POLITEKNIK MALAYSIA
TUANKU SULTANAH BAHIYAH

DEPARTMENT OF MECHANICAL ENGINEERING

5th EDITION STUDENT HANDBOOKS COMMITTEE

(MECHANICAL ENGINEERING DEPARTMENT)

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GREETING FROM DIRECTOR…

السَّلَامُ عَلَيْكُمْ وَرَحْمَةُ اللهِ وَبَرَكَاتُهُ

To all my dearest students,

Welcome to Politeknik Tuanku Sultanah Bahiyah,Kulim (PTSB) ~ your first step to a brighter future!

Thank you for choosing PTSB as your higher learning institution. I assure you that you will not regret it. PTSB offers twelve diploma programs; both in engineering and non-engineering fields, all accredited by ETAC and MQA. The programs are highly sought after by industries, and since 2015, we have achieved a graduate employability rate of over 90%. So, if you are looking for a job after completing your diploma, rest assured, you will not be disappointed. If you wish to pursue further studies at a higher level, do not worry, as more than 10% of our students continue their degrees at local universities.

We want you to make the most of your time with us, experiencing and learning as much as possible. Therefore, this Students' Handbook is designed to help you kick-start your quest for knowledge at PTSB with ease and without any trouble. It will also help you to understand how the learning system works. Learning at the polytechnic involves face-to-face interactions as well as online learning. This means, you will not only attend lectures but also engage in hands-on work in the workshops or laboratories. Occasionally, your lecturers may assign certain tasks to be completed online. 'Blended Learning' has become a culture at PTSB, and we believe that learning in this way can be enjoyable. We have CIDOS and MSTeam as official platforms for online learning, but we can always utilize any other online platforms to enrich our resources. Additionally, the Outcome-Based Education (OBE) approach encourages student-centered learning and teamwork, helping develop your leadership and communication skills.

Please make full use of the facilities available on our campus. You are welcome to enjoy the sport center, library, Pusat Islam, canteen and cafeteria. In addition, we provide the Sistem Penasihatan Akademik, competent counselors at the Counselling Unit, and friendly Majlis Perwakilan Pelajar (MPP) to help you throughout your study journey.

I sincerely hope that you will enjoy this phase of your learning journey and **I WISH YOU… ALL THE BEST**!!

TN. HJ. MOHD RUZI BIN HAMZAH
Director,
Politeknik Tuanku Sultanah Bahiyah.

1. About Polytechnic of Tuanku Sultanah

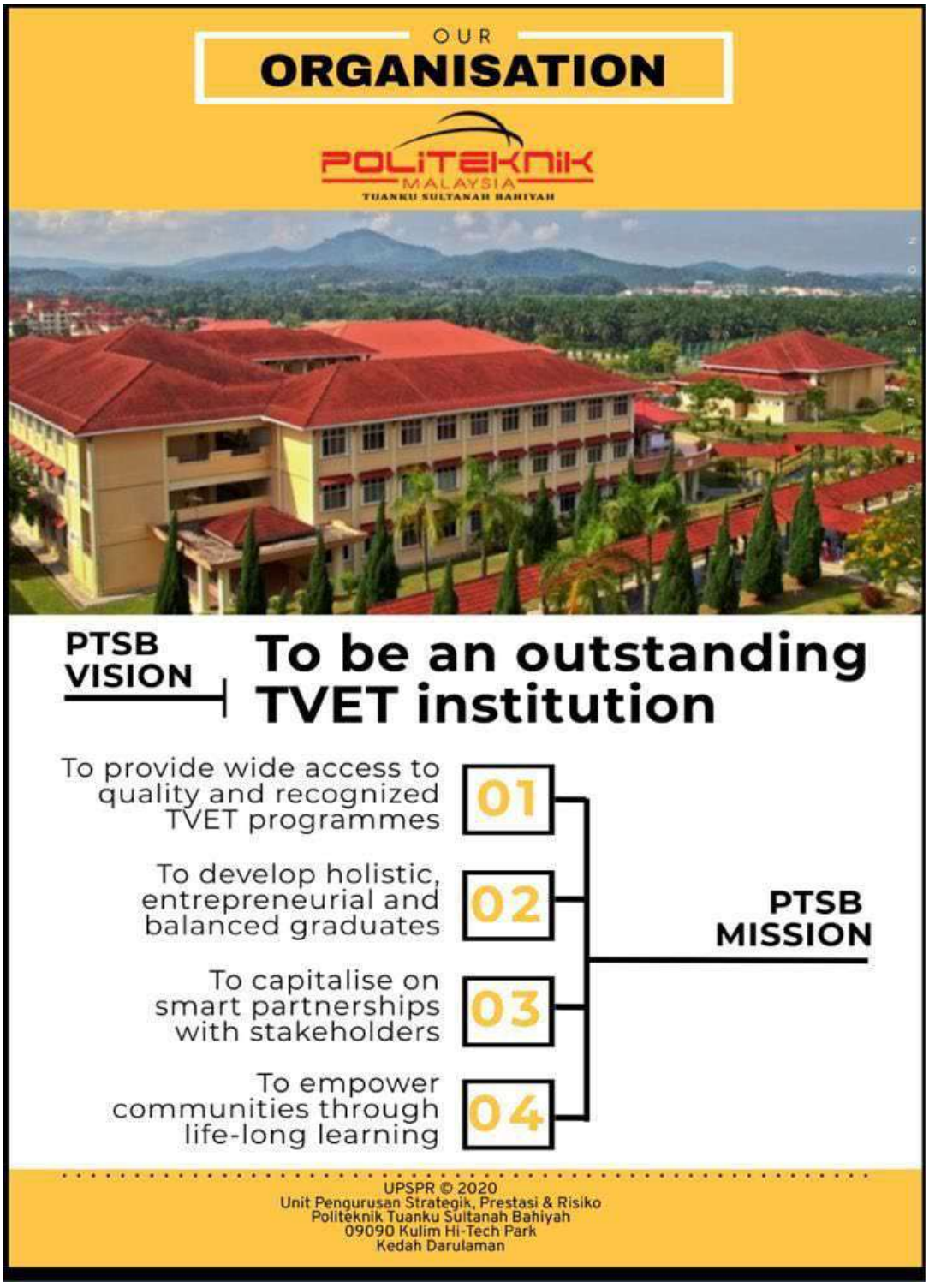
Politeknik Tuanku Sultanah Bahiyah (PTSB), formerly known as Politeknik Kulim (PKU) was the 16th established polytechnic under the Ministry of Education Malaysia. PKU commenced on 1st March 2002 at a temporary campus in Politeknik Seberang Prai, Pulau Pinang. On 3rd March 2003, it was relocated to its new premise of 100 acres at Kulim Hitech Park, Kulim, Kedah. This campus is equipped with up-to-date infrastructure which provides a conducive and ambient environment for higher education learning. It enrolled its first batch of 507 students on 9th June 2003.

This campus was officiated by the late Sultan of Kedah, Sultan Al-Mu'tasimu Billahi Muhibbuddin Tuanku Al-Haj Abdul Halim Mu'adzam Shah Ibni Almarhum Sultan Badlishah on 27th March 2007 and rebranded as Politeknik Tuanku Sultanah Bahiyah (PTSB).

PTSB is one of the Politeknik Malaysia under the administration of Jabatan Pendidikan Politeknik dan Kolej Komuniti (JPPKK). It plays its vital role in producing semiprofessional workers for the engineering and commercial industry in the private and public sectors. There are four main academic departments namely Civil Engineering Department, Electrical Engineering Department, Mechanical Engineering Department and Commerce Department. The teaching and learning processes in these main departments are supported by General Studies Department as well as Mathematics, Science & Computer Department.

The teaching and learning processes at PTSB are certified by SIRIM MS ISO 9001:2015. To maintain this certification, surveillance audit will be done every year and recertification for every three years. Apart from SIRIM certification, all engineering programs are accredited by ETAC and all non-engineering programs are accredited by MQA. By complying with the requirements of SIRIM, ETAC and MQA, we guarantee that students are equipped with all the knowledge and skills they need to serve in their respective fields and beyond. Furthermore, skills and knowledge like entrepreneurship as well as other softskills needed by employers are also nurtured among our students as these qualities are essentials in the current scenario of the working world.

2. Mission & Vision



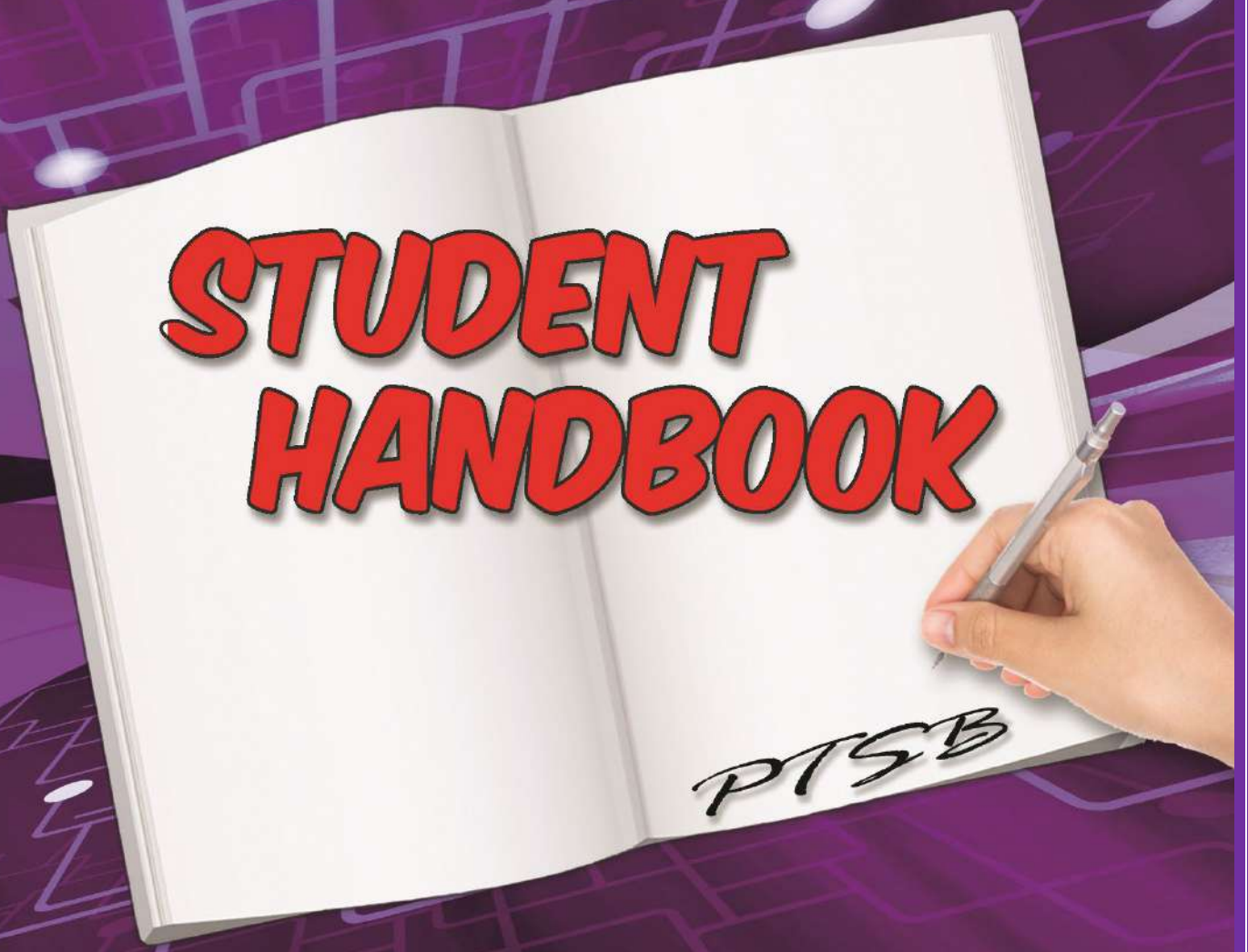
3. PTSB ORGANIZATION CHART

4. Campus Plan

1 ADMINISTRATION
2. LIBRARY AND RESOURCE CENTER
3. TRAINING AND CONTINUOUS LEARNING UNIT
4. DIGITAL MULTIMEDIA LEARNING CENTER
5. MAIN LECTURER HALL
6. DEWAN MUAD'ZAM SHAH (MULTI PURPOSE HALL
7. DEPARTMENT OF MATHEMATICS AND COMPUTER
8. DEPARTMENT COMMERCE
9. DEPARTMENT OF ELECTRICAL ENGINEERING BLOCK
10. DEPARTMENT OF STUDENT AFFAIRS AND DEVELOPMENT.
11. DEPARTMENT OF CIVIL ENGINEERING BLOCK
12. DEPARTMENT OF MECHANICAL ENGINEERING BLOCK
13. CANTEEN
14. DEVELOPMENT AND MAINTENANCE UNIT
15. STORE UNIT
16. DRIVER UNIT
17. MOSQUE
18. CAFETERIA
19. STUDENT HOSTEL BLOCK
20. DEPARTMENT OF SPORT, CO-CURRICULAR AND CULTURE
21. DIRECTOR RESIDENTIAL
22. STAFF RESIDENTIAL
23. HOSTEL MANAGEMENT UNIT
24. WATER TANK
25. WATER TANK
26. MAIN / SUB STATION HOUSE

POLITEKNIK MALAYSIA
TUANKU SULTANAH BAHIYAH

STUDENT HANDBOOK



ACADEMIC TEAM

5.1 Civil Engineering Department

Introduction

Civil Engineering Department (CED) is one of the main academic departments in Politeknik Tuanku Sultanah Bahiyah, Kulim, Kedah. CED has organized a wide range of activities in 2015 for students as well as for the staff to strengthen their skills and enhance their knowledge in various fields. It is our main aim to produce graduates that will be able to demonstrate desired behavioral traits such as integrity, teamwork, problem solving and passion in performing tasks related to their area of specialization. Students are also exposed to entrepreneurial skills that can be contributed to the economic growth in developing the nation towards 2020, especially in the construction industry. It is hoped that more competitive graduates will be produced to accommodate the present global market.

Programs Offered

- Diploma In Civil Engineering (DKA)
- Diploma In Geomatics (DGU)

Facilities

Below are the facilities available at Civil Engineering Department :

- Lecture Theatre
- Lecture Room
- Seminar Room
- CADD Laboratory
- Drawing Studio
- Carpentry Workshop
- Brick Workshop
- Concrete Laboratory
- Pipe Workshop
- Structure Laboratory
- Hydraulic Laboratory
- Geotechnics Laboratory
- Highway Laboratory
- Geomatics' Laboratory
- Photogrammetry Laboratory (Working Area)
- Remote Sensing Laboratory
- Environment Laboratory
-

5.2 Electrical Engineering Department

Introduction

Electrical Engineering Department (EED) is one of the academic departments in Politeknik Tuanku Sultanah Bahiyah (PTSB). It offers engineering program in electrical and electronics field for diploma level.

EED offers quality efficient education and professional services through a broad-based knowledge within the field of electrical and electronic engineering. The aim is to produce graduates with potential, competent and competitive as well as highly skilled. In order to achieve a commendable work, EED is comprised of dedicated professional trainers, with sufficient infrastructure.

Programs Offered

- Diploma in Electrical Engineering (DET)
- Diploma in Electronic (Communication) Engineering (DEP)
- Diploma in Electronic (Computer) Engineering (DTK)
- Diploma in Electrical and Electronic Engineering (DEE)

Facilities

- 25 Classrooms
- 1 Lecture hall
- 2 Electrical and Technology Principle Lab (EPT)
- 3 Computer Programming Lab (ECP)
- 2 Electronic Maintenance Lab (EER)
- 2 Electronic Labs (EEL)
- 1 Telecommunication Lab (ETC)
- 1 Communication Data Lab (EDC)
- 1 Measurement Lab (EME)
- 2 Project Labs (BPL)
- 1 Instrumentation Lab (BIN)
- 1 Electrical Wiring Lab (BEI)
- 1 Power System Lab (BPS)
- 1 Power Electronic Lab (BPE)
- 1 CAD Lab (CAD)
- 1 Project Presentation Room (EPP)
- 1 Hi-Tech Lab (BHI)
- 1 Robotics Lab (BRO)
- 1 Electrical Machine Lab (BEM)

5.3 Mechanical Engineering Department

Introduction

Mechanical Engineering Department (MED) is one of the major departments at the Politeknik Tuanku Sultanah Bahiyah, Kulim Kedah. As one of the academic departments in PTSB, MED provides a plethora of opportunities to the students to learn by organizing many interesting activities and programmes. Students will possess entrepreneurial skills, practice good work ethics, be able to promote good morality and behavior, and continuously enhance their knowledge and skills that will allow them to make tangible contributions and meet new technical challenges. The graduates will communicate and interact responsibly and be able to contribute effectively as a team member. They will also be adaptable to new changes at the workplace.

Programs Offered

- Diploma In Mechanical Engineering (DKM)
- Diploma In Mechanical Engineering (Manufacturing) (DTP)
- Diploma In Mechatronics Engineering (DEM)

Facilities

- Machining Workshop
- Welding Workshop
- Fitting Workshop
- Project Workshop
- Foundry Workshop
- Plastics Workshop
- Strength and Material Laboratory
- Mechanics and Machine Laboratory
- Metrology Laboratory
- Robotics Laboratory
- Plant Laboratory
- CAD/CAM Laboratory
- Automation Laboratory
- Electrical Technology Laboratory
- Instrumentation and Control Laboratory

5.4 COMMERCE DEPARTMENT

Introduction

Commerce Department is one of the academic departments in Politeknik Tuanku Sultanah Bahiyah. It operated on 2003 and it previously known as Politeknik Kulim where it offered several courses such as Accounting, Marketing and Business Studies at Diploma and certificate level. The first batch consisted of 176 students and 17 lecturers during its first session on 2003. Currently the number of students are 1,099 with an average intake of 180 to 250 students for every semester.

Commerce Department is moving forward by offering efficient and professional services in its education based on accounting, marketing and business studies in order to produce potential graduates who are hardworking, charismatic and professional. To realize this, Commerce Department has professional, dedicated and experience lecturers and it also has complete infrastructure such as classrooms, lecture hall and computer lab which are fully equip and comfortable for the students to achieve a successful academic.

Programs Offered

- Diploma in Accountancy (DAT)
- Diploma in Marketing (DPR)
- Diploma in Business Studies (DPM)

Facilities

- A lecture Hall
- 16 Classrooms
- A Business Support Room
- A Presentation Seminar Room
- An Entrepreneurship Development Room
- An Accountancy Computer Lab
- A Micro Accountancy Room
- 2 Meeting Rooms
- 2 Entrepreneurship Kiosks
- A Simulation Office

5.5 Mathematics, Science and Computer Department

Introduction

Mathematics, Science & Computer Department (MSCD) of PTSB is an ancillary department that consists of Mathematics Unit, Science Unit and Computer Unit. The department works to develop students' knowledge and skills in Mathematics, Science and Computer as the basic for them to learn engineering courses in the main academic. As an ancillary academic department, MSCD is also committed to develop students' competence and professionalism in their field. Since December 2015, MSCD has the intake of Pre-diploma in Science (IPS). Pre-Diploma Science is a program implemented to provide candidates who do not meet the minimum diploma-level qualifications to pursue their studies at Polytechnics as well as provide candidates with a second chance to seize jobs and improve their economic status and family.

Courses Offered

- DBM 10013 Engineering Mathematics 1
- DBM 20023 Engineering Mathematics 2
- DBM 30013 Engineering Mathematics 3
- DBM 30043 Electrical Engineering Mathematics
- DBS 10012 Engineering Science
- DBC20012 Computer Application

Facilities

- 1 Meeting Room
- 5 Tutorial Rooms
- 4 Computer Lab
- 2 Science Lab

5.6 General Studies Department

Introduction

General Studies Department (GSD) of PTSB consists of English Language Unit and Islamic Studies and Moral Education Unit that work on a professional partnership in their quest to take students to greater heights, morally and socially. As an ancillary academic department, GSD is committed in improving the English Language proficiency as well as the teaching of Islamic and Moral Education of undergraduates in the main academic departments.

Courses Offered

- DUE10012 – Communicative English 1
- DUE30022 – Communicative English 2
- DUE50032 – Communicative English 3
- MPU23012-Pengajian Islam
- MPU21032- Penhayatan Etika dan Peradaban
- MPU23052- Sains Teknologi Dan Kejuruteraan Dalam Islam
- MPU23042- Nilai Masyarakat Malaysia
- MPU22042- Bahasa Kebangsaan A

Facilities

- 3 Language Labs
- 1 Seminar Room
- 1 Presentation Room
- 1 Meeting Room

5.7 Collaboration, Industrial Services and Employment Centre (CISEC)

Introduction

Collaboration, Industrial Services And Employability Centre (CISEC) is one of unit was established at Politeknik Tuanku Sultanah Bahiyah (PTSB) with the function to four main areas and Alumni Tracer Study, Careers Advisory Service and Continuing Education, Planning and Preparedness into the working world, as well as industrial relations and placement through the industrial services especially in networking and collaboration

Scope And Function CISEC

Focuses on services to the industry, particularly in terms of networking and collaboration

Task 3 :
Increasing employability and job availability polytechnic graduates

Task 2 :
Provide services and respond to industry needs, particularly those involving collaboration and job placement of graduates

Task 4 :
Increase the rate of polytechnic graduates work

Task 1 :
Facilitate networking and collaboration between the Industry Polytechnic

Task 5 :
Provide career counseling, planning and preparation of graduates into the working world

Alumni PTSB

A group of students who have graduated from PTSB since 2010

Alumni Fund Function

helps to shape **PTSB** today and tomorrow by providing critical funds used by the Polytechnic leadership to meet the most pressing needs of the Polytechnic and students

INDUSTRY COLLABORATION MODEL

INDUSTRY ENGAGEMENT

INDUSTRY DIALOGUE

- Networking
- Inputs
  HRD Trends, Curricula, Employment

INDUSTRY ADVISORY

- Inputs
  HRD Trends, Curricula, Employment
- Networking

INDUSTRY FOCUS GROUP

- Focus group seminar
- Focus group advisory
- Networking reach out /discussion
  New fields, HRD Trends, Curricula, Employment

INDUSTRY COLLABORATION

ACADEMICS

Student Industry Training
Staff Industry Attachment
Industry Lecturers/Fellow
Curricula Development
Work Based Learning
Career/technical advice & support

RESEARCH

Joint Research /Project
Consultancy

BUSINESS ENGAGEMENT

Time Sector Privatization
CPD & Workforce development
Specialist Facilities

COLLABORATIVE OUTCOME

NATIONAL AGENDA

Human Capital Projection & Planning

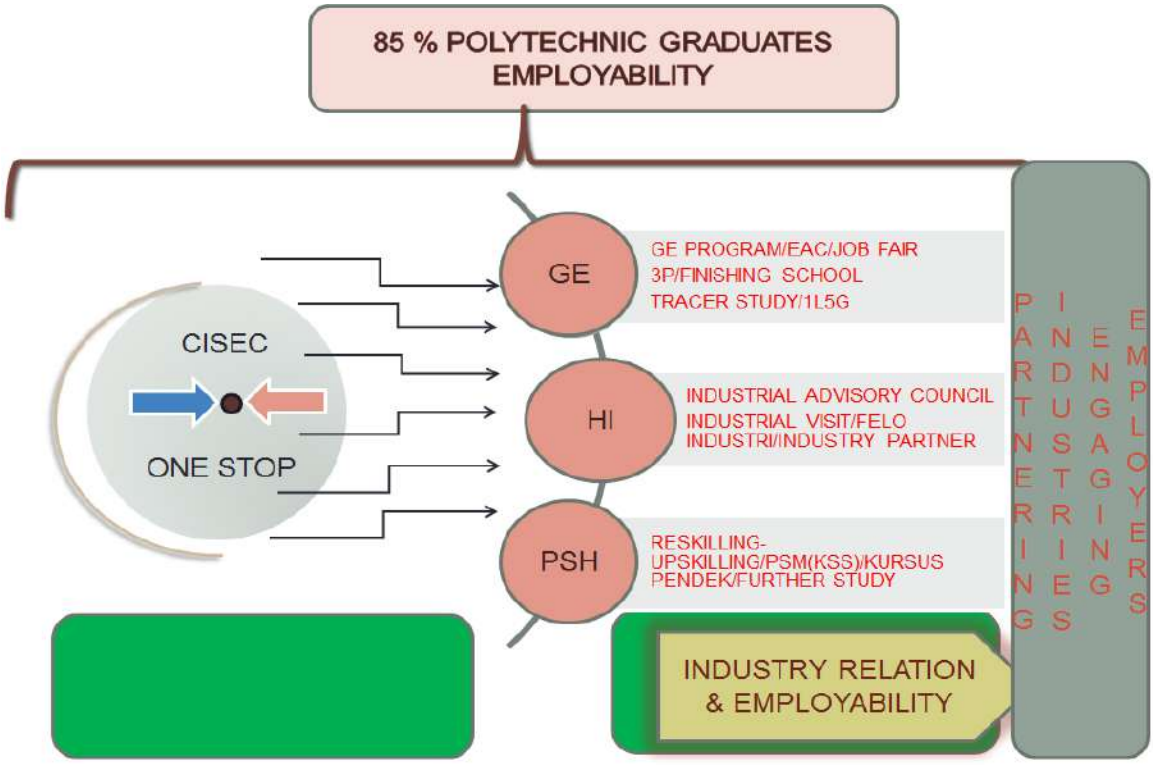
INSTITUTION

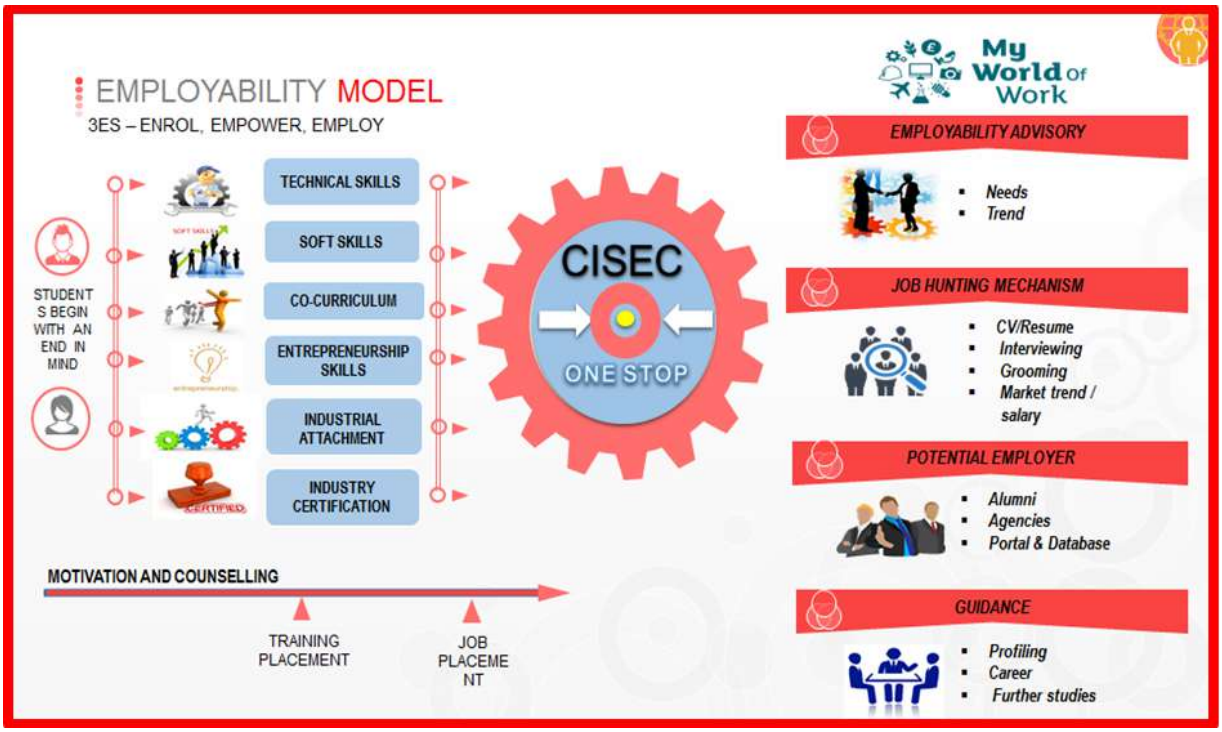
Expertise & Capacity
Competitiveness & Image
Funding Opportunities

GRADUATES

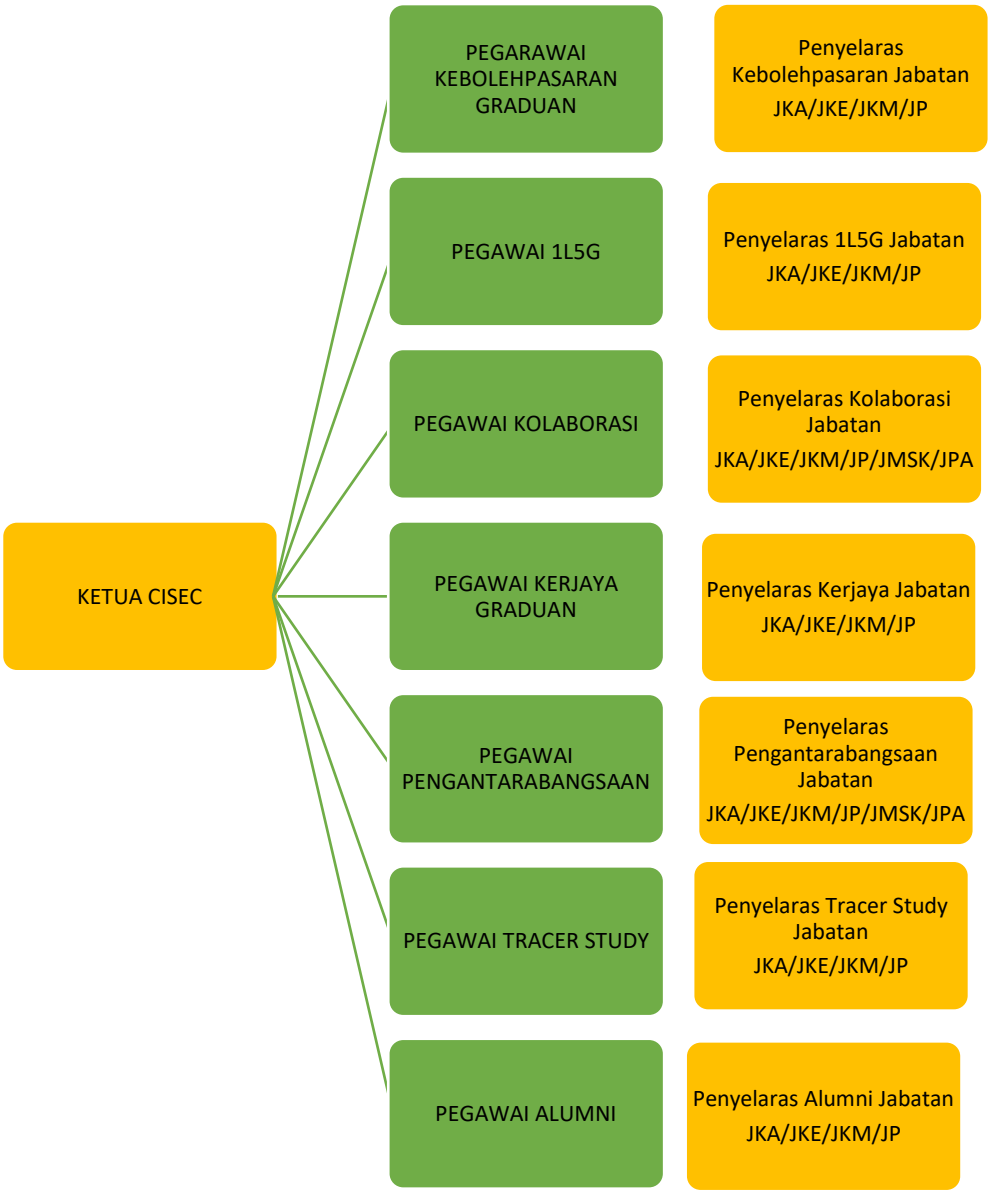
Employability
Salary Enhancement

EMPLOYABILITY MODEL





CISEC ORGANIZATION CHART



5.8 Industrial Training and Liaison Unit

Introduction

The Liaison & Industrial Training Unit (UPLI) is responsible for managing students' industrial training affairs. Students will be assigned to a particular organization during their training period based on their respective fields of study.

The placement process is finalised before training commences. Students are constantly advised to maintain a high level of discipline. They should abide by the rules and regulations of both the polytechnic and organization. Organizations are advised to consult the polytechnic immediately if there are any disciplinary problems.

Function and Roles

Liaise between students and organization where the students undergo their training

Manage the Industrial Training process for the eligible students

Coordinate Industrial Training activity

Industrial Training Course (DUT40110)

Industrial Training exposes students to related workplace competencies demanded by industries. It also equips students with real work experience, thus helping students to perform as novice workers. Upon completion of this course, students should be able to:

- apply related knowledge and skills at the workplace.
- communicate effectively with others.
- practice teamwork.
- professionally and ethically comply with policies, procedures and rules of the organization.
- explain the tasks assigned (during the industrial training) according to the prescribed format.

- **Assessment**

The course assessment is carried out by Coursework where it's a continuous assessment that measures knowledge, technical skills and soft skills. Student will be evaluate by using a rubric form as:

i. Organization Evaluation (total of 60%)
   - Practical Task – 40%
   - Reflective Journal – 20%

ii. Lecturer Evaluation (total of 40%)
   - Observation – 10%
   - Final Report – 20%
   - Presentation – 10%

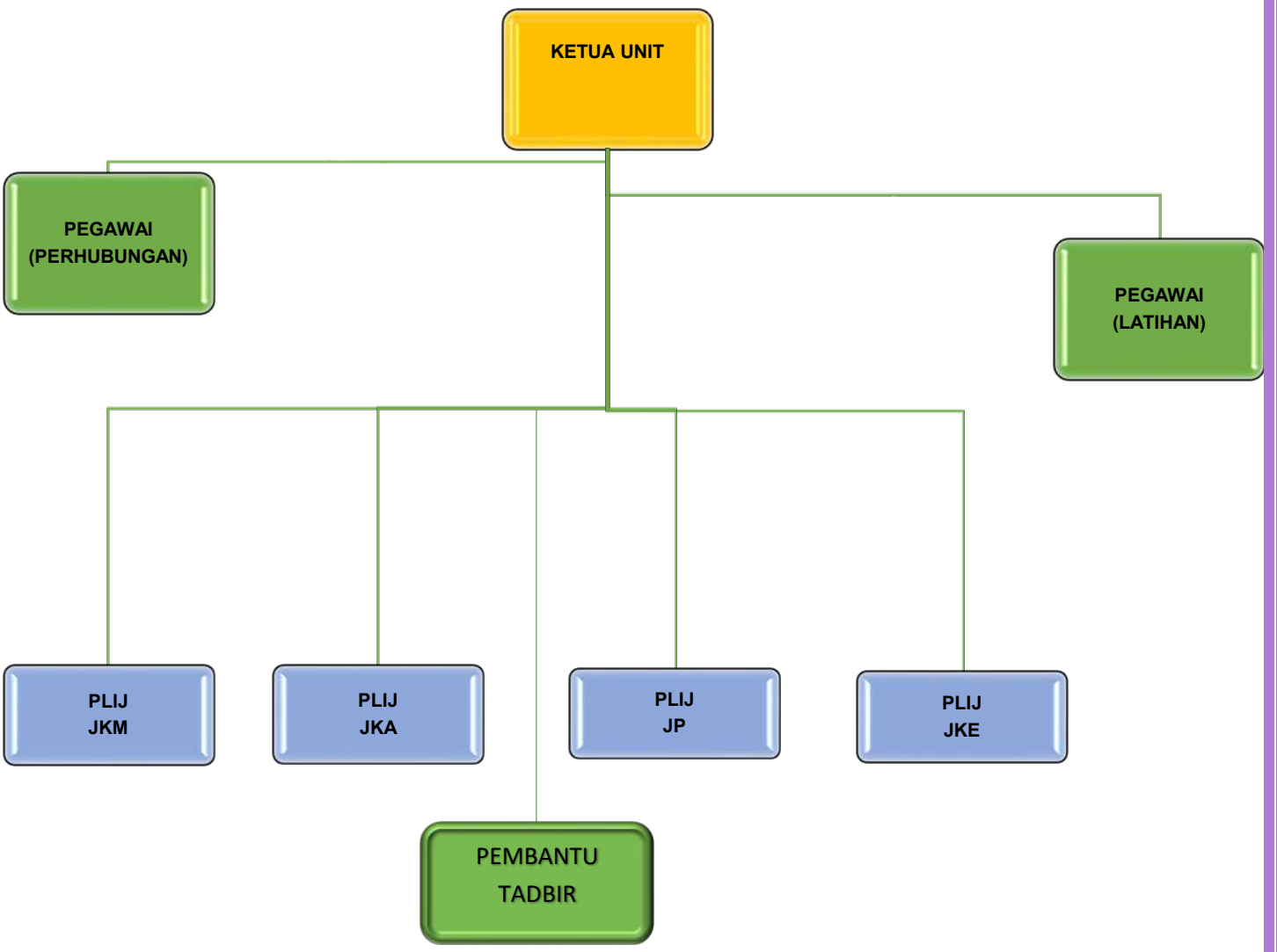
Grading

Industrial Training grade are follow the guideline stated in the Arahan-Arahan Peperiksaan dan Kaedah Penilaian which is approved by the Lembaga Peperiksaan dan Penganugerahan Sijil/ Diploma Politeknik and Dasar Latihan Industri Institusi Pengajian Tinggi which is published by Minister of Higher Education.

Industrial Training DUT40110 are grade as follow:

MARK	RESULT	STATUS
80 – 100	Excellent	Pass
65 – 79	Distinction	
40 – 64	Pass	
0 – 49	Fail	Fail

INDUSTRIAL TRAINING AND LIAISON UNIT
ORGANIZATION CHART14



5.9 Assessment and Examination Unit

Introduction

Examination Unit is responsible to coordinate and to handle activities regarding final examination and certification. The unit is fully supported by all departments to fulfil the responsibilities given. Examination Officer is responsible to monitor the whole examination process of polytechnic while Examination Coordinator is to manage things regarding examination for their respective departments. Other than that, Examination Unit also cooperate in organizing workshops related to examination such as Assessments and Vetting Workshop which is organized every semester in order to produce high quality examination questions to be applied in the Final Examination of Politeknik KPT. There are rooms in the Examination Unit as the offices of the Examination Officer, Departments' Examination Coordinator, Computer Room, and Vault Room, Examination Materials/Equipment Room and Printing Room.

Function and Roles

Prepare Final Examination Schedule and Invigilation of Final Semester

Prepare graduates' Certificates/Diploma and certification matters

Supervise the Final Semester Examination.

Process and prepare documents regarding Final Examination such as Examination Slip, Student's Letters.

Sort and prepare the question for Final Semester Examination.

Repeat Module, Repeat Semester, Fail, Research Data of Examination Result, Board Report, Graduates List and etc.

Questions construction process and organize the workshops for questions construction and vetting.

Prepare examination result transcript

Course Credit

- Credits for each course are as set forth in the Curriculum and Program Structure Document as approved by the Course Curriculum Institution and the Polytechnic Training Program

- The number of credits to be taken by the student for each semester is between 12 to 20 or as specified in the document Curriculum and Program Structure
- The minimum credit amount to be collected by the student before being considered for the award of the certificate is as prescribed in Document Curriculum and Program Structure

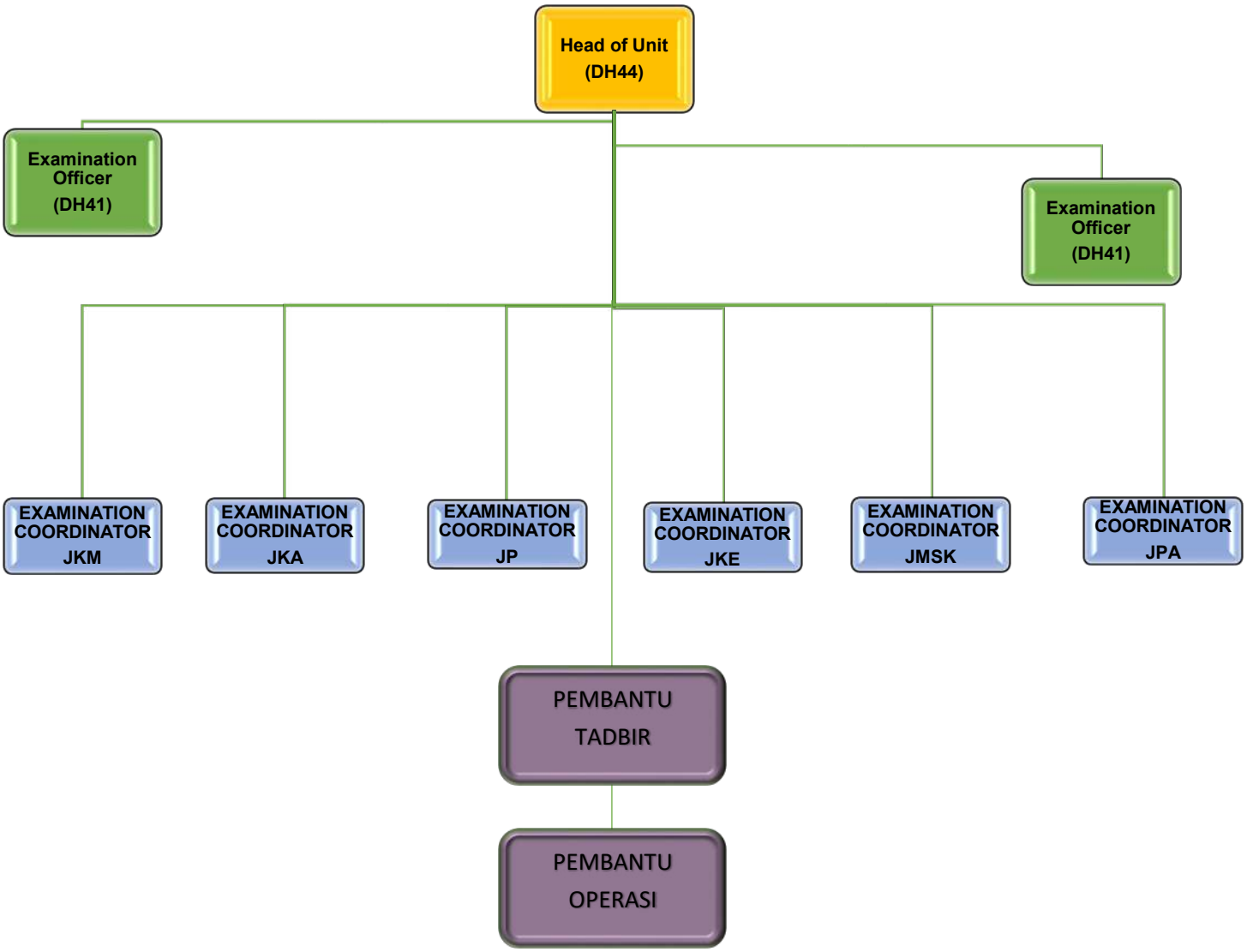
MARKS	POINT OF INTEREST	GRED	STATUS
90 - 100	4.00	A+	Very Excellence
80 - 89	4.00	A	Excellence
75 - 79	3.67	A-	Credit
70 - 74	3.33	B+	Credit
65 - 69	3.00	B	Credit
60 - 64	2.67	B-	Pass
55 - 59	2.33	C+	Pass
50 - 54	2.00	C	Pass
47 - 49	1.67	C-	Pass
44 - 46	1.33	D+	Pass
40 - 43	1.00	D	Pass
30 - 39	0.67	E	Fail
20 - 29	0.33	E-	Fail
0 - 19	0.00	F	Fail

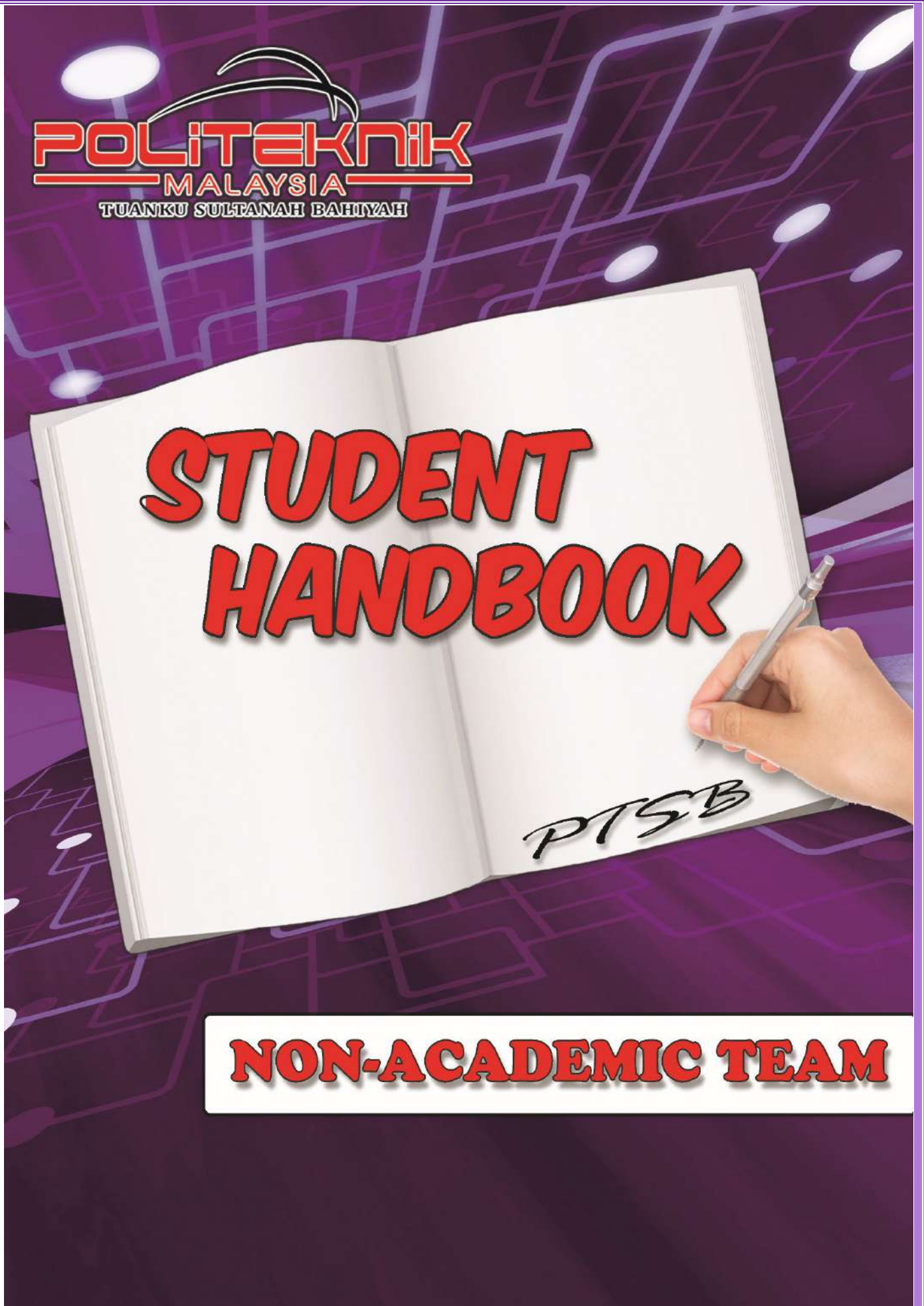
Determination of Passing Mark for Continuous Assessment, Final Assessment, and Final Examination

The requirement or pass marks for both assessments, i.e. Continuous Assessment (CA) and Final Examination / Final Assessment (FE) are used for all courses. The prescribed pass mark is at least:

Continuous Assessment (CA) / Final Assessment = 40%
Final Examination (FE) = 20%
Total Passing Mark = 40%

ASSESSMENT AND EXAMINATION UNIT
ORGANIZATION CHART

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PTSB
NON-ACADEMIC TEAM

6.1 STUDENT AFFAIR DEPARTMENT

This unit is structured into three divisions; Data & Intake, Discipline & Welfare and Student Representative Council / Majlis Perwakilan Pelajar (MPP). Each division is led by an officer assisted by other officers and 3 supporting staff in order to manage the particular job scope.

Division of Data & Intake

- Student intake
- New students' registration and seniors' self-report
- Student card application
- Switching polytechnics and courses
- Semester extension
- Students' study letter confirmation
- Students' quit letter confirmation
- Students' data and record

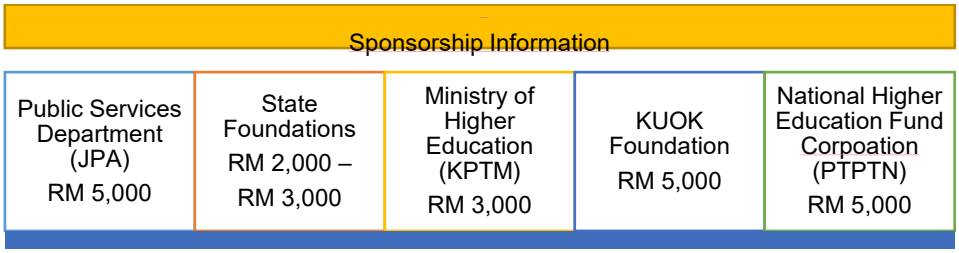
Division of Discipline & Welfare

i. Financial support Management

- Most of the diploma certificate and course students are funded by Perbadanan Tabung Pendidikan Tinggi Nasional (PTPTN) and Ministry of Education (MoE). The rests are sponsored by other sponsors such as State Foundation, Baitul Mal, State Zakat and Majlis Amanah Rakyat (MARA).
- Students can get guidance from Scholarship officers regarding procedures and information for financial support.

ii. Students' Welfare Management

- To manage students' insurance
  (PTSB students are insured by Syarikat Takaful Malaysia through Group Family Plan)
- To manage students' treatment letter
- To manage students' charity
- To report students' death and accident to particular parties
- To issue a student care letter if necessary
- To manage hostel placement for students
- To provide information about off-campus residential for students



iii. Students' Discipline Management

- To provide disciplines planning and management
- To handle cases of misconduct and disciplinary and trial procedures
- The discipline of PTSB Students is subject to ACT 174.

POLITEKNIK MALAYSIA
TUANKU SULTANAH BAHIYAH

ETIKA PAKAIAN PELAJAR

" Personaliti Membentuk Jatidiri Berkualiti "

PAKAIAN FORMAL

Majlis Rasmi, Mesyuarat & Urusan Rasmi

- Kemeja lengan panjang bertali leher
- Baju sentiasa 'tuck-in'
- Seluar panjang 'slack'
- Berkasut pejabat & berstokin
- Pakaian kebangsaan
- Bersongkok hitam
- Memakai kad matrik

- Kemeja lengan panjang
- Seluar panjang
- Berkasut pejabat & berstokin
- Pakaian kebangsaan
- Baju kurung
- Bertudung (Muslim)
- Memakai kad matrik

PAKAIAN SEPARA FORMAL

Dewan Kuliah, Tutorial, Perpustakaan, Bangunan Pentadbiran dan Kafeteria

- Kemeja lengan panjang/pendek
- Baju T 'plain' berkolar
- Baju sentiasa 'tuck-in'
- Berseluar panjang 'slack' atau khakis
- Baju korporat
- Baju bengkel/amali
- Berkasut & berstokin
- Memakai kad matrik

- Kemeja lengan panjang
- Seluar panjang
- 'Blaus' sopan & kemas
- 'Skirt' labuh
- Baju kurung
- Baju korporat
- Baju bengkel/amali
- Bertudung (Muslim)
- Berkasut & berstokin
- Memakai kad matrik

PAKAIAN & PENAMPILAN YANG TIDAK DIBENARKAN SEMASA DI KAWASAN KAMPUS

- Pakaian tidak sopan
- Baju T tanpa kolar
- Seluar 'jeans' / paten 'jeans
- Bertindik / memakain subang / gelang
- Rambut berfesyen seperti 'afro','punk', panjang, berekor atau diwarnakan.
- Bertatu
- Berselipar / terompah / capal

- Pakaian yang mencolok mata
- Baju T tanpa lengan / kolar
- 'Mini skirt' atau seluar pendek
- Seluar 'jeans' / paten 'jeans'
- Mewarnakan rambut
- Bertatu
- Berselipar / terompah / capal

PAKAIAN SUKAN

Yang Bersesuaian Ketika di Gelanggang/ Dewan Sukan/Bilik Gimnasium/ Padang & Majlis Sukan

- Baju T lengan panjang / pendek
- Seluar 'Track Bottom'
- Bertudung (Perempuan Muslim)
- Kasut sukan
- Berstokin

POTONGAN RAMBUT

Semasa Pengajian di Kampus

JABATAN HAL EHWAL & PEMBANGUNAN PELAJAR POLITEKNIK TUANKU SULTANAH BAHIYAH

iv. Student Orientation Week

- To chair and manage new students orientation week

v. Majlis Perwakilan Pelajar (MPP)

- To advise Committee Student Representative

MPP MAJLIS PERWAKILAN PELAJAR
POLITEKNIK TUANKU SULTANAH BAHIYAH

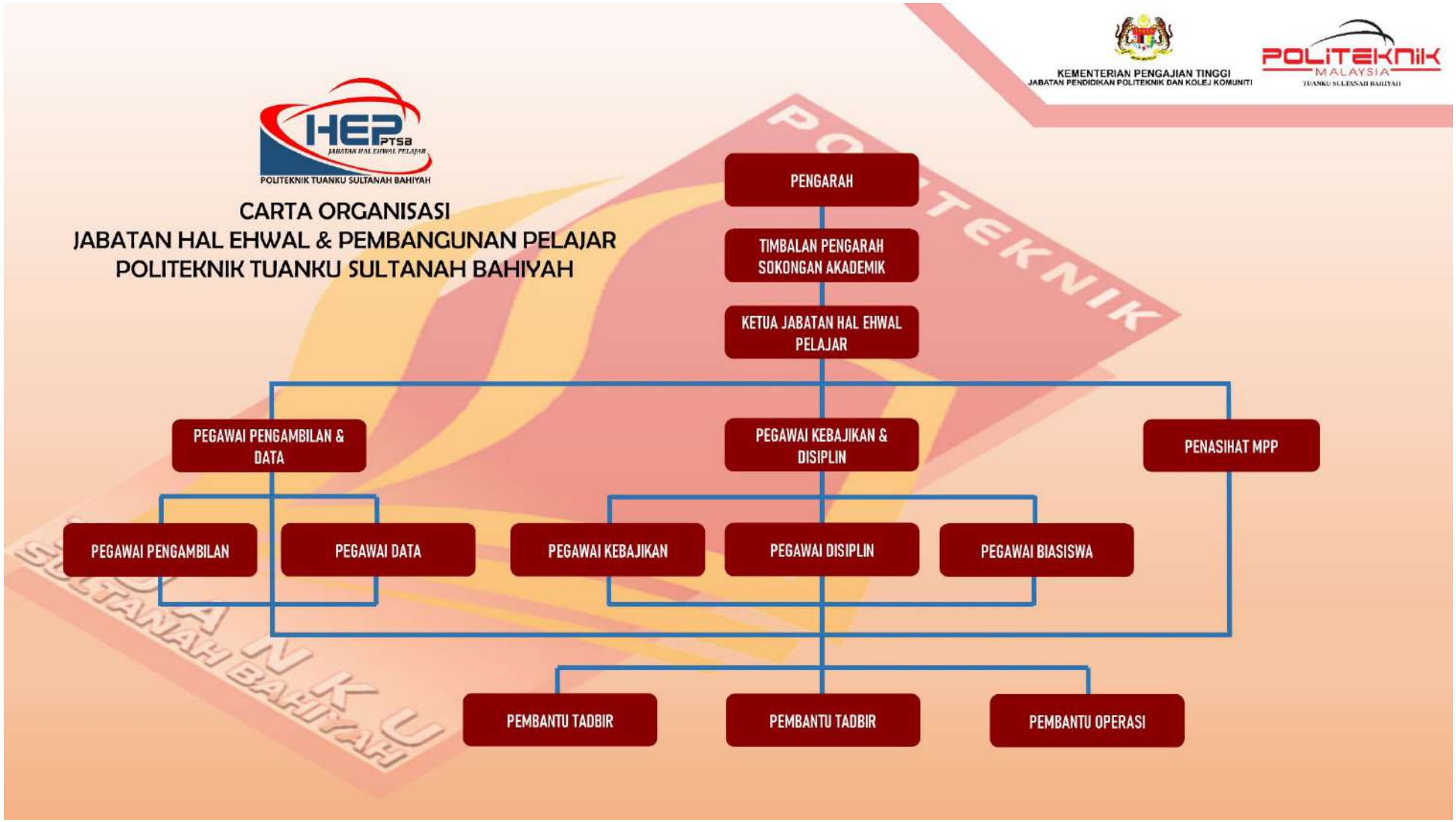
MPP is an abbreviation for the Majlis Perwakilan Pelajar which acts to represent students in all matters and expressed a student's view to a Polytechnic. MPP is also responsible for having an excellent student in skills, academics, sports and so on.

Majlis Perwakilan Pelajar (MPP) was established to develop the personality and ideas of a leader among students. MPP will be formed through learning, management, leadership, implementation of activities, council ethics and motivation to enable them to have different added value to other students. MPP has a role to assist management in identifying the needs and welfare of students. Apart from that, MPP also acted on campus by various agendas and activities for students.

vi. Student Vehicle Registration Management

- To manage matters regarding the registration of students' vehicles in campus
- To take action on traffic offenses according to the education institutions acts and methods

STUDENT AFFAIR DEPARTMENT
ORGANIZATION CHART



6.2 Sports Co-Curricullum and Culture Department

Sports Co-curriculum and Culture Department (SCCD) of Politeknik Tuanku Sultanah Bahiyah (PTSB) consist of Sports Unit, Co-Curriculum Unit and Culture Unit that is commitment to provide opportunities for student and staff to participate in all types of sports, health and fitness activities. SCCD is responsible for planning, organizing, implementing, coordinating, supervising and monitoring sports, co-curriculum and culture activities at polytechnic. The department also manages the equipment and ensures that facilities are at its best and provides quality service to customers.

Objectives

- To nurture young talents amongst PTSB students and at the same time to develop their potential to a higher level.
- To develop "The thinking athletes" among PTSB students as aligned by the aspiration of Ministry of Higher Education's sports development policy.
- To promote to the community that the institution does not only emphasize on academic excellence, but is also active in co-curriculum and sports development.
- To encourage sportsmanship, friendship and positive competitive spirits among higher education institutions.

Courses offered

- Extra Curricullar (Route1-Sports and Club)
- Extra Curricullar (Route2-Uniform)

Facilities

- Football Field
- Rugby Field
- Tennis Courts
- Squasy Court
- Futsal Courts
- Netball Courts
- Badminton Courts
- Volleyball Courts
- Basketball Courts
- Ping Pong
- Gymnasium
- Paintball

KEMENTERIAN PENDIDIKAN TINGGI
JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI

POLITEKNIK MALAYSIA
TUANKU SULTANAH BAHIYAH

CARTA ORGANISASI
JABATAN SUKAN KOKURIKULUM DAN KEBUDAYAAN
2023

KETUA JABATAN
PPPT DH48
MUHAMAD SUJAIRI BIN YUSOF

KETUA KURSUS
PPPT DH44
LATIFAH BINTI HUSAIN

KETUA KURSUS
PPPT DH44
MOHD ZAIDI BIN YUSOF

PEGAWAI BELIA DAN SUKAN S44
NINA AZLINA BINTI ZAKARIA

PEGAWAI KEBUDAYAAN
PPPT DH48
RIDZUAN BIN DIN

PEMBANTU OPERASI
N11/N14
MOHAMAD FAIZAL BIN ABDUL RAHMAN

JSKK
JABATAN SUKAN KOKURIKULUM DAN KEBUDAYAAN

Tarikh kemaskini : 1 Julai 2023

6.3 Psychology Management Unit

The Psychology Management Unit provides facilities where the clients (students, staff and community) are encouraged to maximize their potential. The unit also aimed to nurture good mental health among clients of the Politeknik Tuanku Sultanah Bahiyah.

The Psychology Officer is available to the clients to discuss and share information on education, academic purposes, vocational and technical, personal matters, emotions, social and health problems.

The main objective of the Psychology Management Unit is to help clients to get better understanding on themselves so that they can resolve any problems faced. Group activities are also planned from time to time, to develop communication and interaction skills, leadership skills, management and administration skills. Using this approach, it is hoped that the concept of awareness and responsibilities are nurtured to the clients.

Services :


01
Counseling Services are handled through individual or grouped counselling session.
02
Guidance and Enrichment Service is given through talks, seminars, workshops and forums.
03
Prevention activities like health programs covering physical and mental, drugs and AIDS/HIV prevention, stress management and others are organized.
04
Listing final year students to IPTA and IPTS for chances of further studies.

6.4 Library and Recources Centre

The library provides quality and up to date information to everyone in terms of managing and providing access to information resources. Taking the role as a centre of knowledge, the library acts as a catalyst and assist in the teaching and learning and research in the process of producing creative and innovative semi-professional. The library unit is also an instrument in inculcating the reading culture among PTSB and the local communities through an ongoing reading campaign. All staff and students can access all resources from the library freely. It also can accommodate up to 600 students at one time. In addition, carrel and discussion rooms as well as referral service, photocopying and internet service are also provided for students. Apart from using the materials in the library as a reference source, library users can also use online reference resources such as e-books and e-journals using smartphones via link http://www.u-library.gov.my/portal/web/guest/onlinedatabases.

PTSB Library or Perpustakaan Al-Khawarizmi has been upgraded (floor tiles) using RMK 11 budget and now has a new and refreshing image. Hence, this will attract the students and staff to use the library facilities regularly. The library has conducted many programs to enhance reading among PTSB staff and students since 2020. For example Book Corner competition and the online programs which involve students and staffs such as FB live books review, book review contest and book corner contest. Other than that, library has also taken an initiative to add more academic books collection by organizing book donation program named '1 Staf 1 Buku'.

Library Objectives

01 to be the main resource for staff and students in teaching and learning

02 to update the book collections and other references that currently needed by staff and students

03 to acquire relevant and current information for reference

04 to manage a collection of information using a standard system for easy access.

05 to provide quality information service and cultivate interest in reading

6.5 Student Residential College

The uniquely modern PTSB hostel can easily accommodate a total of 1404 students. Semester one students have the opportunity to benefit the facilities provided in the campus in addition to a comfortable and conducive living environment. Students are placed in the in the hostel to instill good learning habit, moral values integration and friendship among students of different races, religions and culture. Four blocks of which are V1, V2, V3 and V4 are especially for female students, whereas the other two blocks which are V5 and V6 are for male students. Each room is will be occupied by two students and equipped with basic facilities such as bed, mattress, study table, chair and cupboard.

Capacity of PTSB Residence for Students

	Male	Female
Total Block	3	3
Total Rooms	351	351
Total Beds	702	702

Hostel Facilities

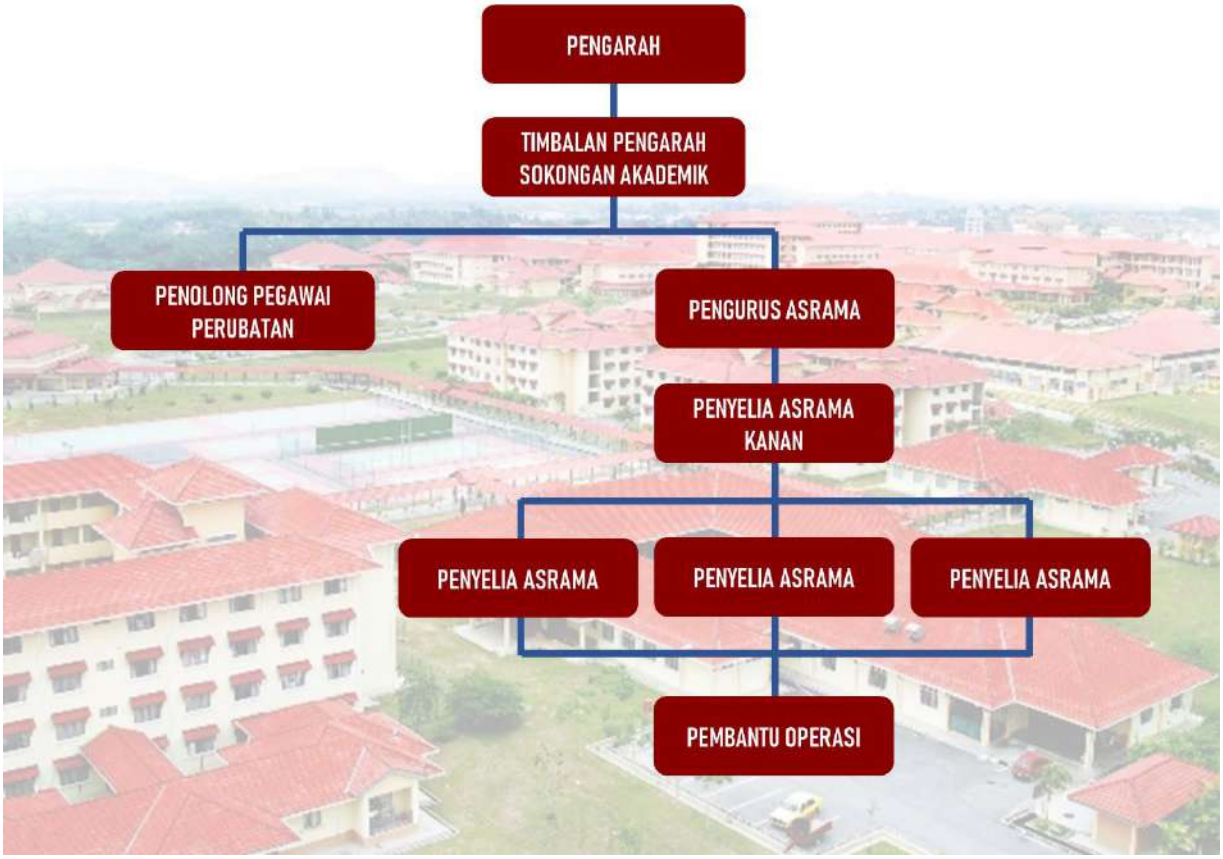
- Hostel Administration Office
- Hostel Warden Office
- Treatment Room
- Recreation and Rest Room
- Laundry Room
- Cafeteria
- Mini Market Under Coop
- Self Service Prepaid Laundry Service

STUDENT RESIDENTIAL COLLEGE ORGANIZATION CHART

KEMENTERIAN PENDIDIKAN TINGGI
JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI

POLITEKNIK MALAYSIA
TUANKU SULTANAH BAHIYAH

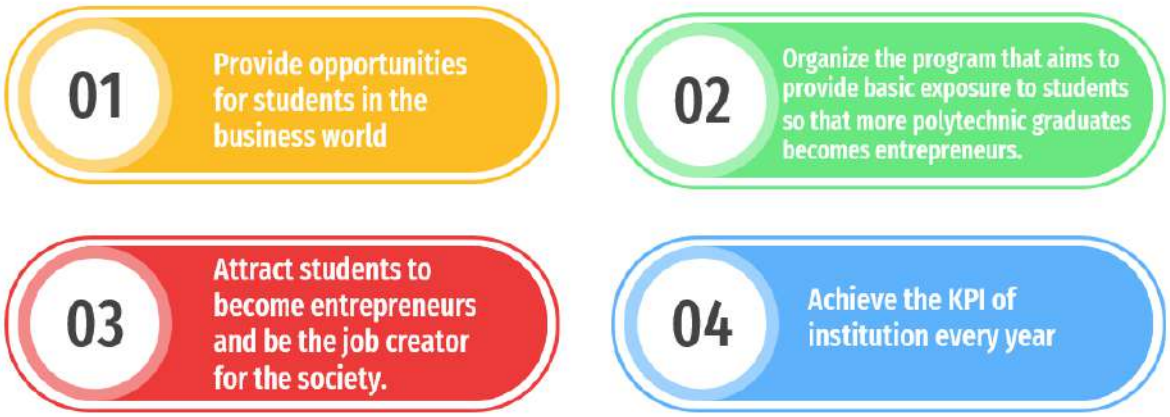
CARTA ORGANISASI
UNIT PENTADBIRAN KAMSIS
POLITEKNIK TUANKU SULTANAH BAHIYAH



6.6 Entrepreneurship Unit

Entrepreneurship Unit (UKES) acts as the main driver in increasing the level of innovation, creativity and competitiveness of a country. Entrepreneurship field has been recognized as a catalyst for economic development in Malaysia. In order to realize the vision and mission of the Entrepreneurship Development Policy for Institutions of Higher Learning, Politeknik Tuanku Sultanah Bahiyah has established the Entrepreneurship unit.

Service Function :



Entrepreneurship Activities :

01 Bazar MyAgrosis Ptsb

02 Program My Best Buy PTSB Bersama FAMA Kulim

03 Program Bisnes Pitching

04 Karnival Street Sale

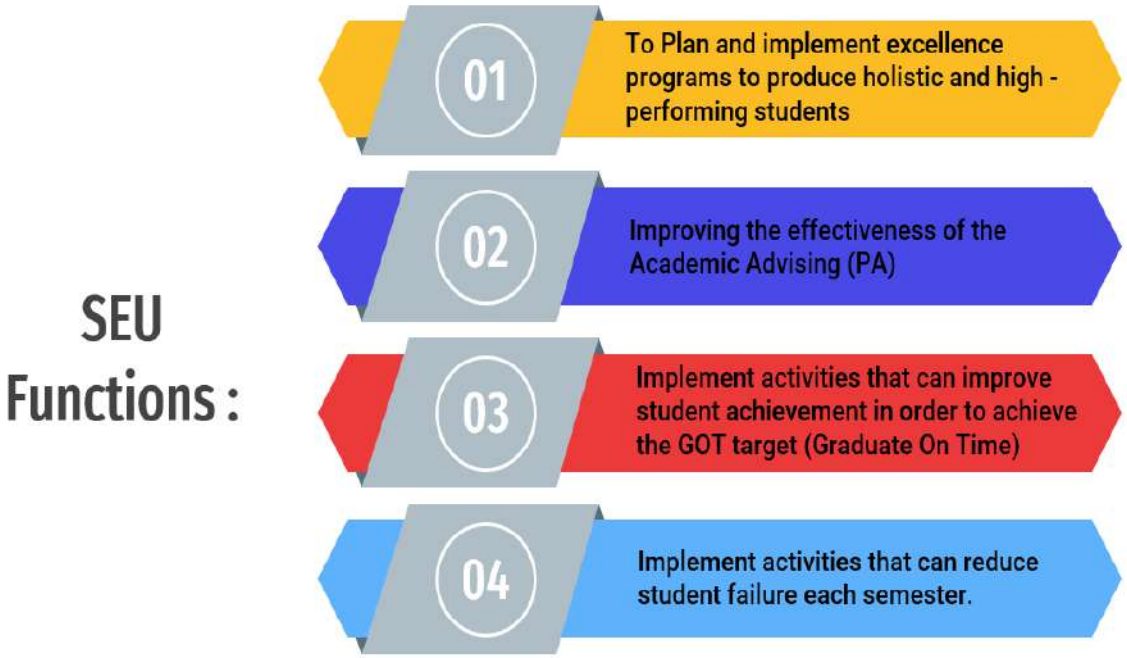
05 Entreprenuer Explorace IR 4.0 Bersama Mentor Alumni Dan PTime Resources

05 Workshop: Mini Project DIY Soap Using Recycled Cooking Oil

6.7 Students Excellence Unit

The Student Skills and Excellence Unit (SSEU) is a unit that plays a role in regulating and improving Student Skills and Excellence at Polytechnic Tuanku Sultanah Bahiyah (PTSB). It is divided into 5 important subunits;

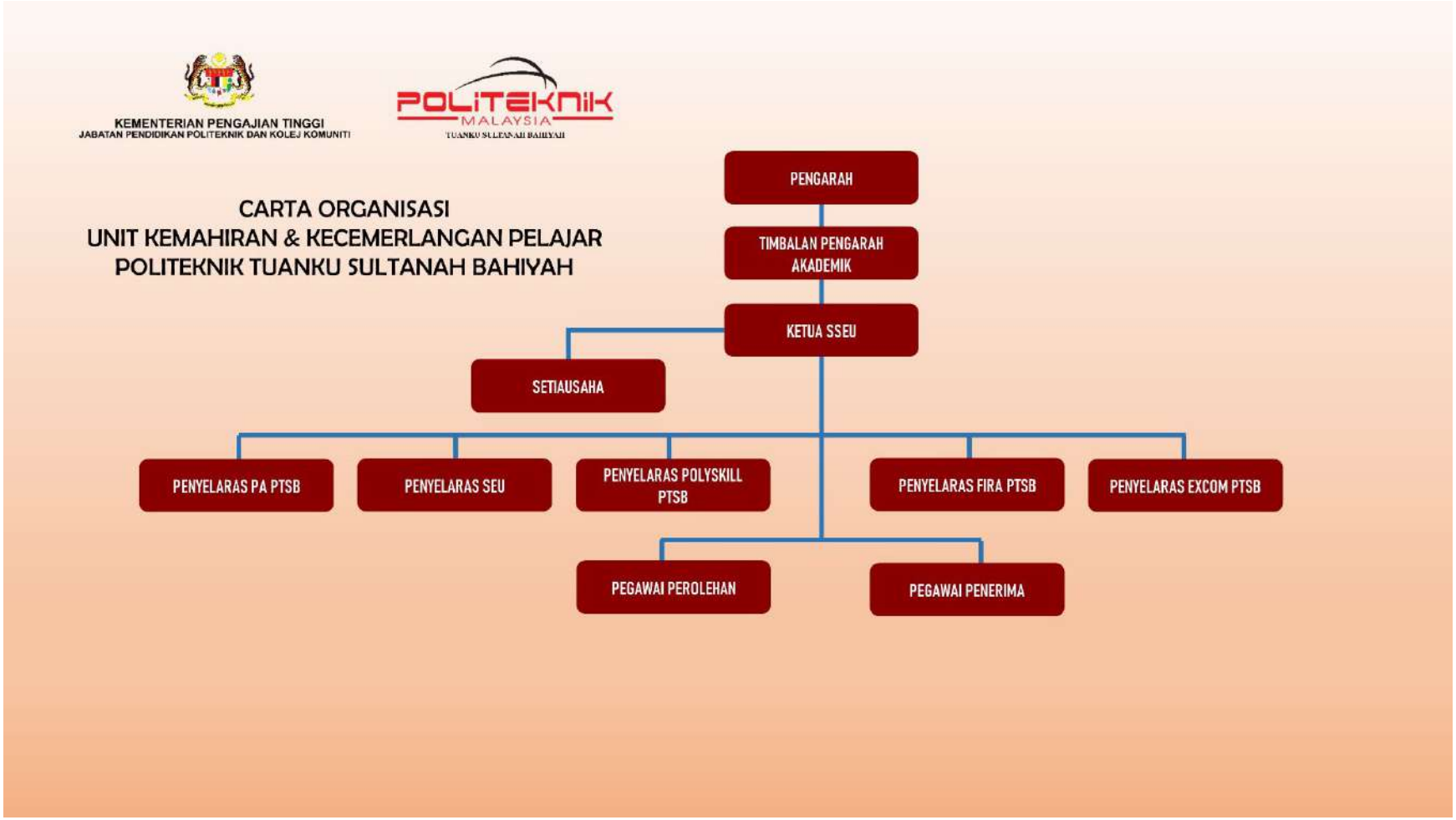
1. Academic Counseling,
2. Student Excellence,
3. Polyskill,
4. Fira and,
5. External Competition




WHAT PEOPLE SEE
2016
WHAT PEOPLE DON'T SEE
PERSISTENCE
DEDICATION
HARD WORK
FAILURE
SACRIFICE
GOOD HABITS
DISSAPOINTMENT
never give up

STUDENTS EXCELLENCE UNIT

ORGANIZATION CHART



6.8 INFORMATION AND TECHNOLOGY UNIT

INTRODUCTION

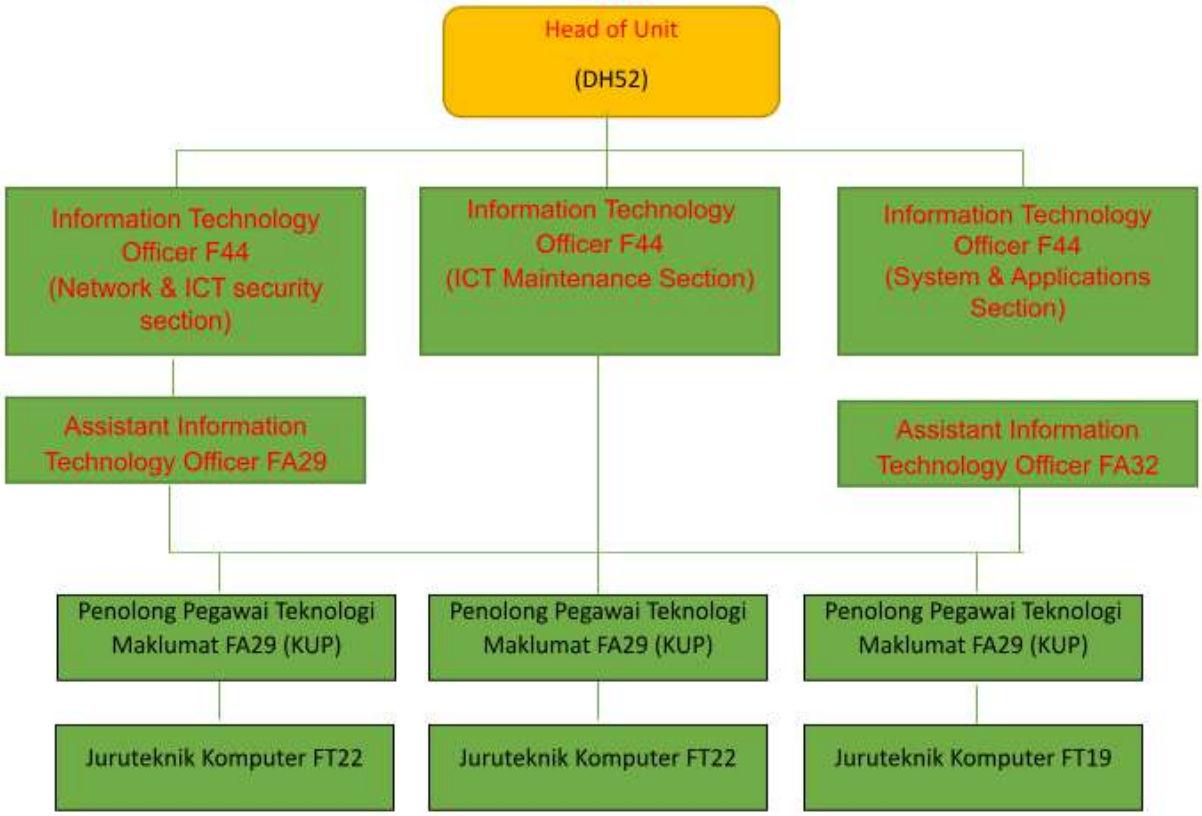
The Information Technology & Communication Unit (UTMK) is a unit that plays a role in maintaining ICT hardware and software, administering and updating application and data systems and providing computer network infrastructure at the Tuanku Sultanah Bahiyah Polytechnic campus (PTSB).

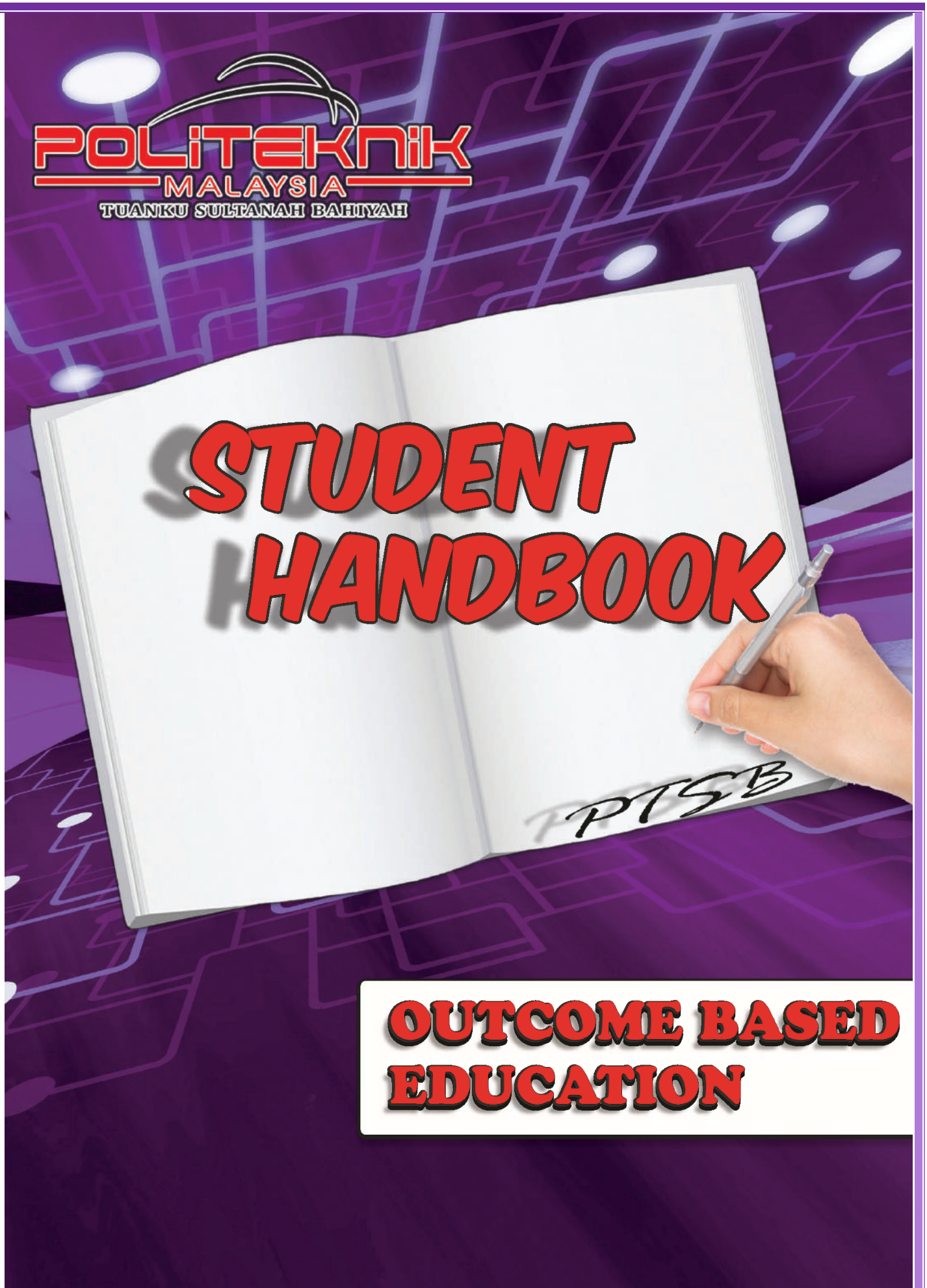
FUNCTIONS & ROLE OF UTMK

I. Manage and implement maintenance of ICT hardware and software as well as application system
II. Planning and implementing the procurement of spare parts, assets and ICT facilities
III. Develop, administer and update online systems and applications
IV. Manage server administration, ICT security and campus network
V. Manage the adoption and implementation of new systems and applications
VI. Planning and managing the implementation of training and inculcating the use of ICT for PTSB staff

INFORMATION AND TECHNOLOGY UNIT

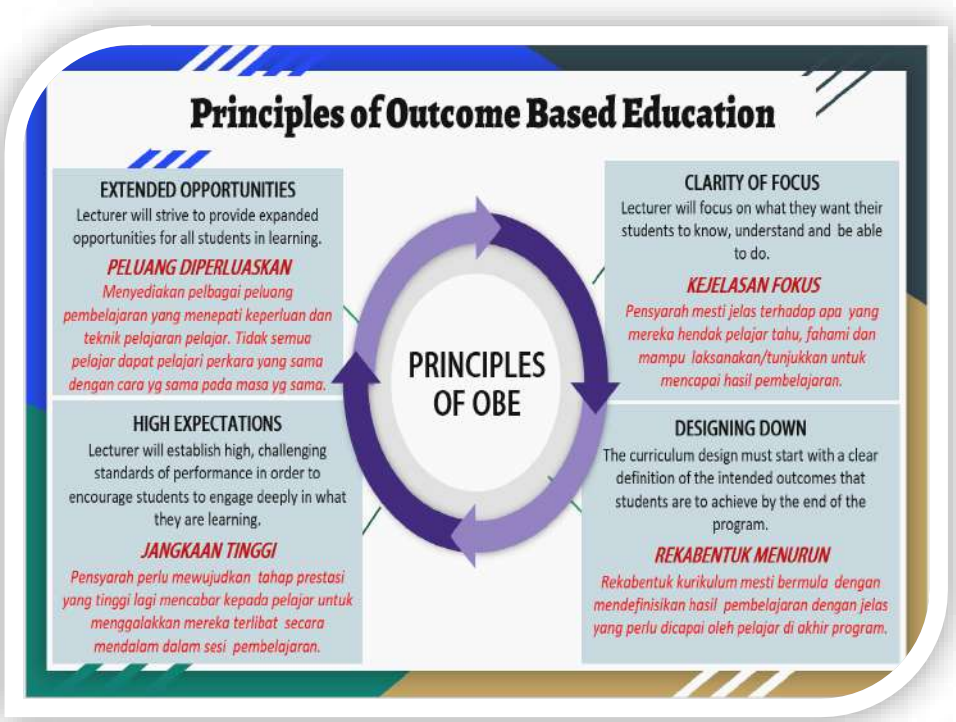
ORGANIZATION CHART



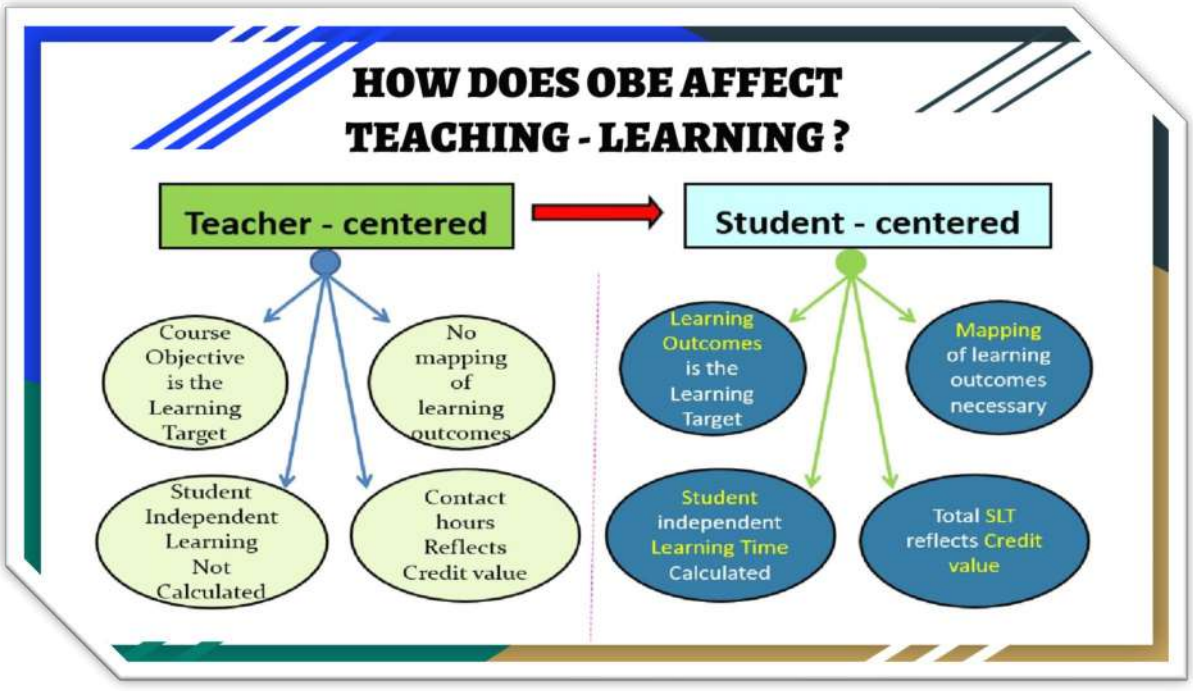

POLITEKNIK
MALAYSIA
TUANKU SULTANAH BAHIYAH
STUDENT
HANDBOOK
PTSB
OUTCOME BASED
EDUCATION

7.1 What is OBE?

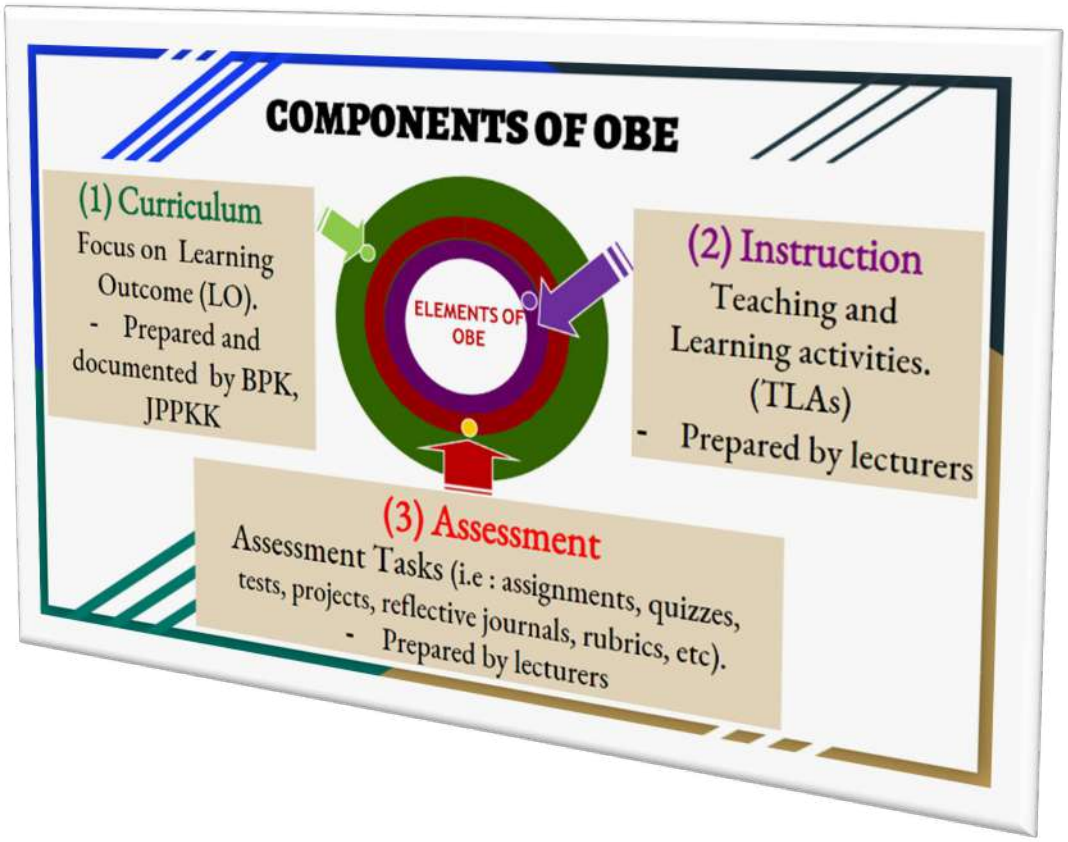
OBE is a holistic method to develop a student based on defined goals and desired outcomes. Hence, it is…

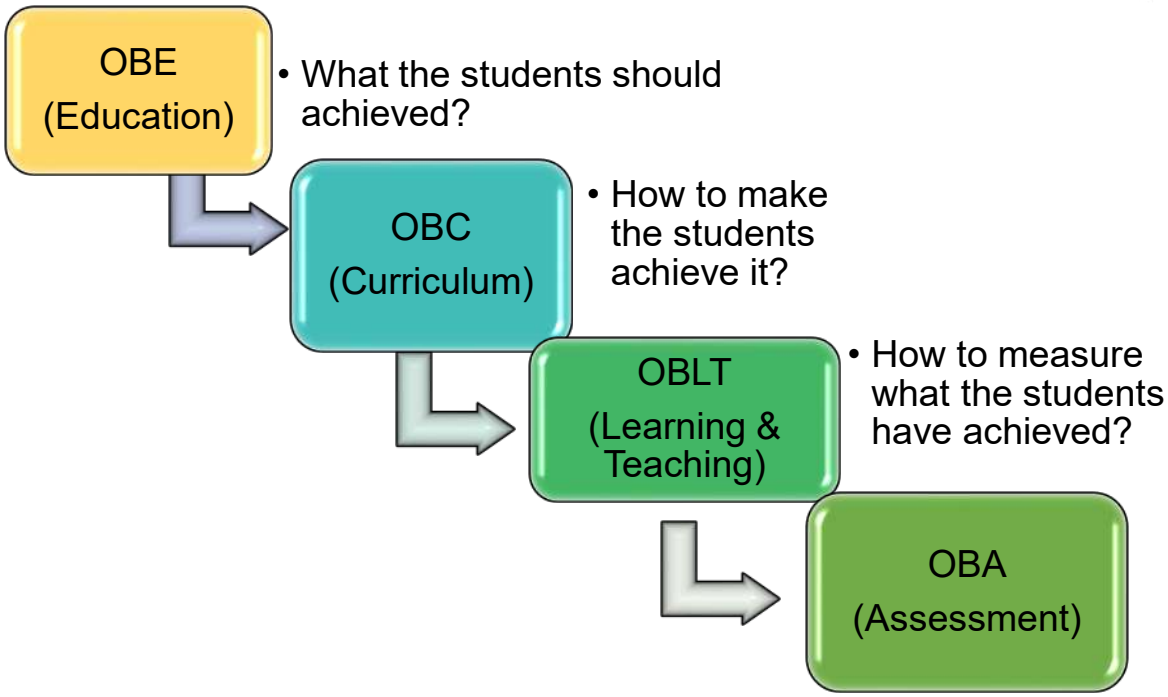


- a method of curriculum design and teaching that focuses on what students can actually **DO** after they are taught.
- Focusing on the outcomes of program implementation.
- Implemented to ensure that our academic programs, curriculum, delivery system, assessment methods and our graduates meet the requirement of international standards.

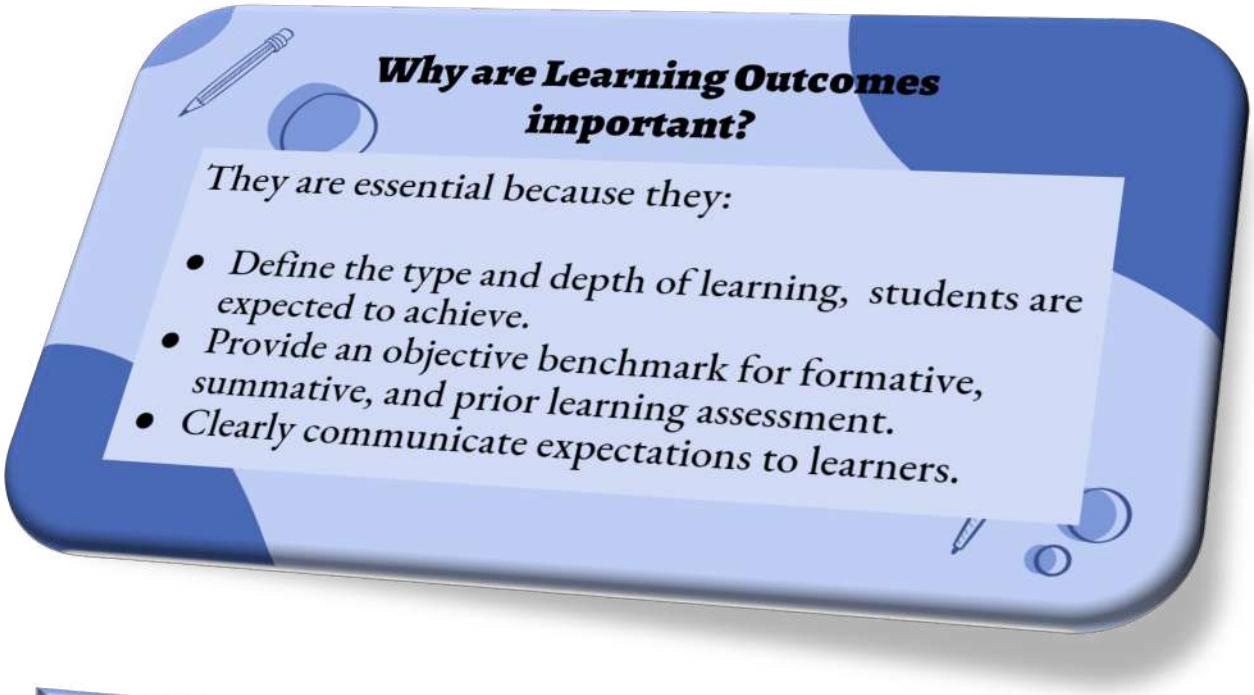


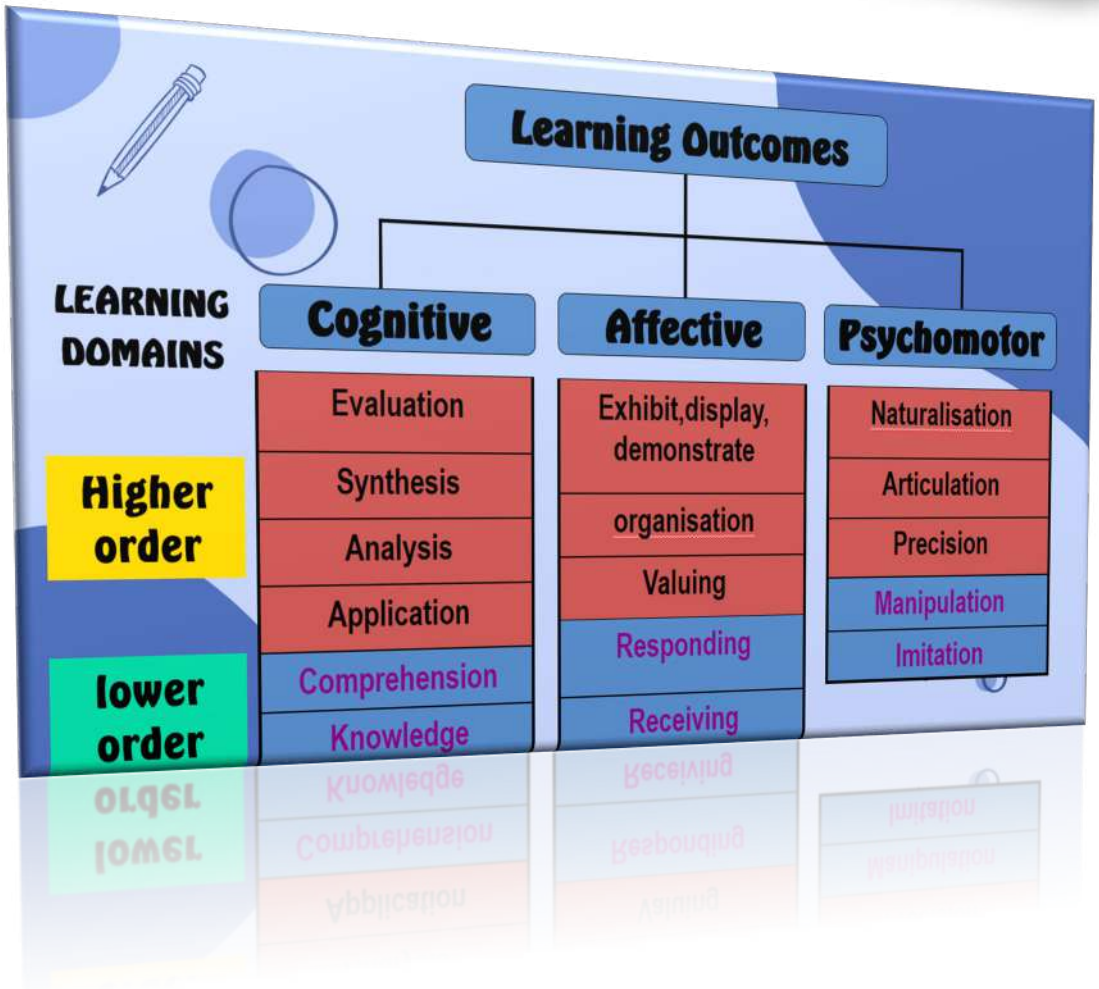
7.2 Components of OBE?

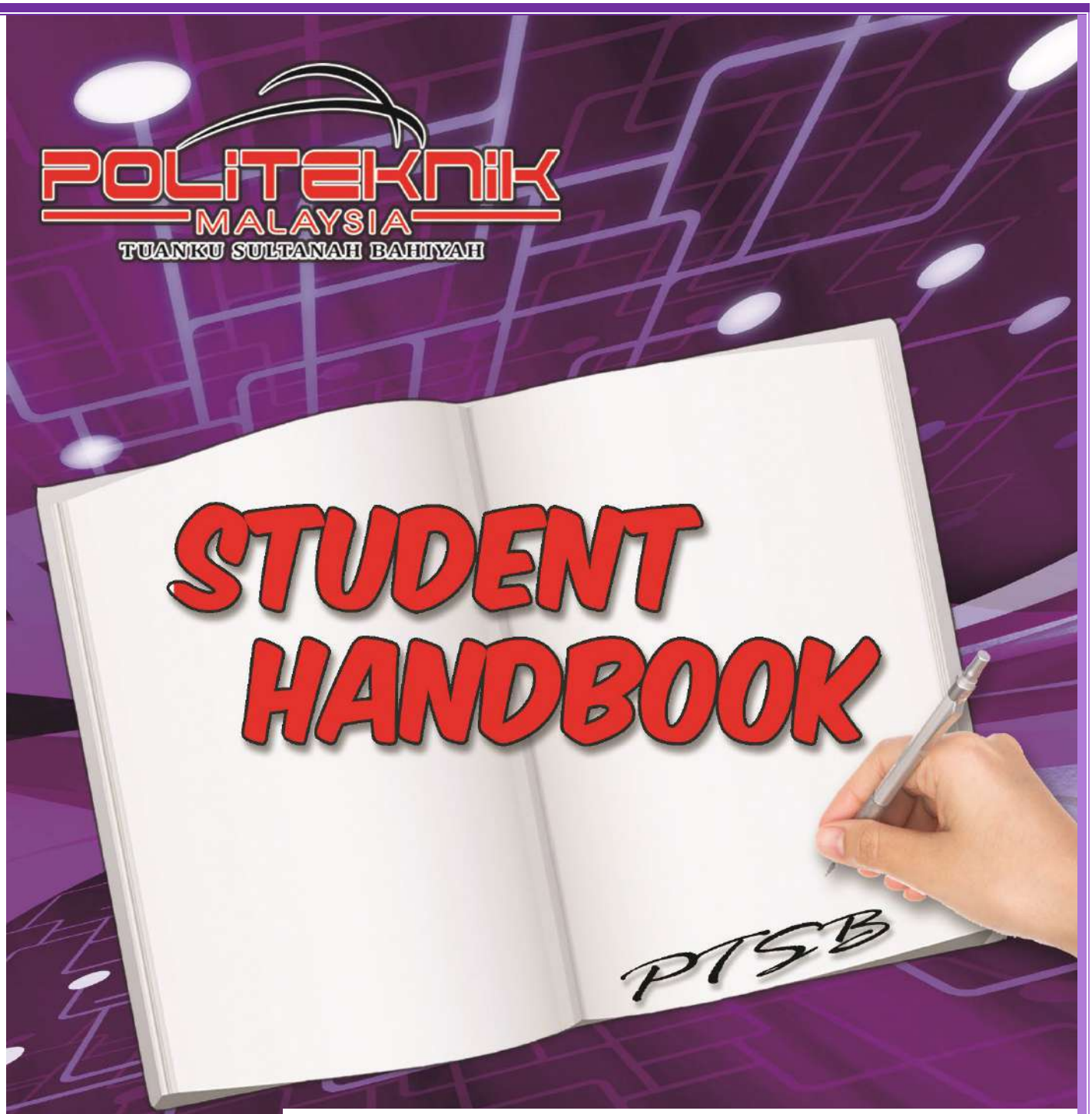




7.3 The OBE Impact







AWARENESS OF ETAC & MQA

8.1 Overview Of ETAC

ENGINEERING TECHNOLOGY ACCREDITATION COUNCIL

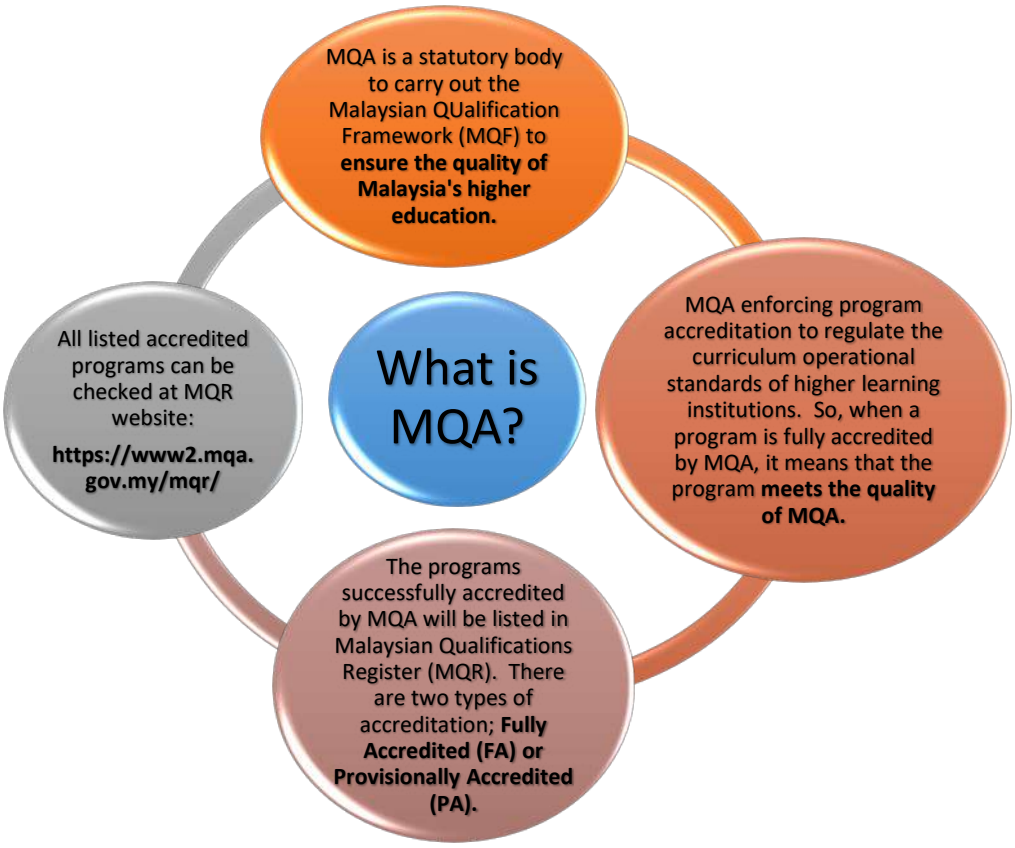
DUBLIN ACCORD SIGNATORY COUNTRIES

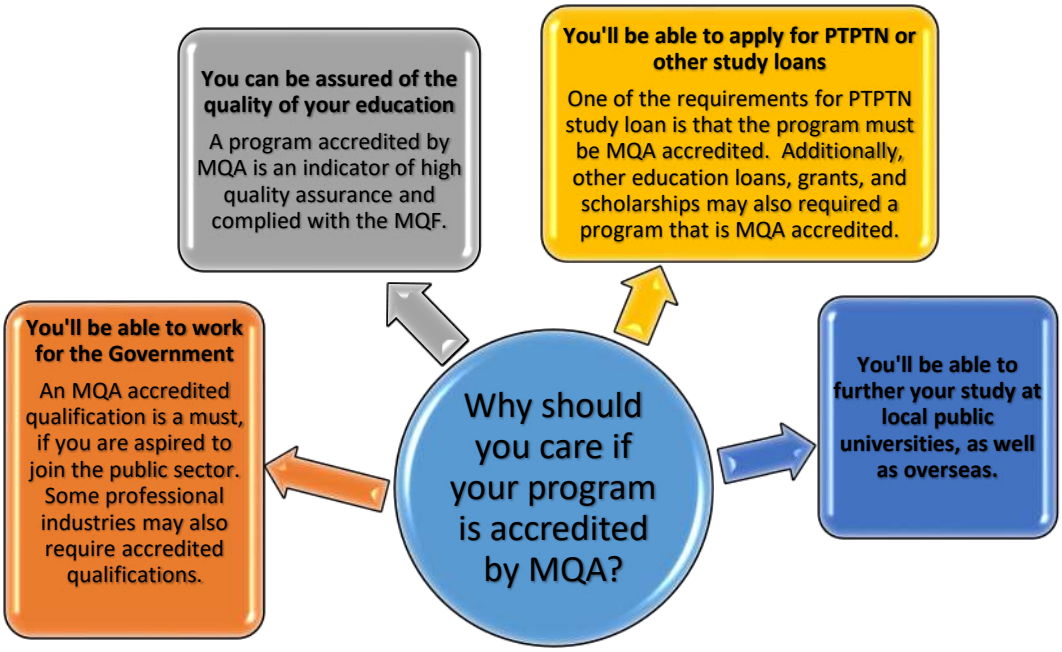
- Australia
- Canada
- Ireland
- New Zealand
- Korea
- South Africa
- United Kingdom
- United States

MALAYSIA (represented by BEM since 2018)

8.2 Overview Of MQA

MALAYSIAN QUALIFICATIONS AGENCY





POLITEKNIK MALAYSIA
TUANKU SULTANAH BAHIYAH

STUDENT HANDBOOK

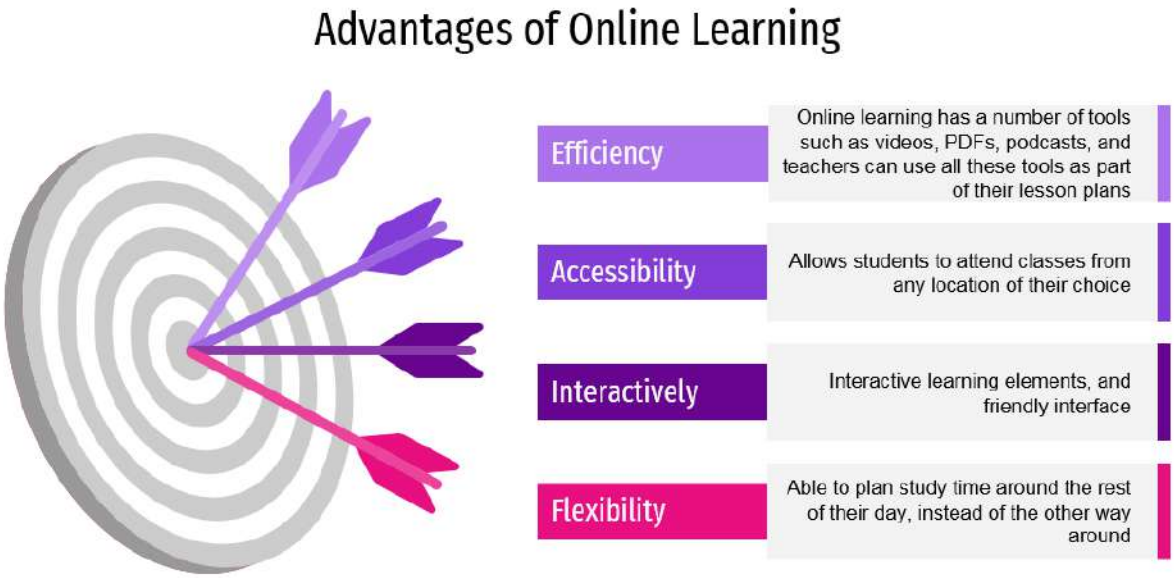
PTSB

BLENDED LEARNING

9.1 e-Learning & Blended Learning

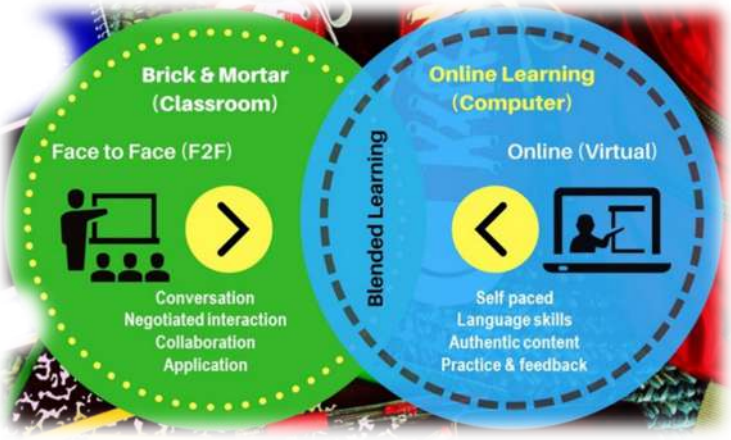
WHAT IS e-LEARNING?

In essence, e-Learning is a computer based educational tool or system that enables you to learn anywhere and at any time. e-Learning is the way of learning which connected to electronic media.
The courses are available 24 hours a day, 7 days a week, and can be access from anywhere as long as the student has the internet access, and computer or smart phone.



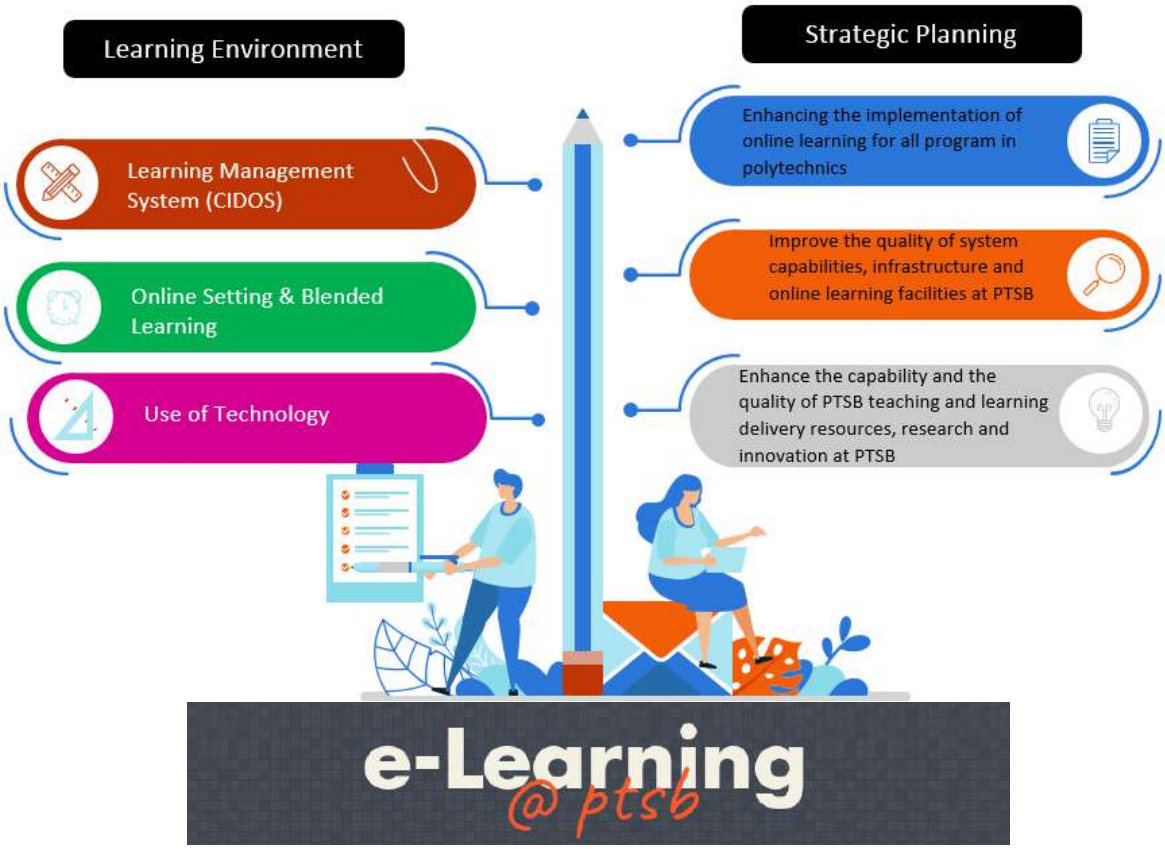
WHAT IS BLENDED LEARNING?

Blended learning combines online delivery of educational content with the best features of classroom interaction and live instruction to personalize learning, allow thoughtful reflection and differentiate instruction from student to student across a diverse group of learners.



Blended learning involves:

- Courses that integrate online with face to face activities.
- Courses that are taught both in the classroom (face to face) and at a distance.
- Mixing or combining instructional technology with actual job tasks, in order to create harmonious effect of teaching and learning.
- Combining computers with traditional teaching. It is also referred to as reverse teaching, flip classroom, backwards classroom, or reverse instruction.



EMPOWERING DIGITAL LEARNING

e-learning
POLITEKNIK TUANKU SULTANAH BAHIYAH

Digital Materials

Development and coordination of PTSB digital teaching and learning materials (ebook & TnL video)

Short TVET PTSB

CIDOS

Consumption empowerment of Learning Management System (LMS) CIDOS

eDOLA

Involvement and participation of lecturers and students in the CIDOS Inspiring Learning Award (eDOLA) competition

TECC

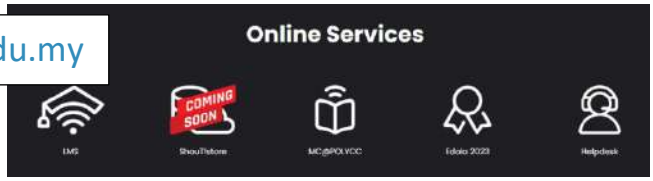
Use of Technology Enable Collaborative Classroom (TECC) in TnL activities

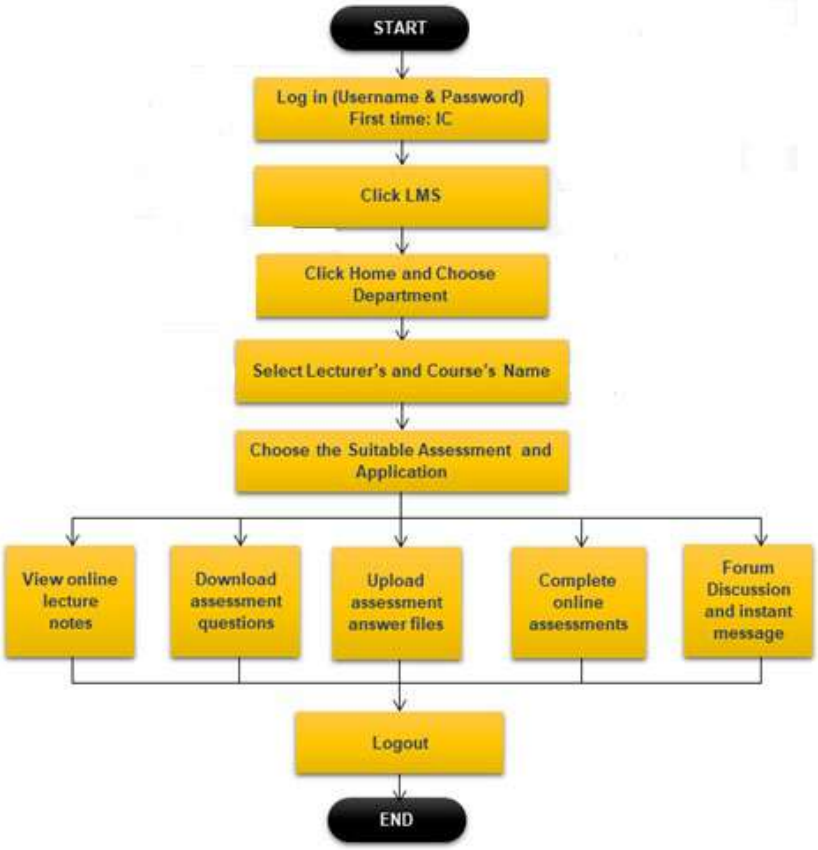
Technology Skills

Improvement of lecturers' skills in the latest technology skills for e-Learning

9.2 Portal Cidos LMS Malaysia

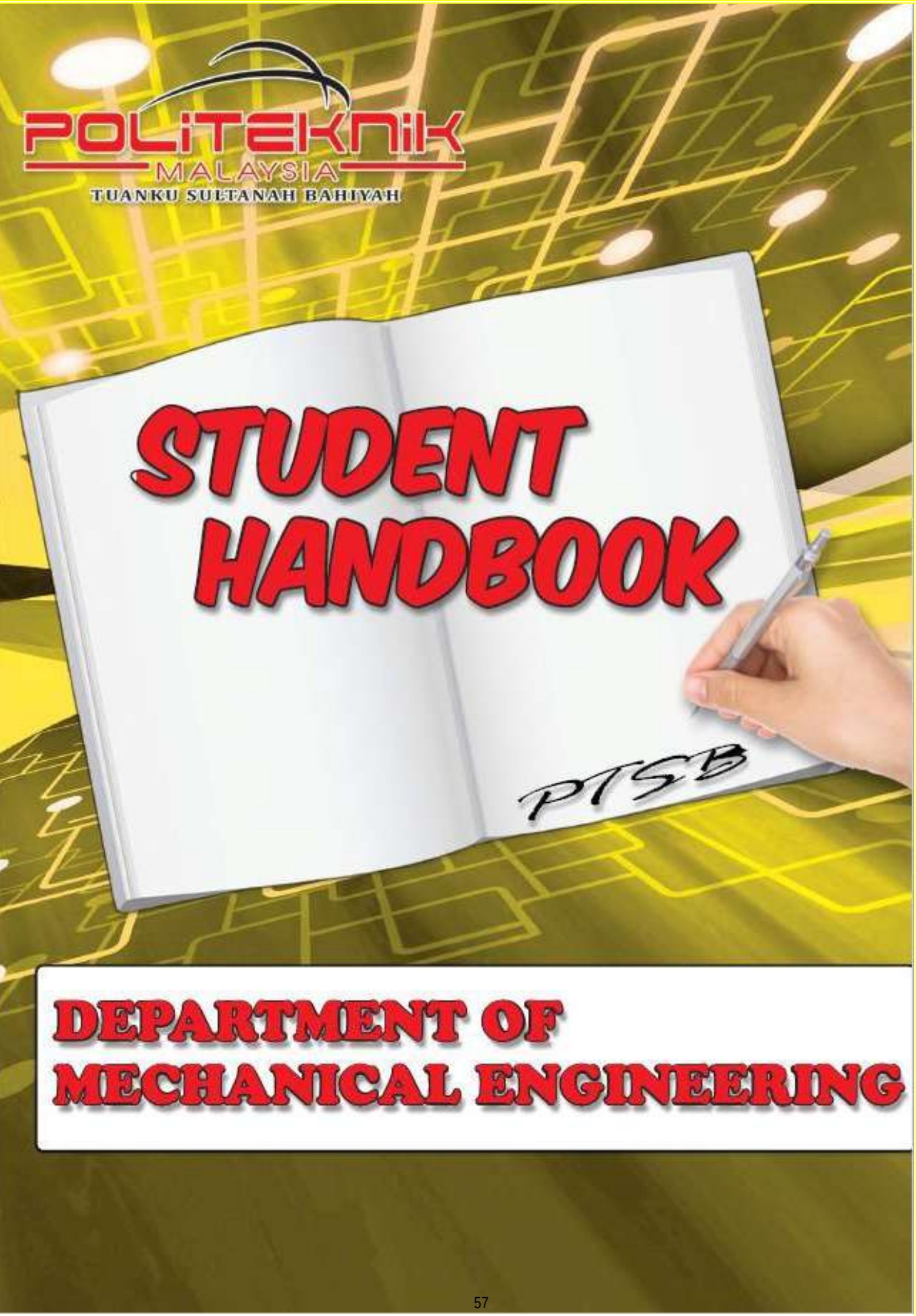
https://polycc.cidos.edu.my



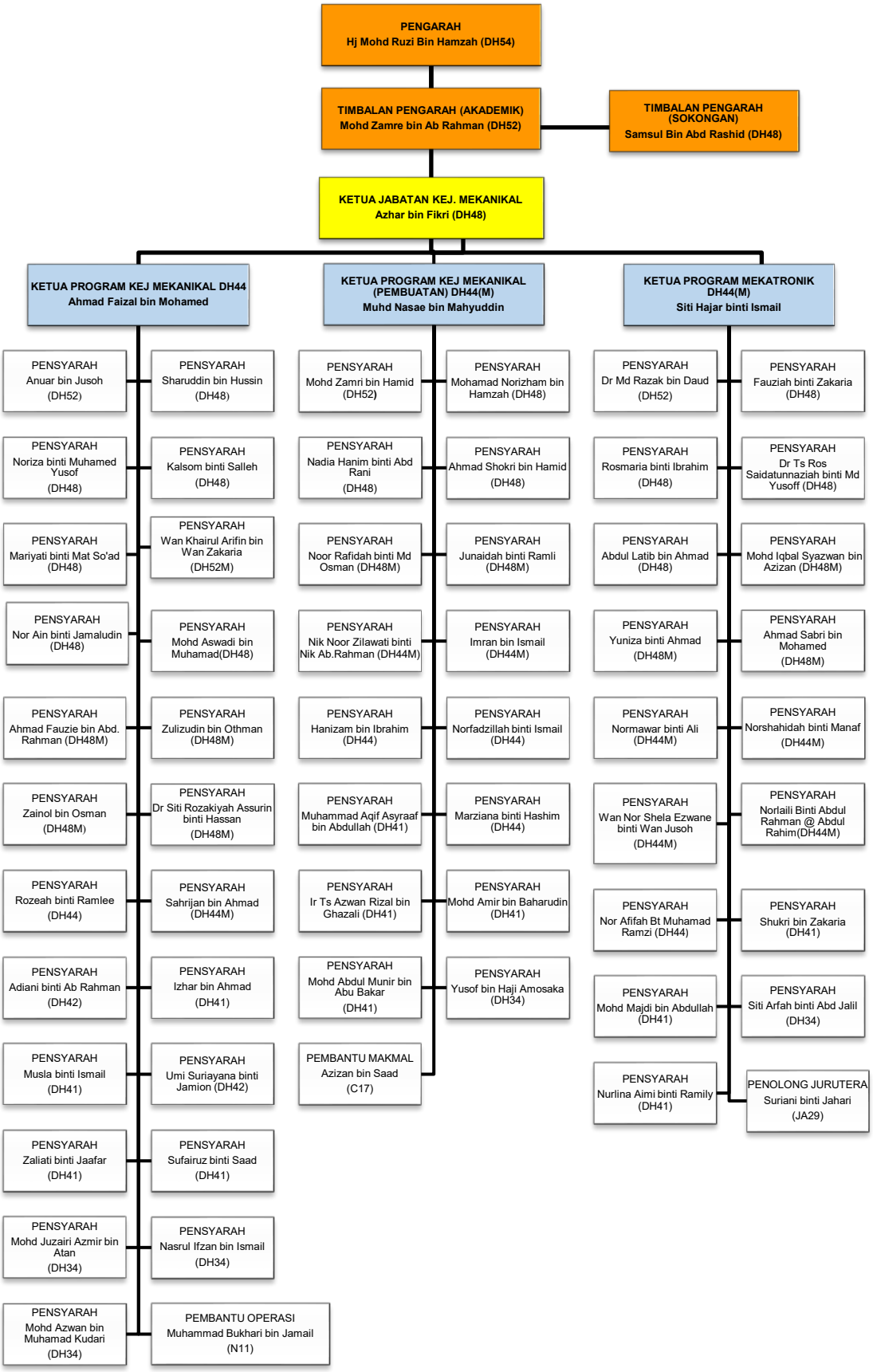


9.3 Technology Enabled Collaborative Classroom (TECC)

Collaborative classrooms are another tool in the educator's resource to achieve their mission of improving learning outcomes. The design of the collaborative classroom emphasizes group learning. Collaborative designs are extremely flexible and fully compatible with emerging styles of learning, including personalized learning, flipped classroom, and gamification.


POLITEKNIK
MALAYSIA
TUANKU SULTANAH BAHIYAH
STUDENT
HANDBOOK
PTSB
DEPARTMENT OF
MECHANICAL ENGINEERING

10.1 MECHANICAL ENGINEERING DEPARTMENT ORGANIZATION CHART



10.1.1 Names of Lecturers

BIL	NAMA	KOD PENSYARAH	E-MEL
1	Azhar B. Fikri	JAZF	azhar@ptsb.edu.my
2	Ahmad Faizal B. Mohamed	JFAI	ahmad_faizal@ptsb.edu.my
3	Muhd Nasae B. Mahyuddin	JMNM	nasae@ptsb.edu.my
4	Siti Hajar Bt. Ismail	JSHI	hajar@ptsb.edu.my
5	Mohd Zamri B. Hamid	JZAM	zamri@ptsb.edu.my
6	Md Razak B. Daud	JMRD	md_razak@ptsb.edu.my
7	Anuar bin Jusoh	JANJ	anuar@ptsb.edu.my
8	Wan Khairul Arifin b Wan Zakaria	JWKA	wan.khairul.arifin@ptsb.edu.my
9	Noriza Binti Muhamed Yusof	JIZA	noriza@ptsb.edu.my
10	Mohamad Norizham Bin Hamzah	JNMH	norizham@ptsb.edu.my
11	Fauziah Bt Zakaria	JFBZ	Adiqgee_357@yahoo.com
12	Ros Saidatunnaziah Bt. Md Yusoff	JROS	saidatunnaziah@ptsb.edu.my
13	Abdul Latib B. Ahmad	JALT	latib@ptsb.edu.my
14	Kalsom Binti Salleh	JSOM	kalsom@ptsb.edu.my
15	Mariyati Bt. Mat So'ad	JMTI	Mariyati@ptsb.edu.my
16	Mohd Aswadi B. Muhammad	JABM	aswadi@ptsb.edu.my
17	Rosmaria bt Ibrahim	JRBI	rosmaria@ptsb.edu.my
18	Ahmad Shokri b Hamid	JASH	shokri@ptsb.edu.my
19	Nor Ain Bt. Jamaludin	JAIN	norain@ptsb.edu.my
20	Sharuddin B. Hussain	JSHH	sharuddin@ptsb.edu.my
21	Nadia Hanim bt Abd Rani	JNAD	nadiahanim@ptsb.edu.my
22	Mohd Iqbal Syazwan B. Azizan	JIQB	iqbalsyaz@ptsb.edu.my
23	Zainol B. Osman	JZAI	zainol_osman@ptsb.edu.my
24	Junaidah Binti Ramli	JJUN	junaidah@ptsb.edu.my
25	Siti Rozakiyah Asssurin Binti Hassan	JSRA	rozakiyah@ptsb.edu.my
26	Ahmad Fauzie bin Abd. Rahman	JAFA	fauzie@ptsb.edu.my
27	Zulizudin bin Othman	JZUL	zulizudin@ptsb.edu.my
28	Yuniza binti Ahmad	JYUN	yuniza@ptsb.edu.my
29	Ahmad Sabri bin Mohamed	JSAM	sabri@ptsb.edu.my
30	Noor Rafidah binti Md Osman	JRAF	rafidah@ptsb.edu.my
31	Norfadzillah Bt. Ismail	JFAD	norfadzillah@ptsb.edu.my
32	Rozeah Bt. Ramlee	JROZ	rozeah@ptsb.edu.my
33	Hanizam B. Ibrahim	JHBI	hanizam@ptsb.edu.my
34	Marziana Bt. Hashim	JMAR	marziana@ptsb.edu.my
35	Normawar bt Ali	JNMW	normawar@ptsb.edu.my
36	Nik Noor Zilawati binti Nik Ab.Rahman	JNNZ	zilawati@ptsb.edu.my
37	Sahrijan bin Ahmad	JSAH	sahrijan@ptsb.edu.my
38	Imran bin Ismail	JIMI	imrani@ptsb.edu.my
39	Norshahidah binti Manaf	JNOR	norshahidah@ptsb.edu.my
40	Nor Afifah Bt Muhamad Ramzi	JFAH	norafifah@ptsb.edu.my
41	Norlaili Bt. Abdul Rahman @ Abdul Rahim	JLAI	norlaili@ptsb.edu.my

42	Wan Nor Shela Ezwane Bt. Wan Jusoh	JSHE	shela@ptsb.edu.my
43	Musla Bt. Ismail	JMUS	musla@ptsb.edu.my
44	Adiani Bt. Ab Rahman	JADN	adiani@ptsb.edu.my
45	Umi Suriayana Binti Jamion	JUSJ	umi.suriyana@ptsb.edu.my
46	Nurlina Aimi binti Ramily	JNAR	nurlina.aimi@ptsb.edu.my
47	Azwan Rizal B. Ghazali	JARG	azwanrizal@ptsb.edu.my
48	Izhar B. Ahmad	JIZH	izhar@ptsb.edu.my
49	Mohd Abdul Munir B. Abu Bakar	JMAM	munir@ptsb.edu.my
50	Mohd Amir B Baharudin	JAMR	mohdamir@ptsb.edu.my
51	Mohd Majdi B. Abdullah	JMAJ	majdi@ptsb.edu.my
52	Muhammad Aqif Asyraaf B. Abdullah	JMAA	aqif@ptsb.edu.my
53	Shukri B. Zakaria	JSIZ	shukri_zakaria@ptsb.edu.my
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55	Zaliati bt. Jaafar	JZLT	zaliati@ptsb.edu.my
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10.2 ENTRY REQUIREMENTS

The implementation of the policies towards achieving the targeted enrollment is overseeing by the Student Admission Division with the support of Student Affairs Department in the respective polytechnics.

10.2.1 Process for Admission

Student admission is carried out twice a year, in June and December respectively during the June intake, application is done through Centralized Admission Agency at the Ministry of Higher Education via the http://upu.mohe.gov.my. Application for the December intake is opened via the Student Admission Division portal at http://politeknik.edu.my. Both intakes are done using online application procedures.

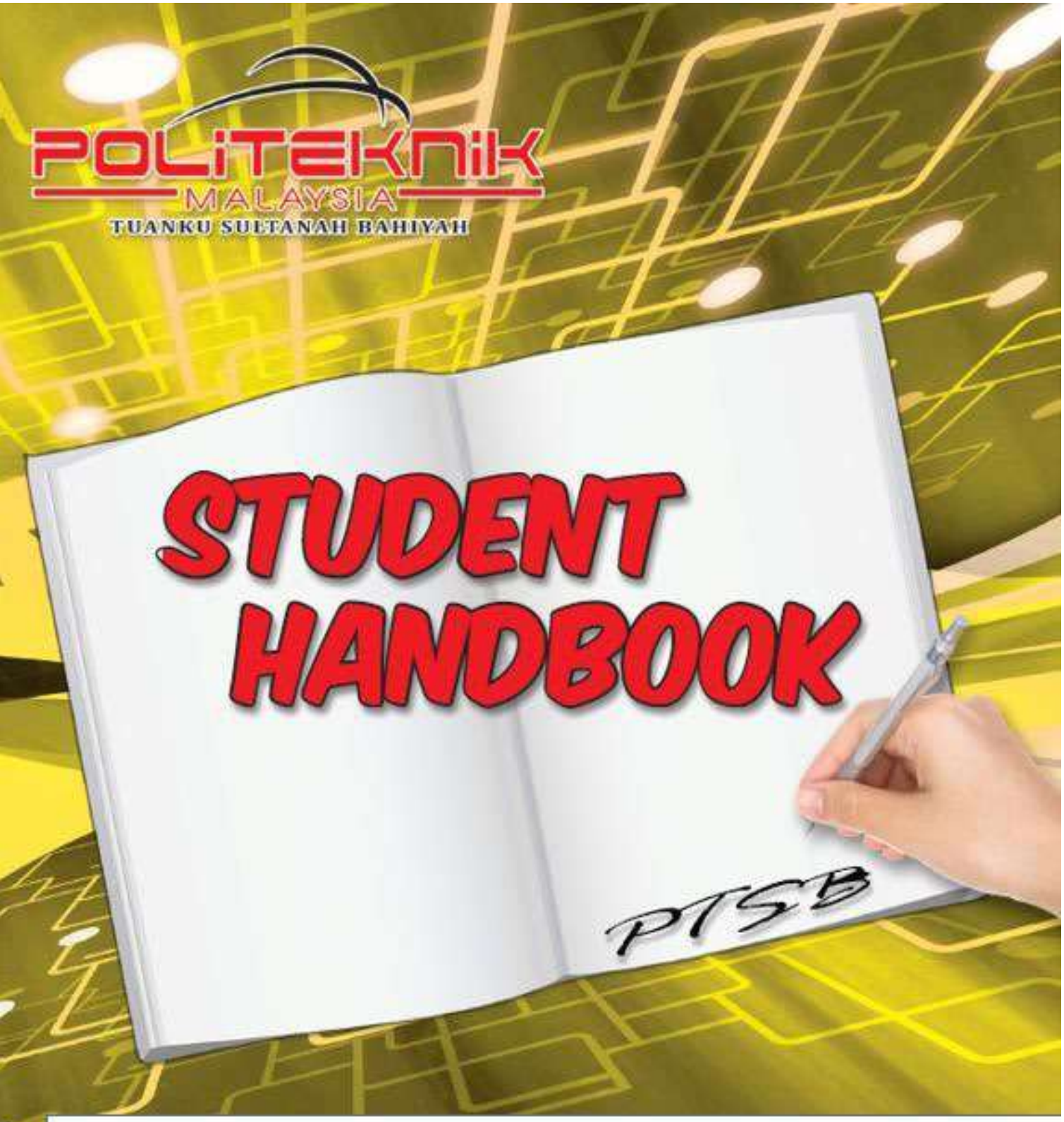
Admission requirements and all information related to admission can be obtained from the student admission portal at http://politeknik.edu.my.

10.2.2 For Malaysian Certificate of Education (SPM) holders:

- Malaysian Citizen
- Has PASSED SPM or its equivalent and meets the following minimum entry requirements:
    i. Pass in Bahasa Melayu
    ii. Pass in English Language
    iii. Pass in History (SPM 2013 onwards)
    iv. THREE (3) credits for the following subjects in SPM
        - Mathematics or Additional Mathematics
        - One (1) subject from the science/technical/vocational grouping of subjects
        - Any subjects not accounted for from (i, ii, iii, & iv)
        - Or any other credit that has not been included
        - Does not have any disability that will hinder practical work.

10.2.3 Ministry of Education Malaysia (KPM) Matriculation Certificate holders:

- Malaysian Citizen
- Has PASSED the Ministry of Education's Matriculation Program



DIPLOMA IN MECHANICAL ENGINEERING (DKM)

11.0 DIPLOMA IN MECHANICAL (DKM)

11.1 INTRODUCTION

In line with the 3rd Industrial Malaysia Plan (IMP3) aiming for the innovative and creative human capital development, via matching talent to expertise with market demand, Diploma in Mechanical Engineering for polytechnic is developed to give balance emphasis on theoretical and practical aspects. The Eleventh Malaysia Plan was drawn to produced 60% out of 1.5 million workers was in TVET sector. Until now a total of 69,475 (51%) of the 136,062 technical education and vocational training (TVET) graduates in Malaysia are working as professionals and skilled workers. Thus, to keep abreast with rapid demand in TVET sector, Department of Polytechnic and Community College Education (DPCCE) progressively collaborates with major industry players in the country in developing the curriculum. The programme will take six semesters to complete, five academic semesters at their respective polytechnics and one semester of industrial training at relevant industries during the final semester. This programme complies with the Board of Engineer (BEM) requirement.

11.2 SYNOPSIS

The Diploma in Mechanical Engineering programme is designed to produced holistic graduates that have knowledge and competent skills in the field of mechanical engineering to fulfil the demand of workers in engineering sector. The programme structure focusses on the area of Solid Mechanics, Statics & Dynamics,Thermodynamics & Heat Transfer, Fluid Mechanics, Materials, Mechanical Design,Workshop Practices, Manufacturing, Instrumentation & Control, Mechanical Maintenance, Electrical & Electronic Technology.

11.3 JOB PROSPECT

This programme provides the knowledge and skills in Mechanical Engineering field that can be applied to a broad range of careers in Mechanical Engineering. The knowledge and skills that the students acquire from the programme will enable them to participate in the job market as:

a. Assistant Engineer
b. Technical Assistant
c. Assistant Service Manager
d. Service Advisor
e. Supervisor
f. Technician
g. Technical Instructor or Lecturer
h. Technical Sales Executive / Engineer
i. Draughter / Designer
j. Entrepreneur

11.4 PROGRAMME AIM

The programme believes that every individual has potential and the programme aims to develop adaptable and responsible Senior Assistant Engineers to support government aspiration to increase workforce in engineering related field.

11.5 PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

The Diploma in Mechanical Engineering programme should produce balanced and competent technical workers who are:

PEO1 : equipped with industry-relevant knowledge and skills in mechanical engineering field

PEO2 : engaging on lifelong and continuous learning to enhance knowledge and skills

PEO3 : instilled with entrepreneurial skills and mind set in the real working environment

PEO4 : established strong linkage with society and players in the industry

11.6 PROGRAMME LEARNING OUTCOMES (PLO)

Upon completion of the programme, students should be able to :

PLO NUMBER	CONTENT
PLO1	Knowledge: Apply knowledge of applied mathematics, applied science, engineering fundamentals and an engineering specialization as specified in DK1 to DK4 respectively to wide practical procedures and practices.
PLO2	Identify and analyse well-defined engineering problems reaching substantiated conclusions using codified methods of analysis specific to their field of activity. (DK1 to DK4)
PLO3	Design solutions for well-defined technical problems and assist with the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations. (DK5)
PLO4	Conduct investigations of well-defined problems; locate and search relevant codes and catalogues, conduct standard tests and measurements.
PLO5	Apply appropriate techniques, resources, and modern engineering and IT tools to well-defined engineering problems, with an awareness of the limitations. (DK6)
PLO6	Demonstrate knowledge of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technician practice and solutions to well-defined engineering problems. (DK7)
PLO7	Understand and evaluate the sustainability and impact of engineering technician work in the solution of well-defined engineering problems in societal and environmental contexts (DK7)
PLO8	Understand and commit to professional ethics and responsibilities and norms of technician practice.
PLO9	Function effectively as an individual, and as a member in diverse technical teams.
PLO10	Communicate effectively on well-defined engineering activities with the engineering community and with society at large, by being able to comprehend the work of others, document their own work, and give and receive clear instructions.
PLO11	Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member or leader in a technical team and to manage projects in multidisciplinary environments.
PLO12	Recognise the need for, and have the ability to engage in independent updating in the context of specialised technical knowledge

Notes:

DK 1 : A descriptive, formula-based understanding of the natural sciences applicable in a sub-discipline

DK 2 : Procedural mathematics, numerical analysis, statistics applicable in a subdiscipline

DK 3 : A coherent procedural formulation of engineering fundamentals required in an accepted sub discipline

DK 4 : Engineering specialist knowledge that provides the body of knowledge for an accepted sub-discipline

DK 5 : Knowledge that supports engineering design based on the techniques and procedures of a practice area

DK 6 : Codified practical engineering knowledge in recognised practice area.

DK 7 : Knowledge of issues and approaches in engineering technician practice: ethics, financial, cultural, environmental and sustainability impacts

11.7 PROGRAMME STRUCTURE

CLASSIFICATION	COURSE CODE	COURSE	CONTACT HOURS				CREDIT VALUES	PREREQUISITE / CO-REQUISITE
			L	P	T	O		
SEMESTER 1								
Compulsory	DUE10012	Communicative English 1	1	0	2	0	2	
	MPU24XX1	Sukan	0	2	0	0	1	
	MPU24XX1	Unit Beruniform 1						
Common Core	DUW10022	Occupational, Safety and Health for Engineering	2	0	0	0	2	
	DBS10012	Engineering Science	2	1	0	0	2	
	DBM10013	Engineering Mathematics 1	2	0	2	0	3	
Discipline Core	DJJ10013	Engineering Drawing	1	3	0	0	3	
	DJJ10022	Mechanical Workshop Practice 1	0	4	0	0	2	
	DJJ10033	Workshop Technology	3	0	0	0	3	
TOTAL			**25**				**18**	
SEMESTER 2								
Compulsory	MPU23052	Sains, Teknologi dan Kejuruteraan Dalam Islam*	1	0	2	0	2	
	MPU23042	Nilai Masyarakat Malaysia**						
	MPU24XX1	Kelab/Persatuan	0	2	0	0	1	MPU24XX1
	MPU24XX1	Unit Beruniform 2						MPU24XX1
Common Core	DBM20023	Engineering Mathematics 2	2	0	2	0	3	DBM10013
Discipline Core	DJJ20042	Mechanical Workshop Practice 2	0	4	0	0	2	DJJ10022
	DJJ20053	Electrical Technology	2	2	0	0	3	
	DJJ20063	Thermodynamics	2	2	0	0	3	
	DJJ20073	Fluid Mechanics	2	2	0	0	3	
TOTAL			**25**				**17**	
SEMESTER 3								
Compulsory	DUE30022	Communicative English 2	1	0	2	0	2	DUE10012
Common Core	DBM30033	Engineering Mathematics 3	2	0	2	0	3	DBM20023
Discipline Core	DJJ30082	Mechanical Workshop Practice 3	0	4	0	0	2	DJJ20042
	DJJ30093	Engineering Mechanics	2	2	0	0	3	
	DJJ30103	Strength of Materials	2	2	0	0	3	
	DJJ30113	Material Science and Engineering	2	2	0	0	3	
	DJJ30122	Computer Aided Design	1	2	0	0	2	DJJ10013
TOTAL			**26**				**18**	

CLASSIFICATION	COURSE CODE	COURSE	CONTACT HOURS				CREDIT VALUES	PREREQUISITE / CO-REQUISITE
			L	P	T	O		
SEMESTER 4								
Common core	DJJ40132	Engineering and Society	2	0	0	0	2	
Discipline Core	DJJ40142	Mechanical Workshop Practice 4	0	4	0	0	2	DJJ30082
	DJJ40153	Pneumatic and Hydraulics	2	2	0	0	3	
	DJJ40163	Mechanics of Machines	2	2	0	0	3	DJJ30093
	DJJ40173	Engineering Design	2	2	0	0	3	DJJ30122
	DJJ40182	Project 1	2	0	0	0	2	
Elective		Elective***						
TOTAL			**20**				**15**	
SEMESTER 5								
Compulsory	MPU21032	Penghayatan Etika dan Peradaban	1	0	2	0	2	
	DUE50032	Communicative English 3	1	0	2	0	2	DUE30012
	MPU22012	Entrepreneurship	1	0	2	0	2	
Discipline Core	DJJ50193	Project 2	0	4	0	0	3	DJJ40182
	DJJ50203	Troubleshooting and Maintenance for Mechanical Components	2	2	0	0	3	
	DJJ50212	Maintenance Engineering and Management	2	0	0	0	2	
Elective		Elective***						
TOTAL			**19**				**14**	
SEMESTER 6								
Industrial Training	DUT600610	Engineering Industrial Training	0	0	0	0	10	
TOTAL			**0**				**10**	
TOTAL CREDIT VALUES							**94**	
ELECTIVES COURSES	DJJ42022	Industrial Management	2	0	0	0	2	
	DJJ42032	Instrumentation and Control						
	DJJ52012	Engineering Plant Technology						
	DJJ52052	Railway Track System	2	0	0	0		
	DJM20032	C Programming	1	2	0	0		
	DJM40082	Programmable Logic Control	1	2	0	0		
	DJM40092	Control System	2	1	0	0		
	DJF51082	Quality Control	2	0	0	0		
1	DUD10012	Design Thinking	1	0	0	1	2	

Course Classification	Total Credit	%
i. (a) Compulsory	14	14.9
(b) Compulsory (Bahasa Kebangsaan A)[b]	2[b]	0.0
ii. Common Core	15	16.0
iii. Discipline Core	53	56.4
Total Credit	**82**	**87**
v. (a) Electives	2	2.1
(b) Free Electives[a]	2[a]	0.0
v. Industrial Training	10	10.6
Grand Total Credit	**94**	**100**

Engineering and Engineering Technology Courses	Credit	%
i. Practice - Oriented Components	33	50.9%
ii. Engineering and Engineering Technology Total Credit	65	100.0%

Legend :

L : Lecture, **P** : Practical / Lab, **T** : Tutorial, **O** : Others

(The numbers indicated under L, P, T & O represent the contact hours per week, to be used as a guide for time table preparation).

*For Muslim Students

**For Non Muslim Students

***Only one (1) elective course can be chosen either in semester 4 or 5

Notes:

1. The minimum and maximum credit value of Electives must be referred to the programme Standard or professional bodies.
2. Elective courses offered are cross -disciplinary and can be chosen from courses listed in the program structure or any courses listed in the inventory of other disciplines; but must adhere to prerequisite / co-requisite requirement in the Programme Information.
3. [a]**Free Electives** are courses which are not included in any programme structure but if taken, will contribute towards students' CGPA, provided that institutions adhere to the Jabatan Pendidikan Politeknik & Kolej Komuniti Free Electives Guidelines.
4. [b]**MPU22042 Bahasa Kebangsaan A** is **COMPULSORY** for students who did not attain credit in Bahasa Melayu at Sijil Pelajaran Malaysia (SPM) level and will contribute to students' CGPA.
5. Co-curriculum pathways:
    a. Path 1 : Sport and Club
    b. Path 2 : Uniform Unit (Students are required to **PASS** Uniform Unit 1 as a prerequisite to Uniform Unit 2)
6. Clusters:
    a. CLS1 : Knowledge & Understanding
    b. CLS2 : Cognitive Skills
    c. CLS3a : Practical Skills
    d. CLS3b : Interpersonal & Communication Skills
    e. CLS3c : Digital & Numeracy Skills
    f. CLS3d : Leadership, Autonomy & Responsibility
    g. CLS4 : Personal & Entrepreneurial Skills
    h. CLS5 : Ethics & Professionalism

1.8 COURSE SYNOPSIS AND COURSE LEARNING OUTCOMES (CLO)

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
1	DUE10012 Communicative English 1	**COMMUNICATIVE ENGLISH 1** focuses on developing students' speaking skills to enable them to communicate effectively and confidently in group discussions and in a variety of social interactions. It is designed to provide students with appropriate reading skills to comprehend a variety of texts. The students are equipped with effective presentation skills as a preparation for academic and work purposes. **CREDIT(S): 2** **PRE-REQUISITE(S): NONE**	CLO 1: Participate in discussion using effective communication and social skills to reach an amicable conclusion by accommodating differing views and opinions. (A3, CLS 3b) CLO 2: Demonstrate awareness of values and opinions embedded in texts on current issues. (A3, CLS 3b) CLO 3: Present a topic of interest that carries identifiable values coherently using effective verbal and nonverbal communication skills. (A2, CLS 4)
1	MPU 24XXI Unit Beruniform 1	**UNIT BERUNIFORM 1** adalah aktiviti yang mengandungi latihan kemahiran berguna secara rekreasi dan peraturan-peraturan tertentu dalam mengejar kecemerlangan bagi penguasaan pengetahuan dan kemahiran khusus secara holistic bagi mengukuhkan pembentukan kemahiran insaniah pelajar yang positif. **CREDIT(S): 1** **PRE-REQUISITE(S): NONE**	CLO 1: Mempamerkan kemahiran khusus bagi kursus yang berkaitan. (P2, CLS 4) CLO 2: Menunjukkan kepimpinan dan kerja berpasukan berdasarkan penguasaan kemahiran dan amalan positif. (A3, CLS 3d)
1	MPU 24XXI Sukan	**SUKAN** adalah aktiviti yang mengandungi latihan kemahiran berguna secara rekreasi dan peraturan-peraturan tertentu dalam mengejar kecemerlangan bagi penguasaan pengetahuan dan kemahiran khusus secara holistic bagi mengukuhkan pembentukan kemahiran insaniah pelajar yang positif. **CREDIT(S): 1** **PRE-REQUISITE(S): NONE**	CLO 1: Mempamerkan kemahiran khusus bagi kursus yang berkaitan. (P2, CLS 4) CLO 2: Menunjukkan kepimpinan dan kerja berpasukan berdasarkan penguasaan kemahiran dan amalan positif. (A3, CLS 3d)

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
1	DUW10012 Occupational Safety & Health for Engineering	**OCCUPATIONAL SAFETY AND HEALTH FOR ENGINEERING** course is designed to impart understanding of the self-regulatory concepts and provisions under the Occupational Safety & Health Act (OSHA). This course presents the responsibilities of workers in implementing and complying with the safety procedures at work. Understanding of notifications of accidents, dangerous occurrences, poisoning and diseases and liability for offences will be imparted upon students. This course will also provide an understanding of the key issues in OSH Management, Incident Prevention, Fire Safety, Hazard Identification Risk Control and Risk Assessment (HIRARC), Workplace Environment and Ergonomics and guide the students gradually into this multi-disciplinary science. **CREDIT(S): 2** **PRE-REQUISITE(S): NONE**	CLO1: Explain briefly Occupational Safety and Health (OSH) procedures, regulation, and its compliance in Malaysia. (C2, PLO1) CLO2: Initiates incident hazards, risks, and safe work practices in order to maintain health and safe work environment. (A3, PLO8) CLO3: Demonstrates communication skill in group to explain the factor that can lead to accident in workplace. (A3,PLO10)
1	DBS10012 Engineering Science	**ENGINEERING SCIENCE** course introduces the physical concepts required in engineering disciplines. Students will learn the knowledge of fundamental physics in order to identify and solve engineering physics problems. Students will be able to perform experiments and activities to mastery physics concepts. **CREDIT(S): 2** **PRE-REQUISITE(S) : NONE**	CLO 1: Use basic physics concept to solve engineering physics problems. (C3, CLS 1) CLO 2: Apply knowledge of fundamental physics in activities to mastery physics concept C3, CLS 1) CLO 3: Perform appropriate activities related to physics concept (P3, CLS 3a).

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
1	DBM10013 Engineering Mathematics 1	**ENGINEERING MATHEMATICS 1** exposes students to basic algebra including resolve partial fractions. This course also covers the concept of trigonometry and the method to solve trigonometry problems by using basic identities, compound angle and double angle formulae. Students will be introduced to the theory of complex numbers and concept of vector and scalar. Students will explore advanced matrices involving 3x3 matrix. **CREDIT(S): 3** **PRE-REQUISITE(S): NONE**	CLO 1: Use mathematical statement to describe relationship between various physical phenomena. (C3, CLS 1) CLO 2: Show mathematical solutions using the appropriate techniques in mathematics. (C3, CLS 3c) CLO 3: Use mathematical expression in describing real engineering problems precisely, concisely, and logically. (A3, CLS 3b)
1	DJJ10013 Engineering Drawing	**ENGINEERING DRAWING** course provides the students with the fundamentals of technical drawings and the application Computer Aided Design (CAD) software. For technical drawing, it emphasizes the practical knowledge of drawing instruments and drawing techniques while for CAD the student will learn to navigate and use the software to create 2D drawing design in engineering. Students shall be able to demonstrate competency in using some standard available features of technical drawing and CAD application to create and manipulate objects or elements in engineering drawing. **CREDIT (S): 3** **PREREQUISITE(S): NONE**	CLO1: Apply the fundamentals of technical drawing and features of CAD software in producing engineering drawing. (C3, PLO1) CLO2: Construct the technical drawing and 2D CAD drawing according to the engineering drawing standards. (P3, PLO5) CLO3: Propose a project report with the following engineering norms and practices in engineering drawing. (A3,PLO8)

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
1	DJJ10022 Mechanical Workshop Practice 1	**MECHANICAL WORKSHOP PRACTICE 1** exposes the students to welding, machining and fitting which involve the use of arc and and gas welding machine, lathe machine, drilling machine, grinding, hand tools, marking out tools, measuring and testing tools. Students are also taught to emphasize on safety procedures and cleanliness in the workshop. **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO1: Measure finished product using appropriate measurement instruments. (P3, PLO5) CLO2: Perform fitting, welding and machining works according to Standard Operational Procedure (SOP). (P4, PLO5) CLO3: Demonstrate an understanding of professional ethics, responsibilities and norms of engineering practices according to the workshop safety regulation. (A3, PLO6)
1	DJJ10033 Workshop Technology	**WORKSHOP TECHNOLOGY** provides exposure and knowledge in using hand tools, machine operation such as drilling, lathe, milling and computer numerical control. It also covers on gear measurement and inspection welding process in oxy acetylene, Shielded Metal Arc Welding (SMAW), Gas Tungsten Arc Welding (GTAW) and Gas Metal Arc Welding (GMAW) **CREDIT(S): 3** **PRE-REQUISITE(S): NONE**	CLO1: Apply the knowledge of basic mechanical components and equipment, hand tools and measuring equipment in workshop technology. (C3, PLO1) CLO2: Apply standard practice in operating mechanical tools and components. (C3,PLO8) CLO3: Demonstrate continuous learning and information management skills to complete assigned task. (A3, PLO12)
2	MPU23052 Sains, Teknologi dan Kejuruteraan Dalam Islam*	**SAINS, TEKNOLOGI DAN KEJURUTERAAN DALAM ISLAM** memberi pengetahuan tentang konsep Islam sebagai al-Din dan seterusnya membincangkan konsep sains, teknologi dan kejuruteraan dalam Islam serta impaknya, pencapaiannya dalam tamadun Islam, prinsip serta peranan syariah dan etika Islam, peranan kaedah fiqh serta aplikasinya. **CREDIT(S): 2** **PRE-REQUISITE(S) : NONE**	CLO 1: Melaksanakan dengan yakin amalan Islam dalam kehidupan seharian (A2, CLS 4) CLO 2: Menerangkan etika dan profesionalisme berkaitan sains teknologi dan kejuruteraan dalam Islam (A3, CLS 5) CLO 3: Menghubungkait minda ingin tahu dengan prinsip syariah, etika dan kaedah fiqh dalam bidang sains, teknologi dan kejuruteraan menurut perspektif Islam (A4, CLS 4)

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
2	MPU23042 Nilai Masyarakat Malaysia**	**NILAI MASYARAKAT MALAYSIA** membincangkan aspek sejarah pembentukan masyarakat, nilai-nilai agama, adat resam dan budaya masyarakat di Malaysia. Selain itu, pelajar dapat mempelajari tanggungjawab sebagai individu dan nilai perpaduan dalam kehidupan di samping cabaran-cabaran dalam membentuk masyarakat Malaysia. **CREDIT(S): 2** **PRE-REQUISITE(S): NONE**	CLO 1: Membincangkan sejarah dan nilai dalam pembentukan masyarakat di Malaysia. (A2, CLS4) CLO 2: Menerangkan etika dan profesionalisme terhadap konsep perpaduan bagi meningkatkan semangat patriotisme masyarakat Malaysia. (A3, CLS5) CLO 3: Menghubungkait minda ingin tahu dengan cabaran-cabaran dalam membentuk masyarakat Malaysia. (A4, CLS4)
2	MPU 24XX1 Kelab/ Persatuan	**UNIT BERUNIFORM 2** memfokuskan kepada penguasaan pengetahuan dan kemahiran khusus secara holistik bagi mengukuhkan pembentukan kemahiran insaniah pelajar yang positif **CREDIT(S): 1** **PRE-REQUISITE(S): MPU24XX1 SUKAN**	CLO 1: Mempamerkan kemahiran khusus bagi kursus berkaitan. (P3, CLS4) CLO 2: Menunjukkan kepimpinan dan kerja berpasukan berdasarkan penguasaan kemahiran dan amalan positif (A3, CLS 3d)
2	MPU24XX1 Unit Beruniform 2	**UNIT BERUNIFORM 2** memfokuskan kepada penguasaan pengetahuan dan kemahiran khusus secara holistik bagi mengukuhkan pembentukan kemahiran insaniah pelajar yang positif **CREDIT(S): 1** **PRE-REQUISITE(S): MPU24XX1 UNIT BERUNIFORM 1**	CLO 1: Mempamerkan kemahiran khusus bagi kursus berkaitan. (P3, CLS4) CLO 2: Menunjukkan kepimpinan dan kerja berpasukan berdasarkan penguasaan kemahiran dan amalan positif (A3, CLS 3d)

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
2	DBM20023 Engineering Mathematics 2	**ENGINEERING MATHEMATICS 2** exposes students to the basic laws of indices and logarithms. This course introduces the basic rules of differentiation concepts to solve problems that relate to maximum, minimum and calculate the rates of changes. This course discusses integration concepts in order to strengthen student's knowledge for solving area and volume bounded region problems. In addition, students will learn application of both techniques of differentiation and integration. **CREDIT(S): 3** **PRE-REQUISITE(S):DBM10013 ENGINEERING MATHEMATICS 1**	CLO 1: Use algebra and calculus knowledge to describe the relationship between various physical phenomena. (C3, CLS 1) CLO 2: Solve the mathematical problems by using appropriate and relevant fundamental calculus techniques. (C3, CLS 3c) CLO 3: Use mathematical language to express mathematical ideas and arguments precisely, concisely, and logically in calculus. (A3, CLS 3b)
2	DJJ20042 Mechanical Workshop Practice 2	**MECHANICAL WORKSHOP PRACTICE 2** exposes the students to arc and gas welding, foundry and machining works. Safety procedure practice is heavily emphasized in the workshop. **CREDIT(S) : 2** **PRE-REQUISITE(S) : DJJ10022 Mechanical Workshop Practice 1**	CLO 1: Follow the appropriate procedure for welding, foundry and lathe machining. CLO 2: Perform welding, foundry and lathe machining according to Standard Operating Procedure (SOP). CLO 3: Demonstrate the ability to work as individual and as a team to complete assigned tasks.
2	DJJ 20053 Electrical Technology	**ELECTRICAL TECHNOLOGY** exposes students to the basic electrical circuit concepts, the application of electromagnetism in electrical machines and transformers. The course focuses on the different types of electrical circuits, the relationship between current and voltage including the resistance. It also provides skills in the methods of constructing basic circuits and operation of electrical machines and transformers. This course also exposes the students to the demonstration of experiments in Electrical Engineering **CREDIT(S): 3** **PRE-REQUISITE(S): NONE**	CLO1: Explain the principles of electrical circuits, electromagnetism, transformers, and electrical machines. CLO2: Solve the problem related to electrical circuits, electromagnetism, transformers and electrical machines. CLO3: Organize appropriately. experiments in groups according to the Standard Operating Procedures.

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
2	DJJ20063 Thermodynamics	**THERMODYNAMICS** provides knowledge of theory, concept and application of principles to solve problems related to thermodynamics. It emphasizes on concept of non-flow process and flow process, properties of steam, Carnot cycle and Rankine cycle. This course also exposes the students to the demonstration of experiments in Thermodynamics by using the real equipment. **CREDIT(S) : 3** **PRE-REQUISITE(S) : NONE**	CLO1 : Explain fundamentals concept and properties of pure substances in thermodynamics. CLO2 : Apply Laws of thermodynamics and it processes. CLO3:Organize appropriately experiments according to the Standard Operating Procedures.
2	DJJ20073 Fluid Mechanics	**FLUID MECHANICS** provides students with a strong understanding of the fundamentals of fluid mechanics principles related to the fluid properties and behavior in static and dynamic situations. This course also exposes the students to the demonstration at the real equipment of fluid mechanics. **CREDIT(S) : 3** **PRE-REQUISITE(S) : NONE**	CLO1: Explain the fundamentals of fluid. CLO2: Solve problems related to fluid properties, fluid statics and fluid dynamics. CLO3: Organize appropriate experiments in groups according to the standard operating procedures.
3	DUE30022 Communicative English 2	**COMMUNICATIVE ENGLISH 2** emphasizes the skills required at the workplace to describe products and services as well as processes and procedures. This course will also enable students to make and reply to enquiries and complaints. **CREDIT(S): 2** **PRE-REQUISITE(S): DUE10012 COMMUNICATIVE ENGLISH 1**	CLO 1: Describe a product or service effectively by highlighting its features and characteristics that appeal to a specific audience. (A3, CLS 3b) CLO 2: Describe processes, procedures, and instructions clearly by highlighting information of concern. (A3, CLS 4) CLO 3: Demonstrate effective communication and social skills in handling enquiries and complaints amicably and professionally. (A3, CLS 3b)

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
3	DBM30033 Engineering Mathematics 3	**ENGINEERING MATHEMATICS 3** exposes students to the statistical and probability concepts and their applications in interpreting data. The course also introduces numerical methods concept to solve simultaneous equations by using Gaussian Elimination method, LU Decomposition using Doolittle and Crout methods, polynomial problems using Simple Fixed-Point Iteration and Newton-Raphson method. In addition, the course also discusses optimization problems by using Linear Programming. To strengthen the students in solving advanced engineering problems. Ordinary Differential Equation (ODE) is also included. **CREDIT(S): 3** **PRE-REQUISITE(S): DBM20023 ENGINEERING MATHEMATICS 2**	CLO 1: solve the mathematical problems by using appropriate mathematical techniques and solutions. (C3, LD1) CLO 2: Show the solution for statistics and probability problems, and linear programming by using appropriate mathematical methods. (C3, LD1) CLO 3: practice mathematical knowledge and skills in different mathematics problems. (C3, LD1)
3	DJJ30082 Mechanical Workshop Practice 3	**MECHANICAL WORKSHOP PRACTICE 3** exposes the students to the use of Tungsten Inert Gas (TIG) and Metal Inert Gas (MIG) welding machines. Students also will perform a task by using lathe and milling machine. In addition, students will be exposed in safety procedures practice will be emphasized in workshop. **CREDIT(S) : 2** **PRE REQUISITE(S) : DJJ 20042 MECHANICAL WORKSHOP PRACTICE 2**	CLO1 : follow welding tasks according to workshop Standard Operating Procedure (SOP). (P3, PLO5) CLO2 : perform machining tasks according to workshop Standard Operating Procedure (SOP). (P4, PLO5) CLO3 : demonstrate awareness of social responsibility and safety procedures in the workshop according to the workshop safety regulations and create a secured environment in an organization while doing practical work. (A3, PLO6)

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
3	DJJ30093 Engineering Mechanics	**ENGINEERING MECHANICS** focuses on theoretical knowledge in statics and dynamics. This course provides students with fundamental understanding of forces and equilibrium, resultants, equilibrium of a particles and structural analysis. This course also covers kinematics and kinetics of particles. This course also exposes the students to the demonstration of experiments in Engineering Mechanics. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	CLO 1: solve problems related to static and dynamics based on the concepts and principle of engineering mechanics. CLO 2: analyze engineering related problems based on fundamentals of static and dynamics. CLO 3: organize appropriately experiment in groups according to Standard Operation Procedures
3	DJM30093 DJJ30103 Strength of Materials	**STRENGTH OF MATERIALS** provides knowledge on concepts and calculation of forces on materials, thermal stress, shear force and bending moment, bending stress, shear stress and torsion in shafts. It also deals with the experiments conducted on tensile test, bending moment, shearing force and torsion and deflection. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	CLO1 : apply the concepts of strength of materials to solve related problems. (C3, PLO1) CLO2 : analyze problems correctly related to strength of materials (C4, PLO2) CLO3 : organize appropriately experiment in groups according to Standard Operation Procedures (SOP). (P4, PLO5)
3	DJJ30113 Materials Science and engineering	**MATERIALS SCIENCE AND ENGINEERING** course introduces students to a comprehensive coverage of fundamentals of materials science and engineering. The course focuses on material structures, properties, fabrication methods, corrosion, thermal processing, and material testing mostly of metals and alloys. A new fabrication method of powder metallurgy is introducing to student to cater the fabrications of devices, sensors for Industry 4.0 technology. **CREDIT(S): 3** **PRE-REQUISITE(S): NONE**	CLO1: Apply the fundamentals of materials science to identify the materials, properties, behavior, processes, and treatment. CLO2: Performed appropriate materials testing according to the Standard Operating Procedures CLO3: Demonstrate the ability to work individually and in group to complete assigned tasks during the practical work session.

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
3	DJJ30122 Computer Aided Design	**COMPUTER AIDED DESIGN exposes the students to the fundamentals and principles of 3D drawing using 3D CAD software. Students are also equipped with various methods of creating a solid model using extrude, revolve, swept, assembly, simulation, and animation. Hands-on exercises drawing of mechanical engineering will also be covered in this course.** **CREDIT(S): 2** **PRE-REQUISITE(S): DJJ10013 ENGINEERING DRAWING**	CLO1: Apply CAD commands in order to produce engineering drawings. CLO2: Construct 3D drawing of Mechanical Components according Drawing Standard. CLO3: Demonstrate a presentation with following technical standard communication
4	DJJ40132 Engineering Society	**ENGINEERING AND SOCIETY** focuses on the introduction to professional ethics, theory and philosophy of ethics, values in professional ethics, engineering bylaws and standards, issues in professional ethics and sustainability. It also relates towards IR 4.0 introduction and green engineering. **CREDIT(S): 2** **PRE-REQUISITE(S): NONE**	CLO1: Implement the roles of engineering profession towards the development of society and its challenges in globalization. CLO2: Determine the importance of work ethics, bylaws, and professionalism in engineering profession. CLO3: Determine the needs for sustainable and green engineering towards providing the solutions in engineering field.
4	DJJ40142 Mechanical Workshop Practice 4	**MECHANICAL WORKSHOP PRACTICES 4** course allows the students to operate machine tools, precision grinding, CNC machine and able to work in a clean and safe workshop environment. **CREDIT(S) : 2** **PRE-REQUISITE(S) : DJJ30082 MECHANICAL WORKSHOP PRACTICE 3**	CLO1 : perform high precision machining processes for the surface or cylindrical grinding machine. CLO2 : construct programs for EDM and CNC machining process using ISO codes or any related machining software. CLO3 : demonstrate safety procedures in the workshop according to the workshop safety regulation correctly to create a secured environment in an organization while doing practical work and ability to work in team to complete assigned tasks during practical work sessions.

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
4	DJJ40153 Pneumatic and Hydraulics	**PNEUMATICS AND HYDRAULICS** provides knowledge and understanding to the importance of pneumatics and hydraulics circuits, equipment and design along with its usage in the industry. **CREDIT(S): 3** **PRE-REQUISITE (S) : NONE**	CLO 1. Analyze the basic concept and function of pneumatics and hydraulics system. CLO 2. Construct pneumatic, electro-pneumatic and hydraulic circuit according to assigned tasks. CLO 3. Perform experiment on pneumatic, electro-pneumatic and hydraulic circuit during practical session.
4	DJJ40163 Mechanics of Machines	**MECHANICS OF MACHINES** exposes the students with knowledge on techniques and concepts of mechanics of machines and analyzing problems related to hoists, simple harmonic motion, velocity and acceleration diagram, and belt drives. This course also exposes the students to the demonstration of experiments in Mechanics of Machines by using the real equipment. **CREDIT(S) : 2** **PRE-REQUISITE(S): DJJ30093 ENGINEERING MECHANICS**	CLO1 : Apply the fundamentals of mechanics of machines to solve related problems in the theoretical and graphical aspects. (C3, PLO1) CLO2 : Analyze problems related to the mechanics of machines in relation to the theoretical aspects. (C4, PLO2) CLO3 : Perform experiments in groups according to the Standard Operating Procedures.
4	DJJ40173 Engineering Design	**ENGINEERING DESIGN** course offers a comprehensive coverage of basic concept engineering design. Student will learn the fundamental concepts for designing process, designing consideration, ergonomic, materials selection and emphasizes on mathematical analysis for simple components designs in engineering. It also provides knowledge on reverse engineering and practical on 3D printing. **CREDIT(S) : 3** **PRE-REQUISITE(S):DJJ30122 COMPUTER AIDED DESIGN**	CLO1: Apply the concept of design process, stress analysis and mechanical joint in an engineering product. (C3 , PLO1) CLO2: Implement engineering design process on project design taking into design consideration, ergonomic factors and material selection. (C3 , PLO3) CLO3: Builds a part or product in 3D modelling based on project design. (P4 , PLO5) CLO4: Adopt design regarding to the environment and sustainability.

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
4	DJJ40182 Project 1	**PROJECT 1** provides students with solid foundation on knowledge and skills in formulating project proposal preparation, writing and presentation **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO1: Identify the engineering problems to be solved. CLO2: Analyze methods to solve problems CLO3 : Propose a solution to problems
5	MPU21032 Penghayatan Etika dan Peradaban	**PENGHAYATAN ETIKA DAN PERADABAN** ini menjelaskan tentang konsep etika daripada perspektif peradaban yang berbeza. Ia bertujuan bagi mengenal pasti sistem, tahap perkembangan, kemajuan dan kebudayaan merentas bangsa dalam mengukuhkan kesepaduan sosial. Selain itu, perbincangan dan perbahasan berkaitan isu-isu kontemporari dalam aspek ekonomi, politik, sosial, budaya dan alam sekitar daripada perspektif etika dan peradaban dapat melahirkan pelajar yang bermoral dan profesional. Penerapan amalan pendidikan berimpak tinggi (HIEPs) yang bersesuaian digunakan dalam penyampaian kursus ini. **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO 1: Membentangkan konsep etika dan peradaban dalam kepelbagaian tamadun. (A2, CLS5) CLO 2: Menerangkan sistem, tahap perkembangan, kesepaduan sosial dan kebudayaan merentas bangsa di Malaysia. (A2,CLS5) CLO 3: Mencadangkan sikap yang positif terhadap isu dan cabaran kontemporari dari perspektif etika dan peradaban. (A3, CLS4)

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
5	DUE50032 Communicative English 3	**COMMUNICATIVE ENGLISH 3** aims to develop the necessary skills in students to analyse and interpret graphs and charts from data collected as well as to apply the job hunting mechanics effectively in their related fields. Students will learn to gather data and present them through the use of graphs and charts. Students will also learn basics of job hunting mechanics which include using various job search strategies, making enquiries, and preparing relevant resumes and cover letters. The students will develop communication skills to introduce themselves, highlight their strengths and abilities, present ideas, express opinions and respond appropriately during job interviews. **CREDIT(S) : 3** **PRE-REQUISITE(S) : DUE 30022 COMMUNICATIVE ENGLISH 2**	CLO1 : Present gathered data in graphs and charts effectively using appropriate language forms and functions (A2 ,CLS 3b) CLO2 : Prepare a high impact resume and a cover letter, highlighting competencies and strengths that meet employer's expectations (A4 , CLS 4) CLO3 : Demonstrate effective communication and social skills in handling job interviews confidently (A3 , CLS 3b)
	MPU22012 Entrepreneurship	**ENTERPRENEUSHIP** focuses on the fundamentals and concept of entrepreneurship in order to inculcate the value and interest in students to choose entrepreneurship as a career. This course can help students to initiate creative and innovative entrepreneurial ideas. It also emphasizes a preparation of a business plan framework through business model canvas. **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO1: Propose the value proposition of entrepreneurial idea using Business model Canvas. (A3, CLS 3b) CLO 2: Develop a viable business plan by organizing business objectives according to priorities. (A4, CLS 4) CLO 3: Organise the online presence business in social media marketing platform. (A3, CLS 4)

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
	DJJ50193 Project 2	**PROJECT 2** is a continuation of Project 1 focusing on project planning, development, project report and presentation. This course introduces students with ability and skills in conducting project planning, development and management based on their project design. It also provides the student with technical writing and presentation skills. The project will be implemented in a group and each group will work on a project under lecturer(s) supervision. Project titles will be based on specialization and students will be assessed individually. **CREDIT(S) : 3** **PRE-REQUISITE(S) : DJJ 40182 PROJECT 1**	CLO1: Demonstrate appropriate and creative solution in solving project problems. CLO2: Perform project plan to achieve objectives with valid and reliable results. CLO3: Explain the project work and defend project outcomes effectively with good communication skills. CLO4: Organize project activities and outcomes in report accordance to the specified standard format that applies engineering management principles.
	DJJ50203 Troubleshooting and Maintenance for Mechanical Components	**TROUBLESHOOTING AND MAINTENANCE FOR MECHANICAL COMPONENTS** course covers necessary mechanical components needed in Industries. The topics include maintenance and troubleshooting principles and procedures, power transmission, bearing and pump. This course provides knowledge and skills on maintenance and troubleshooting lubrication, bearing, power transmission and pump. **CREDIT(S) : 3** **PRE-REQUISITE(S) : NONE**	CLO 1 : Apply the concept of mechanical components to solve related problems. (C3,PLO 1) CLO 2 :Organize appropriately experiments in groups according to Standart Operating Procedure (P4,PLO 5) CLO 3 :Perform the troubleshooting on mechanical component failure and damage (P4,PLO 4)
	DJJ50212 Maintenance Engineering and Management	**MAINTENANCE ENGINEERING AND MANAGEMENT** covers topic such as maintenance organization, maintenance strategies system, system approach to maintenance, maintenance planning and scheduling and computerized maintenance management system (CMMS). **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO1: apply the concepts of maintenance organization and strategies to solve related problems. CLO2: analyze the principles of maintenance strategies and elaborate on the significance of a system approach to maintenance. CLO3: organize project management and finance by group in actual workplace related to maintenance management.

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
6	DUT600610 Engineering Industrial Training	Engineering Industrial Training	

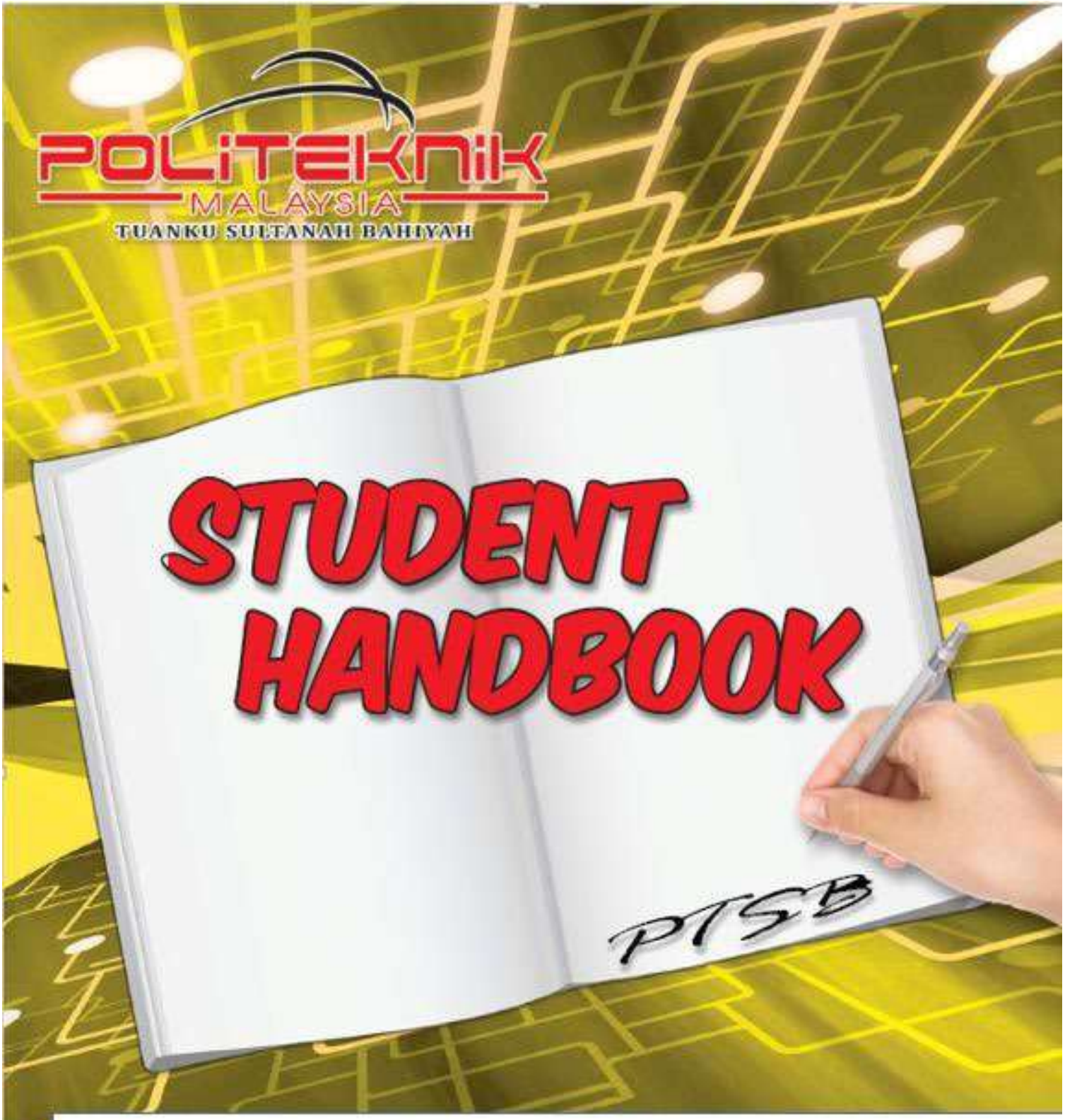
ELECTIVES COURSES

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
ELECTIVE	DJJ42022 Industrial Management	**INDUSTRIAL MANAGEMENT** provides students with a strong fundamental understanding of industrial management prospect and production system planning such as inventory, scheduling, production system operation, facilities, plan location, layout and line balancing. This course also provides knowledge in quality control, and human resource management. **CREDIT(S) : 3** **PRE-REQUISITE(S) : NONE**	CLO1: Apply the basic concept of industrial management system to solve related problems. (C3, PLO2) CLO2: Analyze problems related to industrial management (C4, PLO8) CLO3: demonstrate good communication skills. (A3, PLO10)
ELECTIVE	DJJ42032 Instrumentation and Control	**INSTRUMENTATION & CONTROL** exposes the students to the basic principles in control system and its usage in industrial sector is the main focus in this course. Instrumentation and control also provide knowledge to the students in components measurement in control systems that are normally used in industries. **CREDIT(S) : 1** **PRE-REQUISITE(S) : NONE**	CLO1 : Apply the fundamental of control system and instrumentation used in engineering (C4, PLO2) CLO2 : Explore the measurement and process control system in engineering (C3, PLO4) CLO3 : Demonstrate good communication skill in presentation on assigned topics
ELECTIVE	DJJ52012 Engineering Plant Technology	**ENGINEERING PLANT TECHNOLOGY** provides an introduction to power plant technology industry such as steam power plant, gas turbine power plant, diesel power plant, compressed air plant and water pump. **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO1 : Classify the concepts and technology of power plant system and components to solve related problem based on its application and functions. (C4,PLO2) CLO2: Implement the professional ethics and responsibility and norms of technician practice in power plant system and components. (C3,PLO8) CLO3: Demonstrate skill of communications effectively on well-defined engineering activities with the engineering community and with society of large and information management skills based on related engineering plant technology. (A3,PLO10)

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
ELECTIVE	DJJ52052 Railway Track System	**RAILWAY TRACK SYSTEM** provides knowledge regarding to railway track engineering concepts including track component and system design, construction, evaluation, maintenance, load distribution, and wheel/rail interaction. Topics covered include: Track layout and geometry; ballast and subgrade; ties; rail and fastenings; track analysis and design; special trackwork; grade crossings; track standards; and inspection, condition assessment, and asset management. **CREDIT(S): 2** **PRE-REQUISITE(S): NONE**	CLO 1: Explain the concept of Railway Track System. (C2, PLO 1) CLO 2:Apply the railway engineering and give respond in work application. (C3, PLO 5) CLO 3: Analyze the effectiveness of Railway Track System through engineering issue in group. (C4, PLO 9)
ELECTIVE	DJM20032 C Programming	**C PROGRAMMING** course provides an introduction to programme design and development. Student will learn to design, code, debug, test and document well-structured programs based on technical and engineering problem. Topic covered; software development principle, programming language basic, data types, input and output operation, the use of selection, loops, arrays and function structure. **CREDIT(S): 2** **PRE-REQUISITE(S): NONE**	CLO1: Explain knowledge of basic concepts of C programming to solve given problem using an appropriate data type. CLO2: Construct a high level programming language in solving variety engineering and scientific problems. CLO3: Present a solution for assigned project based on programming which relates to current or upcoming technologies and peripherals.

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
ELECTIVE	DJM40082 Programmable Logic Control	**PROGRAMMABLE LOGIC CONTROLLER (PLC)** is a course designed to provide students with hardware adaptation and programming skills by employing a PLC for an automation system in the industry. Basic types of automation systems will be studied to assist students in visualizing the application of PLC. The co-relation application of PLC in the automation system will be explored both by theoretical and experimental mode. Practical application of an automation system with PLC will be simulated in a laboratory environment to provide a pseudo industrial based experience **CREDIT(S): 2** **PRE-REQUISITE(S) : NONE**	CLO1: Differentiate the types of automation systems and terminologies used in PLC hardware and programmes. CLO2: Write a PLC program related to an industrial automation system CLO3: Program a PLC for an automated application.
ELECTIVE	DJM40092 Control System	**CONRTOL SYSTEM** provides knowledge regarding various concepts of feedback control system and the required mathematical methods. The emphasis of the course is on control action, transfer functions, and Laplace transforms. This course also provides knowledge in analyzing and data interpretation on different types of controller mode. **CREDIT(S): 2** **PRE-REQUISITE (S) : NONE**	CLO 1. Explain the basic concept of control system including controller principle, transfer function and stability CLO 2. Construct experiment on different types of controller mode in order to analyse and interpretation of data CLO 3. Demonstrate the ability to work in team for completing assigned task during practical work sessions
ELECTIVE	DJF51082 Quality Control	**QUALITY CONTROL** provides knowledge on basic principle and concept of quality including statistical method in controlling products quality or services. This course also emphasizes on the application of Control Chart and Quality Control tools and also explains the quality improvement technique. **CREDIT(S) : 2** **PREREQUISITE(S) : NONE**	CLO1 :Apply the relation of statistics and quality management system in understanding of quality control and their application tools. (C3, PLO1) CLO2 : Determine the related quality tools and techniques to control the quality of products or services based on case study. (C4, PLO2) CLO3 :Demonstrate ability to work in team to complete the assigned tasks.

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
ELECTIVE	DUD10012 Design Thinking	**DESIGN THINKING** offers the basic concept of Design Thinking through experiential learning. Students learn the five iterative phases of Design Thinking, which are Empathy, Define, Ideate, Prototype and Testing. Students will apply these design thinking principles, process and techniques to solve a real-world problem and come up with an innovative solution in the form of a product, system or service prototype. **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO1: Apply design thinking principles, process and techniques to solve a real-world problem innovatively (C3 , CLS 2) CLO2: Demonstrate the ability to communicate ideas in solving a real-world problem



DIPLOMA IN MECHANICAL ENGINEERING (MANUFACTURING)(DTP)

12.0 DIPLOMA IN MECHANICAL ENGINEERING (MANUFACTURING)

12.1 Introduction

In line with the 3rd Industrial Malaysia Plan (IMP3) aiming for the innovative and creative human capital development, via matching talent to expertise with market demand, Diploma in Mechanical Engineering (Manufacturing) for polytechnic is developed to give balance emphasis on theoretical and practical aspects. The Eleventh Malaysia Plan was drawn to produced 60% out of 1.5 million workers was in TVET sector. Until now a total of 69,475 (51%) of the 136,062 technical education and vocational training (TVET) graduates in Malaysia are working as professionals and skilled workers. Thus, to keep abreast with rapid demand in TVET sector, Department of Polytechnic and Community College Education (DPCCE) progressively collaborates with major industry players in the country in developing the curriculum. The programme will take six semesters to complete, five academic semesters at their respective polytechnics and one semester of industrial training at relevant industries during the final semester. This programme complies with the Board of Engineer (BEM) requirement.

12.2 Synopsis

The Diploma in Mechanical Engineering (Manufacturing) programme is designed to produce holistic graduates that have knowledge and competent skills in the field of mechanical engineering to fulfil the demand of workers in engineering sector. The programme structure focusses on the area of Solid Mechanics, Statics & Dynamics, Thermodynamics & Heat Transfer, Fluid Mechanics, Materials, Mechanical Design, Electrical, Manufacturing, Instrumentation & Control and Mechanical Maintenance.

12.3 Job Prospect

This programme provides the knowledge and skills in Manufacturing field that can be applied to a broad range of careers in Mechanical Engineering. The knowledge and skills that the students acquire from the programme will enable them to participate in the job market as:

- Assistant Engineer
- Production/ Process Supervisor
- Technical Assistant
- Technician
- Product Designer
- Quality Officer
- CNC Programmer Technical Assistant
- Precision Machinist
- Production / Process Executive
- Procurement Executive
- Technical Specialist
- Technical Instructor or Lecturer
- Entrepreneur

12.4 Programme Aim

The programme believes that every individual has potential and the programme aims to develop adaptable and responsible Senior Assistant Mechanical Engineers to support government’s aspiration to increase workforce in engineering related field.

12.5 Programme Educational Objectives (PEO)

The Diploma in Mechanical Engineering (Manufacturing) programme should produce Assistant Mechanical Engineers who are:

PEO1: equipped with industry-relevant knowledge and skills in Mechanical Engineering field.
PEO2: engaging on lifelong and continuous learning to enhance knowledge and skills.
PEO3: instilled with entrepreneurial skills and mind set in the real working environment.
PEO4: established with strong linkage with society and players in the industry.

12.6 Programme Learning Outcomes (PLO)

Upon completion of the programme, students should be able to:

NO	PLO NUMBER	CONTENT
1	PLO1	apply knowledge of applied mathematics, applied science, engineering fundamentals and an engineering specialisation as specified in DK1 to DK4 respectively for practical procedures and practices
2	PLO2	identify and analyse well-defined engineering problems reaching substantiated conclusions using codified methods of analysis specific to their field of activity (DK1 to DK4)
3	PLO3	design solutions for well-defined technical problems and assist with the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations (DK5
4	PLO4	conduct investigations of well-defined problems; locate and search relevant codes and catalogues, conduct standard tests and measurements
5	PLO5	apply appropriate techniques, resources, and modern engineering and IT tools to well-defined engineering problems, with an awareness of the limitations (DK6)
6	PLO6	demonstrate knowledge of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technician practice and solutions to well-defined engineering problems (DK7)
7	PLO7	understand and evaluate the sustainability and impact of engineering technician work in the solution of well-defined engineering problems in societal and environmental contexts (DK7)
8	PLO8	understand and commit to professional ethics and responsibilities and norms of technician practice
9	PLO9	function effectively as an individual, and as a member in diverse technical teams
10	PLO10	communicate effectively on well-defined engineering activities with the engineering community and with society at large, by being able to comprehend the work of others, document their own work, and give and receive clear instructions
11	PLO11	demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member or leader in a technical team and to manage projects in multidisciplinary environments
12	PLO12	recognise the need for, and have the ability to engage in independent updating in the context of specialised technical knowledge

Notes:

DK 1 : A descriptive, formula-based understanding of the natural sciences applicable in a sub-discipline

DK 2 : Procedural mathematics, numerical analysis, statistics applicable in a sub- discipline

DK 3 : A coherent procedural formulation of engineering fundamentals required in an accepted sub-discipline

DK 4 : Engineering specialist knowledge that provides the body of knowledge for an accepted sub-discipline

DK 5 : Knowledge that supports engineering design based on the techniques and procedures of a practice area
DK 6 : Codified practical engineering knowledge in recognised practice area.
DK 7 : Knowledge of issues and approaches in engineering technician practice: ethics, financial, cultural, environmental and sustainability impacts

12.7 Programme Structure Effective June 2020

CLASSIFICATION	COURSE CODE	COURSE	CONTACT HOURS				CREDIT VALUES	PREREQUISITE / CO-REQUISITE
			L	P	T	O		
SEMESTER 1								
Compulsory	DUE10012	Communicative English 1	1	0	2	0	2	
	MPU24XX1	Sukan	0	2	0	0	1	
	MPU24XX1	Unit Beruniform 1						
Common Core	DUW10022	Occupational, Safety and Health for Engineering	2	0	0	0	2	
	DBS10012	Engineering Science	2	1	0	0	2	
	DBM10013	Engineering Mathematics 1	2	0	2	0	3	
Discipline Core	DJJ10013	Engineering Drawing	1	3	0	0	3	
	DJJ10022	Mechanical Workshop Practice 1	0	4	0	0	2	
	DJJ10033	Workshop Technology	3	0	0	0	3	
TOTAL			**25**				**18**	
SEMESTER 2								
Compulsory	MPU23052	Sains, Teknologi dan Kejuruteraan Dalam Islam*	1	0	2	0	2	
	MPU23042	Nilai Masyarakat Malaysia**						
	MPU24XX1	Kelab/Persatuan	0	2	0	0	1	MPU24XX1
	MPU24XX1	Unit Beruniform 2						MPU24XX1
Common Core	DBM20023	Engineering Mathematics 2	2	0	2	0	3	DBM10013
Discipline Core	DJJ20053	Electrical Technology	2	2	0	0	3	
	DJJ20063	Thermodynamics	2	2	0	0	3	
	DJJ20073	Fluid Mechanics	2	2	0	0	3	
Specialization	DJF21012	Manufacturing Workshop Practice 1	0	4	0	0	2	DJJ10022
TOTAL			**25**				**17**	
SEMESTER 3								

Compulsory	DUE30022	Communicative English 2	1	0	2	0	2	DUE10012
	MPU21032	Penghayatan Etika dan Peradaban	1	0	2	0	2	
Common Core	DBM30033	Engineering Mathematics 3	2	0	2	0	3	DBM20023
	DJJ30113	Material Science and Engineering	2	2	0	0	3	
	DJJ30093	Engineering Mechanics	2	2	0	0	3	
Discipline Core	DJJ30122	Computer Aided Design	1	2	0	0	2	DJJ10013
Specialization	DJF31022	Manufacturing Workshop Practice 2	0	4	0	0	2	DJF21012
TOTAL			**25**				**17**	

CLASSIFICATION	COURSE CODE	COURSE	CONTACT HOURS				CREDIT VALUES	PREREQUISITE / CO-REQUISITE
			L	P	T	O		
SEMESTER 4								
Common core	DJJ40132	Engineering and Society	2	0	0	0	2	
Discipline Core	DJJ40153	Pneumatic & Hydraulics	2	2	0	0	3	
	DJJ30103	Strength Of Materials	2	2	0	0	3	
	DJJ40182	Project 1	2	0	0	0	2	
Specialization	DJF41032	Manufacturing Workshop Practice 3	0	4	0	0	2	DJF31022
	DJF41042	CADCAM	0	4	0	0	2	
	DJF41052	Manufacturing System	2	0	0	0	2	
Elective		Elective***						
TOTAL			**22**				**16**	
SEMESTER 5								
Common Core	DUE50032	Communicative English 3	1	0	2	0	2	DUE30012
	MPU22012	Entrepreneurship	1	0	2	0	2	
Discipline Core	DJJ50193	Project 2	0	4	0	0	3	DJJ40182
Specialization	DJF51062	Manufacturing Control	2	0	0	0	2	
	DJF51072	Jig and Fixture Design	1	2	0	0	2	
	DJF51082	Quality Control	2	0	0	0	2	
	DJF51092	Tool Design	1	2	0	0	2	
Elective		Elective***						
TOTAL			**20**				**15**	
SEMESTER 6								
Industrial Training	DUT600610	Engineering Industrial Training	0	0	0	0	10	
TOTAL			**0**				**10**	
TOTAL CREDIT VALUES							**95**	

ELECTIVES COURSES	DJF42012	Manufacturing Process	2	0	0	0	2	
	DJF52032	Manufacturing Economy						
	DJJ42032	Instrumentation and Control						
	DJJ42022	Industrial Management	2	0	0	0		
	DJJ52052	Railway Track System	2	0	0	0		
	DJM20032	C Programming	1	2	0	0		
	DJM40082	Programmable Logic Control	1	2	0	0		
	DJM40092	Control System	1	2	0	0		
FREE ELECTIVE *								
1	DUD10012	Design Thinking	1	0	0	1	2	

Course Classification	Total Credit	%
i. (a) Compulsory	14	15
(b) Compulsory (Bahasa Kebangsaan A)[b]	2[b]	0
ii. Common Core	15	16
iii. Discipline Core	36	38
iv. Specialization	18	19
Total Credit	**83**	**88**
v. (a) Electives	2	2
(b) Free Electives[a]	2	0
v. Industrial Training	10	10
Grand Total Credit	**95**	**100**

	Total Hours	%
i. Lecture	49	41
ii. Practical	52	44
iii. Tutorial	18	15
Total Contact Hours	**119**	**100**

Legend:

L : Lecture, **P** : Practical / Lab, **T** : Tutorial, **O** : Others
(The numbers indicated under L, P, T & O represent the contact hours per week, to be used as a guide for time table preparation).
*For Muslim Students
**For Non Muslim Students
***Only one (1) elective course can be chosen either in semester 4 or 5

Notes:

1. The minimum and maximum credit value of Electives must be referred to the programme standard or professional bodies.
2. [a]**Free Electives** are courses which <u>are not included</u> in any programme structure but if taken, will contribute towards students' CGPA, provided that institutions adhere to the Jabatan Pendidikan Politeknik & Kolej Komuniti Free Electives Guidelines.
3. **MPU22042 Bahasa Kebangsaan A** is **<u>COMPULSORY</u>** for students who did not attain credit in Bahasa Melayu at Sijil Pelajaran Malaysia (SPM) level and will contribute to students' CGPA.
4. Co-curriculum pathways:
    a. Path 1 : Sport and Club
    b. Path 2 : Uniform Unit (Students are required to **<u>PASS</u>** Uniform Unit 1 as a prerequisite to Uniform Unit 2)

5. Clusters:
    a. CLS1 : Knowledge & Understanding
    b. CLS2 : Cognitive Skills
    c. CLS3a : Practical Skills
    d. CLS3b : Interpersonal & Communication Skills
    e. CLS3c : Digital & Numeracy Skills
    f. CLS3d : Leadership, Autonomy & Responsibility
    g. CLS4 : Personal & Entrepreneurial Skills
    h. CLS5 : Ethics & Professionalism

12.8 Course Synopsis and Course Learning Outcomes (CLO)

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
1	DUE10012 Communicative English 1	**COMMUNICATIVE ENGLISH 1** focuses on developing students' speaking skills to enable them to communicate effectively and confidently in group discussions and in a variety of social interactions. It is designed to provide students with appropriate reading skills to comprehend a variety of texts. The students are equipped with effective presentation skills as a preparation for academic and work purposes **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO 1: Participate in discussion using effective communication and social skills to reach an amicable conclusion by accommodating differing views and opinion. (A3, CLS 3b) CLO 2: Demonstrate awareness of values and opinions embedded in texts on current issues. (A3, CLS 3b) CLO 3: Present a topic of interest that carries identifiable values coherently using effective verbal and nonverbal communication skills. (A2, CLS 4)
1	MPU24XX1 Sukan	**SUKAN** adalah aktiviti yang mengandungi latihan kemahiran berguna secara rekreasi dan peraturan-peraturan tertentu dalam mengejar kecemerlangan bagi penguasaan pengetahuan dan kemahiran khusus secara holistic bagi mengukuhkan pembentukan kemahiran insaniah pelajar yang positif. **CREDIT(S) : 1** **PRE-REQUISITE(S) : NONE**	CLO 1: Mempamerkan kemahiran khusus bagi kursus yang berkaitan. (P2,CLS 4) CLO 2: Menunjukkan kepimpinan dan kerja berpasukan berdasarkan penguasaan kemahiran dan amalan positif.(A3, CLS 3d)
1	MPU24XX1 Unit Beruniform 1	**UNIT BERUNIFORM 1** adalah aktiviti yang mengandungi latihan kemahiran berguna secara rekreasi dan peraturan-peraturan tertentu dalam mengejar kecemerlangan bagi penguasaan pengetahuan dan kemahiran khusus secara holistic bagi mengukuhkan pembentukan kemahiran insaniah pelajar yang positif. **CREDIT(S) : 1** **PRE-REQUISITE(S) : NONE**	CLO 1: Mempamerkan kemahiran khusus bagi kursus yang berkaitan. (P2,CLS 4) CLO 2: Menunjukkan kepimpinan dan kerja berpasukan berdasarkan penguasaan kemahiran dan amalan positif.(A3, CLS 3d)

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
1	DUW10022 Occupational, Safety and Health for Engineering	**OCCUPATIONAL, SAFETY AND HEALTH FOR ENGINEERING** course is designed to impart understanding of the self-regulatory concepts and provisions under the Occupational Safety & Health Act (OSHA). This course presents the responsibilities of workers in implementing and complying with the safety procedures at work. Understanding of notifications of accidents, dangerous occurrence, poisoning and diseases and liability for offences will be imparted upon students. This course will also provide an understanding of the key issues in OSH Management, Incident Prevention, Fire Safety, Hazard Identification Risk Control and Risk Assessment (HIRARC), Workplace Environment and Ergonomics and guide the students gradually into this multi-disciplinary science. **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO 1: Explain briefly Occupational Safety and Health (OSH) procedures, regulation and its compliance in Malaysia.(C2, PLO1) CLO 2: Initiates incident hazards, risks and safe work practices in order to maintain health and safe work environment.(A3, PLO8) CLO 3:. Forms communication skills in a team to respond for an accident action at workplace.(A3, PLO10)
1	DBS10012 Engineering Science	**ENGINEERING SCIENCE** course introduces the physical concepts required in engineering disciplines. Students will learn the knowledge of fundamental physics in order to identify and solve engineering physics problems. Students will be able to perform experiments and activities to mastery physics concepts. **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO 1: Use basic physics concept to solve engineering physics problems (C3, CLS 1) CLO 2: Apply knowledge of fundamental physics in activities to mastery physics concept (C3, CLS 1) CLO 3: Perform appropriate activities related to physics concept (P3, CLS 3a).
1	DBM10013 Engineering Mathematics 1	**ENGINEERING MATHEMATICS 1** exposes students to the basic algebra including resolve partial fractions. This course also covers the concept of trigonometry and the method to solve trigonometry problems by using basic identities, compound angle and double angle formulae. Students will be introduced to the theory of complex number and concept of vector and scalar. Students will explore advanced matrices involving 3x3 matrix. **CREDIT(S) : 3** **PRE-REQUISITE(S) : NONE**	CLO 1: Use mathematical statement to describe relationship between various physical phenomena.(C3, CLS 1) CLO 2: Show mathematical solutions using the appropriate techniques in mathematics.(C3, CLS 3c) CLO 3: Use mathematical expression in describing real engineering problems precisely, concisely and logically. (A3, CLS 3b)

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
1	DJJ10013 Engineering Drawing	**ENGINEERING DRAWING** course provides the students with the fundamentals of technical drawings and the application Computer Aided Design (CAD) software. For technical drawing, it emphasizes on the practical knowledge of drawing instruments and drawing techniques while for CAD the student will learn to navigate and use the software to create 2D drawing design in engineering. Students shall be able to demonstrate competency in using some standard available features of technical drawing and CAD application to create and manipulate objects or elements in engineering drawing. **CREDIT(S) : 3** **PRE-REQUISITE(S) : NONE**	CLO1: Apply the fundamentals of technical drawing and features of CAD software in producing engineering drawing. CLO2: Construct the technical drawing and 2D CAD drawing according to the engineering drawing standards. CLO3: Propose a project report with following engineering norms and practices in engineering drawing.
1	DJJ10022 Mechanical Workshop Practice 1	**MECHANICAL WORKSHOP PRACTICE 1** exposes the students to welding, machining and fitting which involve the use of arc and and gas welding machine, lathe machine, drilling machine, grinding, hand tools, marking out tools, measuring and testing tools. Students are also taught to emphasize on safety procedures and cleanliness in the workshop. **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO1: Measure finished product using appropriate measurement instruments CLO2: Perform fitting, welding and machining works according to Standard Operational Procedure (SOP). CLO3 :Demonstrate an understanding of professional ethics, responsibilities and norms of engineering practices according to the workshop safety regulation.
1	DJJ10033 Workshop Technology	**WORKSHOP TECHNOLOGY** provides exposure and knowledge in using hand tools, machine operation such as drilling, lathe, milling and computer numerical control. It also covers on gear measurement and inspection welding process in oxy acetylene, Shielded Metal Arc Welding (SMAW), Gas Tungsten Arc Welding (GTAW) and Gas Metal Arc Welding (GMAW). **CREDIT(S) : 3** **PRE-REQUISITE(S) : NONE**	CLO1: Apply the knowledge of basic mechanical components and equipment, hand tools and measuring equipment in workshop technology. CLO2: Apply standard practice in operating mechanical tools and component. CLO3: Demonstrate continuous learning and information management skills to complete assigned task.

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
2	MPU23052 Sains, Teknologi dan Kejuruteraan Dalam Islam*	**SAINS, TEKNOLOGI DAN KEJURUTERAAN DALAM ISLAM** memberi pengetahuan tentang konsep Islam sebagai al-Din dan seterusnya membincangkan konsep sains, teknologi dan kejuruteraan dalam Islam serta impaknya, pencapaiannya dalam tamadun Islam, prinsip serta peranan syariah dan etika Islam, peranan kaedah fiqh serta aplikasinya. **CREDIT(S): 2** **PRE-REQUISITE(S) : NONE**	CLO 1: Melaksanakan dengan yakin amalan Islam dalam kehidupan seharian (A2, CLS 4) CLO 2: Menerangkan etika dan profesionalisme berkaitan sains teknologi dan kejuruteraan dalam Islam (A3, CLS 5) CLO 3: Menghubungkait minda ingin tahu dengan prinsip syariah, etika dan kaedah fiqh dalam bidang sains, teknologi dan kejuruteraan menurut perspektif Islam (A4, CLS 4)
2	MPU23042 Nilai Masyarakat Malaysia**	**NILAI MASYARAKAT MALAYSIA** membincangkan aspek sejarah pembentukan masyarakat, nilai-nilai agama, adat resam dan budaya masyarakat di Malaysia. Selain itu, pelajar dapat mempelajari tanggungjawab sebagai individu dan nilai perpaduan dalam kehidupan di samping cabaran-cabaran dalam membentuk masyarakat Malaysia. **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO 1: Membincangkan sejarah dan nilai dalam pembentukan masyarakat di Malaysia. (A2 , CLS 4) CLO 2: Menerangkan etika dan profesionalisme terhadap konsep perpaduan bagi meningkatkan semangat patriotisme masyarakat Malaysia. (A3, CLS 5) CLO 3: Menghubungkait minda ingin tahu dengan cabaran-cabaran dalam membentuk masyarakat Malaysia. (A4, CLS 4)
2	MPU24XX1 Kelab/Persatuan	**UNIT BERUNIFORM 2** memfokuskan kepada penguasaan pengetahuan dan kemahiran khusus secara holistik bagi mengukuhkan pembentukan kemahiran insaniah pelajar yang positif **CREDIT(S) : 1** **PRE-REQUISITE(S) : MPU24XX1**	CLO 1: Mempamerkan kemahiran khusus bagi kursus berkaitan.(P3, CLS4) CLO 2: Menunjukkan kepimpinan dan kerja berpasukan berdasarkan penguasaan kemahiran dan amalan positif (A3, CLS 3d)

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
2	MPU24XX1 Unit Beruniform 2	**UNIT BERUNIFORM 2** memfokuskan kepada penguasaan pengetahuan dan kemahiran khusus secara holistik bagi mengukuhkan pembentukan kemahiran insaniah pelajar yang positif **CREDIT(S) : 1** **PRE-REQUISITE(S) : MPU24XX1**	CLO 1: Mempamerkan kemahiran khusus bagi kursus berkaitan.(P3, CLS4) CLO 2: Menunjukkan kepimpinan dan kerja berpasukan berdasarkan penguasaan kemahiran dan amalan positif (A3, CLS 3d)
2	DBM20023 Engineering Mathematics 2	**ENGINEERING MATHEMATICS 2** exposes students to the basic laws of indices and logarithms. This course introduces the basic rules of differentiation concepts to solve problems that relates maximum, minimum and calculate the rates of changes. This course discusses integration concepts in order to strengthen student's knowledge for solving area and volume bounded region problems. In addition, students will learn application of both techniques of differentiation and integration. **CREDIT(S) : 3** **PRE-REQUISITE(S) : DBM10013**	CLO 1: Use algebra and calculus knowledge to describe relationship between various physical phenomena.(C3, CLS 1) CLO 2: Solve the mathematical problems by using appropriate and relevant fundamental calculus techniques.(C3, CLS 3c) CLO 3: Use mathematical language to express mathematical ideas and arguments precisely, concisely and logically in calculus.(A3, CLS 3b)
2	DJJ20053 Electrical Technology	**ELECTRICAL TECHNOLOGY** exposes students to the basic electrical circuit concepts, the application of electromagnetism in electrical machines and transformers. The course focuses on the different types of electrical circuits, the relationship between current and voltage including the resistance. It also provides the skills on the methods of constructing basic circuits and operation of electrical machines and transformers. This course also exposes the students to the demonstration of experiments in Electrical Engineering. **CREDIT(S) : 3** **PRE-REQUISITE(S) : NONE**	CLO1: Explain the principles and fundamental of electrical circuits, electromagnetism, transformers and electrical machine. CLO2: Solve the problem related to electrical circuits, electromagnetism, transformers and electrical machine. CLO3: Organize appropriately experiments in groups according to the Standard Operating Procedures.

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
2	DJJ20063 Thermodynamics	**THERMODYNAMICS** provides knowledge of theory, concept and application of principles to solve problems related to thermodynamics. It emphasizes on concept of non-flow process and flow process, properties of steam, Carnot cycle and Rankine cycle. This course also exposes the students to the demonstration of experiments in Thermodynamics by using the real equipment. **CREDIT(S) : 3** **PRE-REQUISITE(S) : NONE**	CLO1: Explain fundamentals concept and properties of pure substances in thermodynamics. CLO2: Apply Laws of thermodynamics and it processes. CLO3: Organize appropriately experiments according to the Standard Operating Procedures.
2	DJJ20073 Fluid Mechanics	**FLUID MECHANICS** provides students with a strong understanding of the fundamentals of fluid mechanics principles related to the fluid properties and behavior in static and dynamic situations. This course also exposes the students to the demonstration at the real equipment of fluid mechanics. **CREDIT(S) : 3** **PRE-REQUISITE(S) : NONE**	CLO1: Explain the fundamentals of fluid. CLO2: Solve problems related to fluid properties, fluid statics and fluid dynamics. CLO3: Organize appropriate experiments in groups according to the standard operating procedures.
2	DJF21012 Manufacturing Workshop Practice 1	**MANUFACTURING WORKSHOP PRACTICE 1** exposes the students to the fundamental of manufacturing processes, industrial environment, cultural issues and hands on experiences. This course enables students to apply knowledge and develop required technical skills on sand casting, conventional machining and TIG/MIG welding. The workshop practice helps the students to practice appropriate safety procedures and standard operation on completing mini project and practical task. The practical skills also cover the organizational and housekeeping activity, schedule maintenance, planning skills, supervising design, inspecting and testing welding task in order to meet the quality requirement. **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO1: Build a project using casting, TIG/MIG welding and conventional machine process based on standard operational procedures and safety. CLO2: Perform simple direct indexing operation using indexing head attachment in milling machine processes. CLO3: Demonstrate an understanding of the responsibilities, societal, health, safety, legal and cultural issues during practical work session.

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
3	DUE30022 Communicative English 2	**COMMUNICATIVE ENGLISH 2** emphasises the skills required at the workplace to describe products and services as well as processes and procedures. This course will also enable students to make and reply to enquiries and complaints. **CREDIT(S): 2** **PRE-REQUISITE(S): DUE10012 COMMUNICATIVE ENGLISH 1**	CLO 1: Describe a product or service effectively by highlighting its features and characteristics that appeal to a specific audience.(A3, CLS 3b) CLO 2: Describe processes, procedures and instructions clearly by highlighting information of concern. (A3, CLS 4) CLO 3: Demonstrate effective communication and social skills in handling enquiries and complaints amicably and professionally.(A3, CLS 3b)
3	MPU21032 Penghayatan Etika dan Peradaban	**PENGHAYATAN ETIKA DAN PERADABAN** ini menjelaskan tentang konsep etika daripada perspektif peradaban yang berbeza. Ia bertujuan bagi mengenal pasti sistem, tahap perkembangan, kemajuan dan kebudayaan merentas bangsa dalam mengukuhkan kesepaduan sosial. Selain itu, perbincangan dan perbahasan berkaitan isu-isu kontemporari dalam aspek ekonomi, politik, sosial, budaya dan alam sekitar daripada perspektif etika dan peradaban dapat melahirkan pelajar yang bermoral dan profesional. Penerapan amalan pendidikan berimpak tinggi (HIEPs) yang bersesuaian digunakan dalam penyampaian kursus ini. **CREDIT(S): 2** **PRE-REQUISITE(S): NONE**	CLO 1: Membentangkan konsep etika dan peradaban dalam kepelbagaian tamadun. (A2, CLS5) CLO 2: Menerangkan sistem, tahap perkembangan, kesepaduan social dan kebudayaan merentas bangsa di Malaysia. (A2,CLS5) CLO 3: Mencadangkan sikap yang positif terhadap isu dan cabaran kontemporari dari perspektif etika dan peradaban. (A3, CLS4)

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
3	DBM30033 Engineering Mathematics 3	**ENGINEERING MATHEMATICS 3** exposes students to the statistical and probability concepts and their applications in interpreting data. The course also introduces numerical methods concept to solve simultaneous equations by using Gaussian Elimination method, LU Decomposition using Doolittle and Crout methods, polynomial problems using Simple Fixed Point Iteration and Newton-Raphson method. In additional, the course also discusses optimization problems by using Linear Programming . In order to strengthen the students in solving advanced engineering problems. Ordinary Differential Equation (ODE)is also included. **CREDIT(S) : 3** **PREREQUISITE(S) : DBM20023 & ENGINEERING MATHEMATICS 2**	CLO 1: solve the mathematical problems by using appropriate mathematical techniques and solutions. (C3, LD1) CLO 2: Show the solution for statistics and probability problems,and linear programming by using appropriate mathematical methods. (C3, LD1) CLO 3: practice mathematical knowledge and skills in different mathematics problem. (C3, LD1)
3	DJJ30113 Material Science and Engineering	**MATERIALS SCIENCE AND ENGINEERING** course introduces students a comprehensive coverage of basic fundamentals of materials science and engineering. The course focuses on material structures, properties, fabrication methods, corrosion, thermal processing and material testing mostly of metals and alloys. New fabrication method of powder metallurgy are introduces to student to cater the fabrications of devices, sensors for Industry 4.0 technology. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	CLO1: Apply the fundamental of material science to identify the materials, properties, behavior, processes and treatment. CLO2: Performed appropriate material testing according to the Standard Operating Procedures. CLO3: Demonstrate the ability to work individually and in groups to complete assigned tasks during the practical work session.

3	DJJ30093 Engineering Mechanics	**ENGINEERING MECHANICS** focuses on theoretical knowledge in statics and dynamics. This course provides students with fundamental understanding of forces and equilibrium, resultants, equilibrium of a particles and structural analysis. This course also covers kinematics and kinetics of particles. This course also exposes the students to the demonstration of experiments in Engineering Mechanics. **CREDIT(S) : 3** **PREREQUISITE(S) : NONE**	CLO 1: solve problems related to static and dynamics based on the concepts and principle of engineering mechanics. CLO 2: analyze engineering related problems based on fundamentals of static and dynamics. CLO 3: organize appropriately experiment in groups according to Standard Operation Procedures
3	DJJ30122 Computer Aided Design	**COMPUTER AIDED DESIGN** exposes the students to the fundamentals and principles of 3D drawing using 3D CAD software. Students also equip with various method of creating a solid model using extrude, revolve, swept, assembly, simulation and animation. Hands-on exercises drawing of mechanical engineering will also be covered in this course. **CREDIT(S): 2** **PRE-REQUISITE(S): DJJ10013 ENGINEERING DRAWING**	CLO1: Apply CAD commands in order to produce engineering drawing. CLO2: Construct 3D drawing of Mechanical Components according Drawing Standard. CLO3: Demonstrate a presentation with following technical standard communication
3	DJF31022 Manufacturing Workshop Practice 2	**MANUFACTURING WORKSHOP PRACTICE 2** exposes the students to the fundamental of manufacturing processes, industrial environment, cultural issues and hands-on experiences. This course enables students to apply knowledge and develop required technical skills on CNC machine, conventional machining, surface grinding machine and TIG/MIG welding. The workshop practice helps the students to practice appropriate safety procedures and standard operation on completing mini project and practical task. The practical skills also cover the organizational and housekeeping activity, schedule maintenance, planning skills, supervising design, inspecting and testing welding task in order to meet the quality requirements. **CREDIT(S) : 2** **PRE-REQUISITE(S) : Manufacturing Workshop Practice 1**	CLO1: Build a project using CNC machine and TIG/MIG welding based on standard operational procedures and safety. CLO2: Perform contouring cutting operation using rotary table attachment in milling machine processes. CLO3: Demonstrate an understanding of the responsibilities, societal, health, safety, legal and cultural issues during practical work session.

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
4	DJJ40132 Engineering Society	**ENGINEERING AND SOCIETY** focuses on the introduction to professional ethics, theory and philosophy of ethics, values in professional ethics, engineering bylaws and standards, issues in professional ethics and sustainability. It also relates towards IR 4.0 introduction and green engineering. **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO1: Implement the roles of engineering profession towards the developing of society and its challenges in globalization. CLO2: Determine the important of work ethics, bylaws and professionalism in engineering profession. CLO3: Determine the needs for sustainable and green engineering towards providing the solutions in engineering field.
4	DJJ30103 Strength Of Materials	**STRENGTH OF MATERIALS** provides knowledge on concepts and calculation of forces on materials, thermal stress, shear force and bending moment, bending stress, shear stress and torsion in shafts. It also deals with the experiments conducted on tensile test, bending moment, shearing force and torsion and deflection. **CREDIT(S) : 3** **PRE-REQUISITE(S) : NONE**	CLO1 : apply the concepts of strength of materials to solve related problems. (C3, PLO1) CLO2 : analyze problems correctly related to strength of materials (C4, PLO2) CLO3 :organize appropriately experiment in groups according to Standard Operation Procedures (SOP). (P4, PLO5)
4	DJJ40182 Project 1	**PROJECT 1** provides students with solid foundation on knowledge and skills in formulating project proposal preparation, writing and presentation **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO1: Identify the engineering problems to be solved. CLO2: Analyze methods to solve problems CLO3 : Propose a solution to problems

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
4	DJF41032 Manufacturing Workshop Practice 3	**MANUFACTURING WORKSHOP PRACTICE 3** exposes the students to develop knowledge and skills in Robot Programming and Application, Programmable Logic Control, Additive Manufacturing and Plastic Processing. Robot Application helps the students to learn about programming, hands-on training and robot application. Students will also learn about creating a simple program using PLC which is widely used in manufacturing and mechanical processes. The Additive Manufacturing will focus on designing complex design shapes which involves in modifying and completing design of a prototype. Plastic processing process helps the students to understand the basic principle of the plastic manufacturing processes. **CREDIT(S) : 2** **PRE-REQUISITE(S) : Manufacturing Workshop Practice 2**	CLO1: Manipulates robot programming and PLC programming process. CLO2: Perform mini project using additive manufacturing and plastic processing process. CLO3: Demonstrate an understanding of professional ethics, responsibilities, norms and practices during practical work session.
4	DJF41042 CAD/CAM	**CAD/CAM** explains the theory and basic of coding languages, structures and the use of CAD/CAM systems for generating and verifying tool path. The students will be use CAD/CAM software to demonstrate the integration between CAD and CAM operation that includes design an object, produce a code and simulate the tool path for machining operation prior to the machining process and also generate NC part programming. Students also enables to build a project from NC part programming using CNC milling or lathe machine. **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO1: Calibrates machining code (G and M code) from CAD/CAM software to plan and devise holes process and milling/lathe project. CLO2: Build a project using CNC milling or lathe machine by utilizing related CAD/CAM simulation software. CLO3: Demonstrate continuous learning and information management skill while engaging in independent acquisition of new knowledge and skill to develop a project.

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
4	DJF41052 Manufacturing System	**MANUFACTURING SYSTEM** explains the terminologies and concepts that are necessary in the learning of manufacturing system. It provides knowledge regarding fundamental of manufacturing system, industrial robotics, process layout, material handling systems and Lean system. **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO1: Apply the basic concepts of manufacturing system, robotic in manufacturing, process analysis, process layout and material handling system. CLO2: Investigate problem solving in Lean system. CLO3: Demonstrate good communication skills in engineering society.
5	DUE50032 Communicative English 3	**COMMUNICATIVE ENGLISH 3** aims to develop the necessary skills in students to analyse and interpret graphs and charts from data collected as well as to apply the job hunting mechanics effectively in their related fields. Students will learn to gather data and present them through the use of graphs and charts. Students will also learn basics of job hunting mechanics which include using various job search strategies, making enquiries, and preparing relevant resumes and cover letters. The students will develop communication skills to introduce themselves, highlight their strengths and abilities, present ideas, express opinions and respond appropriately during job interviews. **CREDIT(S) : 2** **PRE-REQUISITE(S) : DUE 30022 & COMMUNICATIVE ENGLISH 2**	CLO1 : Present gathered data in graphs and charts effectively using appropriate language forms and functions (A2 ,CLS 3b) CLO2 : Prepare a high impact resume and a cover letter, highlighting competencies and strengths that meet employer's expectations (A4 , CLS 4) CLO3 : Demonstrate effective communication and social skills in handling job interviews confidently (A3 , CLS 3b)

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
5	MPU22012 Entrepreneurship	**ENTERPRENEUSHIP** focuses on the fundamentals and concept of entrepreneurship in order to inculcate the value and interest in students to choose entrepreneurship as a career. This course can help students to initiate creative and innovative entrepreneurial ideas. It also emphasizes a preparation of a business plan framework through business model canvas. **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO 1: Propose the value proposition of entrepreneurial idea using Business model Canvas.(A3, CLS 3b) CLO 2:Develop a viable business plan by organizing business objectives according to priorities.(A4, CLS 4) CLO 3:Organise the online presence business in social media marketing platform. (A3, CLS 4)
5	DJJ50193 Project 2	**PROJECT 2** is a continuation of Project 1 focusing on project planning, development, project report and presentation. This course introduces students with ability and skills in conducting project planning, development and management based on their project design. It also provides the student with technical writing and presentation skills. The project will be implemented in a group and each group will work on a project under lecturer(s) supervision. Project titles will be based on specialization and students will be assessed individually. **CREDIT(S) : 3** **PRE-REQUISITE(S) : DJJ 40182 PROJECT 1**	CLO1: Demonstrate appropriate and creative solution in solving project problems. CLO2: Perform project plan to achieve objectives with valid and reliable results. CLO3: Explain the project work and defend project outcomes effectively with good communication skills. CLO4: Organize project activities and outcomes in report accordance to the specified standard format that applies engineering management principles.

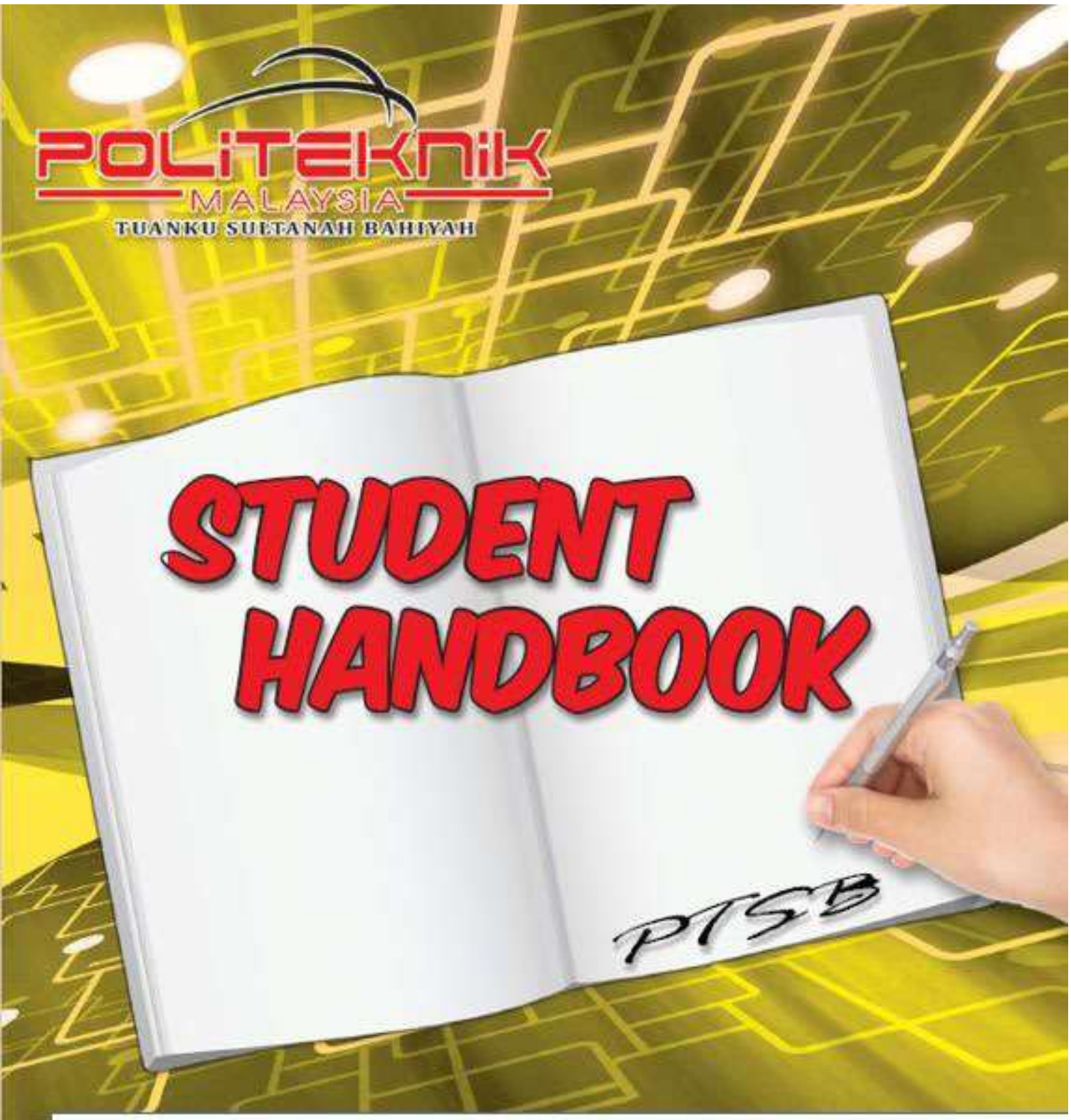
SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
5	DJF51062 Manufacturing Control	**MANUFACTURING CONTROL** provides knowledge about basic principles and concept on managing an organization and major levels in manufacturing planning and control system (MPC) which will help students in making forecast, production plan, control production and manage inventory. This course also gives knowledge about production scheduling. It also includes knowledge in managing MRP system (material management), production scheduling and inventory management. **CREDIT(S) : 2** **PRE-REQUISITE(S): NONE**	CLO1: Attain the concept and application of Manufacturing Forecasting, Production Scheduling, Inventory Control, Productivity and Capacity Planning. CLO2: Integrate Material Requirement Planning (MRP) and inventory control for manufacturing process controlling activities. CLO3: Adopt project management framework to develop a Material Requirement Planning (MRP) according to inventory management.
5	DJF51072 Jig and Fixture Design	**JIG AND FIXTURE DESIGN** covers basic production needs in industry. The topics taught includes types and functions of jigs and fixtures, supporting and locating, clamping and work holding principles, design economics, designing and constructing plate jig and plate fixtures. This course also provides knowledge in management, sustainability and manufacturing systems. **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO1: Apply the concepts and principles of jigs and fixtures in design. CLO2: Calibrate the 3D design by using CAD/CAM software to plan and devise mini project. CLO3: Demonstrate convictions towards environment and sustainability to complete assigned tasks during mini project sessions.
5	DJF51082 Quality Control	**QUALITY CONTROL** provides knowledge on basic principle and concept of quality including statistical method in controlling products quality or services. This course also emphasizes on the application of Control Chart and Quality Control tools and also explains the quality improvement technique. **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO1: Apply the relation of statistics and quality management system in understanding of quality control and their application tools. CLO2: Determine the related quality tools and techniques to control the quality of products or services based on case study. CLO3: Demonstrate ability to work in team to complete the assigned tasks.

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
5	DJF51092 Tool Design	**TOOL DESIGN** exposes the students to the knowledge of datum concept, geometric tolerances and fundamentals to design tool based on clamping and locating principle. The topics also covers the principle of tool applications in metal and non-metal process. All the topics discussed will enable the students to plan and identify the use of tooling. They will also be exposed to the application of tooling in related industries. **CREDIT(S)** : 2 **PRE-REQUISITE(S)** : NONE	CLO1: Apply appropriately the concepts of tool design method and tooling material selection in designing tools. CLO2: Perform the simulation of mould, tool and die design using CAD/CAM software. CLO3: Demonstrate conviction towards environment and sustainability to complete assigned tasks during practical work sessions.
6	DUT600610 Engineering Industrial Training	Engineering Industrial Training	
ELECTIVE	DJF42012 Advanced Manufacturing Process	**ADVANCED MANUFACTURING PROCESS** provides students with an understanding and appreciation of the width and depth of the manufacturing processes and interrelationship between manufacturing processes, product design, material properties and other aspects such as humanity, economy and environment. It will introduce advanced machining process such as electrical discharge machining, laser beam, water jet and abrasive machining. **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO1: Expose the various method and operation for manufacturing process by consideration of material, design and economic aspect. CLO2: Select the appropriate manufacturing processes in making a plastic or composite component based on their characteristics. CLO3: Demonstrate ability to work in team to complete the assigned tasks.

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
ELECTIVE	DJF52032 Manufacturing Economy	**MANUFACTURING ECONOMIC** provides knowledge and understanding for students on economy aspect which includes concepts, categories, factor of supply and demand, basic element and characteristics of cost and decision involve in manufacturing process. This course also focuses on fixed cost, variable cost, direct and indirect cost, actual cost and break-even analysis which leads towards eliminating the wastage in manufacturing. **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO1: Apply knowledge to identify and classify of fixed cost, variable cost, direct and indirect cost which contribute to total cost in production. CLO2: Analyze correctly the actual cost and break-even analysis for decision making process. CLO3: Demonstrate ability to manage project including financial aspect for the task assigned.
ELECTIVE	DJJ42032 Instrumentation and Control	**INSTRUMENTATION & CONTROL** exposes the students to the basic principles in control system and its usage in industrial sector is the main focus in this course. Instrumentation and control also provide knowledge to the students in components measurement in control systems that are normally used in industries. **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO1: Apply the fundamental of control system and instrumentation used in engineering. CLO2: Explore the measurement and process control system in engineering CLO3: Demonstrate good communication skill in presentation on assigned topics
ELECTIVE	DJJ42022 Industrial Management	**INDUSTRIAL MANAGEMENT** provides students with a strong fundamental understanding of industrial management prospect and production system planning such as inventory, scheduling, production system operation, facilities, plan location, layout and line balancing. This course also provides knowledge in quality control, and human resource management. **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO1: Apply the basic concept of industrial management system to solve related problems. CLO2: Analyze problems related to industrial management. CLO3: demonstrate good communication skills.

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
ELECTIVE	DJJ52052 Railway Track System	**RAILWAY TRACK SYSTEM** provides knowledge regarding to railway track engineering concepts including track component and system design, construction, evaluation, maintenance, load distribution, and wheel/rail interaction. Topics covered include: Track layout and geometry; ballast and subgrade; ties; rail and fastenings; track analysis and design; special trackwork; grade crossings; track standards; and inspection, condition assessment, and asset management. **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO1: Explain the concept of Railway Track System. CLO2: Apply the railway engineering and give respond in work application. CLO3: Analyze the effectiveness of Railway Track System through engineering issue in group.
ELECTIVE	DJM20032 C Programming	**C Programming** course provides an introduction to programme design and development. Student will learn to design, code, debug, test and document wellstructured programs based on technical and engineering problem. Topic covered; software development principle, programming language basic, data types, input and output operation, the use of selection, loops, arrays and function structure. **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO1: Explain knowledge of basic concepts of C Programming to solve given problem using an appropriate data type. CLO2: Constructs a high level programming language in solving variety engineering and scientific problems. CLO3: Present a solution for assigned project based on programming which relates to current or upcoming technologies and peripherals

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
ELECTIVE	DJM40082 Programmable Logic Control	**PROGRAMMABLE LOGIC CONTROLLER (PLC)** is a course designed to provide students with hardware adaptation and programming skills by employing a PLC for an automation system in the industry. Basic types of automation systems will be studied to assist students in visualizing the application of PLC. The co-relation application of PLC in the automation system will be explored both by theoretical and experimental mode. Practical application of an automation system with PLC will be simulated in a laboratory environment to provide a pseudo industrial based experience. **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO1: Differentiate the types of automation systems and terminologies used in PLC hardware and programmes. CLO2: Write a PLC program related to an industrial automation system. CLO3: Program a PLC for an automated application.
ELECTIVE	DJM40092 Control System	**CONTROL SYSTEMS** provides knowledge regarding various concepts of feedback control system and the required mathematical methods. The emphasis of the course is on control action, transfer functions, and Laplace transforms. This course also provides knowledge in analyzing and data interpretation on different types of controller mode. **CREDIT(S) : 2** **PRE-REQUISITE (S) : NONE**	CLO1: Explain the basic concept of control system including controller principle, transfer function and stability CLO2: Construct experiment on different types of controller mode in order to analyse and interpretation of data. CLO3: Demonstrate the ability to work in team for completing assigned task during practical work sessions
ELECTIVE	DUD10012 Design Thinking	This course offers the basic concept of Design Thinking through experiential learning. Students learn the five iterative phases of Design Thinking, which are Empathy, Define, Ideate, Prototype and Testing. Students will apply these design thinking principles, process and techniques to solve a real-world problem and come up with an innovative solution in the form of a product, system or service prototype. **CREDIT(S) : 2** **PRE-REQUISITE(S) : NONE**	CLO1: Apply design thinking principles, process and techniques to solve a real-world problem innovatively (C3 , CLS2) CLO2: Demonstrate the ability to communicate



DIPLOMA IN MECHATRONICS ENGINEERING (DEM)

13.0 DIPLOMA IN MECHATRONIC (DEM)

13.1 Introduction

In line with the 3rd Industrial Malaysia Plan (IMP3) aiming for the innovative and creative human capital development, via matching talent to expertise with market demand, Diploma in Mechatronic Engineering for polytechnic is developed to give balance emphasis on theoretical and practical aspects. The Eleventh Malaysia Plan was drawn to produced 60% out of 1.5 million workers was in- TVET sector. Until now a total of 69,475 (51%) of the 136,062 technical education and vocational training (TVET) graduates in Malaysia are working as professionals and skilled workers. Thus, to keep abreast with rapid demand in TVET sector, Department of Polytechnic and Community College Education (DPCCE) progressively collaborates with major industry players in the country in developing the curriculum. The programme will take six semesters to complete, five academic semesters at their respective polytechnics and one semester of industrial training at relevant industries during the final semester. This programme complies with the Board of Engineer (BEM) requirement.

13.2 Synopsis

Diploma in Mechatronic Engineering programme is designed to produce holistic graduates that have knowledge and competent skills in the field of mechatronic engineering to fulfil the demand of workers in the engineering sector. Five components related to the programme have been identified. Components that make up the BOK for Diploma in Mechatronic Engineering are namely Technical, Personal Development, Mathematics, Science and Workplace Competencies. Technical Components is Electronic system, Mechanical System, Computers and Control Systems.

13.3 Job Prospect

This programme provides the knowledge and skills in the Mechatronic Engineering field that can be applied to a broad range of careers in Mechatronic Engineering. The knowledge and skills that the students acquire from the programme will enable them to participate in the job market as:

- Assistant Engineer
- Technical Assistant
- Assistant Service Manager
- Service Advisor
- Controller system supervisor
- Automation and robotic supervisor
- Supervisor
- Technician
- Technical Instructor or Lecturer
- Technical Sales Executive / Engineer
- Drafter / Designer
- Assistant Programmer
- Technical Instructor
- Entrepreneur
- Production Technician

13.4 Programme Aim

The programme believes that every individual has potential, and the programme aims to develop adaptable and responsible Senior Assistant Mechatronic Engineers to support government aspiration to increase workforce in engineering related field.

13.5 Programme Educational Objectives (PEO)

The Diploma in Mechatronic Engineering programme should produce balanced and competent technical workers who are:

PEO1: Equipped with industry-relevant knowledge and skills in mechatronic engineering field.
PEO2: Engaging on lifelong and continuous learning to enhance knowledge and skills.
PEO3: Instilled with entrepreneurial skills and mind set in the real working environment.
PEO4: Established strong linkage with society and players in the industry.

13.6 Programme Learning Outcomes (PLO)

Upon completion of the programme, graduates should be able to:

PLO NUMBER	CONTENT
PLO1	Knowledge: Apply knowledge of applied mathematics, applied science, engineering fundamentals and an engineering specialization as specified in DK1 to DK4 respectively to wide practical procedures and practices
PLO2	Problem analysis: identify and analyze well-defined engineering problems reaching substantiated conclusions using codified methods of analysis specific to their field of activity (DK1 to DK4)
PLO3	Design / development of solution: design solutions for well-defined technical problems and assist with the design of systems, components, or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations (DK5)
PLO4	Investigation: conduct investigations of well-defined problems; locate and search relevant codes and catalogues, conduct standard tests and measurements
PLO5	Modern tool usage: apply appropriate techniques, resources, and modern engineering and IT tools to well-defined engineering problems, with an awareness of the limitations (DK6)
PLO6	The engineer and society: demonstrate knowledge of the societal, health, safety, legal and cultural issues, and the consequent responsibilities relevant to engineering technician practice and solutions to well-defined engineering problems (DK7)
PLO7	Environment and sustainability: understand and evaluate the sustainability and impact of engineering technician work in the solution of well-defined engineering problems in societal and environmental contexts (DK7)
PLO8	Ethics: understand and commit to professional ethics and responsibilities and norms of technician practice
PLO9	Individual and teamwork: function effectively as an individual, and as a member in diverse technical teams
PLO10	Communication: communicate effectively on well-defined engineering activities with the engineering community and with society at large, by being able to comprehend the work of others, document their own work, and give and receive clear instructions
PLO11	Project management and finance: demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member or leader in a technical team and to manage projects in multidisciplinary environments
PLO12	Lifelong learning: recognize the need for, and have the ability to engage in independent updating in the context of specialized technical knowledge

Notes:

DK 1: A descriptive, formula-based understanding of the natural sciences applicable in a sub-discipline

DK 2: Procedural mathematics, numerical analysis, statistics applicable in a sub-discipline

DK 3: A coherent procedural formulation of engineering fundamentals required in an accepted sub-discipline.

DK 4: Engineering specialist knowledge that provides the body of knowledge for an accepted sub-discipline.

DK 5: Knowledge that supports engineering design based on the techniques and procedures of a practice area.

DK 6: Codified practical engineering knowledge in recognised practice area.

DK 7: Knowledge of issues and approaches in engineering technician practice: ethics, financial, cultural, environmental and sustainability impacts

13.7 Programme Structure

CLASSIFICATION	COURSE CODE	COURSE	CONTACT HOURS				CREDIT VALUES	PREREQUISITE / CO-REQUISITE
			L	P	T	O		
SEMESTER 1								
Compulsory	DUE10012	Communicative English 1	1	0	2	0	2	
	MPU24XX1	Sukan	0	2	0	0	1	
	MPU24XX1	Unit Beruniform 1						
Common Core	DUW10022	Occupational, Safety and Health for Engineering	2	0	0	0	2	
	DBS10012	Engineering Science	2	1	0	0	2	
	DBM10013	Engineering Mathematics 1	2	0	2	0	3	
Discipline Core	DJJ10013	Engineering Drawing	1	3	0	0	3	
	DJM10012	Mechatronic Workshop Practices 1	0	4	0	0	2	
	DJJ10033	Workshop Technology	3	0	0	0	3	
TOTAL			**25**				**18**	
SEMESTER 2								
Compulsory	MPU23052	Sains, Teknologi dan Kejuruteraan Dalam Islam*	1	0	2	0	2	
	MPU23042	Nilai Masyarakat Malaysia**						
	MPU24XX1	Kelab/Persatuan	0	2	0	0	1	MPU24XX1
	MPU24XX1	Unit Beruniform 2						MPU24XX1
Common Core	DBM20023	Engineering Mathematics 2	2	0	2	0	3	DBM10013
	DJJ20053	Electrical Technology	2	2	0	0	3	
	DJM20022	Mechatronic Workshop Practices 2	0	4	0	0	2	

CLASSIFICATION	COURSE CODE	COURSE	CONTACT HOURS				CREDIT VALUES	PREREQUISITE / CO-REQUISITE
			L	P	T	O		
Discipline Core	DJM20032	C Programming	1	2	0	0	2	
	DJM20042	Electronic Systems	2	1	0	0	2	
	DJM20053	Thermo-fluids	2	2	0	0	3	
TOTAL			**27**				**18**	
SEMESTER 3								
Compulsory	DUE30022	Communicative English 2	1	0	2	0	2	DUE10012
Common Core	DBM30033	Engineering Mathematics 3	2	0	2	0	3	DBM20023
Discipline Core	DJM30062	Industrial Electronics	1	2	0	0	2	
	DJM30073	Digital System	2	2	0	0	3	
	DJJ30093	Engineering Mechanics	2	2	0	0	3	
	DJJ30113	Material Science and Engineering	2	2	0	0	3	
	DJJ30122	Computer Aided Design	1	2	0	0	2	DJJ10013
TOTAL			**25**				**18**	

CLASSIFICATION	COURSE CODE	COURSE	CONTACT HOURS				CREDIT VALUES	PREREQUISITE / CO-REQUISITE
			L	P	T	O		
SEMESTER 4								
Common core	DJJ40132	Engineering and Society	2	0	0	0	2	
Discipline Core	DJM40082	Programmable Logic Controller	1	2	0	0	2	
	DJM40092	Control Systems	2	1	0	0	2	
	DJM40103	Power Electronics	2	2	0	0	3	
	DJJ40153	Pneumatic and Hydraulics	2	2	0	0	3	
	DJJ40182	Project 1	2	0	0	0	2	
Elective		Elective***						
TOTAL			**18**				**14**	
SEMESTER 5								
Compulsory	MPU21032	Penghayatan Etika dan Peradaban	1	0	2	0	2	
	DUE50032	Communicative English 3	1	0	2	0	2	DUE30012
	MPU22012	Entrepreneurship	1	0	2	0	2	
Discipline Core	DJM50113	Industrial Automation	2	2	0	0	3	
	DJM50122	Embedded System Application	1	2	0	0	2	
	DJJ50193	Project 2	0	4	0	0	3	DJJ40182
Elective		Elective***						

TOTAL			**20**				**14**	
SEMESTER 6								
Industrial Training	DUT600610	Engineering Industrial Training	0	0	0	0	10	
TOTAL			**0**				**10**	
TOTAL CREDIT VALUES							**94**	
ELECTIVES COURSES	DJJ42022	Industrial Management	2	0	0	0	2	
	DJJ42032	Instrumentation and Control						
	DJJ52012	Engineering Plant Technology						
	DJF40142	CADCAM	0	4	0	0		
	DJF51082	Quality Control	2	0	0	0		
	DJM42012	Railway 1 -Communication for rail	2	0	0	0		
	DJM52022	Railway 2 -Signaling in rail	2	0	0	0		
FREE ELECTIVES	DUD10012	Design Thinking	1	0	0	1	2	

Course Classification	**Total Credit**	**%**
i. (a) Compulsory	14	15
(b) Compulsory (Bahasa Kebangsaan A)[b]	2[b]	0
ii. Common Core	15	16
iii. Discipline Core	53	56
Total Credit	**82**	**87**
iv. (a) Elective	2	2
(b) Free Electives[a]	2[a]	0
v. Industrial Training	10	11
Grand Total Credit	**94**	**100**
Engineering and Engineering Technology Courses	**Credit**	**%**
i. Practice - Oriented Components	32	49%
ii. Engineering and Engineering Technology Total Credit	65	100%

Legend:

L: Lecture, **P:** Practical / Lab, **T:** Tutorial, **O:** Others
(The numbers indicated under L, P, T & O represent the contact hours per week, to be used as a guide for timetable preparation).
*For Muslim Students
**For Non-Muslim Students
***Only one (1) elective course can be chosen either in semester 4 or 5

Notes:

1. The minimum and maximum credit value of Electives must be referred to the programme standard or professional bodies.
2. **Free Electives** are courses which are not included in any programme structure but if taken, will contribute towards students' CGPA, provided that institutions adhere to the Jabatan Pendidikan Politeknik & Kolej Komuniti Free Electives Guidelines.

3. **MPU22042 Bahasa Kebangsaan A** is **COMPULSORY** for students who did not attain credit in Bahasa Melayu at Sijil Pelajaran Malaysia (SPM) level and will contribute to students' CGPA.
4. Co-curriculum pathways:
    a. Path 1: Sport and Club
    b. Path 2: Uniform Unit (Students are required to **PASS** Uniform Unit 1 as a pre-requisite to Uniform Unit 2)
5. Clusters:
    a. CLS1: Knowledge & Understanding
    b. CLS2: Cognitive Skills
    c. CLS3a: Practical Skills
    d. CLS3b: Interpersonal & Communication Skills
    e. CLS3c: Digital & Numeracy Skills
    f. CLS3d: Leadership, Autonomy & Responsibility
    g. CLS4: Personal & Entrepreneurial Skills
    h. CLS5: Ethics & Professionalism

13.8 Course Synopsis and Course Learning Outcomes (CLO)

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
1	DUE10012 Communicative English 1	**COMMUNICATIVE ENGLISH 1** focuses on developing students' speaking skills to enable them to communicate effectively and confidently in group discussions and in a variety of social interactions. It is designed to provide students with appropriate reading skills to comprehend a variety of texts. The students are equipped with effective presentation skills as a preparation for academic and work purposes. **CREDIT(S): 2** **PRE-REQUISITE(S): NONE**	CLO 1: Participate in discussion using effective communication and social skills to reach an amicable conclusion by accommodating differing views and opinions. (A3, CLS 3b) CLO 2: Demonstrate awareness of values and opinions embedded in texts on current issues. (A3, CLS 3b) CLO 3: Present a topic of interest that carries identifiable values coherently using effective verbal and nonverbal communication skills. (A2, CLS 4)
1	MPU 24XXI Unit Beruniform 1	**UNIT BERUNIFORM 1** adalah aktiviti yang mengandungi latihan kemahiran berguna secara rekreasi dan peraturan-peraturan tertentu dalam mengejar kecemerlangan bagi penguasaan pengetahuan dan kemahiran khusus secara holistic bagi mengukuhkan pembentukan kemahiran insaniah pelajar yang positif. **CREDIT(S): 1** **PRE-REQUISITE(S): NONE**	CLO 1: Mempamerkan kemahiran khusus bagi kursus yang berkaitan. (P2, CLS 4) CLO 2: Menunjukkan kepimpinan dan kerja berpasukan berdasarkan penguasaan kemahiran dan amalan positif. (A3, CLS 3d)
1	MPU 24XXI Sukan	**SUKAN** adalah aktiviti yang mengandungi latihan kemahiran berguna secara rekreasi dan peraturan-peraturan tertentu dalam mengejar kecemerlangan bagi penguasaan pengetahuan dan kemahiran khusus secara holistic bagi mengukuhkan pembentukan kemahiran insaniah pelajar yang positif. **CREDIT(S): 1** **PRE-REQUISITE(S): NONE**	CLO 1: Mempamerkan kemahiran khusus bagi kursus yang berkaitan. (P2, CLS 4) CLO 2: Menunjukkan kepimpinan dan kerja berpasukan berdasarkan penguasaan kemahiran dan amalan positif. (A3, CLS 3d)

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
1	DUW10012 Occupational Safety & Health for Engineering	**OCCUPATIONAL SAFETY AND HEALTH FOR ENGINEERING** course is designed to impart understanding of the self-regulatory concepts and provisions under the Occupational Safety & Health Act (OSHA). This course presents the responsibilities of workers in implementing and complying with the safety procedures at work. Understanding of notifications of accidents, dangerous occurrences, poisoning and diseases and liability for offences will be imparted upon students. This course will also provide an understanding of the key issues in OSH Management, Incident Prevention, Fire Safety, Hazard Identification Risk Control and Risk Assessment (HIRARC), Workplace Environment and Ergonomics and guide the students gradually into this multi-disciplinary science. **CREDIT(S): 2** **PRE-REQUISITE(S): NONE**	CLO1: Explain briefly Occupational Safety and Health (OSH) procedures, regulation, and its compliance in Malaysia. CLO2: Initiates incident hazards, risks, and safe work practices in order to maintain health and safe work environment. CLO3: Demonstrates communication skill in group to explain the factor that can lead to accident in workplace.
1	DBS10012 Engineering Science	**ENGINEERING SCIENCE** course introduces the physical concepts required in engineering disciplines. Students will learn the knowledge of fundamental physics in order to identify and solve engineering physics problems. Students will be able to perform experiments and activities to mastery physics concepts. **CREDIT(S): 2** **PRE-REQUISITE(S) : NONE**	CLO 1: Use basic physics concept to solve engineering physics problems. (C3, CLS 1) CLO 2: Apply knowledge of fundamental physics in activities to mastery physics concept (C3, CLS 1) CLO 3: Perform appropriate activities related to physics concept (P3, CLS 3a).

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
1	DBM10013 Engineering Mathematics 1	**ENGINEERING MATHEMATICS 1** exposes students to basic algebra including resolve partial fractions. This course also covers the concept of trigonometry and the method to solve trigonometry problems by using basic identities, compound angle and double angle formulae. Students will be introduced to the theory of complex numbers and concept of vector and scalar. Students will explore advanced matrices involving 3x3 matrix. **CREDIT(S): 3** **PRE-REQUISITE(S): NONE**	CLO 1: Use mathematical statement to describe relationship between various physical phenomena. (C3, CLS 1) CLO 2: Show mathematical solutions using the appropriate techniques in mathematics. (C3, CLS 3c) CLO 3: Use mathematical expression in describing real engineering problems precisely, concisely, and logically. (A3, CLS 3b)
	DJJ10013 Engineering Drawing	**ENGINEERING DRAWING** course provides the students with the fundamentals of technical drawings and the application Computer Aided Design (CAD) software. For technical drawing, it emphasizes the practical knowledge of drawing instruments and drawing techniques while for CAD the student will learn to navigate and use the software to create 2D drawing design in engineering. Students shall be able to demonstrate competency in using some standard available features of technical drawing and CAD application to create and manipulate objects or elements in engineering drawing. **CREDIT (S): 3** **PREREQUISITE(S): NONE**	CLO1: Apply the fundamentals of technical drawing and features of CAD software in producing engineering drawing. CLO2: Construct the technical drawing and 2D CAD drawing according to the engineering drawing standards. CLO3: Propose a project report with the following engineering norms and practices in engineering drawing.

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
1	DJM 10012 Mechatronic Workshop Practice 1	**MECHATRONIC WORKSHOP PRACTICE 1** exposes the students to basic work in an engineering workshop with emphasis on safety practices. Students are exposed to fitting, welding, and machining. **CREDIT (S): 2** **PREREQUISITE(S): NONE**	CLO1: Practice and perform correct techniques in handling fitting and machining works and equipment's. CLO2: Perform and perform ability to operate gas and arc welding works – according to Standard Operation Procedure (SOP). CLO3: Demonstrate the understanding and awareness of safety procedures in mechanical workshops according to the workshop safety regulations.
1	DJJ10033 Workshop Technology	**WORKSHOP TECHNOLOGY** provides exposure and knowledge in using hand tools, machine operation such as drilling, lathe, milling and computer numerical control. It also covers on gear measurement and inspection welding process in oxy acetylene, Shielded Metal Arc Welding (SMAW), Gas Tungsten Arc Welding (GTAW) and Gas Metal Arc Welding (GMAW) **CREDIT(S): 3** **PRE-REQUISITE(S): NONE**	CLO1: Apply the knowledge of basic mechanical components and equipment, hand tools and measuring equipment in workshop technology. CLO2: Apply standard practice in operating mechanical tools and components. CLO3: Demonstrate continuous learning and information management skills to complete assigned task.
2	MPU23052 Sains, Teknologi dan Kejuruteraan dalam Islam*	**SAINS, TEKNOLOGI DAN KEJURUTERAAN DALAM ISLAM** memberi pengetahuan tentang konsep Islam sebagai al-Din dan seterusnya membincangkan konsep sains, teknologi dan kejuruteraan dalam Islam serta impaknya, pencapaiannya dalam tamadun Islam, prinsip serta peranan syariah dan etika Islam, peranan kaedah fiqh serta aplikasinya. **CREDIT(S): 2** **PRE-REQUISITE(S): NONE**	CLO 1: Melaksanakan dengan yakin amalan Islam dalam kehidupan seharian (A2, CLS 4) CLO 2: Menerangkan etika dan profesionalisme berkaitan sains teknologi dan kejuruteraan dalam Islam (A3, CLS 5) CLO 3: Menghubungkait minda ingin tahu dengan prinsip syariah, etika dan kaedah fiqh dalam bidang sains, teknologi dan kejuruteraan menurut perspektif Islam (A4, CLS 4)

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
2	MPU23042 Nilai Masyarakat Malaysia**	**NILAI MASYARAKAT MALAYSIA** membincangkan aspek sejarah pembentukan masyarakat, nilai-nilai agama, adat resam dan budaya masyarakat di Malaysia. Selain itu, pelajar dapat mempelajari tanggungjawab sebagai individu dan nilai perpaduan dalam kehidupan di samping cabaran-cabaran dalam membentuk masyarakat Malaysia. **CREDIT(S): 2** **PRE-REQUISITE(S): NONE**	CLO 1: Membincangkan sejarah dan nilai dalam pembentukan masyarakat di Malaysia. (A2, CLS 4) CLO 2: Menerangkan etika dan profesionalisme terhadap konsep perpaduan bagi meningkatkan semangat patriotisme masyarakat Malaysia. (A3, CLS 5) CLO 3: Menghubungkait minda ingin tahu dengan cabaran-cabaran dalam membentuk masyarakat Malaysia. (A4, CLS 4)
2	MPU 24XX1 Kelab/ Persatuan	**UNIT BERUNIFORM 2** memfokuskan kepada penguasaan pengetahuan dan kemahiran khusus secara holistik bagi mengukuhkan pembentukan kemahiran insaniah pelajar yang positif **CREDIT(S): 1** **PRE-REQUISITE(S) : MPU24XX1**	CLO 1: Mempamerkan kemahiran khusus bagi kursus berkaitan. (P3, CLS4) CLO 2: Menunjukkan kepimpinan dan kerja berpasukan berdasarkan penguasaan kemahiran dan amalan positif (A3, CLS 3d)
2	MPU24XX1 Unit Beruniform 2	**UNIT BERUNIFORM 2** memfokuskan kepada penguasaan pengetahuan dan kemahiran khusus secara holistik bagi mengukuhkan pembentukan kemahiran insaniah pelajar yang positif **CREDIT(S): 1** **PRE-REQUISITE(S): MPU24XX1**	CLO 1: Mempamerkan kemahiran khusus bagi kursus berkaitan. (P3, CLS4) CLO 2: Menunjukkan kepimpinan dan kerja berpasukan berdasarkan penguasaan kemahiran dan amalan positif (A3, CLS 3d)
2	DBM20023 Engineering Mathematics 2	**ENGINEERING MATHEMATICS 2** exposes students to the basic laws of indices and logarithms. This course introduces the basic rules of differentiation concepts to solve problems that relate to maximum, minimum and calculate the rates of changes. This course discusses integration concepts in order to strengthen student's knowledge for solving area and volume bounded region problems. In addition, students will learn application of both techniques of differentiation and integration. **CREDIT(S): 3** **PRE-REQUISITE(S): DBM10013**	CLO 1: Use algebra and calculus knowledge to describe the relationship between various physical phenomena. (C3, CLS 1) CLO 2: Solve the mathematical problems by using appropriate and relevant fundamental calculus techniques. (C3, CLS 3c) CLO 3: Use mathematical language to express mathematical ideas and arguments precisely, concisely, and logically in calculus. (A3, CLS 3b)

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
2	DJJ 20053 Electrical Technology	**ELECTRICAL TECHNOLOGY** exposes students to the basic electrical circuit concepts, the application of electromagnetism in electrical machines and transformers. The course focuses on the different types of electrical circuits, the relationship between current and voltage including the resistance. It also provides skills in the methods of constructing basic circuits and operation of electrical machines and transformers. This course also exposes the students to the demonstration of experiments in Electrical Engineering **CREDIT(S): 2** **PRE-REQUISITE(S): NONE**	CLO1: Explain the principles of electrical circuits, electromagnetism, transformers, and electrical machines. CLO2: Solve the problem related to electrical circuits, electromagnetism, transformers and electrical machines. CLO3: Organize appropriately. experiments in groups according to the Standard Operating Procedures.
2	DJM20022 Mechatronic Workshop Practice 2	**MECHATRONIC WORKSHOP PRACTICE 2** enhances knowledge on CNC and EDM and enables students to carry out related task scopes. This course also emphasizes how to operate CNC and EDM machines properly. **CREDIT(S): 2** **PRE-REQUISITE(S): NONE**	CLO1: Construct a CNC and EDM Machine programming according to prescribed procedures and manual. CLO2: Perform CNC and EDM machine programming. CLO3: Demonstrate awareness of safety/health related machine programs to complete certain projects in practical work procedure and practices.
2	DJM 20032 C Programming	**C PROGRAMMING** course introduces programme design and development. Students will learn to design, code, debug, test, and document well-structured programs based on technical and engineering problems. Topic covered, software development principle, programming language basic, data types, input and output operation, the use of selection, loops, arrays, and function structure. **CREDIT(S): 2** **PRE-REQUISITE(S): NONE**	CLO1: Explain knowledge of basic concepts of C programming to solve given problem using an appropriate data type. CLO2: Construct a high-level programming language in solving a variety of engineering and scientific problems. CLO3: Present a solution for assigned project based on programming which relates to current or upcoming technologies and peripherals.

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
2	DJM20042 Electronic System	**ELECTRONIC SYSTEM** covers knowledge on basics of semiconductors materials, electronics devices, and DC power supply. The course emphasizes the electrical characteristics and properties of semiconductor materials, linear DC power supplies system, amplifier circuits and sinusoidal wave oscillator circuits. **CREDIT (S: 2** **PRE-REQUISITE(S): NONE**	CLO1: Apply the characteristics and properties of semiconductor materials. CLO2: Construct an electronic circuit based on schematic diagram. CLO3: Demonstrate understanding of electronic circuit.
2	DJM 20053 Thermofluids	**THERMOFLUIDS** provides students to the basic concepts of thermodynamics and fluid mechanics into one integrated course. This course emphasizes of concepts of conceptual principles in thermos-fluids, fluid application, properties of pure substances, first and second law of thermodynamics. This course also provides knowledge and understanding of theory, concepts, and application of principles to solve problems related to thermos-fluids processes. **CREDIT(S): 3** **PRE-REQUISITE(S): NONE**	CLO1: Solve problem correctly related thermodynamics and fluid mechanics using formula and theories. CLO2: Organize appropriately experiments in group according to the Standard Operating Procedures. CLO3: Demonstrate ability to work in team to complete assigned tasks.
3	DUE30022 Communicative English 2	**COMMUNICATIVE ENGLISH 2** emphasizes the skills required at the workplace to describe products and services as well as processes and procedures. This course will also enable students to make and reply to enquiries and complaints. **CREDIT(S): 2** **PRE-REQUISITE(S): DUE10012 COMMUNICATIVE ENGLISH 1**	CLO 1: Describe a product or service effectively by highlighting its features and characteristics that appeal to a specific audience. (A3, CLS 3b) CLO 2: Describe processes, procedures, and instructions clearly by highlighting information of concern. (A3, CLS 4) CLO 3: Demonstrate effective communication and social skills in handling enquiries and complaints amicably and professionally. (A3, CLS 3b)

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
3	DBM30033 Engineering Mathematics 3	**ENGINEERING MATHEMATICS 3** exposes students to the statistical and probability concepts and their applications in interpreting data. The course also introduces numerical methods concept to solve simultaneous equations by using Gaussian Elimination method, LU Decomposition using Doolittle and Crout methods, polynomial problems using Simple Fixed-Point Iteration and Newton-Raphson method. In addition, the course also discusses optimization problems by using Linear Programming. To strengthen the students in solving advanced engineering problems. Ordinary Differential Equation (ODE) is also included. **CREDIT(S): 3** **PRE-REQUISITE(S): ENGINEERING MATHEMATICS 2**	CLO 1: solve the mathematical problems by using appropriate mathematical techniques and solutions. (C3, LD1) CLO 2: Show the solution for statistics and probability problems, and linear programming by using appropriate mathematical methods. (C3, LD1) CLO 3: practice mathematical knowledge and skills in different mathematics problems. (C3, LD1)
3	DJM 20062 Industrial System	**INDUSTRIAL ELECTRONICS** provides exposure to mechanical, electrical, and electronic devices. This course discusses structures of circuits, switches, relays, solenoids, sensors, and telemetry systems. **CREDIT (S): 2** **PRE-REQUISITE(S): NONE**	CLO1: Explain the function of operational principle of switch, relay, solenoid, sensor, and telemetry system. CLO2: Display types of switches, relay, solenoid, and sensors according to operational principle CLO3: Comply with the switches, relay, solenoid, electronic control devices, converter, and sensors in various circuits.
3	DJM30073 Digital System	**DIGITAL SYSTEM** provides knowledge on the concepts and basic principles of digital circuits used in computer systems. This course focuses on sequential logic circuits, counters, and registers. This course also covers the topics on the methods of signal conversion in electronic circuits. **CREDIT (S):3** **PRE-REQUISITE(S): NONE**	CLO1: Distinguish the characteristics and operations of various digital circuits. CLO2: Construct digital circuits based on schematic diagrams. CLO3: Demonstrate the role of digital circuits in real world applications.

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
3	DJM30093 Engineering Mechanics	**ENGINEERING MECHANICS** focuses on theoretical knowledge in statics and dynamics. This course provides students with a fundamental understanding of forces and equilibrium, resultants, equilibrium of particles and structural analysis. This course also covers kinematics and kinetics of particles. This course also exposes the students to the demonstration of experiments in Engineering Mechanics. **CREDIT(S): 3** **PRE-REQUISITE(S): NONE**	CLO1: Solve problems related to static and dynamics based on the concepts and principle of engineering mechanics CLO2: Analyze engineering related problems based on fundamentals of static and dynamic. CLO3: Organize appropriately experiment in groups according to Standard Operation Procedures
3	DJJ30113 Materials Science and engineering	**MATERIALS SCIENCE AND ENGINEERING** course introduces students to a comprehensive coverage of fundamentals of materials science and engineering. The course focuses on material structures, properties, fabrication methods, corrosion, thermal processing, and material testing mostly of metals and alloys. A new fabrication method of powder metallurgy is introducing to student to cater the fabrications of devices, sensors for Industry 4.0 technology. **CREDIT(S): 3** **PRE-REQUISITE(S): NONE**	CLO1: Apply the fundamentals of materials science to identify the materials, properties, behavior, processes, and treatment. CLO2: Performed appropriate materials testing according to the Standard Operating Procedures CLO3: Demonstrate the ability to work individually and in group to complete assigned tasks during the practical work session.
3	DJJ30122 Computer Aided Design	**COMPUTER AIDED DESIGN** exposes the students to the fundamentals and principles of 3D drawing using 3D CAD software. Students are also equipped with various methods of creating a solid model using extrude, revolve, swept, assembly, simulation, and animation. Hands-on exercises drawing of mechanical engineering will also be covered in this course. **CREDIT(S): 2** **PRE-REQUISITE(S): DJJ10013 ENGINEERING DRAWING**	CLO1: Apply CAD commands in order to produce engineering drawings. CLO2: Construct 3D drawing of Mechanical Components according Drawing Standard. CLO3: Demonstrate a presentation with following technical standard communication

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
4	DJJ40132 Engineering Society	**ENGINEERING AND SOCIETY** focuses on the introduction to professional ethics, theory and philosophy of ethics, values in professional ethics, engineering bylaws and standards, issues in professional ethics and sustainability. It also relates towards IR 4.0 introduction and green engineering. **CREDIT(S): 2** **PRE-REQUISITE(S): NONE**	CLO1: Implement the roles of engineering profession towards the development of society and its challenges in globalization. CLO2: Determine the importance of work ethics, bylaws, and professionalism in engineering profession. CLO3: Determine the needs for sustainable and green engineering towards providing the solutions in engineering field.
4	DJM40082 Programmable Logic Controller	**PROGRAMMABLE LOGIC CONTROLLER (PLC)** is a course designed to provide students with hardware adaptation and programming skills by employing a PLC for an automation system in the industry. Basic types of automation systems will be studied to assist students in visualizing the application of PLC. The co-relation application of PLC in the automation system will be explored both by theoretical and experimental mode. Practical application of an automation system with PLC will be simulated in a laboratory environment to provide a pseudo industrial based experience. **CREDIT(S): 2** **PRE-REQUISITE(S): NONE**	CLO1: Differentiate the types of automation systems and terminologies used in PLC hardware and programmes. CLO2: Write a PLC program related to an industrial automation system. CLO3: Program a PLC for an automated application.

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
4	DJM40092 Control System	**CONRTOL SYSTEM** provides knowledge regarding various concepts of feedback control system and the required mathematical methods. The emphasis of the course is on control action, transfer functions, and Laplace transforms. This course also provides knowledge in analyzing and data interpretation on different types of controller mode. **CREDIT(S): 2** **PRE-REQUISITE (S): NONE**	CLO 1. Explain the basic concept of control system including controller principle, transfer function and stability. CLO 2. Construct experiments on different types of controller mode to analyze and interpretation of data. CLO 3. Demonstrate the ability to work in a team for completing assigned tasks during practical work sessions.
4	DJM40103 Power Electronics	**POWER ELECTRONICS** provides knowledge on widely used motor control concepts, especially those in high power industry. The course focusses on basic concepts of Power Electronic and applications with DC and AC motor control covering construction of DC and AC electrical drives. **CREDIT(S): 3** **PRE-REQUISITE (S): NONE**	CLO 1. Distinguish the characteristics and operations of various power electronic devices, AC & DC converters, and electrical drives. CLO 2. Construct power electronic converter and electrical drive circuits based on schematic diagram. CLO 3. Demonstrate effectively on well-defined engineering of power electronic application. .
4	DJJ40153 Pneumatics and Hydraulics	**PNEUMATICS AND HYDRAULICS** provides knowledge and understanding of the importance of pneumatics and hydraulics circuits, equipment, and design along with its usage in the industry. **CREDIT(S): 3** **PRE-REQUISITE (S): NONE**	CLO 1. Analyze the basic concept and function of pneumatics and hydraulics system. CLO 2. Construct pneumatic, electro-pneumatic and hydraulic circuit according to assigned tasks. CLO 3. Perform experiment on pneumatic, electro-pneumatic and hydraulic circuit during practical session.

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
4	DJJ40182 Project 1	**PROJECT 1** provides students with solid foundation on knowledge and skills in formulating project proposal preparation, writing and presentation. **CREDIT(S): 1** **PRE-REQUISITE(S): NONE**	CLO 1. Identify the engineering problems to be solved. CLO 2. Analyze methods to solve problems. CLO 3. Propose a solution to problems.
5	MPU 21032 Penghayatan Etika dan Peradaban	**PENGHAYATAN ETIKA DAN PERADABAN** ini menjelaskan tentang konsep etika daripada perspektif peradaban yang berbeza. Ia bertujuan bagi mengenal pasti sistem, tahap perkembangan, kemajuan dan kebudayaan merentas bangsa dalam mengukuhkan kesepaduan sosial. Selain itu, perbincangan dan perbahasan berkaitan isu-isu kontemporari dalam aspek ekonomi, politik, sosial, budaya dan alam sekitar daripada perspektif etika dan peradaban dapat melahirkan pelajar yang bermoral dan profesional. Penerapan amalan pendidikan berimpak tinggi (HIEPs) yang bersesuaian digunakan dalam penyampaian kursus ini. **CREDIT(S): 2** **PRE-REQUISITE(S): NONE**	CLO 1: Membentangkan konsep etika dan peradaban dalam kepelbagaian tamadun. (A2, CLS5) CLO 2: Menerangkan sistem, tahap perkembangan, kesepaduan sosial dan kebudayaan merentas bangsa di Malaysia. (A2, CLS5) CLO 3: Mencadangkan sikap yang positif terhadap isu dan cabaran kontemporari dari perspektif etika dan peradaban. (A3, CLS4)

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
5	DUE50032 Communication English 3	**COMMUNICATIVE ENGLISH 3** aims to develop the necessary skills in students to analyse and interpret graphs and charts from data collected as well as to apply the job-hunting mechanics effectively in their related fields. Students will learn to gather data and present them using graphs and charts. Students will also learn basics of job-hunting mechanics which include using various job search strategies, making enquiries, and preparing relevant resumes and cover letters. The students will develop communication skills to introduce themselves, highlight their strengths and abilities, present ideas, express opinions and respond appropriately during job interviews. **CREDIT(S): 2** **PRE-REQUISITE(S): DUE 30022 & COMMUNICATIVE ENGLISH 2**	CLO1: Present gathered data in graphs and charts effectively using appropriate language forms and functions (A2, CLS 3b) CLO2: Prepare a high impact resume and a cover letter, highlighting competencies and strengths that meet employer's expectations (A4, CLS 4) CLO3: Demonstrate effective communication and social skills in handling job interviews confidently (A3 , CLS 3b)
5	MPU22012 Entrepreneurship	**ENTERPRENEUSHIP** focuses on the fundamentals and concept of entrepreneurship to inculcate the value and interest in students to choose entrepreneurship as a career. This course can help students to initiate creative and innovative entrepreneurial ideas. It also emphasizes the preparation of a business plan framework through business model canvas. **CREDIT(S): 2** **PRE-REQUISITE(S): NONE**	CLO 1: Propose the value proposition of entrepreneurial idea using Business model Canvas. (A3, CLS 3b) CLO 2: Develop a viable business plan by organizing business objectives according to priorities. (A4, CLS 4) CLO 3: Organize the online presence business in social media marketing platform. (A3, CLS 4)
5	DJM 50113 Industrial Automation	**THE INDUSTRIAL AUTOMATION** explains the fundamental concept of industrial automation including the mechanical system, actuator control and sensory devices in based on process specification. It also gives students an understanding of modern industrial automation technology. **CREDIT(S): 3** **PRE-REQUISITE(S): NONE**	CLO 1: Apply the fundamental concept of industrial automation including the mechanical system, actuator control and sensory device. CLO 2: Develop control structure for industrial automation system based on process specification. CLO 3: Demonstrate good communication skills in group on assigned topic.

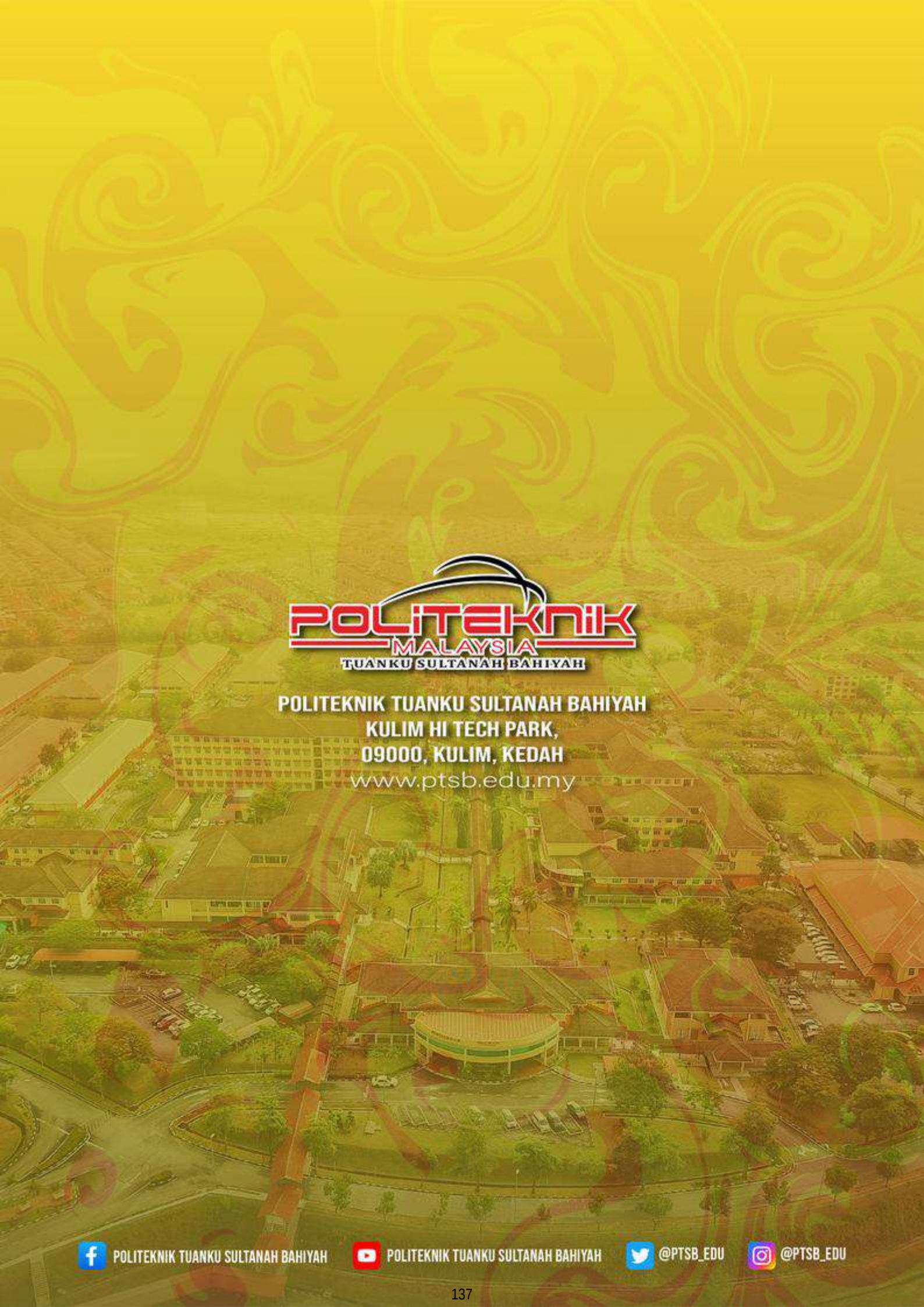
SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO) Upon completion of this course, students should be able to:
5	DJM50122 Embedded System Application	**EMBEDDED SYSTEM APPLICATION** covers the basic concept and application of microcontroller system and embedded system. Students will be able learn programming and hardware on embedded development system and understand how to interface.	CLO1: Explain basic concept of microprocessor and embedded system. CLO2: Construct a programming language in solving in hardware interfacing. CLO3: Perform problem solving skill in assigned practical work.
5	DJJ50193 Project 2	**PROJECT 2** is a continuation of Project 1 focusing on project planning, development, project report and presentation. This course introduces students with ability and skills in conducting project planning, development and management based on their project design. It also provides the student with technical writing and presentation skills. The project will be implemented in a group and each group will work on a project under lecturer(s) supervision. Project titles will be based on specialization and students will be assessed individually. **CREDIT(S): 3** **PRE-REQUISITE(S): DJJ40182 Projects 1**	CLO1: Demonstrate appropriate and creative solution in solving project problems. CLO2: Perform project plan to achieve objectives with valid and reliable results. CLO3: Explain the project work and defend project outcomes effectively with good communication skills. CLO4: Organize project activities and outcomes in report accordance to the specified standard format that applies engineering management principles.
6	DUT600 610	Engineering Industrial Training	

ELECTIVES COURSES

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO)
4	DJJ42022 Industrial Management	**INDUSTRIAL MANAGEMENT** provides students with a strong fundamental understanding of industrial management prospect and production system planning such as inventory, scheduling, production system operation, facilities, plan location, layout, and line balancing. This course also provides knowledge in quality control and human resource management. **CREDIT(S): 2** **PRE-REQUISITE(S): NONE**	CLO 1. Apply the basic concepts of industrial management system in industry to solve related problems. CLO 2: Analyze problems related to industrial management. CLO3: Demonstrate good written communication skills. .
5	DJJ42032 Instrumentation and Control	**INSTRUMENTATION & CONTROL** exposes the students to the basic principles in control systems and its usage in the industrial sector is the focus in this course. Instrumentation and control also provide knowledge to the students in components measurement in control systems that are normally used in industries. **CREDIT(S): 2** **PRE-REQUISITE(S): NONE**	CLO1: Apply the fundamentals of control system and instrumentation used in engineering. CLO2: Explore the measurement and process control system in engineering. CLO3: Demonstrate good communication skill in presentation on assigned topics
5	DJJ52012 Engineering Plant Technology	**ENGINEERING PLANT TECHNOLOGY** introduces power plant technology industry such as steam power plant, gas turbine power plant, diesel power plant, compressed air plant and water pump. **CREDIT(S): 2** **PRE-REQUISITE(S): NONE**	CLO1: Classify the concepts and technology of power plant system and components to solve related problems based on its application and functions. CLO2: Implement the professional ethics and responsibility and norms of technician practice in power plant system and components. CLO3: Demonstrate skill of communications effectively on well-defined engineering activities with the engineering community and with society of large and information management skills based on related engineering plant technology.

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO)
4	DJF40142 CADCAM	**CAD/CAM** explains the theory and basics of coding languages, structures, and the use of CAD/CAM systems for generating and verifying tool path. The students will be using CAD/CAM software to demonstrate the integration between CAD and CAM operation that includes design an object, produce a code and simulate the tool path for machining operation prior to the machining process and generate NC part programming. Students also enable to build a project from NC part programming using CNC milling or lathe machine. **CREDIT(S): 2** **PRE-REQUISITE(S): NONE**	CLO1: Calibrates machining code (G and M code) from CAD/CAM software to plan and devise holes process and milling/lathe project. CLO 2: Build a project using CNC milling or lathe machine by utilizing related CAD/CAM simulation software. CLO 3: Demonstrate continuous learning and information management skill while engaging in independent acquisition of new knowledge and skill to develop a project.
5	DJJ51082 Quality Control	**QUALITY CONTROL** provides knowledge on basic principles and concept of quality including statistical method in controlling products quality or services. This course also emphasizes the application of Control Chart and Quality Control tools and explains the quality improvement technique. **CREDIT(S): 2** **PRE-REQUISITE(S): NONE**	CLO 1: Apply the relation of statistics and quality management system in understanding of quality control and their application tools. CLO 2: Determine the related quality tools and techniques to control the quality of products or services based on case study. CLO 3: Demonstrate ability to work in team to complete the assigned tasks.
4	DJM42012 Railway 1 – Communication for Rail	**RAILWAY 1 -COMMUNICATION FOR RAIL** exposes the student to the principle of railway communication. This course covers basic concepts of telecom, cabling, networking, transmission, telephone in rail environment. Students are exposed to the Railway Communication System. **CREDIT(S): 2** **PRE-REQUISITE(S): NONE**	CLO 1: Apply the basic concept in railway communication environment. CLO 2: recognize the importance of communication in railway environment. CLO 3: Perform understanding of railway communication protocol and application.

SEMESTER	CODE AND COURSE NAME	SYNOPSIS	COURSE LEARNING OUTCOME (CLO)
4	DJM 52022 Railway 2 – Signaling in Rail	**RAILWAY 2 -SIGNALLING IN RAIL** exposes the student to the principle of railway signaling. This course covers basic concepts of data Railway Signaling fundamental. Students are exposed to Railway Signaling & Communication System **CREDIT(S): 2** **PRE-REQUISITE(S): NONE**	CLO 1: Apply the basic concept to railway signaling according to Malaysia Railways mainline. CLO 2: Perform the basic concept of signaling in mainline for the railway's networks. CLO 3: Demonstrate the understanding concept of signaling in railways by using practical work by group.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