a good and effective report with appropriate data analysis and presentation.

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 reactions to solve problems regarding the rate law and rate law parameters.
2. Ability to design solutions for chemical reactor conversion & sizing and to explain steady-state isothermal reactors.
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 projects 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 models of chemical processes, analyze Laplace transform techniques to simplify first order and second order processes and create 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 systems for bioprocess and chemical processes.
4. Ability to calculate and analyze dynamic behavior of closed-loop control systems.

KMJ32603 KESELAMATAN DAN PENCEGAHAN KEHILANGAN [SAFETY AND LOSS PREVENTION]

No of Credits: 3

Course Synopsis:
This course covers the fundamentals of process safety, specifically toxicology, industrial hygiene, source model, fires and explosions as well 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 explosions 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.

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 functioning as an individual, and a member or leader in a team.

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 the production process is introduced. Interpretation and simple analysis of financial statements 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.

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 of the important principles and techniques that are used in the design and analysis of various types of bioreactor systems for microbial, animal and plant cell cultures. It also covers relevant issues in the 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.

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 modeling and simulation purposes. Subsequently, sustainability assessment will be introduced, emphasizing on economic and profitability analysis.

Course Outcomes:
1. Ability to apply and analyze engineering calculations like mass and energy balance, stoichiometry and kinetics of the chemical processes.
2. Ability to analyze processes 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.

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 designed. This course also gives an understanding on the processes involved in waste treatment for different industries keeping in view 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.

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 tasks 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 the chemical 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 chemical engineering.
5. Ability to compose engineering problems and alternative solutions and formulate a sound proposal in chemical engineering project using systematic design process.

KMJ42704 REKA BENTUK LOJI KIMIA II [CHEMICAL PLANT DESIGN II]

No of Credits: 4

Course Synopsis:
This course requires students to work in a predetermined 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, optimize 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 projects 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 expectations.
3. Ability to design components, equipment, process, plant and systems in bioprocess engineering using engineering tools and design software for optimum performance.
4. Ability to display understanding of bioprocess engineering projects and integrate the design for manufacturability, utility and sustainability.
5. Ability to write a project report that conforms to engineering professional standards and to perform verbal presentation on the project.

KMJ42203 AMALAN PENGILANGAN BAIK [GOOD MANUFACTURING PRACTICE]

No of Credits: 3

Course Synopsis:
This course gives a complete overview about the production facility from the 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.

ELEKTIF 2 [ELECTIVE 2]

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 fundamentals 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 subjects 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, students 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 concepts 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 problems 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 environmentally-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 production processes.
3. Ability to propose a biofuel production process from potential biological feedstocks.

ELEKTIF 2 [ELECTIVE 2]

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 systems and propose system optimization.
3. Ability to evaluate retrofit project and its implementation

KMJ42503 KEJURUTERAAN MAKANAN [FOOD ENGINEERING]

No of Credits: 3

Course Synopsis:
This course covers a 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 the function of food processing operation and design solutions 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 pre-treatment 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, pre-treatment, 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.

ELEKTIF 3 [ELECTIVE 3]

KMJ42903 PROSES PETROKIMIA [PETROCHEMICAL PROCESS]

No of Credits: 3

Course Synopsis:
This course provides a holistic understanding of petroleum and petrochemical products manufacturing, presenting 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 include 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 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:
Ability to explain the basic concept of drug absorption and disposition and analyze the related pharmacokinetics.
Ability to explain how nutrients, phytochemicals, toxins and food processing products, including the dietary supplements and functional foods affect the body.
Ability to evaluate the pharmaceutical engineering processes in formulation and production of pharmaceutical and nutraceutical products.
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 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.

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:
1. Ability to calculate the basic concepts and principles of physics related to engineering mechanics based on static or dynamic state.
2. Ability to solve static or dynamic problems through further analysis by applying concepts and principles of describing, sketching and/or drawing free body diagrams.

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.

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 is extended for rubber engineering applications. After studying this course, the students have the basic knowledge on different types of elastomers. They also learn structure properties relationship for fabricating and designing rubber engineering products.

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.

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 associated with 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.

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 conditions to structure, properties, testing and characterisation of polymer blends.
3. Ability to conduct and assess the experiment associated with 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.

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 types 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 involving 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 KEMAHIRAN KEJURUTERAAN [ENGINEERING SKILLS]

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 TEKNOLOGI ELEKTRIK [ELECTRICAL TECHNOLOGY]

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 KIMIA ANALISIS [ANALYTICAL CHEMISTRY]

No of Credits: 3

Course Synopsis:
The first part of the course covers the basic principle of analytical chemistry which includes data analysis and its interpretation. The second part provides an introduction and application of classical analytical methods such as gravimetry and titrimetry as well as modern methods in analytical chemistry such as chromatographic and spectroscopic techniques.

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 with 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 diagrams (PFD) as well as piping and instrumentation diagrams (P&ID) using the Instrumentation Systems and Automation Society (ISA) symbology and tagging systems. Ultimately, the design and development of both PFD and P&ID of both simple and complex systems are studied and practiced.

Course Outcomes:
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 TERMODINAMIK UNTUK KEJURUTERAAN KIMIA [THERMODYNAMICS FOR CHEMICAL ENGINEERING]

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 systems.
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. CO3 - 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 the basic principles of fluid mechanics, both static and dynamics. This course emphasizes fundamental concepts and problem-solving techniques that ties theory directly to real systems 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 fluid dynamics, students will be learning general equations 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 process

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 microorganisms and disease that are contracted from the consumption of food products.

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 problems 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 PEMINDAHAN JISIM [MASS TRANSFER]

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.

KMK23103 BIOKIMIA MAKANAN [FOOD BIOCHEMISTRY]

No of Credits: 3

Course Synopsis:
This course highlighted the 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 biochemical and functional properties of food components, enzymes and food additives (emulsifiers, pigments, colours, flavours, sweeteners, preservatives, etc). Metabolism and processes of nutritive aspects 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 experiments 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 an 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 produce.
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.

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 principles and guidelines on safe design engineering and the design of relief systems. The course also emphasizes on maintenance programs, 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 KAWALAN PROSES DAN DINAMIK [PROCESS CONTROL & DYNAMICS]

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, a 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 concepts of process control and theoretical model of chemical processes.
2. Ability to evaluate and perform the dynamics behaviour of chemical processes and feedback controllers.
3. Ability to design and analyze feedback control systems for chemical processes.

KMK30203 KEJURUTERAAN PEMISAHAN [SEPARATION ENGINEERING]

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 processes.
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 processes involving vapor and liquid.

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 an 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.

KMK30403 PROJEK TAHUN AKHIR 1 [FINAL YEAR PROJECT 1]

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 the research project to meet the required research objectives and deadlines.
3. Ability to PRESENT and defend research proposals with effective communication skills.

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 a food technology processing plant. It focuses on the process synthesis of a typical food product 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 fundamentals 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

KMK33604 SISTEM PENGURUSAN KUALITI DAN KESELAMATAN DALAM PENGELUARAN MAKANAN [QUALITY & SAFETY MANAGEMENT SYSTEM IN FOOD PRODUCTION]

No of Credits: 4

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.

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 technologists 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 processes to engineering projects and business ventures.

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 a 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 a 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

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 systems.

Course Outcomes:
1. Ability to design piping and instrumentation diagrams (P&ID) using appropriate CAD tools and control systems 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 a 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.

KMK43202 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 are bound to the GHP, HACCP, Halal and food regulations standard. It will also cover 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.

KMK40103 JURUTERA TEKNOLOGI DALAM MASYARAKAT [ENGINEERING TECHNOLOGY 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. Introduction the nature to enable engineering technologists to appreciate factors that have to be taken into account in decision-making. Examine and assess issues and challenges faced by engineering 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 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 the community.

KMK49912 LATIHAN INDUSTRI [INDUSTRIAL TRAINING]

No of Credits: 12
Course Synopsis:
This practical-based course exposes students to a company's 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 increase 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 the 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 an individual, a member or leader in diverse technical teams.
6. Ability to communicate and operate assigned tasks given by the host company.
7. Ability to engage in independent and lifelong learning in specialist technologies

KMK21303 PROSES DAN PRODUK OLEOKIMIA [OLEOCHEMICAL PROCESS AND 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 aims to enrich students with the knowledge of bioresource utilization. The course includes 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 the bioresource industry as renewable resources and to and distinguish the different types of bioresources processing technology.
2. Ability to evaluate the application and environmental impact and economic factor of this renewable resource.
3. Ability to conduct guided experiments and open-ended experiments regarding bioresource processing technology.

KMK21602 UTILITI LOJI [PLANT UTILITIES]

No of Credits: 3

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, steam-heating and inert gas in a chemical plant.
2. Ability to evaluate the principle involving air, refrigerant and vacuum pump compressor, with their applications.
3. Ability to conduct experiments related to plant utilities based on the procedures according to the objectives outlined

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 Intoblofuels. 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 gain knowledge on the principle and the environmental aspect of renewable energy.
2. Ability to evaluate the different types of renewable energy resources.
3. Ability to follow the lab works of biomass energy processes in producing biofuels.

KMK31203 KEJURUTERAAN ALAM SEKITAR [ENVIRONMENTAL ENGINEERING]

No of Credits: 3

Course Synopsis:
This course introduces the cause, effect and method to control pollution from Industries. The course covers the three major categories of industrial pollution; water pollution, air pollution and industrial waste management. In the first part, the course includes the source and types of water pollutants, environmental regulations pertaining to waste water discharge, and techniques to treat wastewater before discharging to the environment. The second part of the course covers the source and effect of air pollution, regulations requirements for air pollution control, and technology to control air pollution emissions from industries. The third part covers the management of industrial waste that includes definition of scheduled waste, scheduled waste regulations, and techniques to manage the waste.

Course Outcomes:
1. Ability to apply knowledge of legislative act for waste management in industry.
2. Ability to analyze types of pollution emission from Industries and effect of industrial pollution to the environment and public health.
3. Ability to evaluate air pollution control and wastewater treatment systems.

KMK31303 TEKNOLOGI PEMPROSESAN PETROLEUM DAN GAS [PETROLEUM AND 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.

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.
4. Ability to present the resolution of electrometallurgy and hydrometallurgy techniques with environmental and economic concern.

KMK31503 PENINGKATAN DAN PROSES OPTIMASI [SCALE UP AND 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.

KMK31903 PROJEK REKA BENTUK UNTUK PROSES KIMIA INDUSTRI I [PLANT DESIGN PROJECT FOR INDUSTRIAL CHEMICAL PROCESS]

No of Credits: 3

Course Synopsis:
This course contains the preliminary design of industries chemical process plants. 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. This course contains the preliminary design of industrial chemical process plants. 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,
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 develop communication skills.
5. Ability to monitor project management and appraise the needs and life-long learning in industrial chemical process project design.

KMK32703 TEKNOLOGI PENGESTRAKAN SEBATIAN BIOAKTIF [BIOACTIVE COMPOUNDS EXTRACTION TECHNOLOGY]

No of Credits: 3

Course Synopsis:
The course discusses various sources of natural bioactive compounds 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 analyses to obtain high quality and purified compounds.

KMK31603 TEKNOLOGI PEMPROSESAN POLIMER [POLYMER PROCESSING TECHNOLOGY]

No of Credits: 3

Course Synopsis:
This course intends to give students fair knowledge of the fundamentals 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 the processing technology of the polymer which comprises mixing, extrusion and various types of moulding. The laboratory session consists of polymer synthesis, characterisation of physical and mechanical properties as well as 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 follow analytical techniques and modern engineering tools for polymer characterization and polymer processing and work in a group

KMK41102 JAMINAN KUALITI DAN KAWALAN DALAM KEJURUTERAAN KIMIA [QUALITY ASSURANCE & CONTROL IN CHEMICAL ENGINEERING]

No of Credits: 2

Course Synopsis:
This course covers the principles of quality control that can be applied in related fields of chemical engineering. The course covers related processes and standards commonly used in industry. The course also discusses the statistical method and acceptance sampling as tools and techniques that are 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, apply and present the processes in quality assurance and quality control with statistical methods.
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:
1. Ability to solve and analyse various problems related to the particles/particulate-systems/process and particle equipment design.
2. Ability to apply the particle system/equipment for handling of particle related processes in operation.
3. Ability to function effectively in a group/team to plan and prepare the technical/lab report related to the particles/particulate systems/process.

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 the nutritional properties of food.
3. Ability to evaluate the problems involved in food production.

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) in conjunction with the control system and engineering economic knowledge consisting 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 diagrams (P&ID) and control systems for industrial biotechnology process plants by demonstrating 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-lona learning in project design.

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 advanced topics in production, isolation, purification, immobilization, and application of enzymes in 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 enzyme 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

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 techniques 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

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. CO3 - 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 techniques in processing, manufacturing, and evaluating biopharmaceuticals in a group project.

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 systems 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 systems 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.

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 is 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 possessed by the students

Course Outcomes:
CO1 - Ability to assess the commercial aspects of biotechnology products
CO2 - Ability to select a potential product and prepare a business plan for that particular product
CO3 - Ability to appraise 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

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 an industrial process plant.

Course Outcomes:
1. Ability to develop piping and instrumentation diagrams (P&ID) and control system for industrial biotechnology process plant by demonstrating an appropriate software tool.
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.

FACULTY OF CIVIL ENGINEERING & TECHNOLOGY (FKTA)

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

UR6526001
Bachelor of Civil Engineering with Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
Graduates who have demonstrated career advancement in the field of Civil Engineering or related engineering field.

PEO 2
Graduates who are involved in a professional body or society

PEO 3
Graduates who pursue life-long learning.

PROGRAMME OUTCOMES (PO)

PO1
Engineering Knowledge: Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to the solution of complex engineering problems.

PO2
Problem Analysis: Identify, formulate, research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences. (WK1 to WK4)

PO3
Design/ development of solutions: Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations. (WK5)

PO4
Investigation: Conduct investigations of complex problems using research-based knowledge (WK8) and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

PO5
Modern Tool Usage: Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations. (WK6)

PO6
The Engineer and Society: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems. (WK7)

PO7
Environment and Sustainability: Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts. (WK7)

PO8
Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice. (WK7)

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

PO10
Communication: 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
Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12
Lifelong learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

CURRICULUM STRUCTURE
UR6526001 BACHELOR OF CIVIL ENGINEERING WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	1	2	3	4	5	6	BREAK	7	8
DISCIPLINE CORE & ELECTIVE COURSES (105 CREDITS)	AMJ11004 Statics & Dynamics *a*	AMJ10903 Computer Programming	AMJ20103 Structural Theoryc	AMJ20504 Soil Mechanicse	AMJ30104 Geotechnical Engineering*f*	AMJ30604 Highway & Transportation Engineering	AMJ3990 5 Industrial Training	AMJ40103 Industrialized Building System	AMJ40004 Final Year Project II
	AMJ10202 Engineering Geology	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	AMJ4XX03 Elective II
	AMJ10304 Geomatic Engineering	AMJ10503 Civil Engineering Skills	AMJ20303 Building Material Engineering	AMJ20703 Structural Analysis I*d*	AMJ30303 Structural Analysis II	AMJ30804 Water & Wastewater Engineering		AMJ4XX03 Elective I	AMJ48103 Integrated Design Project II*h*
			AMJ20403 Engineering Drawing	AMJ20803 Hydraulics	AMJ30403 Construction Management	AMJ30903 Reinforced Concrete Structures Design II		AMJ47103 Integrated Design Project I*g*	
					AMJ30503 Hydrology & Water Resources Engineering			AMJ40203 Construction Contract, Estimating & Finance	
COMMON CORE COURSES (14 CREDITS)	QMQ10103 Engineering Mathematics I	QMQ10203 Engineering Mathematics II	QMQ20303 Engineering Mathematics III	QMQ27103 Engineering Statistics					AMJ40302 Professional Engineers
UNIVERSITY REQUIREMENT COURSES (16 CREDITS)	SMZ1XX01 Co-Curriculum I	SMZ2XX01 Co-Curriculum II	SMU22402 Engineering Entrepreneurship	SMB31202 English for Technical Communication		SMU12102 Integrity and Anti Corruption[3]		SMU13002 Philosophy and Current Issues	SMU13102 Appreciation of Ethics & Civilization
	SMB10102 Preparatory English[1]	SMB41002 University Malay Language[4]							
		SMB20102 English for General Communication[2]							
TOTAL CREDITS (135 CREDITS)	14	18	18	18	16	16	5	16	14

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, AMJ41303 Civil /Environmental Engineers for Society

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] International students should register SMU13202 Malaysian Studies.
[4] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course.

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*
COURSE *g* IS A PRE-REQUISITE TO COURSE *h*

ENGINEERING PROGRAMME

UR6526002
Bachelor of Environmental Engineering with Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
Graduates who have developed career advancement in the field of Environmental Engineering or related engineering field.

PEO 2
Graduates who are involved in a professional body or society

PEO 3
Graduates who pursue life-long learning.

PROGRAMME OUTCOMES (PO)

PO1
Engineering Knowledge: Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to the solution of complex engineering problems.

PO2
Problem Analysis: Identify, formulate, research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences. (WK1 to WK4)

PO3
Design/ development of solutions: Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations. (WK5)

PO4
Investigation: Conduct investigations of complex problems using research-based knowledge (WK8) and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

PO5
Modern Tool Usage: Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations. (WK6)

PO6
The Engineer and Society: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems. (WK7)

PO7
Environment and Sustainability: Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts. (WK7).

PO8
Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice. (WK7)

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

PO10
Communication: 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
Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12
Lifelong learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

CURRICULUM STRUCTURE
UR6526002 BACHELOR OF ENVIRONMENTAL ENGINEERING WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		THIRD			FOURTH	
SEMESTER	1	2	3	4	5	6	BREAK	7	8
DISCIPLINE CORE & ELECTIVE COURSES (107 CREDITS)	AMJ10604 Environmental Chemistry	AMJ10903 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 Mechanical 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
		AMJ10503 Civil Engineering Skills	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
		AMJ10803 Fundamental of Chemical Processes	AMJ21203 Environmental Engineering Skills[c]	AMJ21603 Environmental Transport Processes	AMJ31303 Environmental Impact Assessment	AMJ31704 Wastewater Engineering		AMJ 40503 Environmental Remediation	AMJ40302 Professional Engineers
						AMJ31804 Air Pollution Control Engineering		AMJ47203[e] Integrated Environmental Engineering Design Project I	
COMMON CORE COURSES (12 CREDITS)	QMQ10103 Engineering Mathematics I	QMQ10203 Engineering Mathematics II	QMQ20303 Engineering Mathematics III	QMQ27103 Engineering Statistics					
UNIVERSITY REQUIREMENT COURSES (16 CREDITS)	SMZXXX01 Co-Curriculum	SMZ2XX01 Co-Curriculum II		SMB31202 English for Technical Communication	XXXXXX02 Option Subject	SMU12102 Integrity and Anti-Corruption [3]		SMU13002 Philosophy and Current Issues	SMU13102 Appreciation of Ethic and Civilization
	SMB41002 University Malay Language [4]	SMB20102 English for General Communication [2]		SMU22402 Engineering Entrepreneurship					
	SMB10102 Preparatory English [1]								
TOTAL CREDITS (135 CREDITS)	14	17	16	19	15	19	5	16	14

ELECTIVES 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 Engineer for Society

COURSE [a] IS A PRE-REQUISITE TO COURSE [b]
COURSE [c] IS A PRE-REQUISITE TO COURSE [d]
COURSE [e] IS A PRE-REQUISITE TO COURSE [f]

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] International students should register SMU13202 Malaysian Studies.
[4] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course.

ENGINEERING TECHNOLOGY PROGRAMME

UR6526003
Bachelor of Civil Engineering Technology (Construction) with Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
Engineering technology graduates engaged in the field of civil engineering technology as demonstrated through career advancement

PEO 2
Engineering technology graduates who are members and contribute to professional society

PEO 3
Engineering technology graduates embracing in life-long learning or pursuing continuing education opportunities

PEO 4
Engineering technology graduates who are technopreneurs

PROGRAMME OUTCOMES (PO)

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

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

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

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

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

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

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

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

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

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

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

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

CURRICULUM STRUCTURE
UR6526003 BACHELOR OF CIVIL ENGINEERING TECHNOLOGY (CONSTRUCTION) WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		THIRD		FOURTH	
SEMESTER	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
DISCIPLINE CORE & ELECTIVE COURSES (110 CREDITS)	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	AMK20203* 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 I AMK3XX03	Elective II AMK3XX03	Elective III AMK3XX03	
				AMK21104* Geotechnics				
COMMON CORE COURSES (12 CREDITS)	QMQ11103 Mathematics for Engineering Technology I	QMQ11203 Mathematics for Engineering Technology II	QMQ21303 Mathematics for Engineering Technology III		AMK31203 Civil Engineering Technologist in Society			
UNIVERSITY REQUIREMENT COURSES (18 CREDITS)	SMU13002 Philosophy and Current Issues	SMB41002 University Malay Language [5]			SMU22402 Engineering Entrepreneurship			
	SMB10102 Preparatory English[1]	SMB20102 English for General Communication [2]	SMB31202 English for Technical Communication [3]	SMU13102 Appreciation of Ethics and Civilization				
	SMU32202 Thinking Skills	***SMB1XX02 Option Subject (Foreign Language)						
	SMU12102 Integrity and Anti-Corruption [4]							
	SMZXXXX1 Co-Curriculum 1	SMZXXXX1 Co-Curriculum 2						
TOTAL CREDITS (140 CREDITS)	**19**	**19**	**19**	**20**	**19**	**16**	**16**	**12**

[1] MUET Band 2: SMB10102 Preparatory English > SMB20102 English for General Communication> SMB31202 English for Technical Communication, *Optional Course is NOT COMPULSORY.
[2] MUET Band 3: SMB20102 English for General Communication > SMB31202 English for Technical Communication, *Optional Course is NOT COMPULSORY
[3] MUET Band 4 and above: SMB31202 English for Technical Communication, *Optional Course is COMPULSORY
[4] International students should register SMU13202 Malaysian Studies.
[5] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course.

Elective I : AMK30503 Financial & Human Resource Management, AMK30603 Building Survey.
Elective II : AMK31003 Construction Technology of Highway & Bridge, AMK31103 Construction Risk Management.
Elective III : AMK40303 Advanced Structural Design, AMK40403 Construction Technology of Highrise Building, AMK40503 Building Maintenance Information System, AMK40603 Structural Inspection and Repair

**Course with prerequisite

Course	Prerequisite
AMK10503	AMK10102
AMK20203	AMK10603
AMK20602	AMK20102
AMK21104	AMK20303
AMK40006	AMK30004

TECHNOLOGY PROGRAMME

UR6582001
Bachelor of Technology in Building Construction with Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
To produce building construction technologist that able to perform construction works related building technology.

PEO 2
To produce technopreneurs in building construction related technology.

PEO 3
To produce relevant, respected and referred professionals in building construction technology.

PROGRAMME OUTCOMES (PO)

PO1
Apply knowledge of technology fundamentals to broadly-defined procedures, processes, systems and methodologies in building construction.

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

PO3
Demonstrate strong analytical and critical thinking skills to solve broadly-defined problems in building construction.

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

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

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

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

PO8
Demonstrate professionalism and social and ethical consideration.

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

CURRICULUM STRUCTURE
UR6582001 BACHELOR OF TECHNOLOGY IN BUILDING CONSTRUCTION WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		THIRD			FOURTH
SEMESTER	1	2	3	4	5	6	7	8
COMMON CORE (104 CREDITS)	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	AMT30010 Bachelor Degree Project		AMT40112 Industrial Training
	AMT10206 Building Services Technology 1	AMT10405 Building Service Technology 2	AMT20206 Construction Project Management	AMT20504 Safety, Health And Environmental Management	AMT30206 Building Information Modelling	AMT30405 Building Requirement and Law		
		AMT10503 Industrial Revolutions	AMT20303 Psychology in Industry	AMT20604 Construction Value Estimation and Procurement	AMT30304 Technopreneur Project 2	AMT30505 Building Assessment and Reporting		
				AMT20704 Technopreneur Project 1				
UNIVERSITY REQUIREMENT COURSES (18 CREDITS)	SMZXXX01 Co-Curriculum I	SMZXXX01 Co-Curriculum II	SMB11X02 Third Language [3]	SMU22402 Engineering Entrepreneurship	SMU13102 Appreciation of Ethics and Civilization			
	SMB41002 University Malay Language [5]	SMU13002 Philosophy and Current Issue	SMB31202 English for Technical Communication					
	SMB10102 Preparatory English [1]	SMB20102 English for General Communication [2]						
	SMU12102 Integrity and Anti-Corruption [4]							
TOTAL CREDITS (122 CREDITS)	**17**	**18**	**19**	**18**	**18**	**14**	**6**	**12**

Notes:

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] SMB1XX02: Jerman, Mandarin, Japan or etc.
[4] International students should register SMU13202 Malaysian Studies.
[5] International students other than Indonesia, Singapore and Brunei should register the SMB11002 Basic Malay Language course.

LIST OF COURSES:

COURSE CODE	COURSE NAME
AMJ11004	Statik & Dinamik [Statics and Dynamics]
AMJ10202	Geologi Kejuruteraan [Engineering Geology]
AMJ10304	Kejuruteraan Geomatik [Geomatic Engineering]
AMJ10404	Kekuatan Bahan [Strength of Materials]
AMJ10503	Kemahiran Kejuruteraan Awam [Civil Engineering Skills]
AMJ10903	Pengaturcaraan Komputer [Computer Programming]
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]
AMJ30104	Kejuruteraan Geoteknik [Geotechnical Engineering]
AMJ30203	Rekabentuk Struktur Konkrit Bertetulang I [Reinforced Concrete Structures 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]

LIST OF COURSES:

COURSE CODE	COURSE NAME
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]
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]
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]

LIST OF COURSES:

COURSE CODE	COURSE NAME
AMJ47103	Reka Bentuk Projek Berintegrasi I [Integrated Design Project I]
AMJ48103	Reka Bentuk Projek Berintegrasi II [Integrated Design Project II]
AMJ21303	Hydrologi [Hidrology]
AMJ10104	Mekanik Dan Kejuruteraan Bahan [Mechanics And Material Engineering]
AMJ10604	Kimia Persekitaran [Environmental Chemistry]
AMJ10704	Ekologi Asas [Basic Ecology]
AMJ10803	Asas Proses Kimia [Fundamental of Chemical Process]
AMJ20904	Mekanik Bendalir Dan Hidraulik [Fluids Mechanic and Hydraulics]
AMJ21003	Termodinamik [Thermodynamics]
AMJ21103	Asas Kejuruteraan Alam Sekitar [Fundamental Of Environmental Engineering]
AMJ21203	Kemahiran Kejuruteraan Alam Sekitar [Environmental Engineering Skills]
AMJ21403	Perundangan Alam Sekitar, Kesihatan Dan Keselamatan [Environmental Law, Health And Safety]
AMJ21503	Kejuruteraan Geopersekitaran [Geoenvironmental Engineering]
AMJ21603	Proses Pengangkutan Persekitaran [Environmental Transport Process]
AMJ31004	Pemindahan Jisim [Mass Transfer]
AMJ31103	Kejuruteraan Sumber Air [Water Supply Engineering]
AMJ31203	Kejuruteraan Sisa Pepejal Dan Sisa Berbahaya [Solid And Hazardous Waste Engineering]
AMJ31303	Penilaian Kesan Alam Sekitar [Environmental Impact Assessments]
AMJ31403	Kejuruteraan Pencemaran Hingar [Noise Pollution Engineering]

LIST OF COURSES:

COURSE CODE	COURSE NAME
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 Kawalan Pencemaran Udara [Air Pollution Control Engineering]
AMJ40403	Pengurusan Projek Kejuruteraan [Engineering Project Management]
AMJ40503	Remediasi Sekitaran [Environmental Remediation]
AMJ41503	Remote Sensing [Penderiaan Jauh]
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	Environmental Risk Assessment [Penilaian Risiko Alam Sekitar]
AMJ47203	Reka Bentuk Projek Kejuruteraan Alam Sekitar Berintegrasi I [Integrated Environmental Engineering Design Project I]
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]
AMK10402	Lukisan Teknikal [Technical Drawing]

LIST OF COURSES:

COURSE CODE	COURSE NAME
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 Hydraulic]
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]
AMK31003	Teknologi Lebuhraya Dan Jambatan [Highway and Bridge Technology]
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]

LIST OF COURSES:

COURSE CODE	COURSE NAME
AMK30402	Pentadbiran Kontrak dan Tapak [Contract and Site Administration]
AMK30503	Pengurusan Kewangan dan Sumber Manusia [Financial and Human Resource Management]
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]
AMK30903	Asas Kejuruteraan dan Pengurusan Alam Sekitar [Basic Environmental Engineering and Management]
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 [Construction Technology of Highrise Building]
AMK40503	Sistem Maklumat Penyelenggaraan Bangunan [Building Maintenance Information System]
AMK40603	Pemeriksaan Dan Pembaikan Struktur [Structural Assessment and Repair]
AMK49912	Latihan Industri [Industrial Training]
AMT10106	Building Technology 1 [Teknologi Bangunan 1]
AMT10206	Building Services Technology 1 [Teknologi Perkhidmatan Bangunan 1]

LIST OF COURSES:

COURSE CODE	COURSE NAME
AMT10305	Building Technology 2 [Teknologi Bangunan 2]
AMT10405	Building Services Technology 2 [Teknologi Perkhidmatan Bangunan 2]
AMT10503	Industrial Revolutions [Revolusi Perindustrian]
AMT20106	Project Quality Management [Pengurusan Kualiti Projek]
AMT20206	Construction Project Management [Pengurusan Projek Pembinaan]
AMT20303	Psychology In Industry [Psikologi Dalam Industri]
AMT20404	Human Resource And Professional Ethics [Sumber Manusia Dan Etika Profesional]
AMT20504	Safety, Health And Environmental Management [Pengurusan Keselamatan, Kesihatan Dan Alam Sekitar]
AMT20604	Construction Value Estimation And Procurement [Anggaran Nilai Pembinaan Dan Perolehan]
AMT20704	Project Technopreneur 1 [Teknousahawan Projek 1]
AMT30106	Demolition And Construction Waste Management [Pengurusan Perobohan Dan Sisa Pembinaan]
AMT30206	Building Information Modelling [Pemodelan Maklumat Bangunan]
AMT30304	Project Technopreneur 2 [Teknousahawan Projek 2]
AMT30405	Building Requirements And Law [Keperluan Dan Undang-Undang Bangunan]
AMT30505	Building Assessment And Reporting [Penilaian Dan Pelaporan Bangunan]
AMT30010	Final Year Project [Projek Tahun Akhir]
AMT40112	Industrial Training [Latihan Industri]

AMJ11004 STATIK & DINAMIK [STATICS & DYNAMICS]

No of Credits: 4

Course Synopsis:
This course introduces engineering students to the analysis of basic static and dynamic objects and systems encountered in engineering practice. It introduces force systems, simple structural elements and principles of work and energy. Scope of the study includes center of gravity, moment of inertia of a body and impulse and momentum of a rigid body. At the end of the course, students should be able to apply theory and practical to solve problems related to the scope of static and dynamic.

Course Outcomes:
1. Ability to apply the knowledge of statics and dynamics.
2. Ability to analyze statics and dynamics engineering problems.
3. Ability to assess the principles of statics and dynamics engineering through laboratory.

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.

AMJ10903 PENGATURCARAAN KOMPUTER [COMPUTER PROGRAMMING]

No of Credits: 4

Course Synopsis:
This course is designed to expose students to the basic programming concept using computer programming language, which is suitable for the current computer operating system. It emphasises the general idea of computer programming, including problem-solving analysis and programming concept including variables, operators, control structures, function, arrays and pointers.

Course Outcomes:
1. Ability to apply computer programming concepts and principles.
2. Ability to use GNU/LINUX compiler for coding, compiling, executing and debugging computer programs.
3. Ability to analyse solution for engineering related problems using computer programming techniques.

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.
2. Ability to evaluate civil engineering problems using fluid mechanics principles.
3. 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.

AMJ21303 HYDROLOGI [HIDROLOGY]

No of Credits: 3

Course Synopsis:

This course introduces the fundamental of hydrological process such as hydrologic cycle, precipitation, evaporation, transpiration, evapotranspiration and infiltration. Students will be introduced to equations to calculate, and equipments 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, land use, 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. Usage and derivation of Unit Hydrograph will also be included.

Course Outcomes:
1. Ability to examine the scenario of hydrological cycle.
2. Ability to analyze the problem related to hydrology.
3. Ability to DESIGN basic stormwater management using prescribed manual.

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 evaluate the design of reinforced concrete structures.

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.

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.

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 analyze sub-structure engineering and difficult soil problems.
2. Ability to design the foundations and retaining walls.
3. Ability to explain the 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 UNTUK MASYARAKAT [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 embed SULAM element align with KPM inspiration. Student will be placed in 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 collaborative environment 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 combine theory and practice in the society and the consequent responsibilities relevant to Civil/Environmental engineering practice and solution to complex engineering problems.
2. Ability to perform 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

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 todesign a real civil engineering project. In this course, students are required to integrate their knowledge of civil engineering disciplines such asgeotechnical engineering, structural engineering, water supply engineering, and highway engineering. This course also emphasizes projectmanagement and economic evaluation in the conceptual design phase. This course is an actual example of the implementation of complex problemsolving 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 project 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.
6. Ability to evaluate knowledge and understanding of engineering management principles and economics evaluation to manage civil 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.

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. Ability to analyse mechanics and materials engineering problems based on its properties and structures.
3. Ability to assess the principles of mechanics and material engineering through laboratory experiments.

AMJ10604 KIMIA PERSEKITARAN [ENVIRONMENTAL CHEMISTRY]

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 EKOLOGI ASAS [BASIC ECOLOGY]

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/microrganism in ecosystems.
2. Ability to determine energy flow of ecosystems, biochemistry and metabolism pathways of microorganisms in soil, water and wastewater treatment.
3. Ability to analyze the population of organism and microorganisms' growth.

AMJ10803 ASAS PROSES KIMIA [FUNDAMENTAL OF CHEMICAL PROCESS]

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 analyze the basic process calculation and process system variables.
2. Able to evaluate material and energy balances on nonreactive processes and reactive multiple-unit processes.

AMJ20904 MEKANIK BENDALIR DAN HIDRAULIK [FLUIDS MECHANIC AND HYDRAULICS]

No of Credits: 4

Course Synopsis:

This course provides student knowledge in the patterns of movement of fluid particles. By the end of this subject student will be expected to understand the basic characteristics of fluid mechanics and fluid statics, be able to analyze the hydrostatics and basic hydrodynamics in fluid. Student also will be able to analyze and differentiate between the flow in pipe and flow in open channels.

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 analyze experiments associated with fluid mechanics and hydraulic engineering

AMJ21003 TERMODINAMIK [THERMODYNAMICS]

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 ASAS KEJURUTERAAN ALAM SEKITAR [FUNDAMENTAL OF ENVIRONMENTAL ENGINEERING]

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 KEMAHIRAN KEJURUTERAAN ALAM SEKITAR [ENVIRONMENTAL ENGINEERING SKILLS]

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 to produce maps and engineering drawings.
2. Ability to select the suitable method and/or technique of surveying, mapping, and engineering drawing in solving environmental related problems.
3. Ability to demonstrate the proper use of equipment and/or software in surveying, mapping, and engineering drawing

AMJ21403 PERUNDANGAN ALAM SEKITAR, KESIHATAN DAN KESELAMATAN [ENVIRONMENTAL LAW, HEALTH AND SAFETY]

No of Credits: 3

Course Synopsis:

In the promotion of environmentally sound and sustainable development, our country has established the necessary legal and institutional arrangements such that environmental factors are considered for the establishment of business/industry in the country. In this course, the student will be exposed to the knowledge and ethical principles of Environmental, Health, and Safety Legislation in Malaysia. The student will be able to evaluate the issues and the need for Environmental, Health, and Safety Legislation related to occupational safety and health management.

Course Outcomes:

1. Ability to analyse the knowledge and ethical principles of Environmental, Health and Safety legislation in Malaysia
2. Ability to evaluate independently the knowledge by using the broadest context of technological change and recognize the need for Environmental, Health, and Safety Legislation.

AMJ21503 KEJURUTERAAN GEOPERSEKITARAN [GEOENVIRONMENTAL ENGINEERING]

No of Credits: 3

Course Synopsis:
This course presents the principles of geoenvironmental engineering. It covers the chemical and geo-chemistry background of soil, rock classification and groundwater flow. This course also discusses the sources of contaminants and available remediation technologies, which are widely used for groundwater treatment. Global environmental problems pose a challenge to the geoenvironmental engineering profession. In particular, the safe disposal of hazardous solid waste. Concerns should be focused on the requirements and criteria should be established for the safety of public health and the environment.

Course Outcomes:

1. Ability to determine basic principle of geoenvironmental engineering.
2. Ability to evaluate the basic principle of remediation technologies for contaminated land.

AMJ21603 PROSES PENGANGKUTAN PERSEKITARAN [ENVIRONMENTAL TRANSPORT PROCESS]

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 analyze basic concept of transport phenomena toward in depth understanding in environmental transport processes
2. Ability to evaluate models of physical, chemical and biological transport process in the environment
3. Ability to display model of environmental transport process using modern tools

AMJ31004 PEMINDAHAN JISIM [MASS TRANSFER]

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 KEJURUTERAAN SUMBER AIR [WATER SUPPLY ENGINEERING]

No of Credits: 3

Course Synopsis:
This course will be focused on water sources and usage, method on estimating water demand, water quality characteristics and legislation, conventional and advanced water treatment processes, water distributions and reticulation systems. Special focus will be given on the design water treatment unit, applying the design guidelines of water supply system which is applied in Malaysia.

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 KEJURUTERAAN SISA PEPEJAL DAN SISA BERBAHAYA [SOLID AND HAZARDOUS WASTE ENGINEERING]

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 PENILAIAN KESAN ALAM SEKITAR [ENVIRONMENTAL IMPACT ASSESSMENTS]

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 KEJURUTERAAN PENCEMARAN HINGAR [NOISE POLLUTION ENGINEERING]

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 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 KESIHATAN AWAM DAN HIGIN PEKERJAAN [PUBLIC HEALTH AND OCCUPATIONAL HYGIENE]

No of Credits: 3

Course Synopsis:
Public health and occupational hygiene are two interrelated studies. This course is divided into two sections that covers 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 evaluate a base of knowledge in the hazards related to public health
2. Ability to discuss the theoretical, engineering and control aspects for the prevention of occupational hygiene related issues
3. Ability to present the outcome of group work on related issues in public health /occupational hygiene
4. Ability to function effectively as an individual, and as a member or leader in group work on specific scope of public health /occupational hygiene

AMJ31603 SISTEM PENGURUSAN ALAM SEKITAR [ENVIRONMENTAL MANAGEMENT SYSTEM]

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. Ability to assess the requirements for environmental management, monitoring and auditing.
2. Ability to evaluate the environmental aspect and impact of human work processes that may result in adverse effects on the environment
3. Ability to distinguish suitable tools and methods in making an ethical and responsible environmental decision

AMJ31704 KEJURUTERAAN AIR SISA [WASTEWATER ENGINEERING]

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. Ability to analyse the suitable unit process in wastewater engineering
2. Ability to design unit process applied in wastewater treatment
3. Ability to propose on engineering management principles and cost evaluation of the waste water treatment plant/unit
4. Ability to conduct experiment associated with wastewater treatment process.

AMJ31804 KEJURUTERAAN KAWALAN PENCEMARAN UDARA [AIR POLLUTION CONTROL ENGINEERING]

No of Credits: 4

Course Synopsis:
Air pollution damages human health, ecosystems and vegetation, and is expected to worsen in many regions. Because Malaysia, an industrialising country, is developing quickly, it has to contend with increasing air pollution generated predominantly by transport and industry. Therefore, the Regulations of the Environmental Quality (Clean Air) Regulation 2014 was gazetted on June 2014, further make provisions for: monitoring of air pollution control system, maintenance of records, license required to contravene acceptable conditions for emitting emissions into atmosphere, offences and penalties. The regulation also highlighted that every premises shall be equipped with an air pollution control system in accordance with the specifications and ensure that all components of the air pollution control system are in good working condition. Thus, this course is developed to provide a comprehensive understanding of the causes and effects of air pollution, and the management measures and engineering technologies available for its control. In addition, meteorological aspects which control the transport of air pollutants will also be discussed in this course. The laboratory activities will be also incorporated to enhance the understanding on the key parameters that influence the air pollution control system and design.

Course Outcomes:
1. Ability to discuss the behaviour of meteorological conditions and their influence in modelling the air dispersion via the Gaussian Plume Model
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 conclude the effect of key parameters that may influence air pollution control systems efficiencies for a particular application supported by research-based knowledge and research methodologies
5. Ability to evaluate the environmental, societal, and economic impacts within a system, component and/or process in the air pollution control system

AMJ40403 PENGURUSAN PROJEK KEJURUTERAAN [ENGINEERING PROJECT MANAGEMENT]

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 REMEDIASI SEKITARAN [ENVIRONMENTAL REMEDIATION]

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.

AMJ41503 REMOTE SENSING [PENDERIAAN JAUH]

No of Credits: 3

Course Synopsis:
The course introduces the principle of remote sensing for earth observation. Remote sensing is the acquisition of information about an object or phenomenon, without making physical contact with the object. Space-based observation usually consist of measurements of electromagnetic (EM) radiation made by sensors at times and locations by the mechanics of satellite orbits. 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, platforms and sensors also its applications. There are many applications of remote sensing in the domains of environmental science, policy and treaty verification, military applications, meteorology, oceanography, agriculture and ecology. The characteristic of various system in particular: passive and active remote sensing (physical principles of the visible, infrared and microwave section of the electromagnetic spectrum.

Course Outcomes:
1. Ability to evaluate the basic concept of remote sensing.
2. Ability to justify the various system of remote sensing.
3. Ability to manipulate environmental data by using digital image processing.

AMJ41603 KAWALAN PROSES SEKITARAN DAN INSTRUMENTASI [ENVIRONMENTAL PROCESS CONTROL AND INSTRUMENTATION]

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 KEJURUTERAAN AIR SISA TERMAJU [ADVANCED WASTEWATER ENGINEERING]

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 INFORMATIK SEKITARAN [ENVIRONMENTAL INFORMATICS]

No of Credits: 3

Course Synopsis:
Environmental informatics plays an important role in environmental decision making. It investigates the development of effective techniques to deliver comprehensive and reliable information for environmental research, management and public awareness. This assimilates expertise and technologies as well as 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 evaluate the relevant environmental data into reliable information and knowledge for decision making.
3. Ability to manipulate environmental data into decision making information by using statistical anlysis or tools.

AMJ41903 ALAM BINA [BUILT ENVIRONMENT]

No of Credits: 3

Course Synopsis:
This course introduces students to the environmental issues that pervade the built environment and, as a result, influence sustainable design. This is followed by a thorough and systematic evaluation of the designs of energy-efficient buildings, including thermal control, thermal dynamics, green architecture, thermal insulation, ventilation, lighting, and acoustics. At the end of the course, the students are expected to be able to solve engineering problems related to the holistic design of a building, its internal environment, and the system required 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 justify the critical planning solutions to built environment that promote healthier communities and sustainable development

AMJ42003 TENAGA LESTARI [SUSTAINABLE ENERGY]

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 analyze the concept of sustainable energy and relate to a real-world project
2. Ability to assess the potential of different renewable energy approaches as alternative energy
3. Ability to evaluate the present and future energy needs and options for alternative energy sources.

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.

AMJ47203 REKA BENTUK PROJEK KEJURUTERAAN ALAM SEKITAR BERINTEGRASI I [INTEGRATED ENVIRONMENTAL ENGINEERING DESIGN PROJECT 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. CO4 - Ability to function as an individual and as a member or leader in diverse teams.
5. Ability to communicate 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.

AMJ48203 REKA BENTUK PROJEK KEJURUTERAAN ALAM SEKITAR BERINTEGRASI II [INTEGRATED ENVIRONMENTAL ENGINEERING DESIGN PROJECT 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 communicate 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 Kirchhoff's 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 TEKNIK [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 calculate the deformation, shear and bending moment, stress and strain reaction of structural member under axial load.
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 and differentiate between the flow in pipe and flow in open channels.

Course Outcomes:
1. Ability to analyse and solve various fluid properties, 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, Centre of Pressure, Buoyancy, 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, Centre 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, levelling, 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 concept of geomatic consist of vertical and horizontal control, angle measurement, traversing, tacheometry and cut and fill
2. Ability to solve in written, geomatic measurement problem by applying appropriate technique in geomatic
3. Ability to conduct survey using appropriate geomatics instrument according to professional practice

AMK10802 LUKISAN PEMBINAAN [CONSTRUCTION DRAWING]

No of Credits: 2

Course Synopsis:
This course equips student with drafting skills in preparing the construction drawing either manually or by computer-aided software. Besides that, it enables student to interpret the details of construction drawing which has been used for the purpose of building construction process.

Course Outcomes:
1. Ability to drawing up the construction drawing layout and specification of a building through manual drafting
2. Ability to demonstrate the proficiency of using computer-aided 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 trusse

AMK20203 HIDRAULIK DAN HIDROLOGI [HYDRAULIC AND HYDROLOGY]

No of credits: 3

Course Synopsis:
This course builds on the fundamentals given in Fluid Mechanics and reinforces students' understanding of the behaviour of fluids, through the study of the flow of water in typical civil engineering applications. The course covers the study of steady 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 hydraulics and hydrology.
2. Ability to evaluate the problem related to hydraulics and hydrology using theories and principles.
3. Ability to perform the experiment associated with hydrology and hydraulics using lab manual.

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 behaviour 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 the 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 and evaluate types of material used in concrete and their manufacturing process.
2. Ability to determine and evaluate, other construction material namely steel, timber, bricks, geopolymer and their properties.
3. Ability to perform and measures physical and mechanical properties of Construction Material by laboratorial testing.

AMK20503 KHIDMAT BANGUNAN I [BUILDING SERVICE I]

No of credits: 3

Course Synopsis:
To provide students with the basic concept, knowledge and skills in design, installation, operation and monitoring of the technical services in buildings especially mechanical services such as air conditioning, fire protection, cold water and sanitary plumbing, transportation in building, LPG and industrial gas, etc, assembly in developing them to be a good engineering technologist upon graduation. An overview on overall mechanical 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 mechanical building services and how important to a building occupant safety and activities. Students also need to produce a mechanical report related to the building operation that is expected from a Building Engineering Technologist. The perspective that this course is focusing is on the construction point of view related to mechanical building services works. This will be an added advantage for the Building Engineering Technologist to function effectively in the multi-disciplinary team members in their career in future.

Course Outcomes:
1. Ability to EXECUTE the procedure, type, principal operation, terminologies, installation method and supervision of installation of mechanical building services components.
2. Ability to CONSTRUCT project documentation for mechanical building services equipment in the modern building.
3. Ability to DESIGN the mechanical building services system for building construction.
4. Ability to EXAMINE mechanical building services systems in terms of operation and maintenance using modern technologies and tools, for example IR 4.0

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 indeterminate 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 evaluate the internal member forces of statically indeterminate structure using method of consistent deformation and moment distribution method.
2. 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 evaluate the process of project management, work plans of the construction cycle, construction procurement and project cost estimation.
2. Ability to formulate project management activities using appropriate tools (Microsoft Project).
3. Ability to apply project management tools for coordinating all activities in site construction.
4. Ability to demonstrate proper project management activities with professional ethics and norms based on project management process.

AMK20803 ANGGARAN KOS PEMBINAAN [CONSTRUCTION COST 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 apply appropriate techniques by using modern engineering and IT tools, including prediction and modelling in solving problems in Building Services application.
2. Ability to apply of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technology practice in building services technology.
3. Ability to perform as an Engineering Technologist in society by evaluating and considering environmental and sustainability issues for effective Building Services management.
4. Ability to implement the need for and have the ability to engage in independent lifelong learning in specialist technologies using current technology such as IoT, software application and IR 4.0 related pillars.

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 analyze the legal requirement of occupational safety and health laws and regulations. And outline the OSH management system in managing the hazards and risks in the workplace.
2. Ability to assess the occupational hazards and associated risks at the workplace. And evaluate effective remedial or mitigation measures to control the hazards and risks at the workplace.
3. Ability to perform - OSH management system, OSH laws, HIRARC, and site safety assessment (e.g., ergonomics, noise, and chemical hazard assessment) in construction safety.
4. Ability to work effectively in group work.

AMK21104 GEOTEKNIK [GEOTECHNICS]

No of credits: 4

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.

AMK30004 PROJEK SARJANA MUDA I [BACHELOR DEGREE PROJECT I]

No of credits: 4

Course Synopsis:
This course is an individual research project in connection with a special engineering problem. The project undertaken may fall under the following areas; experimental, computer simulation, hardware or software development, device fabrication and case/field study. 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 prepare literature review based on area of specification through written research proposal and reports.
2. Ability to propose analytical and critical thinking in identifying and solving problems that relates to the area of specification through written research proposal and progress report.
3. Ability to design suitable research method according to area of specification in the written research proposal and progress 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.

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 equipment 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 equipment and procedures.
2. Ability to analyse the factors that will affect structural elements and identify the diagnosis pattern of insect attack 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:
This course aims to introduce students to the fundamental principles of structural behaviour and design criteria of steel and timber structure. This course delivers knowledge and understanding on both analysis and design aspects. Students will be able to design steel and timber axial member, flexural member, and connection for steel and timber element.

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
4. Ability to present based on design and detail drawing for steel and timber structural element

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 Resources and Wastewater Systems
2. Ability to evaluate Ground Treatment and Slope Stabilization, and Underground Construction Technology
3. Ability to demonstrate about Instrumentation for Scaffolding, and Structural Health Monitoring and Building Condition Assessment comprising Non-Destructive Tests (NDTs) and Destructive Tests (DTs) used in Repair and Rehabilitation Works
4. Ability to present about Instrumentation for Scaffolding, and Structural Health Monitoring and Building Condition Assessment comprising Non-Destructive Tests (NDTs) and Destructive Tests (DTs) used in Repair and Rehabilitation Works
5. Ability to revise the latest development and technology related to Bridge and Railway Construction Technology

AMK30903 ASAS KEJURUTERAAN DAN PENGURUSAN ALAM SEKITAR [BASIC ENVIRONMENTAL ENGINEERING AND MANAGEMENT]

No of credits: 3

Course Synopsis:
This course focusses on basic elements of environmental engineering and management. Basic principles such as parameters and design consideration in environmental engineering for water and wastewater engineering, air and noise pollution engineering and solid waste management will be taught. Students will be introduced to Environmental Management System (EMS) and ISO 14000 and Environmental Impact Assessment (EIA) including Environmental Management Plan (EMP). Students will be also introduced to the environmental parameters measurement and 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, highway and bridge technologies. The subtopic included are Construction of Pavement, Maintenance and Rehabilitation of Pavement, Road Drainage System, Road Furniture, Fundamental of Bridge, Construction of Bridge Substructure, Construction of Bridge Superstructure, Maintenance and Rehabilitation 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 solve mini project assessment in highway and bridge construction technology

AMK31103 PENGURUSAN RISIKO PEMBINAAN [CONSTRUCTION RISK MANAGEMENT]

No of credits: 3

Course Synopsis:
Managing risk is a critical function to ensure successful construction projects. This course will provide students a solid foundation in the concepts, tools and techniques of construction risk management. The course draws from perspective of the construction industry to give students a well-rounded approach to this process and an understanding of the rationale used in developing effective risk management systems.

Course Outcomes:
1. Ability to describe in detail the basic principles of risk management according to acknowledged standard.
2. Ability to thoroughly analyze the risk in construction projects according to established method.
3. Ability to critically elaborate the risk in construction projects according to project scenario and based on recognized risk management process and method.

AMK31203 JURUTEKNOLOGI 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.

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.

AMK40103 TEKNOLOGI PEMBINAAN BANGUNAN BERINDUSTRI [INDUSTRIALISED BUILDING CONSTRUCTION TECHNOLOGY]

No of credits: 3

Course Synopsis:
This course is designed to expose students to the concepts of IBS which includes the advantages and disadvantages using IBS in Construction, Roadmap of IBS and the usage of IBS. It also highlighted the concept of Score Calculation and submission, Principal of Modular Coordination in IBS and concepts of 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. CAbility 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.

AMK40303 REKABENTUK STRUKTUR TERMAJU [ADVANCED STRUCTURAL 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 HIGH RISE BUILDING]

No of credits: 3

Course Synopsis:
This course is an introduction to the construction technology used to build high rise building. Construction technology related to structural concepts are discussed in relation to steel and concrete buildings. Design of high rise 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 high rise 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

AMK40603 PEMERIKSAAN DAN PEMBAIKAN STRUKTUR [STRUCTURAL ASSESSMENT AND REPAIR]

No of credits: 3

Course Synopsis:

This subject provides an understanding and ability to visualize and analyze the causes of distress in structures, to confirm the causes of distress and suggest suitable repair methods. Among the topics discussed are types and causes of distress in structures; corrosion - mechanism, assessment and repair; methods of testing of structures; semi-destructive and non-destructive testing; strength assessment techniques; durability assessment techniques; integrity assessment techniques; repair strategy and techniques; repair material selection; and strengthening techniques

Course Outcomes:
1. Ability to EVALUATE causes of defects in structures, methods to assess the defects and suitable techniques for repair.
2. Ability to DEMONSTRATE about assessment and repair techniques.
3. Ability to PRESENT about assessment and repair techniques.

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:
To provide students with the basic concept, knowledge and skills in design, installation, operation, and monitoring of the technical services in buildings especially mechanical services such as air conditioning, fire protection, cold water and sanitary plumbing, transportation in building. Besides, knowledge on Liquidated Petroleum Gas (LPG) industrial gas is introduced, the assemble procedure is exposed to students to ensure the Building Technologist knowledge and practices has been gained by students. An overview on the overall mechanical building services system and understanding the functionalities in building operation is the main objective in this course. Students will be able to explain the function of mechanical building services and the importance to a building occupant's safety and activities. Students also need to produce a mechanical report related to the building operation as the required documents that Building Technologist shall produce.

Course Outcomes:
1. Ability to apply the procedure, type, principle operation, terminologies, installation method and supervision of mechanical building services technologies
2. Ability to demonstrate mechanical building services equipment installation plan and operation using appropriate software in the modern building.
3. Ability to recommend the building services system plan in term of operation and maintenance in relation to building facilities problem and issues.
4. Ability to formulate commissioning procedure for testing and commissioning mechanical building services equipment in the modern building in related to the current standard

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 integrate modern method of construction skill in construction activity/project
3. Ability to explain by presenting 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:
The 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 to the technological transformations related to industrial production, cyber-physical, and digital technologies which currently shape the construction industry.

Course Outcomes:
1. Ability to interpret the information presented by drawing a logical conclusion in terms of technological revolution and its impact on the construction industry.
2. Ability to relate the evolution of technology advancement with application in the construction practice.
3. Ability to practice in using computer-aided software of current digital technologies towards fulfilling the requirement of professional establishment in specialist technology.
4. Ability to present the application of current technology advancement 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 is managed and maintained throughout a project. The course focuses on the context which implies the quality that leads to compliance with certain standards. In this course, students will be exposed to quality audit and quality control activities that will be conducted throughout the construction project life cycle.

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. To solve the problem in quality management using tools that apply in construction industry. Project management via practical orientated method
4. To manage project quality management inconstruction with effective communication skills and teamwork skills in handling construction project quality management

AMT20206 CONSTRUCTION PROJECT MANAGEMENT [PENGURUSAN PROJEK PEMBINAAN]

No of Credits: 6

Course Synopsis:
This course aims to provide the knowledge and skills of construction project management that in line with 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. Ability to apply all the possible disciplines needed in the construction project management.
2. Ability to analyse the management process of construction project lifecycles. Ability to demonstrate the construction project management life cycles activities by using Microsoft project software or other equivalent software.
3. Ability to organise the construction project management in handling construction project activities.

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 organizational background, attitudes, behaviour, recruitment, issues, motivation, stress management, conflict, employee performance and healthy workplace. This course emphasized on people skills that encapsulated in between employers and employees collaborating to improve healthy workplace and sustain the organizational productivity.

Course Outcomes:
1. To analyse the psychological issues that relate to organizational workplace in construction industry
2. To organize psychological issues, organizational behaviour, and managing peoples in construction workplace.
3. To evaluate the psychological issues in organization 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 to provide the knowledge of human resources and professional ethics skills focusing on construction perspective. This course will enable the students to be exposed to the concepts, processes, and functions in human resources management and professional ethics as guidance to lead companies or organizations effectively.

Course Outcomes:
1. Ability to apply the theories and concepts of human resource management and professional ethics in the organization.
2. Ability to evaluate the appropriate process and procedure in managing human resources with respect to professional ethics.
3. Ability to display ethical awareness and professionalism in managing human resources organization.
4. Ability to respond to the utilization of human resources development principles with respect to professional ethics in organizing an organization.

AMT20504 SAFETY, HEALTH AND ENVIRONMENTAL MANAGEMENT [PENGURUSAN KESELAMATAN, KESIHATAN DAN ALAM SEKITAR

No of Credits: 4

Course Synopsis:
This course exposes students with necessary knowledge and skills that requires for managing the occupational safety, health, and environmental at the work place. Thus, this course covers on; legislation and requirements in relation with workplace's safety and health, principles and application of SHEaR management including hazard identification, risk assessment and risk control at the workplace. In return, students will develop abilities to manage issues related to safety, health, and environment effectively and ethically.

Course Outcomes:
1. Ability to explain in terms of legislation and requirements of shear in the workplace, and principles of shear management and its application in relation to construction industry
2. Ability to perform workplace hazard and risk assessment at the working site by using appropriate techniques, tools and equipment
3. Ability to demonstrate responsibilities in ensuring safe working environment by applying appropriate accident prevention methods, and risk mitigation & control approach
4. Ability to practice suitable accident investigation methods in relation to workplace safety management

AMT20604 CONSTRUCTION VALUE ESTIMATION AND PROCUREMENT [ANGGARAN NILAI PEMBINAAN DAN PEROLEHAN]

No of Credits: 4

Course Synopsis:
This course expose on the construction value estimating, contractual tendering and procurement method in building construction project works. The concept of estimation preparation, tendering and decision making on the procurement approach will be introduced according to the current practise in construction industry. Other than that, the computer-aided estimation and e-procurement method will be exposed using the relevant software to improve the estimating, tendering and procurement decision making skills.

Course Outcomes:
1. Ability to apply the fundamental and proces of project estimating and procurement concept that is related to requirement in construction project
2. Ability to evaluate the procedure on construction estimating and procurement in respect to standard method of measurement (smm) and form of contractsAbility to demonstrate proficiency using relevant computer aided estimation and e-procurement tools that is related to the requirement in construction projects
3. Ability to organise the project cost estimation and procurement management to fulfil the project's needs and requirements

AMT20704 PROJECT TECHNOPRENEUR 1 [TEKNOUSAHAWAN PROJEK 1]

No of Credits: 4

Course Synopsis:
Technopreneur Project 1 will introduce the students to the business organization and expose them to any available technology in the construction industry that have potential to become their business foundation. This course will expose the students on business creativity, technology integration, innovation, project planning and business management related to the construction industry. Lastly, students will be enlightened to the business approach and negotiation.

Course Outcomes:
1. Ability to apply knowledge of business organization, business planning and management
2. Ability to propose creative and innovative technology integration as a business foundation.
3. Ability to demonstrate management and technopreneurship skills in completing project
4. Ability to deliver the effective communication skills in business approach and negotiation
5. Ability to organise the business organization with an active leadership in teamwork skills

AMT30106 DEMOLITION AND CONSTRUCTION WASTE MANAGEMENT [PENGURUSAN PEROBOHAN DAN SISA PEMBINAAN

No of Credits: 6

Course Synopsis:
This course aims to provide knowledge and insights on building demolition techniques and construction waste management. This course will enable the students to be exposed to the preparation, process, and management of building demolition work planning and execution, safety and risk measures 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 the whole process of demolition towards minimizing waste and moving towards sustainable construction practices.

Course Outcomes:
1. Ability to apply the knowledge on building demolition and construction waste management.
2. Ability to evaluate the techniques of building demolition work and construction waste management in the construction sites.
3. Ability to propose suitable building demolition work planning with respect to the sustainability measures.
4. Ability to display responsibilities of managing construction waste by using appropriate process activities in the waste management plan (wmp).

AMT30206 BUILDING INFORMATION MODELLING [PEMODELAN MAKLUMAT BANGUNAN]

No of Credits: 6

Course Synopsis:
This course will guide the students through a step-by-step project-based workflow to learn and implement BIM using a real project data. The course is therefore designed practically hands-on where the participants are required to model a multiple storey building by focusing on architectural and structural element in a building. Finally, students will learn about coordination between BIM modelling which enable them to check the clashes of the model and prepare the report for the clashed model.

Course Outcomes:
1. Ability to display proficiency of using bim software in completing the projects
2. Ability to derive the solution on the building modelling clashes based on the clash report generated
3. Ability to develop strategies to discover the relevant sources of information and overcome the obstacles to complete the task of modeling the building in terms of architectural and structural elements
4. Ability to display cooperation in the group activities of modelling the architectural and structural elements for a building as well as during modelling coordination

AMT30304 PROJECT TECHNOPRENEUR 2 [TEKNOUSAHAWAN PROJEK 2]

No of Credits: 4

Course Synopsis:
Technopreneur Project 2 course exposes students to the formation and management of the business related to the construction industry. 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 indicator and tools to prepare for financial information for a new bussiness venture
2. Ability to analyse business performance of construction company based on financial statement
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

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 apply the fundamentals of provision and relevant requirements and law related to the building planning and development.
2. Ability to evaluate the compliance of related laws, regulations and requirements enforced by statutory bodies in relation to building planning and development.
3. Ability to manage a building planning and development permission for approval by authorities with effective communication skills.
4. Ability to displays self-reliance in working independently to ensure the compliance of related laws, regulations and requirements enforced by statutory bodies in relation to building planning and development.
5. Ability to organise a building planning and development permission for approval by authorities with an active leadership in teamwork skills.

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 knowledge on building auditing and evaluation in term of process and procedure of BCA will be explained through on site oriented activities. Students will be understand the concept of BCA and will be able to produce audit report on the corrective measures to ensure the building meets the Malaysian Building Condition Assessment Rating System or equivalent.

Course Outcomes:
1. Ability to apply the fundamental of building condition assessment concept based on the physical state of the building
2. Ability to evaluate the preventive measures on the building condition elements according to construction industry standard
3. Ability to deliver the effective communication skills in building condition assessment rating tools for building works
4. Ability to demonstrate the technique in assessing building condition using tools that apply in construction industry project management
5. Ability to organise the process of building condition assessment for building works with an active leadership in teamwork skills

AMT30010 BACHELOR DEGREE PROJECT [PROJEK SARJANA MUDA]

No of Credits: 10

Course Synopsis:
The Bachelor Degree Project is one of the courses for this program which provides 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. This course requires students to conduct research that relates to the building construction sector either a real-industry problem based or a research-oriented or software development. Students will be assisted by industry mentors and academic supervisors in conducting the research which requires students to identify the problem boundaries, investigate and propose possible solutions, explore the appropriate methodology and solve the problem identified in order to deliver the research aims. In addition, students will be exposed to the research reporting and skills on delivering the whole research findings.

Course Outcomes:
1. Ability to synthesis the research information in generating ideas towards solving the research problems identified in the research early stage
2. Ability to present the whole research components during the presentation session within the allocate period.
3. Ability to formulate the research findings in preparing a technical report at the end of the course based on industrial requirements.
4. Ability to systematically conduct the research project activities with research ethics based on the standard, procedures, protocols and requirement outlined.

AMT40112 INDUSTRIAL TRAINING [LATIHAN INDUSRTI]

No of Credits: 12

Course Synopsis:
This course expose on the practical based orientation conduct that enable students to explore on the company technical function and organisation. Besides that the company operational pattern that are comprised of departmental function, work procedure, safety procedure, industrial communication, technical skills and project management. During this course, students will adapt thories that has been learnt in university into and industrial practical based work task

Course Outcomes:
1. Ability to combine technical knowledge and practical skills through training.
2. Ability to display consistency towards society and environmental responsibility in terms of health, safety and legal issues.
3. Ability to display working ethics consistency during training period.
4. Ability to perform effectively as individual or leader in diverse teams.
5. Ability to display effective communication during task orientation.
6. Ability to practice independent and life-long learning in specialist technologies for personal development.

FACULTY OF BUSINESS & COMMUNICATION (FPK)

Programmes Offered:

1. Bachelor of New Media Communication with Honours
2. Bachelor of Business (International Business) with Honours
3. Bachelor of Business (Engineering Entrepreneurship) with Honours

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UR6321001
Bachelor of New Media Communication with Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
To educate and produce the graduates who have the knowledge and skills of professionals in the field of communication and social interaction

PEO 2
To educate and produce the graduates who have the knowledge and skills of professionals in the field of new media,

PEO 3
To educate and produce graduates who have the knowledge and skills of professionals in the field of entrepreneurial management.

PEO 4
To train and produce skilled graduates in implementing and managing projects/research by integrating the latest information related to new media communication.
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PROGRAMME OUTCOMES (PO)

PO 1
To demonstrate professional and research skills in communication and social interaction, new media, entrepreneurship and management.

PO 2
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 3
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 4
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 5
To communicate effectively, both individually and in group.

PO 6
To demonstrate the ability to use hardware and software related to digital media, journalism, advertising, broadcasting, public relations, graphic design, multimedia, and photography.

PO 7
To analyse 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 8
To develop analytical and critical thinking skills that are appropriate in preparation for continuous learning.

PO 9
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 WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		THIRD	
SEMESTER	**I**	**II**	**III**	**IV**	**V**	**VI**
Common /Discipline Core/Elective Courses (105 credits)	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	SMM10703 Innovative and Creative Skills	SMM20403 New Media Analysis	SMM30503 Web Design andDevelopment	SMM40303 Animation for Integrated Media	SMM41003 Skills in Organizational Strategy and Performance Management
	SMM10403 Script Writing &Digital Storyboard	SMM 10803 Introduction to Programming Languages	SMM30103 Media Psychology	SMM30603 New Media Arts	SMM40403 Digital Creative Advertising	SMM41104 Final Year Project 2
	SMM10503 New Media Literacy	SMM1XXXX Elective I	SMM20503 New Era Management	SMM30703 Data Reasoning	SMM31103 Electronic Entrepreneurship	SMM49906 Industrial Training
			SMM30203 Research Method	SMM3XXXX Elective II	SMM40502 Final Year Project 1	
					SMM4XXXX Elective III	
University Requirement Courses (16 credits)	SMB0XX02 Foreign Language	SMB10102 Preparatory English [1]	SMB20102 English for General Communication [2]	SMB31302 English for Academic Purposes		
	SMU13002 Philosophy and Current Issues	SMU13102 Appreciation of Ethics and Civilization	SMU12102 Integrity and Anti Corruption [3]	SMU32202 Thinking Skills		
	SMZXXX01 Co-Curriculum 1	SMB41002 University Malay Language [4]				
		SMZ XXX01 Co-Curriculum 2				
TOTAL CREDITS (123 CREDITS)	**20**	**20**	**22**	**22**	**20**	**19**

Elective I : SMM10903 Principles of Human Computer Interaction, SMM11003 Sociology in New Media
Elective II : SMM30803 3D Modelling for Beginners/ SMM30903 Contemporary Photography, SMM31003 Industrial Psychology
Elective III : SMM40603 Audio Design, SMM40703 Crisis Communication in New Media

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] International students should register for the SMU13202 Malaysian Studies.
[4] International students other than Indonesia, Singapore and Brunei need to register for the SMB11002 Basic Malay Language course.

UR6340001
Bachelor of Business (International Business) with Honours

BUSINESS PROGRAMME

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

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 (PO)

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 (INTERNATIONAL BUSINESS) WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		BREAK	THIRD	
SEMESTER	I	II	III	IV		V	VI
Business Common /Discipline Core Courses (108 credits)	SMP10803 Principles of Marketing	SMP11503 Principles of Entrepreneurship	SMP20203 International Business Management	SMP22203 Managerial Accounting	SMP29204 Industrial Training	SMP33803 Strategic Management	SMP35103 Final Year Project
	SMP10903 Principles of Management	SMP15503 Business Ethics	SMP22403 Business Communication	SMP31603 Leadership in Organisation		SMP22603 Sales Management	SMP33703 International Marketing
	SMP10103 Principles of Economics	SMP11603 Management Information System	SMP22303 Human Resource Management	SMP22103 Operations Management		SMP31803 Research Methodology	SMP30503 International Human Resource Management
	SMP10603 Principles of Accounting	SMP11003 Organisational Behaviour	SMP22503 Digital Business	SMP25503 Digital Marketing		SMP20403 International Finance	SMP33503 International Business Environment
	SMP10703 Principles of Finance	SMP15903 Financial Technology	SMP31403 Cross-Cultural Management	SMP20303 International Economics		SMP34503 Global Economic Issues	SMP36003 International Business Strategy
	SMP15603 Principles of Business Analytics	SMP32103 Services Marketing		SMB10002 Foreign Language		SMP20103 International Accounting	SMP34403 Export Import Management
University Requirement Courses (16 credits)	SMU13002 Philosophy and Current Issues	SMU13102 Appreciation of Ethics and Civilization	SMB20102 English for General Communication [2]			SMB31302 English for Academic Purposes	SMU32202 Thinking Skills
	SMB10102 Preparatory English [1]		SMU12102 Integrity and Anti Corruption [3]	SMB41002 University Malay Language [4]			
			SMZXXX01 Co-Curriculum 1	SMZ XXX01 Co-Curriculum 2			
TOTAL CREDITS (124 CREDITS)	20	20	20	20	4	20	20

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] International students should register for the SMU13202 Malaysian Studies.
[4] International students other than Indonesia, Singapore and Brunei need to register for the SMB11002 Basic Malay Language course.

BUSINESS PROGRAMME

UR6340002
Bachelor Of Business (Engineering Entrepreneurship) With Honours

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO 1
Graduates who are entrepreneurs.

PEO 2
Graduates who are entrepreneurial leaders in the chosen field as demonstrated through career advancement.

PEO 3
Graduates who pursue continuous educational opportunities.

PEO 4
Graduates who contribute to society.

PEO 5
Graduates who contribute through research and development.

PROGRAMME OUTCOMES (PO)

PO 1
Ability to apply 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 engineering entrepreneurship 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 (ENGINEERING ENTREPRENEURSHIP) WITH HONOURS INTAKE 2023/2024

YEAR	FIRST		SECOND		BREAK	THIRD	
SEMESTER	I	II	III	IV		V	VI
Business Program Common Core/ Discipline Core/ Specialization Courses (106 credits)	SMP10803 Principles of Marketing	SMP11003 Organisational Behaviour	SMP22303 Human Resource Management	SMP22003 Technology Entrepreneurship	SMP29104 Incubator Program	SMP22603 Sales Management	SMP33803 Strategic Management
	SMP10903 Principles of Management	SMP27203 Creativity & Business Innovation	SMP25603 Engineering Drawing for Product Design	SMP22103 Operations Management		SMP25303 Entrepreneurial Marketing	SMP21503 Entrepreneurial Finance
	SMP11503 Principles of Entrepreneurship	SMP14203 Introduction to Engineering Technology	SMP15503 Business Ethnics	SMP11603 Management Information System		SMP32203 Supply Chain Management	SMP36203 Business Plan for Engineering Entrepreneurship Project
	SMP15603 Principles of Business Analytics	SMP10103 Principles of Economics	SMP32103 Services Marketing	SMP22203 Managerial Accounting		SMP21903 Product Design and Development	SMP35803 Quality Assurance in Manufacturing Process
	SMP10603 Principles of Accounting	SMP22403 Business Communication	SMP21303 Business Venture Management	SMP25703 Data Analytics for Engineering Management		SMP20203 International Business Management	SMP32603 Project Management
			SMP10703 Principles of Finance	SMP25503 Digital Marketing		SMP31803 Research Methodology	SMP22503 Digital Business
University Requirement Courses (16 credits)	SMU13002 Philosophy and Current Issues	SMU12102 Integrity and Anti Corruption [3]	SMB41002 University Malay Language [4]	SMB31302 English for Academic Purposes		SMU13102 Appreciation of Ethics and Civilization	SMU32202 Thinking Skills
	SMZXXX01 Co-Curriculum 1	SMZ XXX01 Co-Curriculum 2					
		SMB20102 English for General Communication[2]					
TOTAL CREDITS 122 Kredit	18	20	20	20	4	20	20

[1] Compulsory to students with MUET 2.5 and below (local students) or TOEFL 4.5/IELTS 4.0 and below (international students). SMB10102 Preparatory English is an Audit course.
[2] Exemption to students with MUET 4.0 and above (local students) or TOEFL 8.0/IELTS 5.5 and above (international students) and must take any other Optional Course with 2 credits.
[3] International students should register for the SMU13202 Malaysian Studies.
[4] International students other than Indonesia, Singapore and Brunei need to register for the SMB11002 Basic Malay Language course.

LIST OF COURSES:

COURSE CODE	COURSE NAME
SMP10103	Principles of Economics [Prinsip-prinsip Ekonomi]
SMP10603	Principles of Accounting [Prinsip-prinsip Perakaunan]
SMP10703	Principles of Finance [Prinsip-prinsip Kewangan]
SMP10803	Principles of Marketing [Prinsip-prinsip Pemasaran]
SMP10903	Principles of Management [Prinsip Pengurusan]
SMP11003	Organisational Behaviour [Gelagat Organisasi]
SMP11503	Principles of Entrepreneurship [Prinsip-prinsip Keusahawanan]
SMP11603	Management Information System [Pengurusan Sistem Maklumat]
SMP15503	Business Ethics [Etika Perniagaan]
SMP15603	Principles of Business Analytics [Prinsip-prinsip Analitik Perniagaan]
SMP15903	Financial Technology [Teknologi Kewangan]
SMP20103	International Accounting [Perakaunan Antarabangsa]
SMP20203	International Business Management [Pengurusan Perniagaan Antarabangsa]
SMP20303	International Economics [Ekonomi Antarabangsa]
SMP20403	International Finance [Kewangan Antarabangsa]
SMP22103	Operations Management [Pengurusan Operasi]
SMP22203	Managerial Accounting [Perakaunan Pengurusan]
SMP22303	Human Resource Management [Pengurusan Sumber Manusia]
SMP22403	Business Communication [Komunikasi Perniagaan]

LIST OF COURSES:

COURSE CODE	COURSE NAME
SMP22503	Digital Business [Perniagaan Digital]
SMP25503	Digital Marketing [Pemasaran Digital]
SMP22603	Sales Management [Pengurusan Jualan]
SMP29203	Industrial Training [Latihan Industri]
SMP30503	International Human Resource Management [Pengurusan Sumber Manusia Antarabangsa]
SMP31403	Cross-Cultural Management [Pengurusan Silang Budaya]
SMP31603	Leadership in Organisation [Kepimpinan dalam Organisasi]
SMP31803	Research Methodology [Kaedah Penyelidikan]
SMP32103	Services Marketing [Pemasaran Perkhidmatan]
SMP33503	International Business Environment [Persekitaran Perniagaan Antarabangsa]
SMP33703	International Marketing [Pemasaran Antarabangsa]
SMP33803	Strategic Management [Pengurusan Strategik]
SMP34403	Export Import Management [Pengurusan Eksport Import]
SMP34503	Global Economic Issues [isu-isu Ekonomi Global]
SMP35103	Final Year Project [Projek Tahun Akhir]
SMP36003	International Business Strategy [Strategi Perniagaan Antarabangsa]
SMP27203	Creativity & Business Innovation
SMP14203	Introduction to Engineering Technology
SMP25603	Engineering Drawing for Product Design

LIST OF COURSES:

COURSE CODE	COURSE NAME
SMP21303	Business Venture Management
SMP22003	Keusahawanan Teknologi [Technology Entrepreneurship]
SMP25703	Data Analytics for Engineering Management
SMP25303	Entrepreneurial Marketing
SMP32203	Supply Chain Management
SMP21903	Product Design and Development
SMP21503	Entrepreneurial Finance
SMP36203	Business Plan for Engineering Entrepreneurship Project
SMP35803	Quality Assurance in Manufacturing Process
SMP32603	Project Management
SMM10103	Introduction To Communication Theory [Pengenalan Kepada Teori Komunikasi]
SMM10203	Public Speaking [Perucapan Awam]
SMM10303	Introduction To New Media [Pengenalan Kepada Media Baharu]
SMM10403	Script Writing & Digital Storyboard (Penulisan Skrip Dan Papan Cerita Digital)
SMM10503	New Media Literacy [Literasi Media Baharu]
SMM10603	Visual Communication [Komunikasi Visual]
SMM10703	Innovative And Creative Skills [Kemahiran Kreatif Dan Inovatif]
SMM10803	Introduction To Programming Languages [Pengenalan Kepada Bahasa Pengaturcaraan]
SMM10903	Principles of Human Computer Interaction (Prinsip-Prinsip Interaksi Manusia-Komputer)

LIST OF COURSES:

COURSE CODE	COURSE NAME
SMM11003	Sociology In New Media [Sosiologi Dalam Media Baharu]
SMM20103	Organizational Communication [Komunikasi Organisasi]
SMM20203	Digital Photography [Fotografi Digital]
SMM20303	Graphic Design For New Media [Reka Bentuk Grafik Untuk Media Baharu]
SMM20403	New Media Analysis [Analisis Media Baharu]
SMM20503	New Era Management [Pengurusan Era Baru]
SMM30103	Media Psychology [Psikologi Media]
SMM30203	Research Methodology [Kaedah Penyelidikan]
SMM30303	Digital Marketing [Pemasaran Digital]
SMM30403	Digital Video Production [Penerbitan Video Digital]
SMM30503	Web Design And Development [Reka Bentuk Dan Pembangunan Web]
SMM30603	New Media Arts (Seni Media Baharu)
SMM30703	Data Reasoning [Penaakulan Data]
SMM30803	3D Modelling For Beginners [Asas Pemodelan 3d]
SMM30903	Contemporary Photography [Fotografi Kontemporari]
SMM31003	Industrial Psychology [Psikologi Industri]
SMM31103	Electronic Entrepreneurship [Keusahawanan Elektronik]
SMM40103	Public Relations And New Media [Perhubungan Awam Dan Media Baharu]
SMM40203	Ethics And Law In New Media Communication [Undang-Undang Dan Etika Dalam Komunikasi Media Baharu]

LIST OF COURSES:

COURSE CODE	COURSE NAME
SMM40303	Animation For Integrated Media [Animasi Untuk Media Bersepadu]
SMM40403	Digital Creative Advertising [Pengiklanan Kreatif Digital]
SMM40502	Final Year Project 1 [Projek Tahun Akhir 1]
SMM40603	Audio Design [Reka Bentuk Audio]
SMM40703	Crisis Communication In New Media [Komunikasi Krisis Dalam Media Baharu]
SMM40803	Event Management [Pengurusan Acara]
SMM40903	New Media Issues & Challenges [Isu Dan Cabaran Media Baharu]
SMM41003	Skills In Organizational Strategy And Performance [Kemahiran Pengurusan Strategi Dan Prestasi Organisasi]
SMM41104	Final Year Project 2 [Projek Tahun Akhir 2]
SMM49906	Industrial Training [Latihan Industri]
SMB11002	Bahasa Melayu Asas [Basic Malay Language]
SMB41002	Bahasa Melayu Universiti [University Malay Language]
SMB10102	Preparatory English [Bahasa Inggeris Persediaan]
SMB20102	English For General Communication [Bahasa Inggeris Untuk Komunikasi Umum]
SMB31202	English For Technical Communication [Bahasa Inggeris Untuk Komunikasi Teknikal]
SMB31302	English For Academic Purposes [Bahasa Inggeris Akademik]
SMB01402	Mandarin Language For Beginners [Bahasa Mandarin Permulaan]
SMB11402	Preparatory Mandarin Language [Bahasa Mandarin Persediaan]
SMB31402	Elementary Mandarin Language 2 [Bahasa Mandarin Asas 2]

LIST OF COURSES:

COURSE CODE	COURSE NAME
SMB41402	Pre-Intermediate Mandarin Language [Bahasa Mandarin Pertengahan]
SMB01502	Thai Language For Beginners [Bahasa Thai Asas]
SMB11502	Preparatory Thai Language [Bahasa Thai Persediaan]
SMB01602	Arabic Language for Beginners [Bahasa Arab Permulaan]
SMB11602	Preparatory Arabic Language [Bahasa Arab Persediaan]
SMB01702	Japanese Language For Beginners [Bahasa Jepun Permulaan]
SMB11702	Japanese Language Preparatory [Bahasa Jepun Persediaan]
SMB21702	Elementary Japanese Language 1 [Bahasa Jepun Asas 1]
SMB31702	Elementary Japanese Language 2 [Bahasa Jepun Asas 2]
SMB01802	German Language For Beginners [Bahasa Jerman Asas]
SMB11802	Preparatory German Language [Bahasa Jerman Persediaan]
SMB31802	Elementary German Language 2 [Bahasa Jerman Asas 2]
SMB41802	Pre-Intermediate German Language [Bahasa Jerman Pertengahan]
SMB01902	Korean Language For Beginners [Bahasa Korea Asas]
SMB11902	Preparatory Korean Language [Bahasa Korea Persediaan]
SMU13002	Falsafah Dan Isu Semasa [Philosophy And Current Issues]
SMU13102	Penghayatan Etika Dan Peradaban [Appreciation Of Ethics And Civilization]
SMU12102	Integriti Dan Anti Rasuah [Integrity And Anti-Corruption]
SMU22402	Keusahawanan Kejuruteraan [Engineering Entrepreneurship]

LIST OF COURSES:

COURSE CODE	COURSE NAME
SMU32202	Kemahiran Berfikir [Thinking Skills]
SMU12502	Komunikasi Korporat [Corporate Communication]
SMU12202	Kemahiran Komunikasi Dan Teknologi [Communication Skills And Technology]
SMU12602	Psikologi Industri [Industrial Psychology]
SMU12702	Komunikasi Dan Pengurusan Konflik [Communication And Conflict Management]
SMU12802	Pengurusan Sumber Manusia [Human Resource Management]
SMU13202	Pengajian Malaysia [Malaysian Studies]

SMP10103 PRINCIPLES OF ECONOMICS [PRINSIP EKONOMI]

No of Credits: 3

Course Synopsis:
This course covers two branches of economics, namely microeconomics and macroeconomics. The study of microeconomics involves basic economics concepts, demand, supply, market equilibrium, production costs, and market structures. Macroeconomics concerns business cycles, national income accounting, aggregate demand, aggregate supply, government policies and national debt.

Course Outcomes:
1. The ability to demonstrate detailed knowledge of economic analysis in business.
2. The ability to analyse business issues and appropriate economic tools.
3. The ability to evaluate economic analysis and the complexity of business issues.

SMP10603 PRINCIPLES OF ACCOUNTING [PRINSIP-PRINSIP PERAKAUNAN]

No of Credits: 3

Course Synopsis:
This course is an introductory course that provides students with the accounting concepts, principles, and assumptions that are essential to the preparation and presentation of financial statements. Students will also prepare financial statements based on accounting standards. In addition, this course provides students with the skills of interpreting financial statements.

Course Outcomes:
1. Ability to apply the basic concepts of accounting as well as principles and procedures.
2. Ability to classify accounting information in the financial statements to present the information to the internal and external users.
3. Ability to analyse the accounting information for companies to make the best decision for the organization as a whole.

SMP10703 PRINCIPLES OF FINANCE [PRINSIP-PRINSIP KEWANGAN]

No of Credits: 3

Course Synopsis:
This course focuses on the methods of valuation for financial assets, investments in long-term assets, capital structure, dividends policy of the company and emphasize practical methods for the management of working capital and business finance of a company. It is related to understanding the concept and scope of the financial management environment, the method of financing a company, decision making in an investment focusing on the private business management sector in Malaysia particularly. This approach is based on the theory and practical approach to make financial decisions for a firm. At the end of this course, students are expected to understand and be able to apply the financial decision-making methods that can increase the economic value of a firm.

Course Outcomes:
1. Ability to interpret financial information tools on the financial problem.
2. Ability to analyse using various techniques for short-term, long-term financing, and investment decisions.
3. Ability to evaluate the financial information in making financial decisions.

SMP10803 PRINCIPLES OF MARKETING [PRINSIP-PRINSIP PEMASARAN]

No of Credits: 3

Course Synopsis:
The course deals with the study and analysis of the basic principles, theories, problems, and practices of marketing in an ever-changing economic environment. Emphasis is placed on the marketing functions, planning, and the distribution of goods and services from the producer to the ultimate consumer. The marketing mix (product, price, place, and promotion) is presented as a controllable variable to target market segments. They have unmet needs and wants that a firm can satisfy and be profitable. Market research and information tools of the marketing manager are explored.

Course Outcomes:
1. Ability to determine the marketing concepts and its related environments.
2. Ability to analyse issues and challenges in marketing.
3. Ability to evaluate marketing strategies and techniques

SMP10903 PRINCIPLES OF MANAGEMENT [PRINSIP PENGURUSAN]

No of Credits: 3

Course Synopsis:
This course presents thorough and systematic coverage of management theory and practice. It focuses on the management's fundamental roles, skills, and functions, particularly attention to managerial responsibility for the effective and efficient achievement of goals.

Course Outcomes:
1. Ability to explain the fundamental concepts management.
2. Ability to analyse the managerial process of planning, organizing, leading, and controlling in the organizational context.
3. Ability to analyse the interaction between the environment, technology, human, and organization to achieve organizational objectives.

SMP11003 ORGANISATIONAL BEHAVIOUR [GELAGAT ORGANISASI]

No of Credits: 3

Course Synopsis:
This course discusses the role of organisational behaviour including individual values and perception, team dynamics, power, politics, conflict, organisational culture and change management. The learning outcomes of this course allow graduates to assess the importance of understanding organisational behaviour, propose solutions and create functional organisations based on the structure and culture of an organisation.

Course Outcomes:
1. Ability to explain the importance of organisational behaviour and individual differences in the workplace.
2. Ability to apply the theories and concepts of motivation and leadership.
3. Ability to analyse the influence of groups and teams, power, influence and politics, culture and change to organisational behaviour.

SMP11503 PRINCIPLES OF ENTREPRENEURSHIP [PRINSIP-PRINSIP KEUSAHAWANAN]

No of Credits: 3

Course Synopsis:
This course addresses the concept of entrepreneurship which includes individual components of entrepreneurship and its implications to the society. It introduces the basics of planning and launching a business by identifying problems and opportunities, creative problem solving, developing a viable business model and entrepreneurial ethics. Students will develop an understanding of successes, opportunities, and risks of entrepreneurship.

Course Outcomes:
1. Ability to explain the nature and dynamic role of entrepreneurship.
2. Ability to recognise business opportunity and creative solutions.
3. Ability to formulate a feasible business model.

SMP11603 MANAGEMENT INFORMATION SYSTEM [PENGURUSAN SISTEM MAKLUMAT]

No of Credits: 3

Course Synopsis:
This course will expose students to the Management Information System (MIS) topics like organisations, management, infrastructures, and applications for managing the information system.

Course Outcomes:
1. Ability to explain principles and role of Management Information Systems (MIS) in business organizations.
2. Ability to analyse tools and techniques of the information system hardware, software, database, and networking technologies.
3. Ability to examine the core information system applications to improve operational excellence and decision making.

SMP15503 BUSINESS ETHICS [ETIKA PERNIAGAAN]

No of Credits: 3

Course Synopsis:
Ethics refers to well-founded standards of right and wrong that prescribe what humans ought to do, usually in terms of rights, obligations, benefits to society, fairness, or specific virtues. However, business ethics is one of the important branches of applied ethics. Business ethics is the application of general ethical ideas to business. Ethics in business is concerned with collective action problems among dispersed investors and the reconciliation of conflicts of interest between various corporate stakeholders. Business ethics and corporate governance of an organization go hand in hand. In fact, an organization that follows ethical practices in all its activities will, in all probability, follow best corporate governance practices as well. The purpose of this course is to give an overview of the concept of business ethics, theories of ethics and ethical principles in business as well as theories, principles and regulations related to corporate business environment.

Course Outcomes:
1. Ability to apply the importance of business ethics as a system of interlinked concepts derived from management and social science.
2. Ability to analyse solution for transformation of ethical code of conduct responsibilities in business environmental.
3. Ability to evaluate the outcome of business ethics programme in contemporary social business reasoning.

SMP15603 PRICIPLES OF BUSINESS ANALYTICS [PRINSIP-PRINSIP ANALITIK PERNIAGAAN]

No of Credits: 3

Course Synopsis:
This course is an application-oriented study of statistical concepts and techniques. It provides statistical methods for decision-making in business problems. This course will introduce some statistical techniques that can help in the decision-making process and analyze the output accurately.

Course Outcomes:
1. Ability to describe the statistical concept in business problems.
2. Ability to apply the appropriate statistical methods to business problems.
3. Ability to analyze the solutions for business problems using statistical methods.

SMP15903 FINANCIAL TECHNOLOGY [TEKNOLOGI KEWANGAN]

No of Credits: 3

Course Synopsis:
This course acquaints students with the fundamentals of financial technology and how it functions and fits into the organization. Using a cycle approach, the course introduces internal control procedures, covers the basics elements of the procedures, covers the basic elements of the revenue and expense cycles, and enables students to become proficient with documentation techniques, such as flowcharting. The course focuses on the needs and responsibilities of accountants as users and developers of information technology and as auditors. Students will explore the capabilities of accounting software and undertake a course related project.

Course Outcomes:
1. Ability to synthesize the role, purpose and importance of an accounting information system.
2. Ability to apply common tools in financial accounting information systems as a basis of decision-making.
3. Ability to demonstrate higher quality of accounting services (financial statements) based on the security, confidentiality, privacy, processing integrity and availability suggested by accounting bodies.

SMP20103 INTERNATIONAL ACCOUNTING [PERAKAUNAN ANTARABANGSA]

No of Credits: 3

Course Synopsis:
International accounting is a vital component of the overall profession in the current economy. Students are expected to understand the international differences in financial accounting theory and practice, harmonization and convergence of accounting standards. Analysing the foreign currency market and accounting for foreign currency transactions and translation. Ultimately to demonstrate the knowledge of international accounting issues related to financial reporting, international taxation and international transfer pricing that lead to decision making role in the real world.

Course Outcomes:
1. Ability to explain the international differences in financial accounting theory and practice, harmonization and convergence of accounting standard.
2. Ability to analyse the foreign currency market and accounting for foreign currency transactions and translation.
3. Ability to demonstrate knowledge of international accounting issues related to additional financial reporting, international taxation and international transfer pricing.

SMP20203 INTERNATIONAL BUSINESS MANAGEMENT [PENGURUSAN PERNIAGAAN ANTARABANGSA]

No of Credits: 3

Course Synopsis:
This course will expose students to globalization and internationalization issues, cross-cultural business, political economy, international business ethics, economic development of nations, international trade theory, international trade and investment, international trade organization, trade policy, regional economic integration, international business strategy, selecting and managing international entry modes and other related to international business management activities. Students will be able to describe the opportunities and threats in the international business environment.

Course Outcomes:
1. Ability to recognize the issues and trends of international business.
2. Ability to discuss international business theories and practices.
3. Ability to describe opportunities and threats in the international business environment.

SMP20303 INTERNATIONAL ECONOMICS [EKONOMI ANTARABANGSA]

No of Credits: 3

Course Synopsis:
Students will learn the ideas and perspectives of economic theory and thinking that build International Economics. They will also learn critical ideas in understanding the three main components of International Economics: International Trade, International Finance, and the International Financial System. Then students will apply concepts and theories to understand issues and criticisms in the global economy.

Course Outcomes:
1. Ability to define the basic concepts of International Economics and differentiate the economic thoughts of various economists.
2. Ability to analyse issues related to the International Trade, International Finance and International Monetary System.
3. Ability to interpret the theories and economic thoughts of International Economics with regards to the current global economic issues.

SMP20403 INTERNATIONAL FINANCE [KEWANGAN ANTARABANGSA]

No of Credits: 3

Course Synopsis:
The subject matter of international finance consists of issues raised by the special problems of economic interaction between sovereign states. This course will introduce the main concepts and theories of international finance and illustrates them with applications drawn from the real world. It will address a wide range of issues, including the balance of payments, exchange rate determination, international policy coordination, and the international capital market. The international finance course will focus on the monetary side of the international economy and international financial transactions.

Course Outcomes:
1. Ability to identify the general multinational corporations' operations and the international financial environment and its components.
2. Ability to analyze the critical relationship involving exchange rates i.e. exchange rates movement, interest rate parity, and purchasing power parity.
3. Ability to prepare the various function to involve in the management of exchange rate risk and apply the techniques for performance forecasting and hedging.

SMP22103 OPERATIONS MANAGEMENT [PENGURUSAN OPERASI]

No of Credits: 3

Course Synopsis:
The purpose of Operations Management course is to ensure students gain an understanding of the managerial processes for effective operations in both goods-producing and service-rendering organizations. This course is an introduction to the concepts, principles, problems, and practices of operations management. This course intends to provide students in gaining knowledge and understanding on the importance of operations management existence in organizations and expose students to the planning and control of manufacturing and service operations at local and international level.

Course Outcomes:
1. Ability to apply the Operations Management theories and concepts.
2. Ability to analyse a range of organisational problems and issues concerning the operations management field.
3. Ability to evaluate models and tools in Operations Management in solving organisational problems and issues.

SMP22203 MANAGERIAL ACCOUNTING [PERAKAUNAN PENGURUSAN]

No of Credits: 3

Course Synopsis:
This course provides an understanding of the importance of an organization's managerial accounting information in planning, controlling, and decision-making; enables the students to apply costing and budgeting methods which will provide useful information to the organization's internal users.

Course Outcomes:
1. Ability to apply various cost behaviour, performance measurement and costing methods in managing internal business and making business decisions.
2. Ability to adapts relevant costing and decision-making concepts in a variety of business environments.
3. Ability to evaluate various budgeting methods to plan, control and make a decision for internal business.

SMP22303 HUMAN RESOURCE MANAGEMENT [PENGURUSAN SUMBER MANUSIA]

No of Credits: 3

Course Synopsis:
The course is developed to enhance the knowledge and understanding related to the managing human resource in the organization. The course covers the concepts and practices of human resources management (HRM) functions to ensure both employers and employees are managed effectively and efficiently to achieve common goals. The human resource activities that will be discussed are introduction of human resource management, legal environment in HRM, job analysis and design, staffing, human resource development, performance appraisal, compensation management, occupational safety and health, industrial relations and employee rights and discipline.

Course Outcomes:
1. Ability to explain the definition of human resource management and its functions in the workplace.
2. Ability to apply the legal Acts in Malaysia which influence human resource management practices in Malaysia.
3. Ability to analyse the effects of human resource management functions to the individual and organisation.

SMP22403 BUSINESS COMMUNICATION [KOMUNIKASI PERNIAGAAN]

No of Credits: 3

Course Synopsis:
Communication is one of the most vital skills to success, especially in business. This course is designed to help students understand various aspects of business communication and to acquire the skills and competencies of good oral and written business communication, that will help them communicate and develop a communication strategy effectively.

Course Outcomes:
1. Ability to apply the skills of business communication in appropriate business situation.
2. Ability to establish the concept of communication in business contexts.
3. Ability to relate the concepts and theories of communication in business environment.

SMP22503 DIGITAL BUSINESS [PERNIAGAAN DIGITAL]

No of Credits: 3

Course Synopsis:
This course is a comprehensive guide to identify the driving forces of a digital business. The course analyzes the key concepts of digital business such digital supply chain management, procurement and infrastructure. This course will also guide students to design a proper marketing campaign that is complemented by proper digital customer relationship management.

Course Outcomes:
1. Ability to identify the scope of digital business in driving business opportunities for companies.
2. Ability to analyze the potential components of digital business such as digital supply chain management, procurement, and infrastructure.
3. Ability to design a digital marketing campaign with improved elements of digital customer relation management concepts of digital marketing.

SMP22603 SALES MANAGEMENT [PENGURUSAN JUALAN]

No of Credits: 3

Course Synopsis:
This course emphasises on duties of professional salesperson on the way to develop the sales presentations. It also covers the entire sales management process from prospecting to follow up, and the importance of the proper use and management of one's time and sales territory coverage. This course provides students with the ability to analyse the sales opportunity based on business activities. It also exposes students on the ability to evaluate the elements of sales application towards supplier and customer.

Course Outcomes:
1. Ability to explain the sales management principles in empowering the selling strategies and techniques.
2. Ability to apply the sales management concept based on business activities.
3. Ability to analyse the sales opportunity using the personal selling strategies and techniques.

SMP25503 DIGITAL MARKETING [PEMASARAN DIGITAL]

No of Credits: 3

Course Synopsis:
This course provides the most comprehensive guide to all aspects of using the Internet, digital media, and marketing technology to achieve the goals of integrated multichannel marketing. The emerging trends in marketing through social media and digital platforms are gathered and informatively explained. With the growing use of digital comes an increasing demand for employees who have strategic and practical digital marketing skills like search engine optimization, social media and creating effective websites.

Course Outcomes:
1. Ability to apply digital competency to enhance the marketing techniques.
2. Ability to correlate ordinary or conventional marketing into digital marketing methods.
3. Ability to plan digital marketing programmes for related projects.

SMP29204 INDUSTRIAL TRAINING [LATIHAN INDUSTRI]

No of Credits: 4

Course Synopsis:
Industrial Training is a practical-oriented course where students will go for attachment at industries or some related organizations for certain period of time. During industrial training, the students will be exposed to the real working environment where they will learn about the company operations, department functions, works and safety procedures, project management, technical skills, communication, administration, etc. The students are also required to submit their logbook and final report at the end of the Industrial Training period.

Course Outcomes:
1. Ability to display good work performance and adapt to the working environment during training period.
2. Ability to practice good communication skills and work ethics during training period.
3. Ability to demonstrate leadership, autonomy and responsibility to the assigned task given by the host company.

SMP30303 INTERNATIONAL HUMAN RESOURCE MANAGEMENT [PENGURUSAN SUMBER MANUSIA ANTARABANGSA]

No of Credits: 3

Course Synopsis:
This course introduces the students to the critical issues faced by the organizations in managing their human resources at the local and international levels. It will specialize in elements involving the international aspect of human resources, such as the corporate strategies, effective management of expatriates, and handling people in multinational enterprises across countries.

Course Outcomes:
1. Ability to demonstrate international Human Resource Management models and practices.
2. Ability to identify the roles of international Human Resource Management for the global market.
3. Ability to explain trends and future challenges in international Human Resource Management.

SMP31403 CROSS-CULTURAL MANAGEMENT [PENGURUSAN SILANG BUDAYA]

No of Credits: 3

Course Synopsis:
This course covers the cultural aspect of leadership, corporate strategy, change in organizations, marketing, business communication across culture and its barriers, negotiation and international teams, and cultural conflicts. The Cross-culture management course also explains the cross-cultural management theories and concepts in the international business setting. Cross-cultural competencies are exposed the students to work effectively in international business organizations.

Course Outcomes:
1. Ability to explain the cross-cultural management theories and concepts in international business setting.
2. Ability to identify the suitability of cultural knowledge, theories, and concepts for international business opportunities.
3. Ability to propose solutions based on cross-cultural theories and concepts for solving international business problems.

SMP31603 LEADERSHIP IN ORGANISATION [KEPIMPINAN DALAM ORGANISASI]

No of Credits: 3

Course Synopsis:
This course is designed to enhance students' understanding and widen their perspective, knowledge and conceptions of leadership theories, styles, effectiveness and practical applications for their career in business, government and non-profit organizations. The main focus of this course is on managerial leadership effectiveness and what makes a person an effective leader. The syllabus covers leadership approaches, behavioural tendencies of leaders, teamwork, uses of power, participation, delegation, and empowerment, effective change, developing leaderships skills, cross-cultural leadership and other topics related to leadership in organization.

Course Outcomes:
1. Ability to explain the meaning of leadership, its concepts and various theories that have been developed and practiced in organization today.
2. Ability to analyse effective leadership skills in communication, building strong teams, creating effective change, motivation and persuasion to increase followers' commitment and loyalty.
3. Ability to investigate the leader, follower and situational factors that affect the leadership styles and behaviours in organization.

SMP31803 RESEARCH METHODOLOGY [KAEDAH PENYELIDIKAN]

No of Credits: 3

Course Synopsis:
To successfully conduct a business research, students must develop a foundation of their understanding with regards to the key elements of the process and procedure in completing their research project. This course emphasizes the basic knowledge for business students in developing their strategies to produce impactful research project.

Course Outcomes:
1. Ability to analyse the main key terms of research methodology based on existing research articles.
2. Ability to formulate a systematic research project by understanding the flow of the research process.
3. Ability to explain the concept of the whole research process.

SMP32103 SERVICES MARKETING [PEMASARAN PERKHIDMATAN]

No of Credits: 3

Course Synopsis:
This course will explain about the characteristics of the service, how to understand the service, how consumer behavior is related to the service and how to market the service. This course will facilitate understanding to learn about services and also how one can be a part of a successful service marketer. The course will also cover on the development of the concept and value of services, also explain about the products, distribution, pricing and communication strategies necessary to develop a successful business model.

Course Outcomes:
1. Ability to discuss the service product consumers and markets in the new market perspectives.
2. Ability to explain the 4Ps of marketing to services and identify the role of marketing communication.
3. Ability to analyse the managing service processes and relate the service environment

SMP33503 INTERNATIONAL BUSINESS ENVIRONMENT [PERSEKITARAN PERNIAGAAN ANTARABANGSA]

No of Credits: 3

Course Synopsis:
This course will describe the PESTLE+C analysis which is used as a base for theories and concept evaluation of the international business environment with a focus on global politics, economics, social, technology, legal, environmental, and competition forces to international business activities.

Course Outcomes:
1. Ability to describe the impact of global political, economic, social, technological, legal and environmental changes from an international business perspective.
2. Ability to explain international business theories and concepts in the global business environment.
3. Ability to propose solutions for international business problems, based on the current information.

SMP33703 INTERNATIONAL MARKETING [PEMASARAN ANTARABANGSA]

No of Credits: 3

Course Synopsis:
This course will expose students to issues involved in international marketing, the market strategy for a product and a service in every country, general examples and frameworks of international marketing through the text, lecture and discussion and also, specific and in-depth examples of how to market a product/service in a country.

Course Outcomes:
1. Ability to explain the importance of international marketing theories and concepts.
2. Ability to apply theories and models in international marketing.
3. Ability to analyse the outputs from the application of the models and tools in international marketing.

SMP33803 STRATEGIC MANAGEMENT [PENGURUSAN STRATEGIK]

No of Credits: 3

Course Synopsis:
Strategic management educates aspiring managers on how to deal with uncertainty and achieve organisational goals. Strategic management requires ongoing analysis of the environment, strategy formulation, strategy implementation, and performance evaluation. The corporation focuses on its capabilities to maximise environmental potential. Strategic management as a capstone-multidisciplinary course analyses business, management, and strategic direction issues.

Course Outcomes:
1. Ability to analyse business environments to determine strategic factors that are critical to the organization.
2. Ability to formulate and implement strategies to achieve competitive advantages for the organization.
3. Ability to assess the appropriateness of strategies implemented and take corrective actions to get the organization back on track to attain goals and objectives.

SMP34403 EXPORT IMPORT MANAGEMENT [PENGURUSAN EKSPORT IMPORT]

No of Credits: 3

Course Synopsis:
This course focuses on the knowledge, skills and experience base needed to manage the import and export business activities either as comprehensive trading company or a department in the company with import and export activities. This course will also expose students to the responsibilities of a manager in the import and export and develop students' mental preparation for working in the field of international business. Exposure includes knowledge of the rules, procedures and organizations involved in the import and export business.

Course Outcomes:
1. Ability to explain the application of primary documents and procedures in export and import, and INCOTERMS in international business.
2. Ability to identify the various export and import business processes and procedures in international business.
3. Ability to evaluate various export and import documentation based on the mode of international transportation.

SMP34503 GLOBAL ECONOMIC ISSUES [ISU-ISU EKONOMI GLOBAL]

No of Credits: 3

Course Synopsis:
This course will focus on major global economic issues that characterise the state of our current world. Students will be exposed to topics relating to global economic issues, world economy evolution, economic cooperation among the nations, demographics, geopolitics, giant economic powers, industrial revolutions, world hunger and poverty, sustainable development and current issues evolved. Students of this course will be able to discuss and argue on the current economic problems and issues and intellectually find ways to resolve the issues discussed.

Course Outcomes:
1. Ability to apply the basic concepts of global economic issues.
2. Ability to analyse the importance of cooperation amongst nations, demographics, geopolitics and powers.
3. Ability to evaluate the impacts of global economic issues connected on current social, political, cultural and environmental responsibilities.

SMP35103 FINAL YEAR PROJECT [PROJEK TAHUN AKHIR]

No of Credits: 3

Course Synopsis:
This course applies theory into practice; it will start with identifies the business or management issues, develops understanding base on theory and past literature, structuring the independent and dependent variables, applies research methodology, interprets collecting data, and provides structured and organize information to support the decision-making process.

Course Outcomes:
1. Ability to conduct and manage research.
2. Ability to organize research works and research reports independently.
3. Ability to decide appropriate and accurate methods in data analysis.
4. Ability to propose conclusions and recommendations to support the decision-making process.

SMP36003 INTERNATIONAL BUSINESS STRATEGY [STRATEGI PERNIAGAAN ANTARABANGSA]

No of Credits: 3

Course Synopsis:
This course is designed to explore the basic knowledge and skills to formulate international business strategy. It highlights for students the process that multinational companies engage in when deciding to compete in the global economy and the management consequences of these strategic choices. Students will learn the basic concepts of international business strategy that provide essential background on the nature of multinational management, how multinational companies formulate successful strategies to compete internationally, the management systems used to implement multinational strategies, the adaptation of international human resource practices across cultures and strategy implementation at the level of the individual in the organization.

Course Outcomes:
1. Ability to explain the concepts and elements related to international business strategy.
2. Ability to formulate successful strategies to compete internationally.
3. Ability to solve international business strategy case study.

SMP32603 PROJECT MANAGEMENT

Course Synopsis
In this course, students will study basic concepts and models that will enhance successful management of projects in engineering and technology. Topics will include a structured approach to project management, project life cycle, project selection and evaluation, organizational concepts in project management, project planning, conflict and negotiation, budgeting and cost estimation, scheduling, resource allocation, monitoring, information systems and project evaluation and control, project reviewing and project termination.

Course Outcome
1. Ability to define and discuss organizational issues and management methods that are necessary for successful project management.
2. Ability to understand and apply organizational concepts and project planning, including conflict and negotiation in project management.
3. Ability to analyse and evaluate budgeting and cost estimation, project scheduling, resources allocation, project monitoring, information systems and project evaluation, project reviewing and project termination.

SMP14203 INTRODUCTION TO ENGINEERING TECHNOLOGY

Course Synopsis

This course is designed to expose students to the fields or disciplines of Engineering and Manufacturing Technology and Processes. In the first part of the course, teaching and learning will begin with explanation about the functions of an engineer with a breakdown of engineering fields or disciplines. Furthermore, the second part of the subject will deal with manufacturing technologies and its processes. Whereas, students will totally focus on the processing and assembly operations. At the end of this course, students will have a clear understanding of the roles, responsibilities and gain knowledge related to operations and processes in the manufacturing sector.

Course Outcome

1. Ability to APPLY knowledge about areas of expertise, disciplines and responsibilities in the engineering profession with any related activities.
2. Ability to CORRELATE the processing and assembly operations in manufacturing activities with applicable situations.
3. The ability to ANALYSE manufacturing technologies and processes to produce a product or in applicable engineering activities

SMP21303 BUSINESS VENTURE MANAGEMENT

Course Synopsis

This course introduces to the students about the stages in the entrepreneurial process such as decision to become an entrepreneur, developing successful business ideas, moving from an idea to an entrepreneurial firm and managing and growing an entrepreneurial firm. The focus will be on the start up phase in which the individual decides to become an entrepreneur and goes through the opportunity discovery, exploitation and allocation of resources.

Course Outcome

1. Ability to analyse the entrepreneurial process for new venture creation.
2. Ability to express opportunity-driven business ideas using appropriate methodology.
3. Ability to organize resources in new business ventures.

SMP25703 DATA ANALYTICS FOR ENGINEERING MANAGEMENT

Course Synopsis

This course is designed as a preparation for meaningful opportunities in the future with respect to data analytics. This course will introduce the data analytics and describes the important phases of data analytics project. It will further guide students to use different functions of spreadsheets regarding data analytics. Next, Pivot tables and their use in data analytics will be introduced. The students will learn the way to represent data using charts and tables, as well as analyse the visualised data in the Data Visualization phase. This course also allows students to build project according to case study and producing final deliverables. At the end of this course, students will be introduced to some optimization techniques used in data analytics to improve decision making.

Course Outcome

1. Ability to understand the phases of data analytics project and other related optimization techniques in data analytics
2. Ability to apply basic operations and formatting as well as different formulae and functions in spreadsheets.
3. Ability to analyze the visualized data in spreadsheets.

SMP22003 TECHNOLOGY ENTREPRENEURSHIP

Course Synopsis

This course will give exposure to the process of innovative transformation of knowledge into commercial product and service. Students will assess real technologies for the commercial potential in terms of licensing and for venture development. The course begins by examining concepts associated with technology commercialisation. Concepts are introduced to improve and accelerate the commercialisation process, from decisions made by scientists at the research bench, through development, intellectual property protection, to the formation of technology-based ventures.

Course Outcome

1. Ability to analyse key concepts in technology entrepreneurship and commercialisation.
2. Ability to adopt a model for technology commercialization.
3. Ability to conceptualize technology opportunities.

SMP21903 PRODUCT DESIGN AND DEVELOPMENT

Course Synopsis
The aims of the course are to further the students ability to plan and propose product design solutions/concepts using proper product development processes, tools and methods. In addition, students will be exposed to three main disciplines and their functions in a product design and development project. Student will experience on how to design and develop product from the earliest planning stage and finished with a final proposal of design concept and its specifications. These are done by having an individual and a group design project. At the end of the course, students are expected to be ready and able to manage and participate in a multidisciplinary product design and development project.

Course Outcome
1. Ability to integrate the nature and role of multidisciplinary product development team tasks and their responsibilities in the process of developing a product
2. Ability to classify appropriate design strategies at different stages in the product development process.
3. Ability to analyze design factors using proper product design and development methods and tools for different types of products

SMP25603 ENGINEERING DRAWING FOR PRODUCT DESIGN

Course Synopsis
The aims of the course are to further the ability to communicate technical information by graphical means, using CAD software packages to develop technical products. This will be achieved through the ability to visualize and understand spatial/3-dimensional relationships, and the ability to select and use appropriate graphical methods for representing specifications, object forms, and sizes. The course will comprise of visualization and graphical theory, drawing standards and conventions, CAD drawing tools, and the use of drawings in engineering applications. By the end of the course, the students will be able to draw, visualize and read specifications of any engineering parts and components in engineering drawings using CAD software.

Course Outcome
1. Ability to analyze standard language and symbols used in engineering drawing.
2. Ability to manipulate CAD software interfaces, and tools with proper engineering drafting methods and standards.
3. Ability to evaluate graphical objects for communication of concepts, ideas, and design of engineering components or products through CAD drawings.

SMP27203 CREATIVITY & BUSINESS INNOVATION

Course Synopsis
This course is designed for students to develop their creative and innovative thinking skills in solving problems. They will learn about the creativity and innovation in the context of entrepreneurship. The students will be exposed to various aspects of business innovation and innovation management. At the end of the course, the students are expected to be able to use the creativity tools to generate ideas as well as to use methods and processes to build an innovative organization.

Course Outcome
1. Ability to analyze the concepts of creativity and innovation in entrepreneurship.
2. Ability to develop ideas using creative tools.
3. Ability to adapt methods in managing innovation.

SMP35803 QUALITY ASSURANCE IN MANUFACTURING PROCESS

Course Synopsis
The aims of the course are to further the ability to perform thorough product assessments using total quality management. A fully implemented quality management system in the manufacturing industry ensures better control of processes and workflows to deliver a quality product. An end-to-end quality management system boosts the overall effectiveness of any manufacturing unit, maintaining consistency with the resources. Better control also indicates the implementation of best practices in the system, processes, as well as product. By the end of the course, the students will be able to evaluate appropriate quality management tools to improve the quality of processes while ensuring customer satisfaction at the end.

Course Outcome
1. Ability to analyze appropriate quality management knowledge for detecting manufacturing process problems.
2. Ability to appraise quality management tools for manufacturing process
3. Ability to develop solutions for quality monitoring in manufacturing processes

SMP32203 SUPPLY CHAIN MANAGEMENT

Course Synopsis
Supply chain management is a highly-detailed system used by small and large organizations alike to get products to consumers, from obtaining raw materials, manufacturing and delivering the final product to the customer. A well-organized supply chain management system involves optimizing operations functionality to be fast and efficient.

Course Outcome
1. Ability to analyse the general concepts and processes involve in supply chain management.
2. Ability to evaluate supply chain model.
3. Ability to design effective supply chain in a business environment.

SMP36203 BUSINESS PLAN FOR ENGINEERING PROJECT

Course Synopsis
This course is a capstone final year project, which provides exposure to the students in culminating their learning of business, basic engineering, and technology. Students will apply their learning theory into practice, by developing a business plan for their new start-up business, in a specific format and for a specific product or project.

Course Outcome
1. Ability to organize concepts into practice.
2. Ability to develop opportunity-driven business ideas using appropriate business tools.
3. Ability independently create a business plan for an engineering project

SMP21503 ENTREPRENEURIAL FINANCE

Course Synopsis
Entrepreneurial finance is the study of value and resource allocation, applied to new ventures and the questions which confront all entrepreneurs pertaining to the amount of funding that can and should be raised, the timing to raise funding, the suitable sources of funding that should be approached, valuing a startup worth, and structuring funding contracts and exit decisions.

Course Outcome
1. Ability to analyse financial information for the development of the firm's financial plan
2. Ability to explain the financial concepts in relation to the entrepreneurial process.
3. Ability to express solutions to entrepreneurial finance problems using appropriate financial tools.

SMM10103 INTRODUCTION TO COMMUNICATION THEORY [PENGENALAN KEPADA TEORI KOMUNIKASI]

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 explain 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 PUBLIC SPEAKING [PERUCAPAN AWAM]

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 INTRODUCTION TO NEW MEDIA [PENGENALAN KEPADA MEDIA BAHARU]

No of Credits: 3

Course Synopsis:
This course provides an insight into modern cyberculture, 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 the current 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 explain 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 SCRIPT WRITING & DIGITAL STORYBOARD [PENULISAN SKRIP DAN PAPAN CERITA DIGITAL]

No of Credits: 3

Course Synopsis:
The purpose of this course is to expose students to their writing skills and their 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 of 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 explain the concepts of new media scriptwriting & digital storyboard.
2. Ability to demonstrate scriptwriting and storyboard development skills for the new media content.
3. Ability to justify creative ideas in new media writing and storyboard development.

SMM10503 NEW MEDIA LITERACY [LITERASI MEDIA BAHARU]

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 explain 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 VISUAL COMMUNICATION [KOMUNIKASI VISUAL]

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 analyse the elements of visual communication of the product creation.
3. Ability to produce communication products that emphasize on the aspects of visual communication.

SMM10703 INNOVATIVE AND CREATIVE SKILLS [KEMAHIRAN KREATIF DAN INOVATIF]

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 identify the basic concepts for thinking creatively and innovatively
2. Ability to solve problems creatively and innovatively.
3. Ability to analyse innovation activities in different organizations and environments

SMM10803 INTRODUCTION TO PROGRAMMING LANGUAGES [PENGENALAN KEPADA BAHASA PENGATURCARAAN]

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 PRINCIPLES OF HUMAN COMPUTER INTERACTION [PRINSIP-PRINSIP INTERAKSI MANUSIA-KOMPUTER]

No of Credits: 3

Course Synopsis:
This course provides an overview of the principles of human-computer interaction (HCI) that are applicable to the 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 analyse its relevance and usage for managerial usage and decision making.

Course Outcomes:
1. Ability to identify the principles of human-computer interaction to relate with today's activities.
2. Ability to analyse 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 SOCIOLOGY IN NEW MEDIA [SOSIOLOGI DALAM MEDIA BAHARU]

No of Credits: 3

Course Synopsis:
This course provides an overview of the study of the relationship between humans and society in the context of new media. This course 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 analyse social problems to discover their causes and possible solutions. This course also prepares the students for employment in social service, recreation, teaching, and preparation for pre-professional studies.

Course Outcomes:
1. Ability to explain the concepts related to sociology.
2. Ability to analyse how social change factors affect individuals and society
3. Ability to propose solutions using sociological perspectives to solve problems on the impact of media towards society.

SMM20103 ORGANIZATIONAL COMMUNICATION [KOMUNIKASI ORGANISASI]

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 explain organizational communication elements and processes.
2. Ability to analyse communication problems in organizational contexts.
3. Ability to develop strategies based on the organizational communication issues and problems

SMM20203 DIGITAL PHOTOGRAPHY [FOTOGRAFI DIGITAL]

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 GRAPHIC DESIGN FOR NEW MEDIA [REKA BENTUK GRAFIK UNTUK MEDIA BAHARU]

No of Credits: 3

Course Synopsis:
This course is designed upon creative industry needs nowadays for every graphic designer. The students will learn the skills in using Adobe software, fundamentals of design, and how to solve a design problem in the real world. Covering every aspect of fundamentals include Design Principle, Elements of Arts, Stages of Design and many more. At the end of this course, students should be able to demonstrate the skill of using Adobe software, the fundamentals and problem solving in design.

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 NEW MEDIA ANALYSIS [ANALISIS MEDIA BAHARU]

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 explain the process and technique of new media analysis
2. Ability to analyse processes and techniques to create media works.
3. Ability to create media content for different contexts, audiences and purposes.

SMM30103 MEDIA PSYCHOLOGY [PSIKOLOGI MEDIA]

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 explain 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.

SMM20503 NEW ERA MANAGEMENT [PENGURUSAN ERA BARU]

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 explain 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.

SMM30203 RESEARCH METHODOLOGY [KAEDAH PENYELIDIKAN]

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 explain 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 DIGITAL MARKETING [PEMASARAN DIGITAL]

No of Credits: 3

Course Synopsis:
Digital marketing is an exciting area of marketing practice. In this course, we will cover the what, why, and how of major current approaches, including online listening and monitoring, website traffic analytics, search engine optimization, search and display ads, affiliates, email marketing, and social media. Digital marketers approach their jobs with a curiosity about how new technologies will change business, with an insistence that strategy drive tactics, and with a measurement mindset. The course is designed to get the student to think like a digital marketing professional.

Course Outcomes:
1. Ability to explain the concepts and frameworks used in Digital marketing.
2. Ability to evaluate digital marketing concepts in business.
3. Ability to produce effective digital marketing strategies in business.

SMM30403 DIGITAL VIDEO PRODUCTION [PENERBITAN VIDEO DIGITAL]

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 storyboarding, directing, lighting and shooting, sound recording, and will finish productions using current video and sound-editing software. Particular attention is paid to the skills required to successfully bring a mediated story or message to an audience. Students will learn to analyse and respond critically to a variety of audio/visual productions.

Course Outcomes:
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 WEB DESIGN AND DEVELOPMENT [REKA BENTUK DAN PEMBANGUNAN WEB]

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 perform the skills of applying new media elements on websites.
3. Ability to design a functioning prototype website.

SMM30603 NEW MEDIA ARTS [SENI MEDIA BAHARU]

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 which 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 DATA REASONING [PENAAKULAN DATA]

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 analysed 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 understand the concepts and terms related to the basics of statistical analysis.
2. Ability to use software for data entry and mining.
3. Ability to analyse research data based on quantitative and qualitative.
4. Ability to interpret findings and develop a meaningful conclusion.

SMM30803 3D MODELLING FOR BEGINNERS [ASAS PEMODELAN 3D]

No of Credits: 3

Course Synopsis:
This course aims to expose the students to the skills of practical in basic 3D modelling through providing in-depth experience of 3D modelling practices and applications. Object manipulation, lighting and rendering techniques, and specialized components, such as characters, are addressed at various levels. Students completing the class will have a foundational understanding of, and practical experience in creating three-dimensional animated text, graphics, and characters that can be used in games, multimedia, and transmedia applications.

Course Outcomes:
1. Ability to produce simple 3D models and environments.
2. Ability to demonstrate materials for 3D models (Texturing).
3. Ability to compose effective & rendering of 3D environments.

SMM30903 CONTEMPORARY PHOTOGRAPHY [FOTOGRAFI KONTEMPORARI]

No of Credits: 3

Course Synopsis:
The course 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 INDUSTRIAL PSYCHOLOGY [PSIKOLOGI INDUSTRI]

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 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 explain 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 ELECTRONIC ENTREPRENEURSHIP [KEUSAHAWANAN ELEKTRONIK]

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 explain the theories and concepts that are relevant to electronic 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 PUBLIC RELATIONS AND NEW MEDIA [PERHUBUNGAN AWAM DAN MEDIA BAHARU]

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 explain the various ways, new and emerging media technologies are shaping and changing PR practices and activities.
2. Ability to analyse 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 ETHICS AND LAW IN NEW MEDIA COMMUNICATION [UNDANG-UNDANG DAN ETIKA DALAM KOMUNIKASI MEDIA BAHARU]

No of Credits: 3

Course Synopsis:
This course aims to enhance students' understanding and knowledge about policies, laws, and ethics related to communication and new media. Students will develop an understanding and appreciation of issues related to policies, law, and ethics in new media. The case study approach will be used, with an emphasis on the principles and philosophy that underlie the various aspects of communications. At the end of this course, students should be able to analyse the important law and ethical issues involved with the new media scenarios.

Course Outcomes:
1. Ability to explain 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

SMM40403 DIGITAL CREATIVE ADVERTISING [PENGIKLANAN KREATIF DIGITAL]

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 practices that develop students' capability to articulate their learning to enter professional new media and advertising practice in the creative industry.

Course Outcomes:
1. Ability to create creative ideas and skills to communicate through media with audiences.
2. Ability to evaluate 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 FINAL YEAR PROJECT 1 [PROJEK TAHUN AKHIR 1]

No of Credits: 2

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 AUDIO DESIGN [REKA BENTUK AUDIO]

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.

SMM40303 ANIMATION FOR INTEGRATED MEDIA [ANIMASI UNTUK MEDIA BERSEPADU]

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 aftereffects 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 graphics for new media.
3. Ability to design and compose themed animation for new media.

SMM40703 CRISIS COMMUNICATION IN NEW MEDIA [KOMUNIKASI KRISIS DALAM MEDIA BAHARU]

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 analyse 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 EVENT MANAGEMENT [PENGURUSAN ACARA]

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 organize, 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 analyze 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 NEW MEDIA ISSUES & CHALLENGES [ISU DAN CABARAN MEDIA BAHARU]

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 a research topic of their choice, discuss these issues with experts in the field of project or 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 SKILLS IN ORGANIZATIONAL STRATEGY AND PERFORMANCE [KEMAHIRAN PENGURUSAN STRATEGI DAN PRESTASI ORGANISASI]

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 explain 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 documents.

SMM41104 FINAL YEAR PROJECT 2 [PROJEK TAHUN AKHIR 2]

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 preprojects.
3. Ability to sent and justify the projects.

SMM49906 INDUSTRIAL TRAINING [LATIHAN INDUSTRI]

No of Credits: 5

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 technical and professional as well 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 the training period.
3. Ability to perform assigned tasks given by the host company.

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.

SMB10102 PREPARATORY ENGLISH [BAHASA INGGERIS PERSEDIAAN]

No of Credits: 2

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 are 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 ENGLISH FOR GENERAL COMMUNICATION [BAHASA INGGERIS KOMUNIKASI UMUM]

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-centered 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 critically 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 ENGLISH FOR TECHNICAL COMMUNICATION [BAHASA INGGERIS UNTUK KOMUNIKASI TEKNIKAL]

No of Credits: 2

Course Synopsis:
This course is designed to build students' competency in technical writing. Various fundamentals 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 analyzing 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 fundamentals of technical communication.
2. Ability to produce clear, well- structured technical document based on the fundamentals of technical communication and supported with appropriate examples.
3. Ability to discuss critically and express agreement and disagreement within a group on a variety of topics related to the technical discipline.

SMB31302 ENGLISH FOR ACADEMIC PURPOSES [BAHASA INGGERIS AKADEMIK]

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 discplines 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 discplines convincingly.

SMB01402 MANDARIN LANGUAGE FOR BEGINNERS [BAHASA MANDARIN PERMULAAN]

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 oneself 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 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.

SMB11402 PREPARATORY MANDARIN LANGUAGE [BAHASA MANDARIN PERSEDIAAN]

No of Credits: 2

Course Synopsis:
This course is designed for students who have no prior backgroud in Mandarin language.The course focus on receptive and productive skills. The 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 in Mandarin language.

Course Outcomes:
1. Ability to comprehend words and phrases insimple 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.

SMB31402 ELEMENTARY MANDARIN LANGUAGE 2 [BAHASA MANDARIN ASAS 2]

No of Credits: 2

Course Synopsis:
The objective of this course is the introduction to 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 PRE-INTERMEDIATE MANDARIN LANGUAGE [BAHASA MANDARIN PERTENGAHAN]

No of Credits: 2

Course Synopsis:
The objective of this course is the introduction to developing productive and reflective language skill 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 identity general information in formal andinformal texts relating to a variety of workplace contexts.
2. Ability to write formal and informal texts and describe informative materials relating to workplace contexts.
3. Ability to interpret information and conversations on 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 THAI LANGUAGE FOR BEGINNERS [BAHASA THAI ASAS]

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 one self 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 PREPARATORY THAI LANGUAGE [BAHASA THAI PERSEDIAAN]

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. language on workplace related topics and contexts.

SMB01602 ARABIC LANGUAGE FOR BEGINNERS [BAHASA ARAB PERMULAAN]

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 one self 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 PREPARATORY ARABIC LANGUAGE [BAHASA ARAB PERSEDIAAN]

No of Credits: 2

Course Synopsis:
This course is designed for students who have no prior backgroud 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 one self 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.

SMB01702 JAPANESE LANGUAGE PREPARATORY [BAHASA JEPUN PERMULAAN]

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 one self 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 PREPARATORY JAPANESE LANGUAGE [BAHASA JEPUN PERSEDIAAN]

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. CAbility 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 ELEMENTARY JAPANESE LANGUAGE 1 [BAHASA JEPUN ASAS 1]

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 ELEMENTARY JAPANESE LANGUAGE 2 [BAHASA JEPUN ASAS 2]

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 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 experiences and social contexts.
3. Ability to interpret clear, standard speech on familiar matters in real life situations.
4. Ability to describe their plans and arrangements, activities and personal experiences.

SMB01802 GERMAN LANGUAGE FOR BEGINNERS [BAHASA JERMAN PERMULAAN]

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 one self 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 PREPARATORY GERMAN LANGUAGE [BAHASA JERMAN PERSEDIAAN]

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. words and basic phrases

SMB31802 ELEMENTARY GERMAN LANGUAGE 2 [BAHASA JERMAN ASAS 2]

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 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 and formal contexts.
2. Ability to write sentences using correct grammar to produce longer dialogues and essay relating to personal experiences and social and formal contexts.
3. Ability to interpret clear, standard speech on familiar matters in real life situations.
4. Ability to describe their plans and arrangements, activities and personal experiences.

SMB41802 PRE-INTERMEDIATE GERMAN LANGUAGE [BAHASA JERMAN PERTENGAHAN]

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 and informal texts, and describe informative materials relating to workplace context.
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 KOREAN LANGUAGE FOR BEGINNERS [BAHASA KOREA ASAS]

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 one self 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 PREPARATORY KOREAN LANGUAGE [BAHASA KOREA PERSEDIAAN]

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.

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 "Rukun Negara".
2. Ability to explain current issues base on the main stream of various philosophical school of thought.
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 issues related to economics, politics, society, culture and the environment from an ethical and civilizational perspective.

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 does not only happen in society but also involves 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 analyze the value of integrity and corrupt behavior 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.

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 instil entrepreneurial mindset among students in conducting daily activities.

Course Outcomes:
1. Ability to comprehend the elements and the concept of entrepreneurship based on selected case study.
2. Ability to create a creative and innovative entrepreneurship idea.
3. Ability to develop a business plan.

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 analyze 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.

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 expose to relevant knowledge of theories, concepts and practice 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 analyze the suitable and appropriate concept and theories of corporate communication within corporate communication contexts.
3. Ability to discuss the suitable and appropriate concept and theories of corporate communication within corporate communication contexts.

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 introduction to the principle of public speaking. The aim of this course is to be exposed 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 analyze 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.

SMU12602 PSIKOLOGI INDUSTRI [INDUSTRIAL PSYCHOLOGY]

No of Credits: 2

Course Synopsis:
The Industrial Psychology course offered to provide students an exposure to relevant knowledge of conventional and contemporary theories and practices in public and private sectors. Students will be able to comprehend, analyze and discuss the current issues on industrial psychology activities through a well-organized teaching and learning module.

Course Outcomes:
1. Ability to comprehend the concept, theories and process of human resource management.
2. Ability to analyze the suitable and appropriate concept, theories and process of human resource management within any given issues.
3. Ability to discuss the suitable and appropriate concepts, theories and process of human resource management 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 concept, theories, process and management of conflict and communication.
2. Ability to analyze the suitable and appropriate concept, 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.

SMU12802 PENGURUSAN SUMBER MANUSIA [HUMAN RESOURCE MANAGEMENT]

No of Credits: 2

Course Synopsis:
Students will be exposed to 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 concept, theories and process of human resource management.
2. Ability to analyze the suitable and appropriate concept, theories and process of human resource management within any given issues.
3. Ability to discuss the suitable and appropriate concepts, theories and process of human resource management within any given contexts.

SMU13202 PENGAJIAN MALAYSIA [MALAYSIAN STUDIES]

No of Credits: 2

Course Synopsis:
The Malaysian Studies course emphasizes on the political, economic, and social aspects of the country's formation and growth. It contains details on the background history of ancient and Indian Southeast Asian kingdoms. Additionally, it covers Malacca's earliest known population, Malay Sultanate, Malay Kingship traditions, the rise and fall of Malacca, the nationalistic era, and the path to independence. Along with a brief history of Perlis, it also addresses topics such as foreign policy, globalization challenges, democratic and administrative characteristics.

Course Outcomes:
1. Ability to explain Malaysian historical background, nationalism, development, and growth to reach independence.
2. Ability to analyze the Malaysian process of democracy and system of administration.
3. Ability to discuss Malaysian issues and challenges in the era of globalization.

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LIST OF COURSES:

COURSE CODE	COURSE NAME
QMQ10103	Matematik Kejuruteraan I [Engineering Mathematics I]
QMQ10203	Matematik Kejuruteraan II [Engineering Mathematics II]
QMQ11103	Matematik Untuk Teknologi Kejuruteraan I [Mathematics for Engineering Technology I]
QMQ11203	Matematik Untuk Teknologi Kejuruteraan II [Mathematics for Engineering Technology II]
QMQ20303	Matematik Kejuruteraan III [Engineering Mathematics III]
QMQ21303	Matematik Untuk Teknologi Kejuruteraan III [Mathematics for Engineering Technology III]
QMQ22103	Matematik Diskrit Dan Aljabar Linear [Discrete Mathematics and Linear Algebra]
QMQ27103	Statistik Kejuruteraan [Engineering Statistics]
QMQ27203	Kebarangkalian Dan Statistik [Probability and Statistics]
QMQ27303	Statistik Untuk Teknologi Kejuruteraan [Statistics for Engineering Technology]

QMQ10103 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 derivative will be discussed.

Course Outcomes:
1. Ability to apply concepts of complex numbers, matrices and vectors in engineering problems.
2. Ability to apply concepts of differentiation and integration in engineering problems.
3. Ability to analyse solution of partial derivative in engineering problems.

QMQ10203 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 first and second order ordinary differential equations, partial differential equations and certain physical problems that relate to differential equations.
2. Ability to analyse the function and appropriate properties of Laplace transform in solving initial value problem that relate to first and second order ordinary differential equations.
3. Ability to analyse periodic function using the fundamental understanding of Fourier series in generating Fourier series and Fourier series expansions.

QMQ11103 MATEMATIK UNTUK TEKNOLOGI 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 are the essential tools 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 basic concepts of algebra in solving mathematical problems using complex numbers, matrices and vectors.
2. Ability to apply basic concepts of calculus in solving mathematical problems using methods of differentiation and integration.
3. Ability to analyze related problems by using statistical data analysis.

QMQ11203 MATEMATIK UNTUK TEKNOLOGI KEJURUTERAAN II [MATHEMATICS FOR ENGINEERING TECHNOLOGY II]

No of Credits: 3

Course Synopsis:
This course will introduce the concepts of ordinary differential equations. The topics that will be discussed in this course are the methods in solving the differential equations including first and second order differential equations and its applications. Next, the course will introduce to the Laplace transform method to solve differential equations and at the end of topic, Fourier Series expansion of a function will be discussed to the students.

Course Outcomes:
1. Ability to evaluate first and second order ordinary differential equations and certain physical problems that related to differential equations.
2. Ability to analyse the function and appropriate properties of Laplace transform in solving initial value problem that related to first and second order ordinary differential equations.
3. Ability to analyse periodic function using the fundamental understanding of Fourier series in generating Fourier series and Fourier series expansions.

QMQ20303 MATEMATIK KEJURUTERAAN III [ENGINEERING MATHEMATICS III]

No of Credits: 3

Course Synopsis:
This course generally introduces the concepts of 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, Gauss, and Stokes theorems. In the numerical methods chapter, several numerical methods will be discussed to solve nonlinear equations, interpolation, differentiation, integration, ordinary differential equations, and partial differential equations.

Course Outcomes:
1. Ability to apply vector calculus concepts for solving single, double or triple integrals.
2. Ability to evaluate classical theorems in vector calculus based on the concept of differentiation and integration in vector calculus.
3. Ability to predict the approximate solution by using appropriate numerical methods for solving mathematical problems.

QMQ21303 MATEMATIK UNTUK TEKNOLOGI 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 methos 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 and triple integrals.
3. Ability to predict the approximate solution by using appropriate numerical methods for solving mathematical problems.

QMQ22103 DISKRIT MATEMATIK & ALJABAR LINEAR [DISCRETE MATHEMATICS & LINEAR ALGEBRA]

No of Credits: 3

Course Synopsis:
This course introduces the definition and concepts in discrete mathematics and linear algebra which is an essential tool 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 solve engineering problems using the knowledge in discrete mathematics and linear algebra.

QMQ27103 STATISTIK KEJURUTERAAN [ENGINEERING STATISTICS]

No of Credits: 3

Course Synopsis:
This course introduces the fundamental principles and techniques of statistics, focusing on data analysis, interpretation, and probability. Students will learn the statistical methods necessary to understand and work with data effectively. The course emphasizes how statistical ideas, concepts, techniques, and probability can be applied in real-world scenarios.

Course Outcomes:
1. Able to apply fundamentals of statistical data analysis and concepts of probability distributions to enhance statistical reasoning skills.
2. Able to formulate solutions using statistical inference methods for decision-making.
3. Able to evaluate the significance of a linear regression model for making predictions.

QMQ27203 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 for discrete and continuous random variables.
2. Ability to solve discrete and continuous probability distribution problems.
3. Ability to evaluate statistical inference methods and simple linear regression model in solving engineering problems.

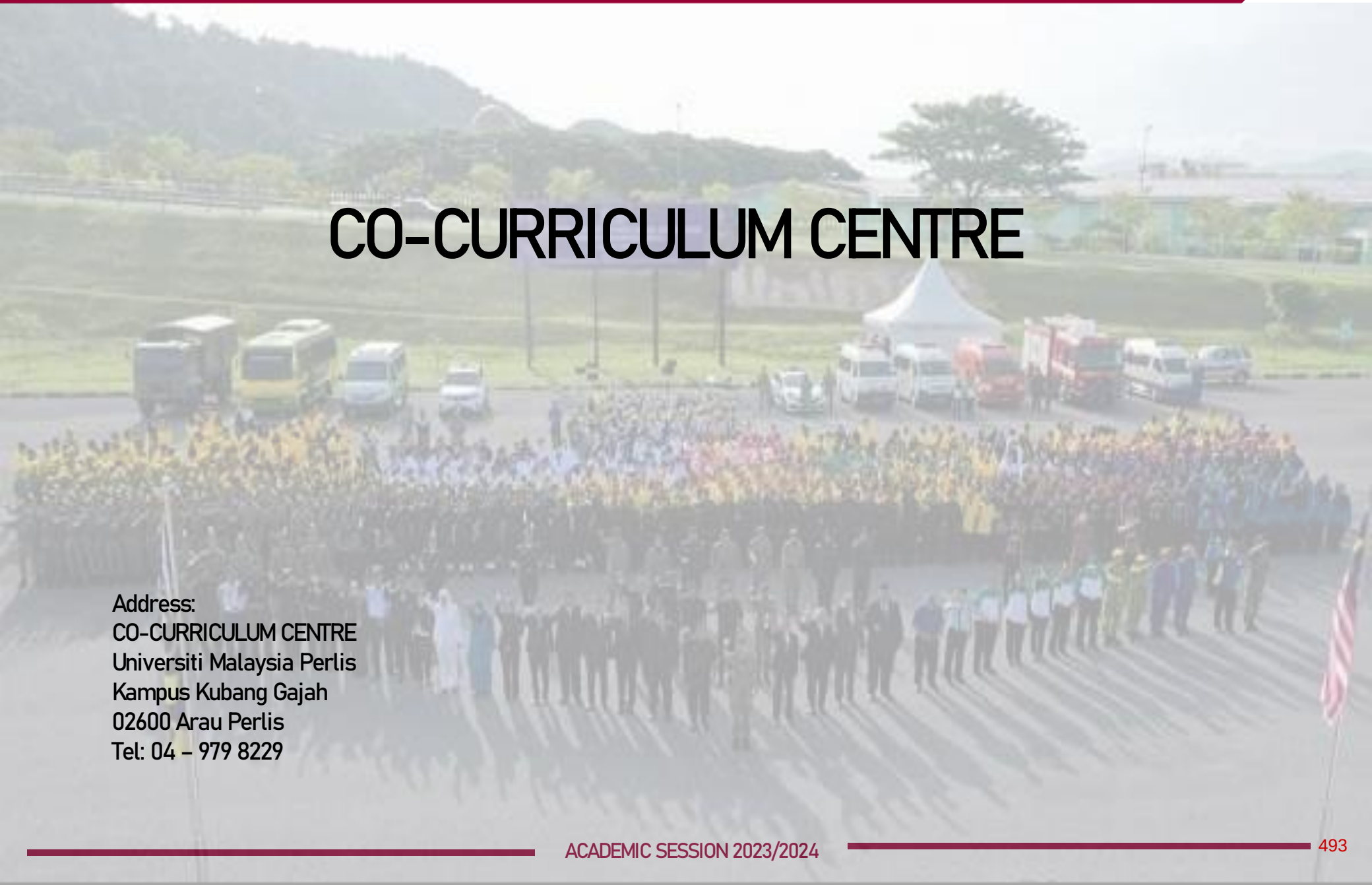
QMQ27303 STATISTIK UNTUK TEKNOLOGI KEJURUTERAAN [STATISTICS FOR ENGINEERING TECHNOLOGY]

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. Able to apply fundamentals of statistical data analysis and concepts of probability distributions in enhancing statistical reasoning skills.
2. Able to evaluate solutions using statistical inference methods for decision-making.
3. Able to evaluate the significance of a linear regression model for making predictions.

CO-CURRICULUM CENTRE



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LIST OF COURSES:

COURSE CODE	COURSE NAME
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)]
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]

LIST OF COURSES:

COURSE CODE	COURSE NAME
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]
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]

LIST OF COURSES:

COURSE CODE	COURSE NAME
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]
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]

LIST OF COURSES:

COURSE CODE	COURSE NAME
SMZ17401	Taekwon-Do ITF I [Taekwon-Do ITF I]
SMZ27401	Taekwon-Do ITF II [Taekwon-Do ITF 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]
SMZ18901	Sofbol [Softball]
SMZ10301	Woodball [Woodball]
SMZ10401	Bola Sepak [Football]
SMZ10501	Bola Jaring [Netball]
SMZ10601	Tenis [Tennis]
SMZ10901	Bola Tampar [Volleyball]

LIST OF COURSES:

COURSE CODE	COURSE NAME
SMZ13201	Penerbitan Video [Video Publishing]
SMZ15501	Seni Pergerakan Kreatif [Arts of Creative Movement]
SMZ15601	Drama, Pementasan & Seni Lakon [Drama, Playwright & Acting]
SMZ18201	Petanque [Petanque]
SMZ17901	Olahraga [Athletic]
SMZ18401	Badminton [Badminton]
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]
SMZ19501	Radio Kampus [Campus Radio]
SMZ19901	Tulisan Jawi [Jawi Orthography]

SMZ11001 SUKARELAWAN SISWA/SISWI KOREKSIONAL JABATAN PENJARA MALAYSIA I

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

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 mengorganisasikan aktiviti kepenjaraan yang bersesuaian dengan komuniti.

SMZ21001 SUKARELAWAN SISWA/SISWI KOREKSIONAL JABATAN PENJARA MALAYSIA 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

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)

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)

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)

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)

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)

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)

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. **C**Keupayaan untuk mempraktikkan kemahiran berkomunikasi dengan berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan teknik dan langkah-langkah aktiviti menyelamat dalam dunia maritim.

SMZ21701 PASUKAN KADET MARITIM MALAYSIA 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.

SMZ11701 PASUKAN KADET MARITIM MALAYSIA 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 mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Berkeupayaan untuk menganjurkan aktiviti dan program keselamatan maritim dengan komuniti

SMZ12001 BRIGED BOMBA DAN PENYELAMAT 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

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

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

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

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

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 mempraktikkan 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

No. of Credits: 1

Course Synopsis:
Kursus ini merupakan kesinambungan kepada kursus St. John Ambulans II. Pelajar yang telah lulus Sijil Asas Pertolongan Cemas 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

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 mempamerkan langkah-langkah aktiviti menyelamat dan pertolongan cemas dalam komuniti.

SMZ12601 KUMPULAN LATIHAN KELANASISWA MALAYSIA I (DARAT)

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)

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)

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)

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.

SMZ15101 ASAS 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

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 mempamerkan sikap profesional dan kerja berpasukan dalam permainan muzik gamelan.
2. Keupayaan untuk mempraktikkan kemahiran komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan program atau aktiviti berkaitan muzik gamelan dengan komuniti.

SMZ15201 KUMPULAN JAZZ 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 (praktikal) 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

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 mempamerkan sikap profesional dan kerja berpasukan dalam permainan muzik jazz.
2. Keupayaan untuk mempraktikkan kemahiran komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan program atau aktiviti berkaitan muzik kumpulan jazz dengan komuniti.

SMZ15301 PANCARAGAM 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 ancaragam. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan dari segi kemahiran bermain alatan pancaragam.

Course Outcomes :
1. Keupayaan untuk 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

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 mempamerkan sikap profesional dan kerja berpasukan dalam permainan pancaragam.
2. Keupayaan untuk mempraktikkan kemahiran komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan program atau aktiviti pancaragam dengan komuniti.

SMZ15401 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

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.

SMZ16001 PALAPES DARAT 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

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 mempraktikkan komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan sikap profesional dan tanggungjawab dalam pasukan.

SMZ26001 PALAPES DARAT 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, kepemimpinan, 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

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

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

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.

SMZ16201 KOR SISWA SISWI PERTAHANAN AWAM 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

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

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

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

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.

SMZ16401 KURSUS PERSIJILAN BULAN SABIT MERAH MALAYSIA 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

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. **CO**Keupayaan untuk mengaplikasikan pengetahuan dan kemahiran asas BSMM dalam komuniti.

SMZ16601 KOR SUKARELAWAN POLIS SISWA/SISWI 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

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

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

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

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

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.

SMZ16801 BRIGED RELA SISWA SISWI 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

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

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

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.

SMZ17101 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

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 mempamerkan kemahiran dan teknik silat secara berdisiplin dan bertanggungjawab dalam kumpulan.
2. Keupayaan untuk mempraktikkan kemahiran komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan program dan aktiviti silat dengan komuniti.

SMZ17401 TAEKWON-DO ITF I

No. of Credits: 1

Course Synopsis:
Kursus Taekwon-Do I (International Taekwon-Do Federation - ITF) bertujuan untuk mengasah bakat seni mempertahankan diri para pelajar melalui ilmu asas serta teori dan teknikal yang terdapat dalam Taekwon-Do itu sendiri. Para pelajar akan didedahkan kepada sejarah, latar belakang, terminologi, aspek teknikal, pengurusan diri serta aspek-aspek lain yang berkaitan Taekwon-Do I. Latihan asas kemahiran kaki dan tangan juga akan didedahkan kepada pelajar dan pelajar akan diuji dari masa ke semasa.

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.

SMZ27401 TAEKWON-DO ITF II

No. of Credits: 1

Course Synopsis:
Kursus Taekwon-Do II (International Taekwon-Do Federation - ITF) bertujuan untuk membangunkan bakat dan memantapkan kemahiran insaniah para pelajar melalui teori dan teknikal yang terdapat dalam seni mempertahankan diri Taekwon-Do itu sendiri. Dalam aspek teori, kursus ini lebih menjurus kepada sejarah, latar belakang, terminologi, pengurusan diri dan lain-lain yang berkaitan Taekwon-Do II. Dalam aspek teknikal pula, kursus ini akan memberi lebih tumpuan kepada kepada latihan amali atau praktikal melalui kemahiran kaki dan tangan yang dilakukan dari masa ke semasa.

Course Outcomes :
1. Keupayaan untuk menunjukkan kemahiran teakwon-do secara berdisiplin dan bertanggungjawab.
2. Keupayaan untuk mempraktikkan kemahiran komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan program dan aktiviti teakwon-do bersama komuniti.

SMZ17301 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

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 menunjukan kemahiran karate-do secara berdisiplin dan bertanggungjawab.
2. Keupayaan untuk mempraktikkan kemahiran komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan program dan aktiviti karate-do dengan komuniti.

SMZ17601 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, peratuan 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

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 menunjukkan kemahiran teakwon-do secara berdisiplin dan bertanggungjawab.
2. Keupayaan untuk mempraktikkan kemahiran komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan program dan aktiviti teakwon-do bersama komuniti.

SMZ17701 SILAT OLAHRAGA I

No. of Credits: 1

Course Synopsis:
Kursus Kokurikulum Silat Olahraga ini memperkenalkan dan mendedahkan para pelajar berkenaan 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 aktiviti silat.

SMZ27701 SILAT OLAHRAGA 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 menunjukkan kemahiran seni silat olahraga secara berdisiplin, bertanggungjawab dan beretika.
2. Keupayaan untuk mempraktikkan kemahiran komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan progran dan aktiviti silat olahraga sebagai aktiviti sukan dalam komuniti.

SMZ17501 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, disipiln 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

No. of Credits: 1

Course Synopsis:
Kursus ini merangkumi pengenalan kepada asas-asas ilmu tajwid, pengetahuan asas hokum-hakam bacaan Al-Quran yang tepat, dan seterusnya tallaqqi dan latihan bacaan Al-Quran secara mujawwad. Pelajar mengetahui asas-asas hokum tajwid, mengadakan perbincangan dalam sesi muzakarah, menjalani latihan bacaan Al-Quran, mengaplikasikan ilmu tajwid dan seterusnya menjalani talaqqi 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 mengorganisasikan aktiviti bacaan al-quran dalam komuniti

SMZ19601 STUDENT IN-FREE ENTERPRISE

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 mengorganisasikan perniagaan yang bersesuaian dalam komuniti.

SMZ19801 MANUSIA DAN KELESTARIAN ALAM

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

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 mempraktikkan kemahiran komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kemahiran dan teknik asas sukan golf dalam komuniti.

SMZ18901 SOFBOL

No. of Credits: 1

Course Synopsis:
Kursus Kokurikulum ini bertujuan mendedahkan pelajar-pelajar kepada ilmu sukan sofbol 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 sofbol. Manakala dari segi teknikal, kursus ini lebih menumpukan kepada latihan amali dari segi kemahiran bermain sofbol. Selain itu, kursus ini dapat menarik minat pelajar untuk mewakili Universiti dalam sukan Sofbol untuk kejohanan MASUM, SUKIPTS dan kejohanan-kejohanan lain.

Course Outcomes :
1. Keupayaan untuk menunjukkan kemahiran kepimpinan, disiplin dan etika dalam sukan sofbol secara berkumpulan.
2. Keupayaan untuk mempraktikkan kemahiran komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kemahiran dan teknik asas sukan sofbol dalam komuniti.

SMZ10301 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 mempraktikkan kemahiran komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan program berkaitan sukan woodball dengan komuniti.

SMZ10401 BOLA SEPAK

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 kemahiran komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan program berkaitan sukan bola sepak dengan komuniti.

SMZ10501 BOLA JARING

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 mempraktikkan kemahiran komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasi program berkaitan sukan bola jaring bersama komuniti.

SMZ10601 TENIS

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 kemahiran komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kemahiran dan teknik asas sukan tenis dalam komuniti.

SMZ10901 BOLA TAMPAR

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 kemahiran komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan program berkaitan sukan bola tampar dengan komuniti

SMZ13201 PENERBITAN VIDEO

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

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 kemahiran komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan persembahan seni tari dalam komuniti.

SMZ15601 DRAMA, PEMENTASAN & SENI LAKON

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 kemahiran komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan persembahan drama/teater dalam komuniti.

SMZ18201 PATANQUE

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 kemahiran komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kemahiran dan teknik asas petanque dalam komuniti.

SMZ17901 OLAHRAGA

No. of Credits: 1

Course Synopsis:
Kursus Ko-Kurikulum 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 meganjurkan sesuatu Sukan Olahraga.

Course Outcomes :
1. Keupayaan untuk menunjukkan kemahiran kepimpinan dan disiplin dalam sukan olahraga secara berkumpulan.
2. Keupayaan untuk mempraktikkan kemahiran komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan program berkaitan sukan olahraga bersama komuniti.

SMZ18401 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 mempamerkan kemahiran kepimpinan dan disiplin dalam sukan badminton secara berkumpulan.
2. Keupayaan untuk mempraktikkan kemahiran komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan program berkaitan sukan badminton dengan komuniti.

SMZ18601 SEPAK TAKRAW

No. of Credits: 1Course 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 kemahiran komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan program berkaitan sukan sepak takraw bersama komuniti.

SMZ18701 RAGBI

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 pertauran 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.

SMZ18801 MEMANAH

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 kemahiran komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mempamerkan kemahiran dan teknik asas sukan memanah dalam komuniti.

SMZ19001 SUKAN BERBASIKAL

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

No. of Credits: 1

Course Synopsis:
Kursus kokurikulum Khidmat Masyarakat adalah bagi memupuk semangat kemasyarakatan dan kesukarelawanan di 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 kemahiran komunikasi berkesan dalam aktiviti berkumpulan.
3. **CO**Keupayaan untuk mengorganisasikan program dan aktiviti bersama komuniti.

SMZ19201 DAYA USAHA & INOVASI

No. of Credits: 1

Course Synopsis:
Kursus ini bertujuan melatih pelajar untuk menguasai kemahiran asas seni reka dan kejuruteraan. Di samping itu juga, ianya memberi pendedahan kepada pelajar untuk mengetahui cara-cara menggunakan bahan-bahan kitar semula, mekanisma-mekanisma yang boleh digunakan dan seterusnya teknik-teknik merekabentuk. 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 kemahiran komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mereka bentuk produk inovasi yang boleh dikomersialkan dalam komuniti.

SMZ19501 RADIO KAMPUS

No. of Credits: 1

Course Synopsis:
Radio merupakan salah satu medium penyebar 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 kemahiran komunikasi berkesan dalam aktiviti berkumpulan.
3. Keupayaan untuk mengorganisasikan pengurusan radio dalam komuniti.

SMZ19901 TULISAN JAWI

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.

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