KEMENTERIAN PENGAJIAN TINGGI

POLITEKNIK MALAYSIA
MUADZAM SHAH

MECHANICAL ENGINEERING
DEPARTMENT

STUDENT GUIDE

DIPLOMA IN MECHANICAL ENGINEERING (PRODUCT DESIGN)

2023 REVISED EDITION

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PREFACE

Politeknik Muadzam Shah

Bismillahirrahmanirrahim
Assalamualaikum.

Dear Students,

Welcome to our beautiful and cosy campus of Politeknik Muadzam Shah (PMS). Our students come from all walks of life and various backgrounds. It is our commitment at PMS to help you, as an adult learner, succeed in upgrading yourself and achieve the right balance holistically.

The world faces dynamic changes in technology and business at amazing speed. To sustain our economy, the Malaysian workforce needs to continuously upgrade itself to acquire new skills and knowledge so as to stay relevant. Striking a good balance between your studies and co-curricular activities, I do believe that PMS will broaden your views about tertiary education and guide you to enhance your future career.

The rapid changes around the globe demands educational institutions to be dynamic and responsive towards the technological changes around the world. To accommodate such requirement, the courses offered by the Mechanical Engineering, Commerce, Information Technology & Communication, Design & Visual Communication as well as Tourism & Hospitality Departments. PMS are designed to produce graduates who are creative, innovative and possess towering personality. In order for PMS to achieve its intended target, we have well-trained lecturer whom are able to assist and facilitate the students in their learning as well as their holistic education.

We are so pleased that you are here. Best wishes and welcome to PMS !

TUAN HAJI CHE ALIAS BIN MOHD YUSOF
Director
Politeknik Muadzam Shah

PREFACE

Politeknik Muadzam Shah

Assalamualaikum.

Dear Students,

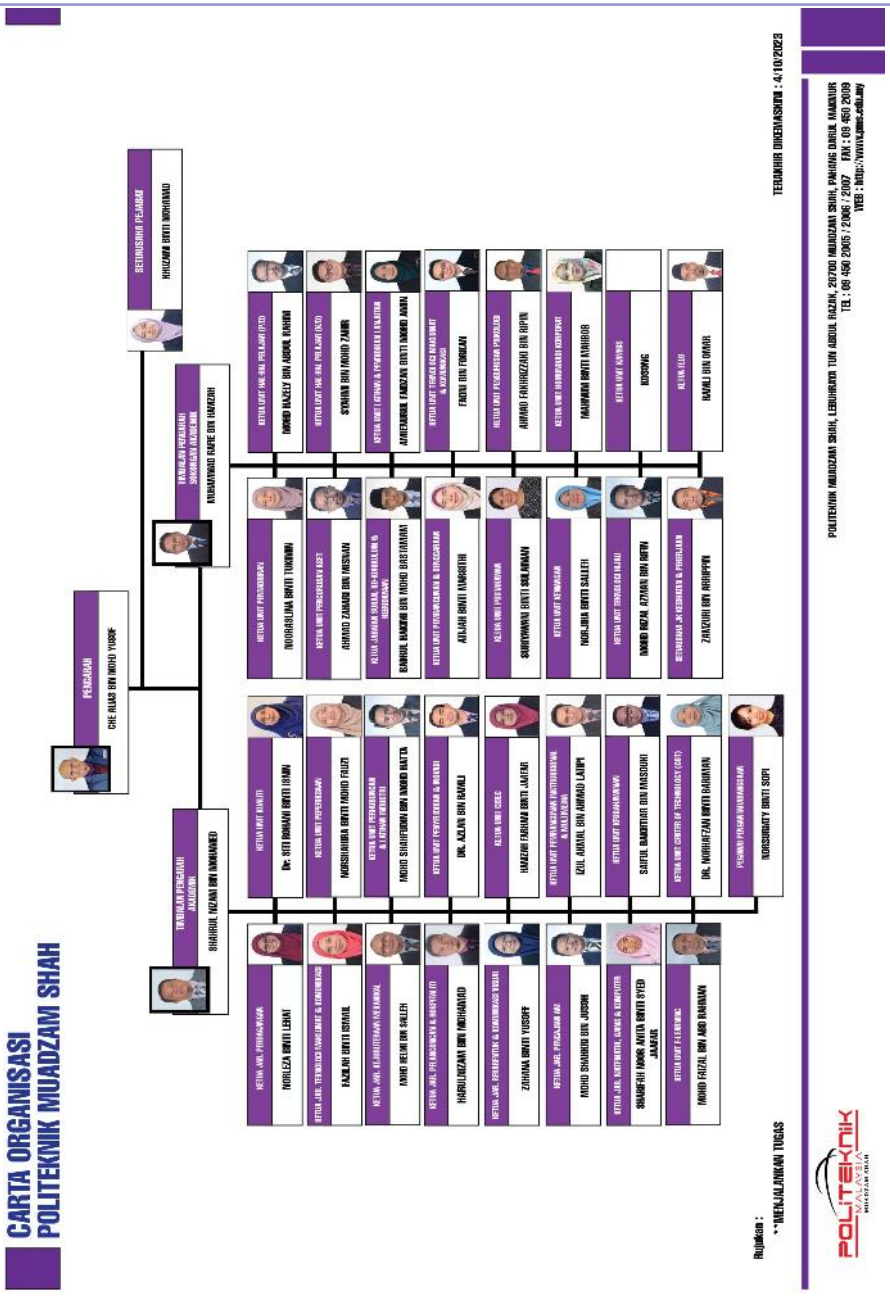
Welcome to the new academic year in Mechanical Department of Politeknik Muadzam Shah (PMS). I wish you a successful and enjoyable in this semester.

This handbook had been prepared for the current and prospective for mechanical department students. It outlines the knowledge, skills and outcomes of all the programmes curriculum develops for its graduates. Currently, we offer Diploma of Mechanical Engineering (Product Design)-DRP, Diploma Mechanical Engineering (Automation)-DMA, Diploma of Mechanical Engineering (Automotive Manufacturing Design)-DRA and Diploma of Mechanical Engineering (Manufacturing)-DTP. In order for the students to graduate, the four categories of courses are to be completed – compulsory, common core, discipline and elective. We also provide the necessary facilities such as Advance Manufacturing Lab, Welding Workshop, fitting and Machining workshop and others. Beside we also have support Centre and Wi-Fi connections to realize the learning potential of students.

All the lecturers look forward in seeing all you and we hope that your presence here will make Mechanical Engineering Department more interesting and lively. We believe that you are able to contribute to the better image and excellence of the department. Studying in PMS will be one of the most exciting and memorable time in your life. Good Luck !

Wassalam.

MOHD HELMI BIN SALLEH
Head of Mechanical Engineering Department
Politeknik Muadzam Shah


CARTA ORGANISASI
POLITEKNIK MUADZAM SHAH
PENGARAH
CHE ALIAS BIN MOHD YUSOF
TIMBALAN PENGARAH AKADEMIK
SHAHRUL NIZAM BIN MOHAMED
KETUA JABATAN PENGAJIAN SAINS GUNAAN & TEKNOLOGI MAKLUMAT
NORLEZA BINTI LEHAT
KETUA UNIT KEJURUTERAAN ELEKTRIK
MOHD HELMI BIN SALEH
KETUA UNIT PERNIAGAAN & KEWANGAN
HARDILNIZAM BIN MOHAMAD
KETUA UNIT SAINS & MATEMATIK
ZAHARA BINTI YUSOFF
KETUA UNIT PENGAJIAN AM
MOHD SHAMSIR BIN JUSOH
KETUA UNIT KOMPUTER & KOMUNIKASI
SHAHRIEH NOOR ANITA BINTI SYED JAAFAR
KETUA UNIT ELEKTRONIK
MOHD FAIZAL BIN ABD RAHMAN
KETUA UNIT BIASISWA
Dr. SITI RAHAH BINTI IRWAN
KETUA UNIT HUBUNGAN KORPORAT
NORSHAHIDA BINTI MOHD FAUZI
KETUA UNIT PENGURUSAN & LATIHAN INDUSTRI
MOHD SHAFUDDIN BIN MOHD BAKTA
KETUA UNIT PENYELIDIKAN & INOVASI
DR. AZLAN BIN RAHALI
KLUSTER UNIT CSCE
HAMZAH FADHAM BINTI JAAFARI
KETUA UNIT PENYELENGARAAN KEMUDAHANFASA & HAL EHWAL
IZUL AMRAL BIN AHMAD LAIPI
KETUA UNIT KESIHATAN, KESELAMATAN & KEBERSIHAN
SAIFUL BAHRITHO BIN HASSOHI
KETUA UNIT CENTRE OF TECHNOLOGY (CAT)
DR. NORHAFZAN BINTI BAHARIAN
PEGAWAI PENGAMBANGAN
NORSHIDATY BINTI SOPI
KETUA UNIT PERUNDANGAN
NOORASLINA BINTI TUKIMAN
KETUA UNIT PENGURUSAN ASET
AHMAD ZAHARI BIN HASSAN
KLUSTER JAMINAN KUALITI, BIO-KEMUDAHAN & KESIHATAN
BAHRUL HAKIMI BIN MOHD BARIHAMAT
KETUA UNIT PERSEKITARAN & KESELAMATAN
ATILAHI BINTI KAMARUDIN
KLUSTER UNIT PENTADBIRAN
SURIYAWANI BINTI SULAIMAN
KETUA UNIT KEWANGAN
NORLIHA BINTI SALLEH
KETUA UNIT PERHUBUNGAN KORPORAT
NORAINI BINTI ISMUBOH
KETUA UNIT PENGURUSAN & PEMBELIAN
ZAHZURI BIN HARIPPIN
KETUA UNIT PENGURUSAN & PEMBANGUNAN SUMBER MANUSIA
ANDRADIYANTO RAPIE BIN HARZAIH
KETUA UNIT HAL EHWAL PELAJAR (UTP)
AHMAD HAZELY BIN ABDUL KHANI
KETUA UNIT HAL EHWAL PELAJAR (UTC)
SYAHIRA BINTI MOHD ZAHIR
KETUA UNIT LATIHAN & PERKEMBANGAN PELAJAR
AZMEERUDDIN FAMDZAN BINTI MOHD AMIN
KETUA UNIT TADBIR URUS MAKLUMAT & KOMUNIKASI
FADZLI BIN FOROUKH
KETUA UNIT PERGURUAN PENDIDIK
AHMAD FAHRIRIZANI BIN RIPIN
KETUA UNIT BIMBINGAN KEAFIAN
FAUZIANNA BINTI KHAIRUDIN
KETUA UNIT KAYSIS
KOSSHG
KETUA UNIT
RAHALI BIN OMAR
SETIAUSAHA PEJABAT
KHAZANA BINTI MOHAMAD
Rujukan :
**MENJALANKAN TUGAS
TERAKHIR DIKEMASKINI : 4/10/2023
POLITEKNIK MUADZAM SHAH, LEBUHRAYA TUN ABDUL RAZAK, 26700 MUADZAM SHAH, PAHANG DARUL MAKMUR
TEL : 09 450 2905 / 2906 / 2907 FAX : 09 450 2909
WEB : http://www.pms.edu.my
POLITEKNIK MASA KINI

VISION

To Be The Leading Edge TVET Institution

MISSION

1. To provide wide access to quality and recognized TVET programmes.
2. To empower communities through lifelong learning.
3. To develop holistic, entrepreneurial and balanced graduates.
4. To capitalise on smart partnership with stakeholders.

VISI

Menjadi Peneraju institusi TVET yang unggul.

MISI

1. *Menyediakan akses yang meluas kepada program TVET berkualiti dan diiktiraf.*
2. *Memperkasa komuniti melalui pembelajaran sepanjang hayat.*
3. *Melahirkan graduan holistik, berciri keusahawanan dan seimbang.*
4. *Memanfaatkan sepenuhnya perkongsian pintar dengan pihak berkepentingan.*

Outcome Based Education (OBE)

Ministry of Higher Education, Malaysian Qualification Agency (MQA) and related professional bodies require all programs offered by Institution of Higher Learnings to adopt the Outcome Based Education approach in their teaching and learning activities. This is in line with the paradigm shift mooted by the Ministry of Higher Education to enhance the quality of education in Malaysia.

Outcome-based education (OBE) is an educational approach that focuses on what students are able to do upon completion of a course. All curriculum and teaching decisions are made based on how best to facilitate the desired outcome. The term outcomes in this matter would be a set of values or 'wish list' on what students should acquire upon their educational program completion. Outcome-based education is designed so that "all students are equipped with the knowledge, skills and qualities needed to be successful after they exit the educational system" (Spady, 1994, p. 9).

In brief, OBE answers the following questions:

- What must the student learn?
- What do the teachers or lecturers want the student to learn?
- How does what student learn affect the overall educational outcome?
- How do the teachers or lecturers make sure that the students learn what they are intended to learn?

Thus, OBE outlines the guidance for planning, delivering and evaluating teaching and learning activities to achieve the results expressed in terms of individual student learning outcomes as shown in Figure 4.1 below.

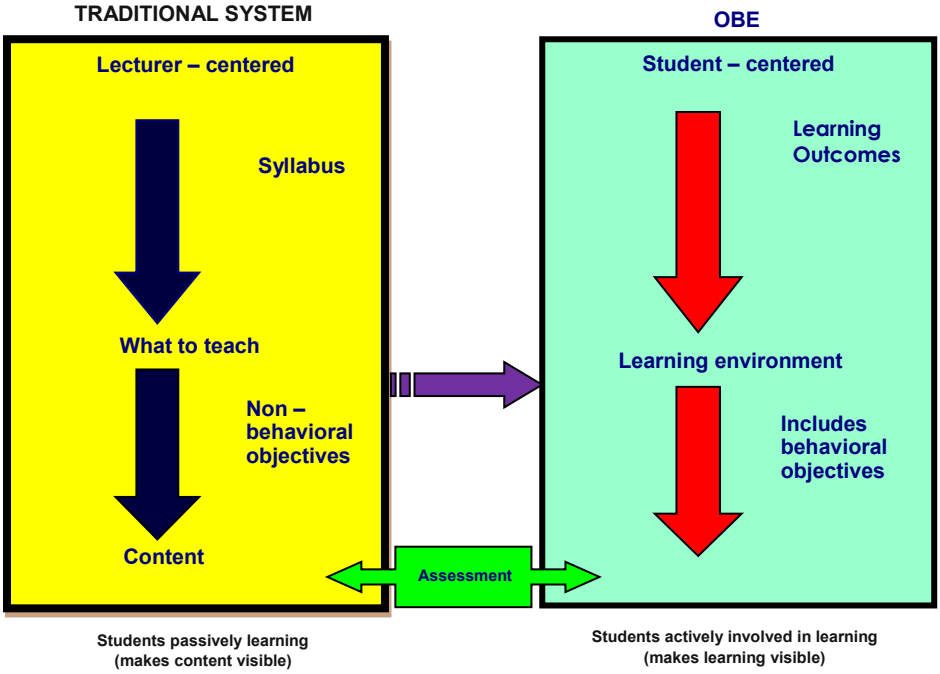


Figure 4.1 : A Paradigm Shift for Educational System

Outcome Based Education (OBE)

OBE EDUCATIONAL FRAMEWORK

Programme Educational Objectives (PEO):
The broad statements that describe the career and professional accomplishments which the program is preparing graduates to achieve.

Programme Learning Outcomes (PLO):
The statements that describe what students are expected to know and able to perform or attain in terms of skills, knowledge and behaviour or attitude by the time of graduation.

Course Learning Outcomes (CLO):
The statements that describe the specification of what a student should learn upon completing a course .

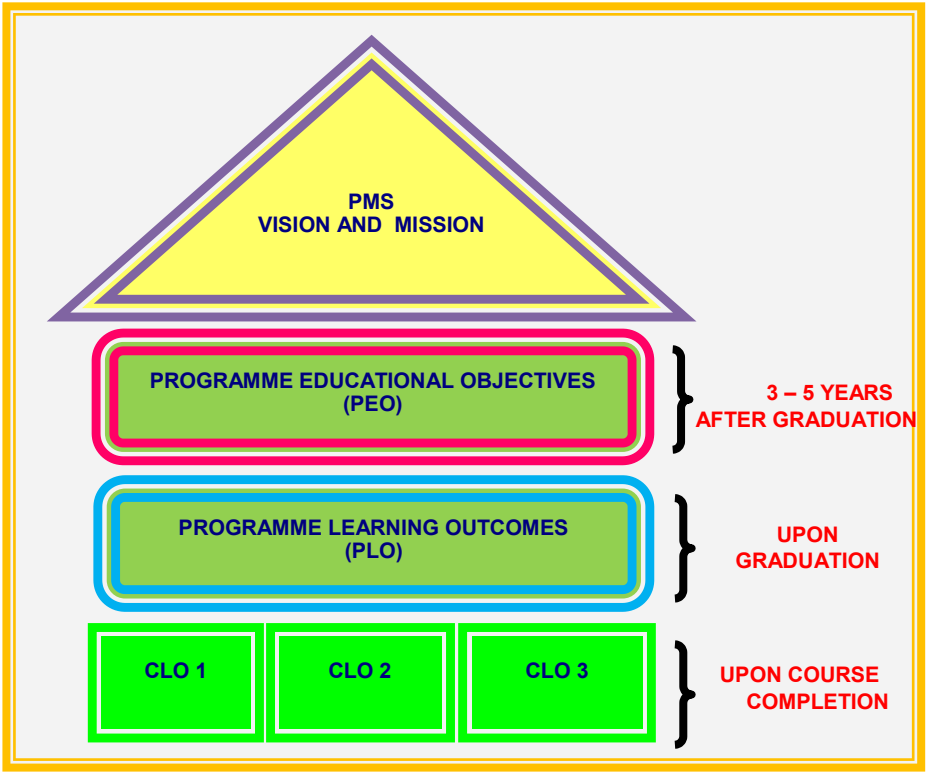


Figure 4.2: OBE Educational Framework

THREE MAIN STAGES IN TEACHING AND LEARNING PROCESS

In general, OBE concept divides teaching and learning activities into three parts, namely:
i. Planning,
ii. Implementation and
iii. Assessment

At the planning stage, learning outcomes should be determined in advance by taking into account what students can do after attending a teaching process.

At the implementation stage, the teaching and learning activities should be designed to achieve the specified learning outcomes.

Finally, the assessment is to be determined where it measures how far students have achieved the specified learning outcomes and assessment provides input to continuously improve the teaching and learning process.

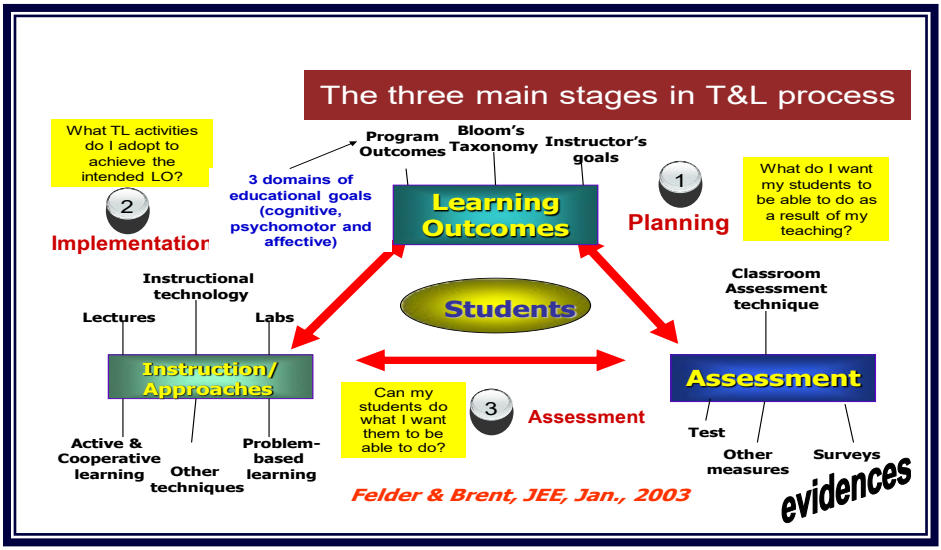


Figure 4.3: Teaching and Learning process

Towards the future of OBE:
1. Courses will help students to want, passionately, to do things, rather than just 'be able to' do things.
2. Assessment will assess whether students actually and spontaneously achieve the outcomes, rather than just 'being able to'
3. Outcomes will include values and principles and purposes as well as abilities.

In conclusion, the call for accountability is inevitably one of the reasons that lead to the introduction of OBE in Politeknik Muadzam Shah. All parties need to make necessary changes, modifications, and improvements in the light of the changes aimed. The roles of curriculum, lecturers or instructors and assessment must gear the students towards the intended outcomes.

INTRODUCTION
Engineering Technology Accreditation Council

INTRODUCTION

The Engineering Technology Accreditation Council (ETAC) is a delegated body by the Board of Engineers Malaysia. ETAC started as a Protem Council in 2011 in order to provide a smooth transition in the accreditation of Engineering Technology and Engineering Technician education programmes. The Protem ETAC initially focused on the Sydney Accord based education programmes, and obtained the approval of its inaugural Engineering Technology Accreditation Manual by the BEM in 2015. With the 2015 amendment to the Registration of Engineers Act 1967, the BEM established a 21-person ETAC, comprising the seven groupings (BEM, learned bodies, industry/employer, Public Services Department (PSD), Malaysian Qualification Agency (MQA), Ministry, and public representatives) in 2015 as the only recognized accrediting body for engineering technology bachelor degree, engineering diploma and engineering technology diploma programmes offered in Malaysia.

The ETAC was instrumental in ensuring Malaysia's accredited engineering technology bachelors' degree, engineering diploma and engineering technology diploma programmes are substantially equivalent to the engineering degrees of the signatories of the Sydney Accord (SA) and Dublin Accord (DA). This will ensure that through its accreditation process, the qualities of graduates of accredited programmes meet global standards. Accredited programmes are placed in the ETAC and MQA registers. BEM-ETAC is in the process of joining the Sydney and Dublin Accords. It is hoped that by July 2017 BEM-ETAC will be accepted as a Provisional Signatory for both Accords. In becoming signatory to these Accords BEM-ETAC will be able to ensure Malaysian engineering technology and technician graduates meet an international standard. It will accord for mutual recognition of engineering technology degrees and diplomas and their graduates across the member countries. The same education standards for engineering technology and technician for all member countries is maintained through the guidelines provided by the International Engineering Alliance (IEA – www.ieagreements.org) custodian of the SA and DA. ETAC is determined to uphold the high standard of accreditation process, on behalf of BEM, to become the main catalyst for change in Malaysia and the region.

ACCREDITATION OBJECTIVES

The objectives of ETAC are to ensure:

1. The graduates of the accredited engineering programs meet the minimum academic requirements to be registered as graduate engineer with BEM.
2. The Continual Quality Improvement (CQI) is being practiced by Institutions of Higher Learning (IHLs). Accreditation may also serves as a tool to benchmark engineering programs offered by IHLs in Malaysia.

ADVANTAGES FOR STUDENT AND ORGANIZATION

1. Assurance that the diploma programs offered meet the high standards set by ETAC.
2. Enable students to further studies at local or overseas institutions.
3. Institution will be given opportunities to offer technology and TVET programs.
4. Graduates with diploma in engineering will be accepted to be Engineering Technician/ Inspector of Work (IOW) - registered with BEM.

DEPARTMENT OF MECHANICAL ENGINEERING

BACKGROUND

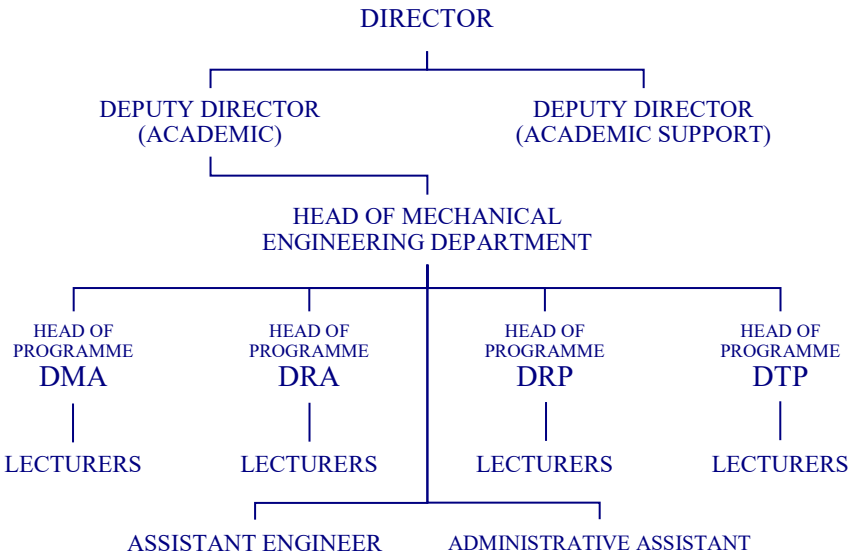
Mechanical Engineering Department **(JKM)** was established at the Politeknik Muadzam Shah at the end of November 2010. It's establishment is in line with the movements of the Campus PMS operations while the permanent campus. There are four diploma programs offered in this polytechnic:

- Diploma of Mechanical Engineering (Automation)
- Diploma of Mechanical Engineering (Product Design)
- Diploma of Mechanical Engineering (Automotive Manufacturing Design)
- Diploma of Mechanical Engineering (Manufacturing)

The entire programs will take six semesters to complete, relatively five academic semesters at the polytechnics and one semester of industrial training at relevant industries during the final semester. The department consists a Head of Department, Heads of Program and academic lecturers. Lecturers allocated for each program based on their background, expertise and experiences.

Mechanical Engineering Department Organization

Organization Chart



Head of Department Mechanical Engineering

MOHD HELMI BIN SALLEH

Position : Head of Department Mechanical Engineering
Grade : DH48
Qualification : Master in Technic & Vocational Education, B. Mech. Engineering (Hons)

Email : helmi@pms.edu.my

ACADEMIC & TECHNICAL STAFF
Dip. in Mech. Eng. (Product Design) - DRP

AHMAD HUZAIRI BIN BAHARUDDIN

Position : Program Curriculum Chairman
Grade : DH 48
Qualification : B. Mech. Engineering (Hons)
Email : zairi@pms.edu.my

MUHAMAD SYIRAZI BIN SUHAIMI

Position : Head of Program (DRP)
Grade : DH 44
Qualification : Master in Mfg Engineering (System Engineering), B. Mech Engineering (Industry),
Email : syirazisuhaimi@pms.edu.my

HJ. CHE KU IHSAN BIN CHE KU ABDUL SATAR

Position : Senior Lecturer
Grade : DH 48
Qualification : Master in international Automotive Engineering
Email : ck.ihsan@pms.edu.my

ACADEMIC & TECHNICAL STAFF

Dip. in Mech. Eng. (Product Design) - DRP

MOHAMMAD AIZRULSHAH BIN KAMARUDDIN

Position : Lecturer
Grade : DH 42
Qualification : Master in Mfg Engineering (System Engineering),
B. Mfg Engineering (Mfg Design),
Email : aizrulshah@pms.edu.my

AZLINDA BINTI MOHAMAD

Position : Lecturer
Grade : DH42
Qualification : Master in Mfg Engineering (System Engineering),
B. Mfg Engineering (Mfg Design),
Email : azlinda @pms.edu.my

ANIZA BINTI MD. LATIFF

Position : Lecturer
Grade : DH42
Qualification : Master in Mfg Engineering (System Engineering),
B. Mech Engineering (Industry),
Email : aniza@pms.edu.my

JAMADEEL IZWAN BIN IBRAHIM

Position : Lecturer
Grade : DH44
Qualification : Master in Mfg Engineering (System Engineering),
B. Mech Engineering (Design & Innovation),
Email : jama@pms.edu.my

MOHD EMRAN BIN MAT HASSAN

Position : Lecturer
Grade : DH44
Qualification : B. Electrical Engineering (Control & Instrumentation)
Email : emran@pms.edu.my

ACADEMIC & TECHNICAL STAFF

Dip. in Mech. Eng. (Product Design) - DRP

MOHD SYAIFUL HIDZIR BIN RAMLI

Position : Lecturer
Grade : DH41
Qualification : B. Engineering (Product Design)
Email : syaifulhidzir@pms.edu.my

MUHAMMAD AIMAN BIN ABU JOHAN

Position : Lecturer
Grade : DH41
Qualification : B. Mfg Engineering (Hons)
Email : muhammad.aiman@pms.edu.my

SUYANI BINTI ARIFIN

Position : Lecturer
Grade : DH41
Qualification : B. Mech Engineering with Mfg. Engineering
Email : suyani@pms.edu.my

GOGULASANTI A/P K. GANESAN

Position : Lecturer
Grade : DH41
Qualification : B. Engineering (Product Design)
Email : g.santi@pms.edu.my

AZMI BIN MD NOR

Position : Lecturer
Grade : DH34
Qualification : Diploma in Mech. Engineering with Education
Email : azmi@pms.edu.my

MECHANICAL ENGINEERING DEPARTMENT
SUPPORTING STAFF

ZAMRI B. SA'AT

Position : Adminstrative Assistant
Grade : N19
Email : zamri_saat@pms.edu.my

AFRIWIZAL BIN ABD RAHMAN

Position : Assistant Engineer
Grade : JA29
Email : afriwizal@pms.edu.my

LABORATORY FACILITIES

Department of Mechanical Engineering

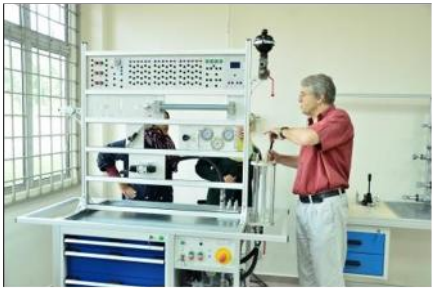
NO	ROOM
1	Design Studio 2
2	Design Studio 3
3	Design Studio 4
4	Quality Assurance Lab
5	Automation Lab
6	CAD/CAM Lab
7	Control Engineering Lab
8	Engineering Science Lab
9	Advance Manufacturing Lab
10	Prototyping Lab 1
11	Prototyping Lab 2
12	Project Room and Foundry
13	Fitting & Machining Workshop
14	Automotive Workshop
15	Model Making Workshop
18	CAD/CAE Lab
19	Instruction Room
20	Electrical Lab

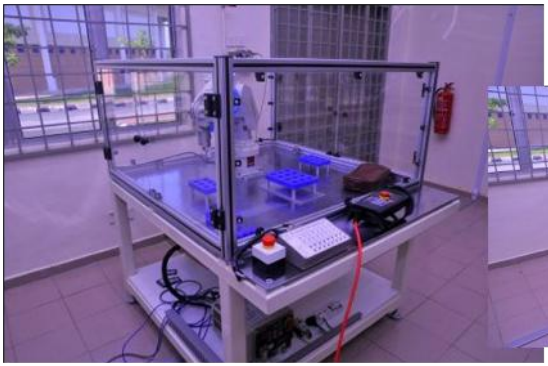
Welding Workshop

LABORATORY FACILITIES

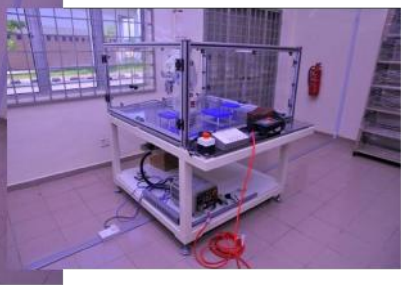
Department of Mechanical Engineering

Robot Facility





Control Lab



DIPLOMA IN
MECHANICAL ENGINEERING
(PRODUCT DESIGN)

DIPLOMA IN MECHANICAL ENGINEERING (MANUFACTURING)

SYNOPSIS

The Diploma in Mechanical Engineering (Product Design) 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, Workshop Practices, Instrumentation & Control, Electrical & Electronic Technology, Design, Manufacturing and Management.

DIPLOMA IN MECHANICAL ENGINEERING (MANUFACTURING)

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

The Diploma in Mechanical Engineering (Product Design) 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.

DIPLOMA IN MECHANICAL ENGINEERING (PRODUCT DESIGN)

PROGRAMME LEARNING OUTCOMES (PLO)

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

PLO1: Apply knowledge of applied mathematics, applied science, engineering fundamentals and an engineering specialisation 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

JOB PROSPECT

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

- Assistant Engineer
- Assistant Product Engineer
- Assistant Design Engineer
- Assistant Project Engineer
- Process Technician
- Supervisor
- Technical Specialist
- Design Drafter
- CAD/CAE Technician
- CAD/CAM Technician
- Product Design Entrepreneur

PROGRAMME STRUCTURE DIP. IN MECH. ENG.
Product Design (DRP)

CLASSIFICATION	COURSE CODE	COURSE	CONTACT HOURS			CREDIT VALUE
			L	P	T	
SEMESTER 1						
Compulsory	DUE10012	Communicative English 1	1	0	2	2
	MPU24001	Sukan (U4)	0	2	0	1
	MPU24001	Unit Beruniform 1*** (U4)	0	2	0	
Common Core	DUW10012	Occupational, Safety and Health	2	0	0	2
	DBS1012	Engineering Science	2	1	0	2
	DBM10013	Engineering Mathematics 1	2	0	2	3
Discipline Core	DJJ10013	Engineering Drawing	1	3	0	3
	DJJ10033	Workshop Technology	3	0	0	3
Specialization	DJD11012	Product Design 1	1	3	0	2
TOTAL			**25**			**18**
SEMESTER 2						
Compulsory	MPU23052	Sains, Teknologi dan Kejuruteraan Islam*	1	0	2	2
	MPU23042	Nilai Masyarakat Malaysia**	1	0	2	
	MPU24001	Kelab/Persatuan (U4)	0	2	0	1
	MPU24001	Unit Beruniform 2*** (U4)	0	2	0	
Common Core	DBM20023	Engineering Mathematics 2	2	0	2	3
Discipline Core	DJJ10022	Mechanical Workshop Practice 1	0	4	0	2
	DJJ20053	Electrical Technology	2	2	0	3
	DJJ30093	Engineering Mechanics	2	2	0	3
Specialization	DJD21012	Product Design 2	0	4	0	2
TOTAL			**25**			**16**

PROGRAMME STRUCTURE DIP. IN MECH. ENG.
Product Design (DRP)

CLASSIFICATION	COURSE CODE	COURSE	CONTACT HOURS			CREDIT VALUES
			L	P	T	
SEMESTER 3						
Compulsory	DUE30012	Communicative English 2	1	0	2	2
Common Core	DBM30033	Engineering Mathematics 3	2	0	2	3
Discipline Core	DJJ20073	Fluid Mechanics	2	2	0	3
	DJJ30103	Strength Of Materials	2	2	0	3
	DJJ30113	Material Science and Engineering	2	2	0	3
Specialization	DJD31022	CAD and Rapid Prototyping	1	3	0	2
TOTAL			**23**			**16**
SEMESTER 4						
Common core	DJJ40132	Engineering and Society	2	0	0	2
Discipline Core	DJJ20063	Thermodynamics	2	2	0	3
	DJJ40153	Pneumatic & Hydraulics	2	2	0	3
	DJJ40182	Project 1	2	0	0	2
Specialization	DJD41012	Product Design and Development	1	3	0	2
	DJD41032	Ergonomics	2	0	0	2
	DJD42012	CAD/CAM Technology	1	3	0	2
Elective		Elective***	2	0	0	2
TOTAL			**22**			**18**

PROGRAMME STRUCTURE DIP. IN MECH. ENG.
Product Design (DRP)

CLASSIFICATION	COURSE CODE	COURSE	CONTACT HOURS			CREDIT VALUES
			L	P	T	
SEMESTER 5						
Compulsory	MPU21012	Pengajian Malaysia	1	0	2	2
	DUE50032	Communicative English 3	1	0	2	2
	MPU22012	Entrepreneurship (U2)	2	1	0	2
Discipline Core	DJJ50193	Project 2	0	4	0	3
Specialization	DJD52023	Manufacturing Process	2	1	0	3
	DJD53012	Operations Management	2	0	0	2
Elective		Elective***	2	0	0	2
TOTAL			**14**			**16**
SEMESTER 6						
Industrial Training	DUT600610	Industrial Training	0	0	0	10
TOTAL			**0**			**10**
TOTAL CREDIT VALUES						**94**
ELECTIVE COURSES						
1	DJV20012	Automation Programming	1	2	0	2
2	DJF51072	Jig and Fixture Design	1	2	0	2
3	DJF51082	Quality Control	2	0	0	2
4	DJF50192	Tool Design	1	2	0	2
5	DJM30062	Industrial Electronics	1	2	0	2
6	DJJ42032	Instrumentation and Control	2	0	0	2
FREE ELECTIVES*						
1	DUD10012	Design Thinking	1	0	0	2

SUPPORTING DEPARTMENTS

SUPPORTING DEPARTMENT

Mathematics, Science and Computer Department
General Studies Department

The Mathematics, Science and Computer Department which is also known as JMSK is an academic supporting department. It is responsible dot the B code courses in three different fields that are Mathematics, Science and Computer. Besides, JMSK coordinate all courses in Mathematics, Engineering Science and Computer which became as a core to the students' academic achievement in Politeknik Muadzam Shah.

This department was set up in December 2010 and its currently running with 11 lecturers, one laboratory assistant and one office assistance.

JMSK is supported by the head of department; supported by three (3) course leaders of Mathematics, Science and Computer. This department is equipped with computer laboratories, science laboratory, mathematical laboratory and classrooms.

The General Studies Department strives to produce excellent students in both cognitive and spiritual faculties. For that end, the department provides courses that complement the programmes offered by the main departments.

The English courses prepare the students with the essential knowledge and skills in communication to meet the challenges in their future workplace. Apart from that, students are also nurtured with the teachings of Islam, moral values and the knowledge of Islamic civilization.

This department comprises the Head of Department, together with three Heads of Course and also lecturers from the English Language Unit, the Islamic Education and Moral Studies Unit and Co-curriculum Unit. Furthermore, the department has three language laboratories that are equipped with the necessary peripherals to enhance the languages' learning and teaching sessions.

Lastly, it is with high expectation that this Programme Handbook will enlighten the students regarding the courses offered by the Department of General Studies, Politeknik Muadzam Shah.

SYNOPSIS & COURSE LEARNING OUTCOME (CLO) FOR ALL COURSES

SYNOPSIS AND COURSE LEARNING OUTCOME

Compulsory

COURSE CODE	CREDIT HOUR	SYNOPSIS	CLO
DUE10012 Communicative English 1	2	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.	CLO1 : Participate in a discussion using effective communication and social skills to reach an amicable conclusion by accommodating differing views and opinions (A3 , CLS 3b) CLO2 : Demonstrate awareness of values and opinions embedded in texts on current issues (A3 , CLS 3b) CLO3 : Present a topic of interest that carries identifiable values coherently using effective verbal and non-verbal communication skills (A2 , CLS 4)
MPU24XX1 Sukan/Unit Beruniform 1	1	SUKAN adalah aktiviti yang mengandungi latihan kemahiran berguna secara rekreasi dan peraturan-peraturan tertentu dalam mengejar kecemerlangan bagi penguasaan pengetahuan dan kemahiran khusus secara holistik bagi mengukuhkan pembentukan kemahiran insaniah pelajar yang positif.	CLO1 : Mempamerkan kemahiran khusus bagi kursus berkaitan. (P2 , CLS 4) CLO2 : Menunjukkan kepimpinan dan kerja berpasukan berdasarkan penguasaan kemahiran dan amalan positif. (A3 , CLS 3d)
MPU 24021 Kelab/Unit Beruniform 2	1	KELAB memfokuskan kepada penguasaan pengetahuan dan kemahiran khusus secara holistik bagi mengukuhkan pembentukan kemahiran insaniah pelajar yang positif.	CLO1 : Mempamerkan kemahiran khusus bagi kursus berkaitan. (P2 , CLS 4) CLO2 : Menunjukkan kepimpinan dan kerja berpasukan berdasarkan penguasaan kemahiran dan amalan positif. (A3 , CLS 3d)

SYNOPSIS AND COURSE LEARNING OUTCOME

Compulsory

COURSE CODE	CREDIT HOUR	SYNOPSIS	CLO
MPU23052 Sains, Teknologi dan Kejuruteraan Dalam Islam	2	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.	CLO1 : Melaksanakan dengan yakin amalan Islam dalam kehidupan seharian (A2 , CLS 4) CLO2 : Menerangkan etika dan profesionalisme berkaitan sains teknologi dan kejuruteraan dalam Islam(A3 , CLS 5) CLO3 : Menghubungkait minda ingin tahu dengan prinsip syariah, etika dan kaedah fiqh dalam bidang sains, teknologi dan kejuruteraan menurut perspektif Islam(A4 , CLS 4)
MPU23042 Nilai Masyarakat Malaysia**	2	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.	CLO1 : Membincangkan sejarah dan nilai dalam pembentukan masyarakat di Malaysia(A2 , CLS 4) CLO2 : Menerangkan etika dan profesionalisme terhadap konsep perpaduan bagi meningkatkan semangat patriotisme masyarakat Malaysia(A3 , CLS 5) CLO3 : Menghubungkait minda ingin tahu dengan cabarancabaran dalam membentuk masyarakat Malaysia (A4 , CLS 4)

SYNOPSIS AND COURSE LEARNING OUTCOME

Compulsory

COURSE CODE	CREDIT HOUR	SYNOPSIS	CLO
DUE30022 Communicative English 2	2	COMMUNICATIVE ENGLISH 2 emphasises the skills required at the workplace to describe products or services as well as processes or procedures. This course will also enable students to make and reply to enquiries and complaints.	CLO1 : Describe a product or service effectively by highlighting its features and characteristics that appeal to a specific audience(A3 , CLS 3b) CLO2 : Describe processes, procedures and instructions clearly by highlighting information of concern (A3 , CLS 4) CLO3 : Demonstrate effective communication and social skills in handling enquiries and complaints amicably and professionally (A3 , CLS 3b)
MPU21012 Pengajian Malaysia	2	PENGAJIAN MALAYSIA membincangkan sejarah dan politik, perlembagaan Malaysia dan sistem pemerintahan negara, kemasyarakatan dan perpaduan, pembangunan negara dan isu-isu keperihatinan negara. Kursus ini adalah bertujuan untuk melahirkan graduan yang mempunyai identiti kebangsaan dan semangat patriotisme yang unggul.	CLO1 : Menerangkan nilai sejarah bangsa dan negara di Malaysia (A3 , CLS 5) CLO2 : Menghubungkait sikap dan tanggungjawab yang signifikan dengan sistem pemerintahan negara (A4 , CLS 5) CLO3 : Membentuk minda ingin tahu menerusi aktiviti kemasyarakatan atau patriotisme dalam kalangan pelajar (A3 , CLS 4)

SYNOPSIS AND COURSE LEARNING OUTCOME

Compulsory

COURSE CODE	CREDIT HOUR	SYNOPSIS	CLO
DUE50032 Communicative English 3	2	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.	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	2	ENTREPRENEURSHIP 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.	CLO1 : propose the value proposition of entrepreneurial idea using Business model Canvas (A3 , CLS 3b) CLO2 : develop a viable business plan by organizing business objectives according to priorities (A4 , CLS 4) CLO3 : Organize the online presence business in social media marketing platform (A3 , CLS 4)

COURSE CODE	CREDIT HOUR	SYNOPSIS	CLO
DUW10022 Occupational Safety and Health for Engineering	2	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, Emergency Preparedness and Response (EPR), fire safety, Hazard Identification, Risk Control and Risk Assessment (HIRARC) and guide the students gradually into this multi-disciplinary science.	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 : Forms communication skills in a team to respond for an accident action at workplace.(A3, PLO 10)
DBS10012 Engineering Science	2	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.	CLO1 : Use basic physics concept to solve engineering physics problems (C3, CLS 1) CLO2 : Apply knowledge of fundamental physics in activities to mastery physics concept(C3, CLS 1) CLO3 : Perform appropriate activities related to physics concept(P3, CLS 3a)

COURSE CODE	CREDIT HOUR	SYNOPSIS	CLO
DBM10013 Engineering Mathematics 1	3	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.	CLO1 : Use mathematical statement to describe relationship between various physical phenomena.(C3, CLS1) CLO2 : Show mathematical solutions using the appropriate techniques in mathematics. (C3, CLS 3c) CLO3 : Use mathematical expression in describing real engineering problems precisely, concisely and logically. (A3 , CLS 3b)
DBM20023 Engineering Mathematics 2	3	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.	CLO1 : Use algebra and calculus knowledge to describe relationship between various physical phenomena.(C3, CLS 1) CLO2 : Solve the mathematical problems by using appropriate and relevant fundamental calculus techniques. (C3, CLS 3c) CLO3 : Use mathematical language to express mathematical ideas and arguments precisely, concisely and logically in calculus. (A3, CLS 3b)

COURSE CODE	CREDIT HOUR	SYNOPSIS	CLO
DBM30033 Engineering Mathematics 3	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 methods. In order to strengthen the students in solving engineering problems, Ordinary Differential Equation (ODE) is also included. In additional, the course also discusses optimization problems by using Linear Programming. It is designed to build students' teamwork and problems solving skill.	CLO1 : Demonstrate an understanding of the common body of knowledge in mathematics.(C3, CLS 1) CLO2 : Demonstrate problems solving skills in engineering problems.(C3, CLS 3c) CLO3 : Use mathematical expression in describing real engineering problems precisely, concisely and logically. (A3, CLS 3b)
DJJ40132 Engineering Society	2	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.	CLO 1: Implement the roles of engineering profession towards the developing of society and its challenges in globalization (C3,PLO6) CLO 2 : Determine the important of work ethics, bylaws and professionalism in engineering profession. (C4,PLO8) CLO3 : Determine the needs for sustainable and green engineering towards providing the solutions in engineering field. (C4,PLO7)

COURSE CODE	CREDIT HOUR	SYNOPSIS	CLO
DJJ10013 Engineering Drawing	3	ENGINEERING DRAWING course provides the students with the fundamentals oft echnical 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.	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 following engineering norms and practices in engineering drawing.(A3, PLO8)
DJJ10022 Mechanical Workshop Practice 1	2	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.	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)

COURSE CODE	CREDIT HOUR	SYNOPSIS	CLO
DJJ10033 Workshop Technology	3	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).	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 component(C3, PLO8) CLO3 : Demonstrate continuous learning and information management skills to complete assigned task(A3, PLO12)
DJJ20053 Electrical Technology	3	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.	CLO1 : Explain the principles and fundamental of electrical circuits, electromagnetism, transformers and electrical machine (C2, PLO1) CLO2 : Solve the problem related to electrical circuits, electromagnetism, transformers and electrical machine (C3, PLO1) CLO3 : Organize appropriately experiments in groups according to the Standard Operating Procedures. (P4, PLO5)
DJJ20063 Thermodynamics	3	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.	CLO1 : Explain fundamentals concept and properties of pure substances in thermodynamics (C2, PLO1) CLO2 : Apply Laws of thermodynamics and it processes (C3, PLO1) CLO3 : Organize appropriately experiments according to the Standard Operating Procedures (P4, PLO5)

SYNOPSIS AND COURSE LEARNING OUTCOME

Discipline Core

COURSE CODE	CREDIT HOUR	SYNOPSIS	CLO
DJJ20073 Fluid Mechanics	3	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.	CLO1: Explain the fundamentals of fluid (C2, PLO1) CLO2: Solve problems related to fluid properties, fluid statics and fluid dynamics(C3, PLO1) CLO3: Organize appropriate experiments in groups according to the standard operating procedures (P4, PLO5)
DJJ30113 Material Science and Engineering	3	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.	CLO1 : Apply the fundamental of material science to identify the materials, properties, behavior, processes and treatment.(C3 ,PLO1) CLO2 : Performed appropriate material testing according to the Standard Operating Procedures.(P4 , PLO5) CLO3 : Demonstrate the ability to work individually and in groups to complete assigned tasks during the practical work session.(A3 ,PLO9)
DJJ30093 Engineering Mechanics	3	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.	CLO 1:solve problems related to static and dynamics based on the concepts and principle of engineering mechanics (C3, PLO 1) CLO 2:analyze engineering related problems based on fundamentals of static and dynamics(C4, PLO 2) CLO 3:organize appropriately experiment in groups according to Standard Operation Procedures (P4, PLO 5)

SYNOPSIS AND COURSE LEARNING OUTCOME

Discipline Core

COURSE CODE	CREDIT HOUR	SYNOPSIS	CLO
DJJ 30103 Strength of Materials	3	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.	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
DJJ40153 Pneumatic & Hydraulics	3	PNEUMATICS & HYDRAULICS provides knowledge and understanding to the importance of pneumatics and hydraulics circuits, equipment and design along with its usage in the industry.	CLO1: Analyze the basic concept and function of pneumatics and hydraulics system. (C4,PLO2) CLO2: Construct pneumatic, electro-pneumatic and hydraulic circuit according to assigned tasks. (C5, PLO3 & P4, PLO4) CLO3: Demonstrate understanding of engineering norm and practices in pneumatics and hydraulics during practical work sessions. (A3, PLO8)
DJJ40182 Project 1	2	PROJECT 1 prepares students with basic skills knowledge in preparing research proposal and a well written paperwork. This module emphasize on personal development in preparing a good presentation.	CLO1: Organize research or project systematically. (C5) CLO2: Demonstrate good communication skill of oral presentation in group. (A3) CLO3: Demonstrate continuous learning and information management skill while engaging in independent acquisition of new knowledge and skill to develop a project . (A3)

COURSE CODE	CREDIT HOUR	SYNOPSIS	CLO
DJJ50193 Project 2	3	PROJECT 2 introduces the students to the concepts of conducting a design or case study. The students select a project, list the project's needs, the processes involved, cost estimation, project schedule by applying appropriate methodology in the project planning. It also involves project implementation, project report and presentation	CLO1: develop creative solution to solve the problems in the project design or case study (C5, PLO3) CLO2: organize the selected design or case study based on the project planning (P5, PLO4) CLO3: demonstrate good communication skills of presentation in group (A3, PLO6) CLO4: demonstrate ability to lead a team to complete assigned project during practical work sessions (A3, PLO7) CLO5: demonstrate awareness of management, business practices and entrepreneurship related to product of project (A3, PLO9) CLO6: demonstrate awareness of social responsibility in practical work procedure and practices (A3, PLO10)

COURSE CODE	CREDIT HOUR	SYNOPSIS	CLO
DJD11012 Product Design 1	2	PRODUCT DESIGN 1 covers the history of design and the basic principles of design. Student will be able to learn the fundamental concepts for designing the products. They also are able to acquire analytical thinking through critic session. This course also provides the basic knowledge for graphic aids presentation and present the economic and environment impact on design development.	CLO1 : Capture the history of product design and philosophy behind the design and manufactured products (C3, PLO1) CLO2 : Display the basic element knowledge and principles of design the artwork (P4, PLO5) CLO3 : Explain the economic and environment impact on design development (A3, PLO7)
DJD21012 Product Design 1	2	PRODUCT DESIGN 2 is one of the subjects that emphasizes practical aspects and uses CAD Software technology. Students will be taught on the steps to produce a product. Firstly, the students will be able to analyze the product and produce the sketches. Then, students are required to enter the workshop to produce the product using the appropriate material. Ultimately, students are required to present a presentation on the product produced with the necessary documents in the presentation.	CLO1 : Construct an advance sketches or drawings with proper technique (P3, PLO3) CLO2 : Organizes detail drawing base on technical specification and model making through the latest technology (P4, PLO5) CLO3 : Demonstrate the design and project systematically based on society, safety,legal and cultural issues that are relevant to engineering (A3, PLO6)

COURSE CODE	CREDIT HOUR	SYNOPSIS	CLO
DJD 31022 CAD and Rapid Prototyping	2	CAD and Rapid Prototyping will expose the student to Advance Computer Aided Design (Solid Modeling) Software. Students will be able to sketch and create a solid model part using the software, then; they will create an assembly model consisting of components. The student will be introduced to the Reverse Engineering and Rapid Prototyping processes that are relevance to the design process.	CLO1 : Construct a 3D solid model part from sketches and reverse engineering method AND prepare rapid prototyping and 2D drafting (C3, PLO3) CLO2 : Construct 3D solid model, assembly and drafting using 3D CAD software by using reverse engineering to produce rapid prototyping (P4, PLO5) CLO3 : Demonstrate the ability to work in team to complete assigned tasks. (A3, PLO9)
DJF41012 Product Design and Development	2	PRODUCT DESIGN AND DEVELOPMENT covers the development of design ideas, specifications and solutions, based on design and development process, it considers the current market demands starting from product planning until realization of the product.	CLO1 : Construct a 3D solid model part from sketches and reverse engineering method AND prepare rapid prototyping and 2D drafting (C3, PLO3) CLO2 : Construct 3D solid model, assembly and drafting using 3D CAD software by using reverse engineering to produce rapid prototyping (P4, PLO5) CLO3 : Demonstrate the ability to work in team to complete assigned tasks. (A3, PLO9)

COURSE CODE	CREDIT HOUR	SYNOPSIS	CLO
DJD41032 Ergonomics	2	ERGONOMICS covers the introduction to ergonomics, human biomechanics, anthropometry, the design of controls and displays, ergonomics approach in product design and design applications. Students are made aware of human factors considerations in product design.	CLO1 : analyze the ergonomics factors towards human biomechanics and anthropometry needed in work systems involving people and machine (C4, PLO2). CLO2 : illustare the ergonomics approaches on workstation, device or product design (C4, PLO3) CLO3 : justify the ergonomics approaches used on the proposed design (A3,PLO12)
DJD42012 CAD/CAM Technology	2	CAD/CAM TECHNOLOGY is an introduction course to basic CAD/CAM technology and its application. The student will be exposed to the application of CAD/CAM software in designing geometric modelling and part programming. Basically, the topics covered 3D modelling, generating 2D graphic element, geometric modelling system, generative or interactive drafting, CAD and CAM integration and CAD/CAM programming. The student also will be able to do simulation and part programming before starting the machining operation. At the end of the course the student will be able to produce a product or part using an advance machining center.	CLO1 : apply CAD/CAM in Product Design (C3, PLO3) CLO2 : construct basic part using CAD Software and generate machine code using CAM software (P4, PLO5) CLO3 : demonstrate ability to work in teams to produce the final product(A3, PLO9)

COURSE CODE	CREDIT HOUR	SYNOPSIS	CLO
DJD52023 Manufacturing Process	3	MANUFACTURING PROCESS provides knowledge on concepts of fundamental manufacturing, metal casting process, forming and shaping process and powder metallurgy. This course also provides knowledge in manufacturing processing parameters that influence design consideration and produce a quality product.	CLO 1 : Illustrate the various metal casting processes, forming and shaping processes, plastics and composite material processes, and powder metallurgy process. (PO 2, C4) CLO 2 : Perform the influence of manufacturing processes on the design of a product. (PO5, P4) CLO 3 : Describe the different types of process sequence, concept and equipments need for metal casting processes, forming and shaping process, plastics and composite material processes, and powder metallurgy process. (PO12, A3)
DJD53012 Operations Management	2	OPERATIONS MANAGEMENT focuses on the understanding of problem solving techniques and operations management strategies. Students will be introduced to several tools used in decision making and management strategic planning. Every aspect in management is explained starting from the introduction to operations management, decision making tools, strategic decision in operation management, project management and quality management.	CLO1 : integrate problem solving skills to conduct operations management (C4, PLO4) CLO2 : demonstrate knowledge of effective operation management, project management and quality management. (C3, PLO11) CLO3 : share information, views and suggestions from exploration of issues related to operations management. (A3, PLO12)

COURSE CODE	CREDIT HOUR	SYNOPSIS	CLO
DJV20012 Automation Programming	2	AUTOMATION PROGRAMMING course provides knowledge relating to the concept and basic principles of programming using a C/C++ language. The emphasis of this course is to understand use of objects, language structures and program structures. This course also provides knowledge and practical skills to develop complete programming tasks through various visual programming techniques.	CLO1 : Classify the basic commands, types of data, operators, expressions and logical structure in C/C++ programming (C3,PLO1) CLO2 : Construct appropriate C/C++ programmes according to the instruction given. (P3,PLO5) CLO3 : Develop a program structure using C/C++ software in group. (A4,PL09)
DJF51082 Quality Control	2	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.	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. (A3, PLO9)

COURSE CODE	CREDIT HOUR	SYNOPSIS	CLO
DJF51072 Jig and Fixture Design	2	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.	CLO1 : Apply the concepts and principles of jigs and fixtures in design. (C3, PLO2) CLO2 : Calibrate the 3D design by using CAD/CAM software to plan and devise mini project. (P4, PLO3) CLO3 : Demonstrate convictions towards environment and sustainability to complete assigned tasks during mini project sessions.(A3, PLO7)
DJF51092 Tool Design	2	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.	CLO1 : Apply appropriately the concepts of tool design method and tooling material selection in designing tools.(C3, PLO2) CLO2 : Perform the simulation of mould, tool and die design using CAD/CAM software.(P4, PLO3) CLO3 : Demonstrate conviction towards environment and sustainability to complete assigned tasks during practical work sessions.(A3, PLO7)

COURSE CODE	CREDIT HOUR	SYNOPSIS	CLO
DJM30062 Industrial Electronics	2	INDUSTRIAL ELECTRONICS provides exposure to mechanical, electrical and electronic devices. This course discusses structures of circuits, switches, relays, solenoids, sensors and telemetry systems.	CLO1 : Explain the function of operational principal of switch, relay, solenoid, sensor and telemetry system (C2, PLO1) CLO2 : Display types of switches, relay, solenoid and sensors according to operational principle (P4, PLO5) CLO3 : Comply the switches, relay, solenoid, electronic control devices, converter and sensors in various circuit (A2, PLO10)
DJM42032 Instrumentation and Control	2	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	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

STUDENT SUPPORT SERVICES

ACCOMMODATION

Hostel – Conducive, safe, comfortable and peaceful accommodation for learning

Accommodation in the hostel:
New students – will be given priority
Existing students – accommodation will be offered if vacant room is available through the selection process based on the criteria determined by Polytechnic. The criteria includes social economic, home distance, academic and co-curriculum achievement, contribution and disciplinary performance.

Capacity:

Total Block	4 (Male)	6 (Female)
Total Room	536	804
Total Beds	1440	2160

Supporting Facilities:

Facilities	Capacity
Hostel Office	Hostel Supervisor Office and Warden Office
Cafeteria	4 Food Stalls
Recreation Room	At each Block (1 room)
Reading Room	At each Block (1 room)
Surau	At each Block (1 room)
WIFI	At Recreation Room and Reading Room

HEALTH SERVICES

- Equipped with first aid facility.
- Hostel Supervisors are responsible to provide transportation service for sick students when medical treatment is needed in the office hour. While this duty will be taken by wardens after office hour.
- Periodic food quality monitoring in the cafeteria/canteen will be carried out periodically.

INSURANCE

GROUP TERM FAMILY TAKAFUL OF POLITEKNIK MUADZAM SHAH

INSURANCE OVERVIEW

All the students are insured using Takaful protection known as 'Group Term Family Takaful'. Agency and Insurance Company The policy chosen is based on Takaful accordance. Generally, the premium, the scope and the sum assured are issued by the insurance company chosen. Currently, the students in Politeknik Muadzam Shah are subjected to Takaful protection by Syarikat Takaful Malaysia Berhad. The following table lists the scope and sum assured by the company.

Company	Scope	Sum Covered
Takaful Malaysia Berhad Premium: RM15.00 yearly Students are insured 24 hours during their studies in Politeknik Muadzam Shah, Pahang	Death (Natural /Disease Cause) Death (Accidental Cause) Total Permanent Disablement (Natural / Disease Cause) Total Permanent Disablement (Accidental Cause) Partial Permanent Disablement (Accidental Cause) Funeral Expenses (Natural / Disease Cause) Funeral Expenses (Accidental Cause) Accidental Medical Reimbursement Hospital Benefit (Accident, Max. 30 days)	RM 5,000.00 RM40,000.00 RM 5,000.00 RM40,000.00 RM40,000.00 RM 750.00 RM1,500.00 RM3,000.00 RM1,500.00 (RM50.00/ day)

Steps to be taken if accidents occur:

i. Students could get medical treatment from Public or Private Hospital
ii. Academic Advisor/Student should inform the details of the accident to the Student Affairs Department within 5 days from the date of occurrence.
iii. The Student Affairs Department will inform the insurance company within 24 hours from the date of report received.
iv. Insurance Claim Form will be given to the student for claim purpose.
v. A completed form with supporting documents should be submitted to the Student Affairs Department for futher process by the insurer.

The supporting documents for the claim:

- A copy of MyKad / IC
- Student card
- A copy of relation document (birth certificate)
- A copy of Police Report/ Factory etc.
- The Doctor's / Medical Report/Post Mortem
- Burial permit (applicable for death claim)
- Driving license (death causes by accident)
- A copy of death certificate (applicable for death claim)
- Others document (if need)

FINANCIAL AID

Scholarships

- Yayasan-yayasan Negeri
- Jabatan Kemajuan Orang Asli (JAKOA)

Loans

- Perbadanan Tabung Pendidikan Tinggi Malaysia (PTPTN)
- Tabung Pinjaman Pendidikan Kementerian Pengajian Tinggi Malaysia (KPT)

PMS provides its community with a wide range of facilities for fitness and leisure activities. The facility provides a comfortable environment for both students and staff to relax and stay fit.

SPORTS & CULTURAL

List of Recreational Facilities & Other Amenities are as in table below:

NO.	RECREATIONAL AND FACILITIES AND OTHERS AMENITIES	QUANTITY
1.	Football Field	1
2.	Rugby Field	1
3.	Netball Court	4
4.	Basketball Court	2
5.	Volleyball Court	4
6.	Tennis Court	4
7.	Futsal Court	2
8.	Badminton Court	8
9.	Gymnasium	1
10.	Archery equipment	4
11.	Tennis Table	5
12.	Sport Complex	1
13.	Squash Court	2
14.	Swimming Pool	1
15.	Wood Ball equipment	10
16.	Golf Equipment	2
17.	Synthetic Track	1
18.	Music equipment	6 Guitar / 1 Drum set / Nasyid Instrument Set
19.	Kayaking equipment	14
20.	Hockey Field	1
21.	Mountain Bike	6
22.	Takraw Court	4
23.	Petanque Court	2

Table: Recreational Facilities & Other Amenities

UNIT OF PSYCHOLOGY & CAREER (UPK)

Unit of Psychology & Career Polytechnic Muadzam Shah (UPK PMS) is the unit responsible for providing effective services to students in particular to the process of enrichment and development expand along with the students' academic development. This unit consists of a Career in Psychology Officer assisted by Guidance & Counseling Department Coordinator appointed by the respective department heads. This unit is responsible for implementing the terms of reference as follows:

1. Managing Individual Counseling Services
2. Managing Group Counseling Services
3. Managing Career Counseling Services
4. Managing Lecture
5. Managing Study Visit
6. Managing Control Workshop / Course
7. Managing Exhibition
8. Managing PRS Polytechnic Training
9. Managing the dissemination of Units of Psychology and Career

NO	FACILITIES
1	Individual Counseling Room- 2
2	Discussion / Group Counseling Room – 1

Table: Facilities

ROLE OF AN ACADEMIC ADVISOR

Academic advising is an essential element of the educational process. The academic advisor is a member of the teaching staff who will be guiding students on academic matters throughout their tenure in the polytechnic.

The role an academic advisor:

- Assists the student in obtaining a well balanced education and in interpreting polytechnic policies and procedures. The academic advisor approves the students' academic schedules each semester
- Advise the students on the courses s h e / he should take during a particular semester.
- Will inform the students about the pre requisites and the minimum or maximum number of credit hours a student is eligible to take.
- Will provide the information about the students GPA , CGPA etc.

ASSESSMENTS

GRADING POINT SYSTEM

- Under Polytechnics' assessment system, student's performance is being measured on the basis of quantitative method and being known as Grading Point System (GPS).

- In the Grading Point System, there are measures to evaluate student's performance:

GRADE POINT AVERAGE (GPA) -PNM

- The average grade of a student for a given semester is being computed by taking the sum of the courses' credit hours and grade point divided by the total credit hours taken in that semester.

- Formula: **GPA =** $\frac{\text{Total credit hours x Grade point}}{\text{Total credit hours taken in that semester}}$

CUMULATIVE GRADE POINT AVERAGE (CGPA) -HPNM

- The sum of the courses' credit hours and the grade point for all courses taken in all semesters, divided by the total credit hours taken in all semesters.

- Formula: **CGPA =** $\frac{\text{Total credit hours x Grade point in all semester}}{\text{Total credit hours taken in all semester}}$

SAMPLE GPA CALCULATION

The table below gives the grades obtained by a student during first semester at diploma level.

CODE	COURSE TITLE	CREDIT HOURS	GRADE ACHIEVED	GRADE POINTS
DUE10012	Communicative English 1	2	A	4.00
MPU24XX1	Sukan	1	B	3.00
DBM10013	Engineering Mathematics 1	3	B+	3.33
DBS10012	Engineering Science	2	A-	3.67
DUW10022	Occupational, Safety and Health	2	A-	3.67
DJJ10013	Engineering Drawing	3	B	3.00
DJJ11012	Product Design 1	2	B+	3.33
DJJ10033	Workshop Technology	3	A	4.00
Credit Total		**18**		

$$GPA = \frac{\Sigma \text{ (Credit hours X Credit points)}}{\Sigma \text{ Total Credit hours}}$$

$$= \frac{\{(2X4) + (1X3) + (3X3.33) + (2X3.67) + (3X3) + (2X3.33) + (3X4)\}}{\{2+1+3+2+2+3+2+3\}}$$

$$= \frac{55.99}{18}$$

$$= 3.11$$

Therefore, **Semester GPA = 3.11**

GRADING SYSTEM

- A student will be evaluated based on the following mark scales, grades and grade points as being outlined in Table below:

Mark Scale	Grade Point	Grade	Status
90 – 100	4.00	A+	High Distinction
80 - 89	4.00	A	Distinction
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
45 – 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

COURSE CREDIT HOUR

- Total credit hours taken by students are in between 12 to 20 credit hours every semester which have been stated in the Curriculum Document and Program Structure.
- A minimum total credit hours shall be fulfilled before the students are qualified to be awarded a Diploma (including advanced diploma) which has also been stated in the curriculum document and program structure.

REGISTER COURSE

- Students must register within fourteen days (14) of the commencement date of each semester.
- Students should get an advice from the Academic Advisor and get approval from the Head of Commerce Department before registering the courses.
- Students should register the repeated course/s in the current semester if that particular course/s being offered except, there was undue circumstances. Therefore, students must get an approval first from the Head of Commerce Department.
- If students fail to register the repeated course/s or any course/s that should be taken in the particular semester:

- The student will be given Grave F with the grade point equivalent to 0.00 for that particular course; and
- The student will be assumed as has already taken the course and failed it.

ADD COURSE

- Course adding can be done on the 3rd until the 6th week of an academic session. Students should get an advice from the Academic Advisor and obtain an approval from the Head of Commerce Department.

DROP COURSE

- Students are allowed to drop the course with one condition that the students' credit hours are not less than 12 hours.
- Course's dropping can be done on the 3rd until the 6th week of an academic session. Students should get an advice from the Academic Advisor or the Head of Program, and obtain an approval from the Head of Commerce Department.

REPEAT COURSE

- Student who fails two or more courses in previous semester is required to repeat that particular course/s in any semester after getting confirmation from the Examination Board.

ASSESMENT RESULT CATEGORY

- Assessment result for each semester can be categorized into:

Pass status

- Student who obtains a CGPA (Cumulative Grade Point Average) equivalent to or more than 2.00.

Conditional pass status

- Student who obtains a CGPA (Cumulative Grade Point Average) equivalent to or more than 1.60 and less than 2.00.

Fail status

- Student who obtains a CGPA (Cumulative Grade Point Average) less than 1.60.
- Student who obtains a GPA (Cumulative Grade Point Average) less than 1.00 except for final semester student and part-time student.
- Student who fails in any courses for three times including the special final examination.
- Student who obtains conditional pass status for three times consecutively.
- Student who fails Training Industry for two times consecutively.
- Student who exceeds the maximum period of study.

CRITERIA TO GRADUATE UNDER NEW GRADING SYSTEM

A student will graduate from his/her studies for a program if he/she fulfills the criteria below:

I. Pass all courses under a program;
II. Obtain a CGPA (Cumulative Grade Point Average) equivalent to or more than 2.00;
III. Obtain sufficient total credit hours for a program;
IV. Student who obtain the minimum passing grade (C-, D+ and D) is allowed to repeat the course only once to improve their grade for the next semester including the short semester. Only the higher grade calculation will be taken into the result without adding the credit hour.
V. Fulfill all program's requirement and certified by the Lembaga Peperiksaan.

PROGRAM DURATION

- Duration of a full-time program are as follows:

  Advanced Diploma (for Diploma graduate)
  - Minimum is four (4) semesters
  - Maximum is eight (8) semesters

  Diploma
  - Minimum is five (5) semesters
  - Maximum is nine (9) semesters

- Student that has been charged disciplinary action (will be suspended under Act 174) is included in the duration of study.
- The period of deferment that has been approved by the Director of Polytechnic will not be computed as part of the period of study.

ALUMNI

- The alumni assist students preparing for their professional future through:
  Their own success stories
  Career Information
  Seminars/Talks on career
- Alumni/polytechnic graduates are expected to provide their feedback through the Tracer Study which is carried out annually. 85% of polytechnic graduates take part in this Tracer Study in order to provide their feedback pertaining to the curriculum taught and their mandatory 6-month industrial experience. All these Input serves provide the basis for curriculum development, achievement of learning outcomes and future programs.
- Details of Alumni of Politeknik Muadzam Shah are as follows:

Address : **PERSATUAN ALUMNI POLITEKNIK MUADZAM SHAH**
Politeknik Muadzam Shah
Lebuhraya Tun Abdul Razak
26700 Muadzam Shah
Pahang Darul Makmur
No Telefon : 09 – 4502005
No. Faks : 09 – 4502009
Website : https://pms.mypolycc.edu.my/

INDUSTRIAL TRAINING

INTRODUCTION TO INDUSTRIAL TRAINING

Industrial Training (LI) is part of the curriculum requirements that must be fulfilled by the students before they are awarded with Diploma from Polytechnic. Diploma students will undergo their LI in last semester.

Duration of the LI is 20 weeks where the students are spreads to selected firms and organizations all over the country. LI programme will be conducted on December and June session every year. Before the students are allowed to undergo the LI, they should pass all the course in programme structure.

PREPARATION FOR INDUSTRIAL TRAINING

Once eligible, the students need to follow proper procedures for the LI. Each student must attend the LI Preparation Briefing by Industrial Training Unit. The students are required to apply for LI placement from the firms or organizations that offered LI via the Industrial Training Officer of Department (PLIJ) respectively. It is advisable that the LI should be relevant to the students' academic courses of study.

The following documents will be issued by the PLIJ to be used in the application for a placement in the firms or organizations:

- Industrial Training Application Letter/*Surat Memohon Tempat Latihan Industri* - that has Polytechnic's letterhead
- Reply Form/*Borang Jawapan* - that has to be submitted to the firms/organizations

INDUSTRIAL TRAINING

DURING INDUSTRIAL TRAINING

The confirmation of the LI attachment is done when the students submit the following documents for verification purpose on the registration of the LI day at each respective firms/organizations:

- Letter of Report Duty/*Surat Lapor Diri* - that has Polytechnic's letterhead
- Polytechnic Student's ID card/*Kad Pelajar*
- Reflection Journal
- Self Confirmation Card/ *Kad Pengesahan Lapor Diri*
- Student Information Card & Location Plan/ *Kad Maklumat Pelajar & Pelan Lokasi*

An academic supervisor will be assigned to each of the students. The academic supervisor (or representative) will visit the students at the firms/organizations during the LI and thus, will be evaluated :

- My Internship Reflection
- Reflection Journal
- Draft of Industrial Training report
- Student Recommendation/ suggestion about the training

COMPLETION OF INDUSTRIAL TRAINING

After completing the six months of LI, the students are required to re-register to the Polytechnic with :

- End of Training Confirmation Letter from firms/organizations
- LI Performance Assessment by firms/organizations (Practical Task form & Reflective Journal form)
- Reflection Journal
- Final Report on Industrial Training
- Present about the training to the polytechnic evaluation panel

Squash Court

Multipurpose Court

Swimming Pool

Futsal Court

Tennis Court

Basketball Court

Gym

Football Field

Jogging Track

Rugby Field

Volley Ball Court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All feedback or suggestions for the Handbook should be directed to Administrator of Department of Mechanical Engineering Politeknik Muadzam Shah

DEPARTMENT OF MECHANICAL ENGINEERING
Politeknik Muadzam Shah
Lebuhraya Tun Abdul Razak
26700 Muadzam Shah, Pahang Darul Makmur

https://pms.mypolycc.edu.my/
No Tel : 09 - 450 2005 / 2006 Fax : 09 - 450 2009

Facebook Page: https://www.facebook.com/jkmpms/