KEMENTERIAN PENGAJIAN TINGGI

POLITEKNIK MALAYSIA MERLIMAU

PROGRAMME HANDBOOK

MECHANICAL ENGINEERING DEPARTMENT

DIPLOMA IN MECHANICAL ENGINEERING (MANUFACTURING)

(DTPJ)

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https://www.pmm.edu.my
06-2636687
06-2636678

Sixth Edition

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PREFACE

Bismillahirrahmanirrahim

Assalamulaikum w.b.t and Salam Sejahtera.

Dear Students,
First and foremost, I would like to welcome you to our beloved Politeknik Merlimau (PMM). As you can see, the atmosphere and the ambience here are very conducive for teaching and learning.
As we are aware, the industry requires graduates who are knowledgeable and have impeccable track records and self-discipline. We in PMM have taken measures to ensure all these requirements are met.
Furthermore, in order to add value to our graduates, we greatly emphasize our students to be involved in co-curricular activities, especially the uniformed bodies.
I believe that with the quality courses offered by the Civil, Electrical and Mechanical Engineering Departments as well as Commerce and Tourism and Hospitality, we would be able to produce high quality of towering personality graduates who would contribute to the development of our nation.
I am looking forward to meeting you and I hope that you would take advantage of all the facilities provided in order for you to attain the best knowledge and become the contributing citizen for our beloved Malaysia.

Thank you.
Sincerely,

Mohd Hatta bin Zainal
Director
Politeknik Merlimau

PREFACE

Assalamualaikum w.b.t and Salam 1 Malaysia

.

I am happy to note that we are able to come up with this Programme Handbook to facilitate students with the information on our Politeknik Merlimau and Department of Mechanical Engineering. Our is dynamic and ever-evolving that offers students the opportunity to become excellent. Using innovative teaching methodologies and technology integration, the department sets its standard for student success both in the classroom and in the workplace. The department, staff and administration welcome you to our family. This Programme Handbook will be the initial window to the information on the engineering programmes being offered by this department.

The programmes offered are Diploma in Mechanical Engineering or DKM, Diploma in Mechanical Engineering (Manufacturing) or DTP and Diploma in Mechatronic Engineering or DEM. Those programmes cater to four categories of courses or subjects. It means that students have to complete all the courses listed for their programmes in order to graduate. The four categories of courses are the core, elective, compulsory and common courses.

Having had their life in PMM, the students are exposed to various kinds of activities whether the activities are academic-based or non-academic-based. Amongst those activities are Innovation, Pre-graduation Night, Industrial Attachment, Head of Department Award/List, Collaboration and Community Service. The activities organised gear the students to develop themselves into a more competitive and resourceful people that would lead to the creation of towering personality graduates.

This department provides a vast range of facilities which are like Fitting and Machining Workshop, Welding Workshop, Foundry Workshop, Plant Laboratory, Strength of Materials Laboratory, CADCAM Laboratory, Metrology Laboratory, Instrumentation and Control Laboratory, M-CAD 1 Laboratories, Metallurgy Laboratory, Mechanics of Machines Laboratory, lecture room, Lecture Hall and Drawing Room.

To conclude, I would like to express my highest appreciation and gratitude to all who have contributed to the programme handbook for the Department of Mechanical Engineering. May I wish and sincerely hope that this initiative will be of immense help for the students.

Thank you.

Azlan Shah Bin Kamaruddin
The Head of Mechanical Engineering Department
Politeknik Merlimau

INTRODUCTION

Politeknik Merlimau (PMM) is the 14th polytechnic of the Department of Polytechnic Education Ministry of Higher Education. PMM is located in the District of Merlimau, 26 kilometers south of the state capital city, Melaka Historical City.

Established in 2002, PMM started in Politeknik Melaka (back then was Politeknik Kota Melaka). Moving to its own Merlimau campus in the end of 2002, Politeknik Merlimau since then has risen to the forefront of achievements in various fields, emerging as the catalyst polytechnic in academic, innovation as well as social responsibilities activities.

The PMM campus is spread across the area of 100 acres which houses seven academic departments, two non-academic departments and twelve supporting service units. Those academic departments consist of five main departments and two ancillary departments. The main departments are the Department of Civil Engineering, Department of Electrical Engineering, Department of Mechanical Engineering, Department of Commerce and Department of Hospitality and Tourism. The ancillary departments, on the other hand, are the Department of Mathematics, Science & Computer and Department of General Studies.

PMM believes that learning environments play a critical role in the development of strong learning communities which is one of the key aims of curriculum evolution at PMM. These communities are supported by place, technology and cohort-targeted of diploma graduate students. Thus, PMM provides a wide range of facilities and spaces that can be utilized by both the staff and students of PMM such as the CIDOS e-learning tools which serves as the Learning Management System. It is developed for the purpose of teaching and learning processes continuous improvement.

PMM provides a broad-based curriculum underscored by multi-disciplinary courses with the enrichment of the ancillary department's courses which are aligned with the transformative pillars of the Department of Polytechnic Education, Ministry of Higher Education. The classroom lessons and activities are based on sound principles of pedagogy and practice where lectures are given in English. These promote to nurture well-rounded graduates characterized by innovative thinking and relevant skills to thrive in a knowledge economy.

All in all, PMM provides students an ideal, supportive and innovative environment in which students can find their future direction, while making full use of their valuable time. This is further enhanced with practicality, entrepreneurship, and the pursuit of academic and management excellence. It is hoped that the well-rounded graduates enveloped with outstanding leadership qualities will enable them to make valuable contributions to tomorrow's society .

VISION & MISSION

VISSION

To Be the Leading-Edge TVET Institution

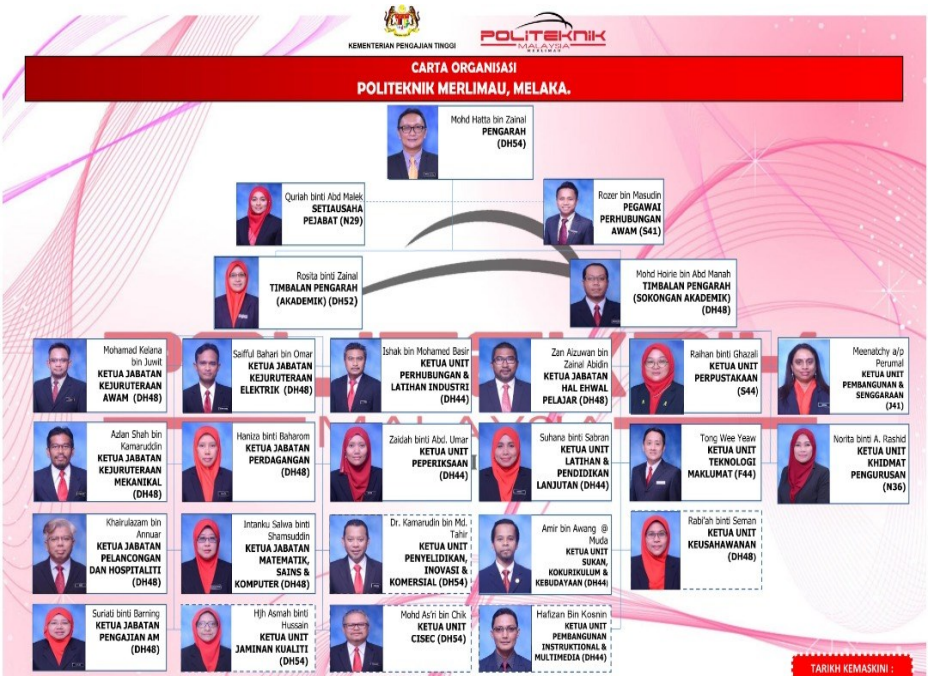
TAG LINE

Expertise For Excellence, X4X

MISSION

1.To develop holistic, entrepreneurial and balanced TVET graduates through dynamic education in-line with the current Industrial Revolution.
2.To capitalise on smart partnership with stakeholders.
3.To empower communities through life-long learning, research and innovation.

MANAGEMENT ORGANISATION



OUTCOME BASED EDUCA-

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 Educatio (OBE) 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 5.1 below.

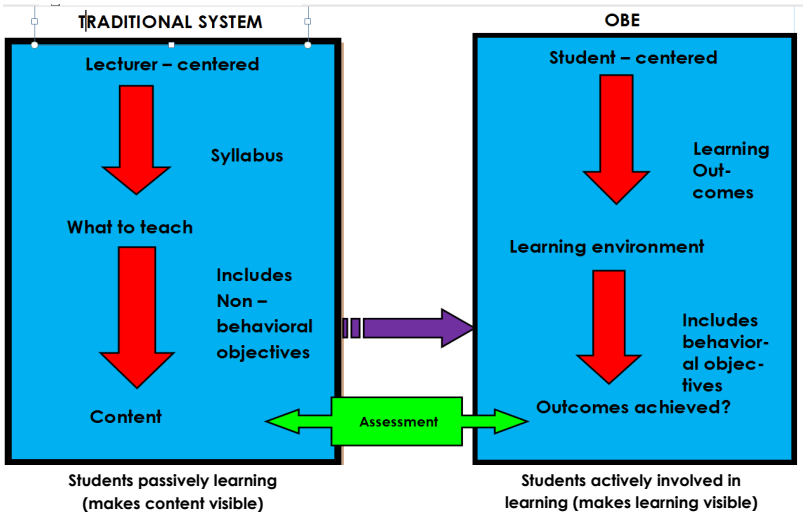
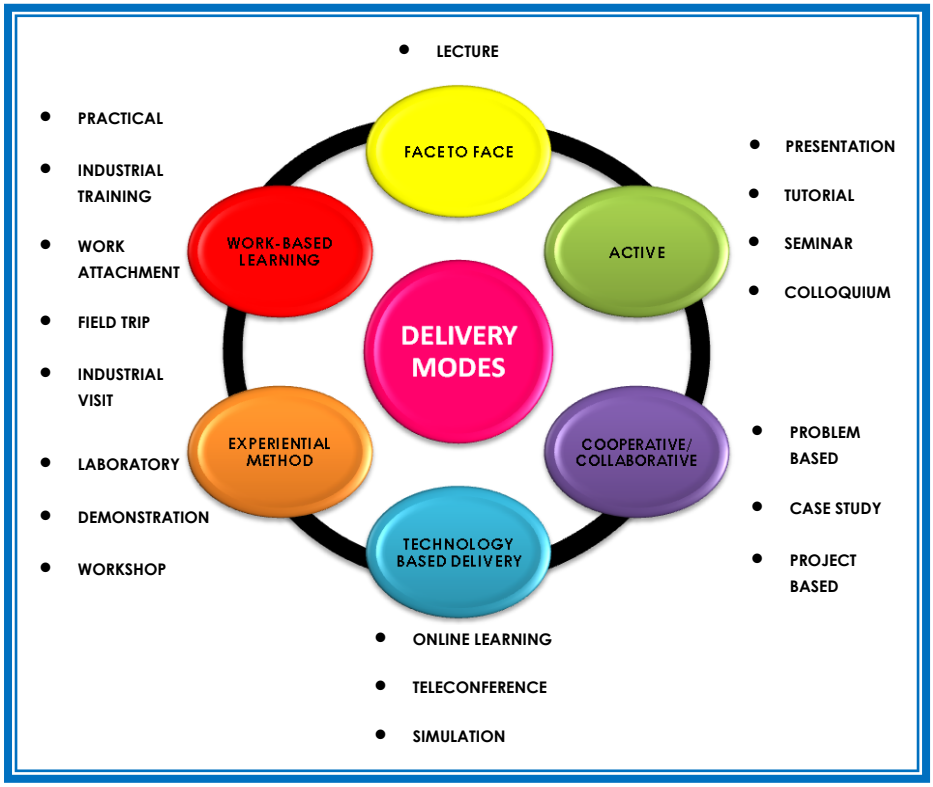


Figure 5.1: A Paradigm Shift for Educational System

DELIVERY MODES

The diversity of teaching and learning methodologies can be adapted by lecturers as to cater to the hetrogeneous or different students' potentials. This is important to ensure that different students are at the maximum level while the less potential ones are not left behind. Figure 5.2 shows that there are many modes of delivery that can be employed to suit various teaching and learning purposes.



OUTCOME BASED EDUCA-

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 .

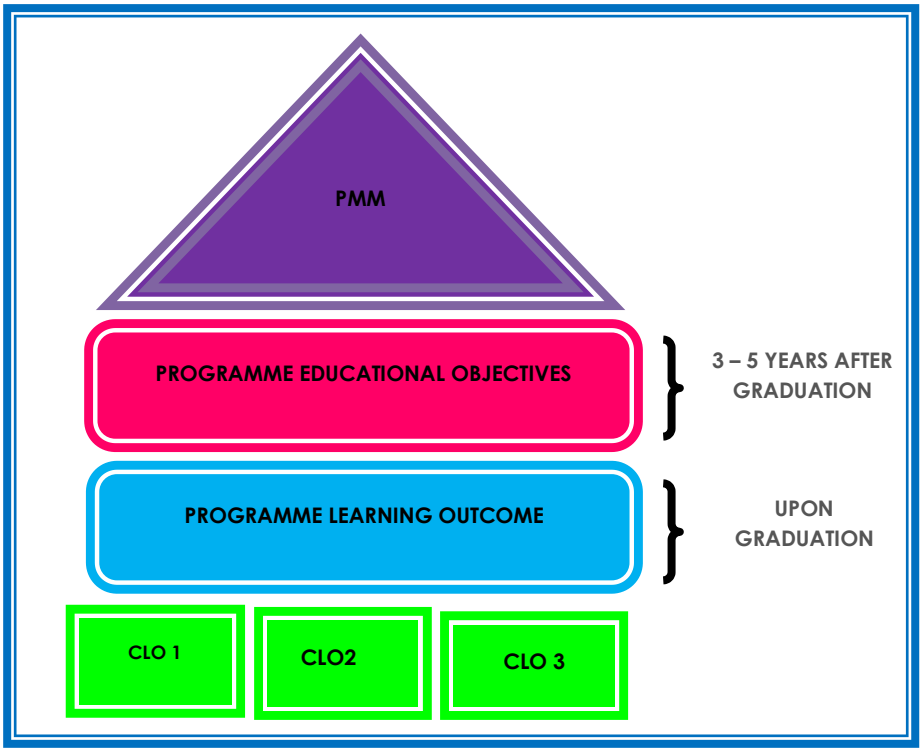


Figure 5.3 : OBE Educational Framework

FORMATION OF LEARNING OUTCOMES

The achievement of students is measured by learning outcomes. These learning outcomes should specify the competencies acquired by students upon completion of their studies. The Learning outcome consist of 8 domains that have been clustered into 5 clusters. The diagram Malaysian Qualifications Framework 2nd Edition: Level Descriptors below shows the cluster ;

MQF LEVEL	Summary of Learners' Profile	CLUSTER 1: Knowledge and Understanding	CLUSTER 2: Cognitive skills	CLUSTER 3: FUNCTIONAL WORK SKILLS				CLUSTER 4: Personal and entrepreneurial skills	CLUSTER 5: Ethics and Professionalism
				Practical skills	Interpersonal and Communication Skills	Digital and Numeracy Skills	Leadership, Autonomy and Responsibility		
Level 4 DIPLOMA	Learners will have a broad knowledge of the general theories, principles and demonstrate skills in a focused area of study/ discipline enabling them to undertake specialized work leading to a career path in technical, professional or management fields. Learners express interest in pursuing further education. Learners will have a commitment for appropriate ethical behavior and express an appreciation of national aspirations within global perspectives.	Demonstrate systematic comprehension (understanding) of a broad range of complex technical and theoretical knowledge and skills to undertake varied, complex, routine and non-routine tasks/ study within afield/ discipline.	Identify, interpret, apply and evaluate general concepts, theory and/ or operational principles within a well-defined context of a subject/discipline and/or work with minimal supervision. Solve problems of a common and well- defined kind as well as those others of a non-routine nature.	Apply a limited range of practical skills, essential tools, methods and procedures to perform required tasks/work. Reflect and make adjustments to Practices and processes, as necessary, related to routine or non- routine tasks.	Communicate clearly, both orally and in writing, ideas, information, problems and solutions, to others including peers, experts and non-experts. Interact effectively, individually or as member of a team with supervisors, Peers and subordinates. Demonstrate a high level of proficiency in at least one other language besides the national language.	Use a range of digital applications to support study /work as well as to seek and process data related to work or study. Demonstrate skills to use and interpret routine and complex numerical and graphical/visual data.	Perform work with significant degree of personal responsibility and autonomy under broad guidance and direction on well- defined and non- routine study /work activities performed in a variety of contexts. Lead and manage diverse teams to manage issues at work.	Identify self-improvement initiatives and possibilities for further education. Develop realistic Career and professional goals. Explore and engage in activities relating to entrepreneurship. Show interest in and participate at professional and civic activities leading to local and region wide communities building.	Demonstrate ability to understand and comply with, organizational and professional ethics in work environment. Demonstrate ability to apply sustainable practices in the context of local and global work and social environment.

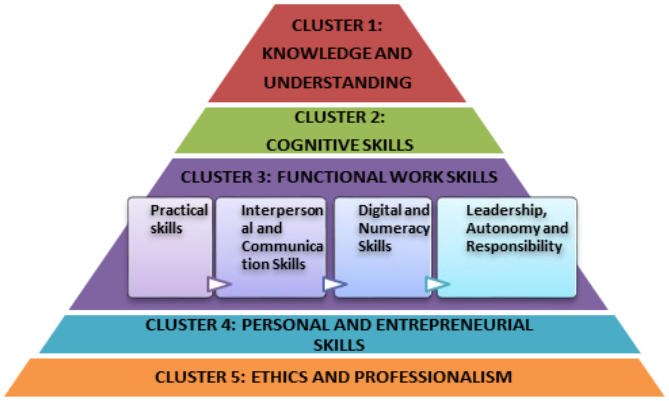


Figure 5.4 :Competency Domain to be applied in MQA Outcomes

(Learning Outcomes, LO)

OUTCOME BASED EDUCA-

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.

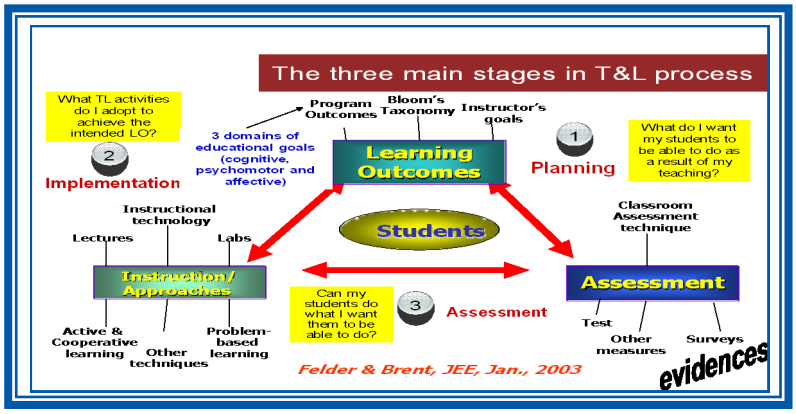


Figure 5.5 : Three Main Stage in Learning and Teaching Process

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 Merlimau. 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.

UNIT OF E-LEARNING

INTRODUCTION

CeLT (Center for e-Learning & Teaching) is a special name for Digital Learning Unit under the Instructional and Digital Learning Division, Polytechnic Education Department, Ministry of Higher Education Malaysia. CeLT is created to help empower the special National e-Learning agenda for all Malaysian Polytechnic.

VISION

Transforming Politeknik Merlimau towards global competitiveness through e-learning.

MISSION

Build a competitive, creative and sustainable e-learning framework.

OBJECTIVE

1. Encourage quality, fair and equitable education opportunities through e-learning (open, neutral and active)
2. Provide appropriate infrastructure and e-learning friendly
3. Creating a variety of creativity to strengthen the 21st century learning and teaching process
4. Improve staff and student skills through e-learning in the 21st century

The roles and responsibility of the e-Learning Unit are to :

1. Coordinate, support and monitor the implementation of e-Learning through the CIDOS platform.
2. Develop and improve CIDOS functionality to meet the effective R & D requirements and suit the rapid development of ICT (including Mobile-ready).
3. Improve literacy and training and mentoring on e-Learning.
4. Plan training and mentoring and support e-Content development support for academic and student staff.
5. Designing strategies and coordinating the EDOLA competition organized by CELT's Department of Polytechnic Education such as TVET Tunes, Poli TV, EMCC, VR 360 and Augmented Reality (AR).

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UNIT OF E-LEARNING

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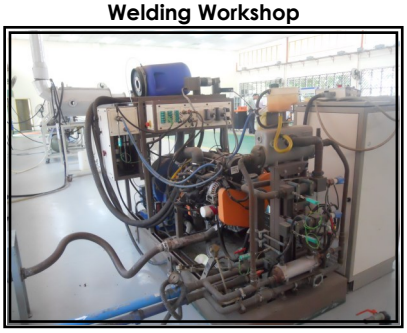
FACILITIES

Machine Workshop

Fitting Workshop

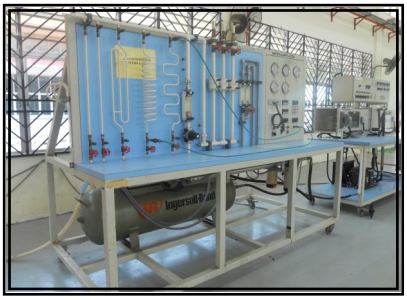
Welding Workshop

Foundry Workshop



Plant Lab.

Pneumatic & Hydraulic Lab.



Thermodynamic Lab.

CADCAM Lab.

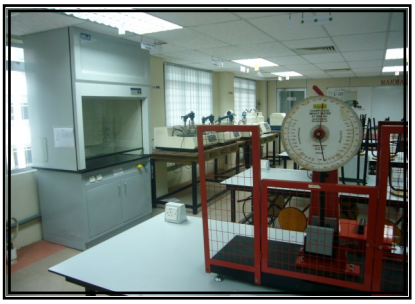
FACILITIES

Metrology Lab.

Instrumentation & Control Lab

M-CAD Lab. 1

Plastic Workshop



Metalluargy Lab.

Robotic Lab.

Fluid Lab.

FACILITIES

Seminar Room

Lecture Room

Lecture Hall

Technical Drawing Room

Discussion Area

DIPLOMA IN MECHANICAL

Programme Overview

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 togive balance emphasis on theoretical and practical aspects. The Eleventh Malaysia Plan was drawn produced 60% out of 1.5 million workers was in TVET sector. Until now a total of 69,45 (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 progamme will take six semesters to complete, five academic semester at their respective polytechnics and one semester of industrial training at relevant industries

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 Tranfer, Fluid Mechanics, Materials, Mechanical Design, Electrical, Manufacturing, Instrumention & Control and Mechanical Maintenance.

Job Prospects

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. Production/Process Supervisor
c. Technical Assistant
d. Technician
e. Product Designer
f. Quality Officer
g. CNC Programmer Technical Assistant
h. Precision Machinist
i. Production/Process Executive
j. Procurement Executive
k. Technical Instructor or Lecturer
m. Entrepreneur

DIPLOMA IN MECHANICAL

Vision

To be the Leading-Edge TVET Institution

Mission

a. To provide wide access to quality and recognized TVET programmes
b. To empower communities through lifelong learning
c. To develop holistic, entrepreneurial and balanced graduates
d. To capitalise on smart partnership with stakeholders

Educational Goal

To produce holistic and competent TVET graduates capable of contributing to the nation development

Programme Aims

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

Programme Educational Objectives (PEO)

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: Establish with strong linkage with society and players in the industry.

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 for 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

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

PROGRAMME STRUCTURE

CLASSIFICATION	COURSE CODE	COURSE	CONTACT HOURS				CREDIT VALUES	PROGRAMME LEARNING OUTCOME (PLO)												PREREQUISITE /CO-REQUISITE
								PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10	PLO 11	PLO 12	
			L	P	T	O		Knowledge	Problem Analysis	Design/Development of Solution	Investigation	Modern Tool Usage	The Engineer and Society	Environment and Sustainability	Ethic	Individual and Teamwork	Communication	Project Management and Finance	Life Long Learning	
								CLS 1	CLS2	CLS2	CLS2	CLS 3a/c	CLS 3b	CLS5	CLS5	CLS 3d	CLS 3b	CLS 4	CLS 4	
SEMESTER 1																				
Compulsory	DUE10012	Communicative English 1	1	0	2	0	2										√		√	
	MPU24XX1	Sukan / Unit Beruniform 1	0	2	0	0	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 / Unit Beruniform 2	0	2	0	0	1									√			√	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
Discipline Core	DJJ30113	Material Science and Engineering	2	2	0	0	3	√				√				√				
	DJJ30093	Engineering Mechanics	2	2	0	0	3	√	√			√								
	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**													

PROGRAMME STRUCTURE

CLASSIFICATION	COURSE CODE	COURSE	CONTACT HOURS				CREDIT VALUES	PROGRAMME LEARNING OUTCOME (PLO)												PREREQUISITE /CO-REQUISITE
			L	P	T	O		PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10	PLO 11	PLO 12	
								Knowledge	Problem Analysis	Design/Development of Solution	Investigation	Modern Tool Usage	The Engineer and Society	Environment and Sustainability	Ethic	Individual and Teamwork	Communication	Project Management and Finance	Life Long Learning	
								CLS 1	CLS2	CLS2	CLS2	CLS 3a/c	CLS 3b	CLS5	CLS5	CLS 3d	CLS 3b	CLS 4	CLS 4	
SEMESTER 4																				
Common Core	DJJ40132	Engineering 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	CAD/CAM	0	4	0	0	2			√		√							√	
	DJF41052	Manufacturing System	2	0	0	0	2		√		√						√			
Elective		Elective ***																		
		TOTAL		**22**			**16**													
SEMESTER 5																				
Compulsory	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																				
1	DJF42012	Advanced Manufacturing Process	2	0	0	0	2		√		√					√				
2	DJF52032	Manufacturing Economy	2	0	0	0			√		√							√		
3	DJJ42032	Instrumentation and Control	2	0	0	0														
4	DJJ42022	Industrial Management	2	0	0	0			√					√			√			
5	DJJ52052	Railway Track System	2	0	0	0														
6	DJM20032	C Programming	1	2	0	0		√		√						√				
7	DJM40082	Programmable Logic Control	1	2	0	0		√				√				√				
8	DJM40092	Control System	1	2	0	0		√				√				√				

FREE ELECTIVES																				
1	DUD10012	Design Thinking	1	0	0	1	2		√								√			

SYNOPSIS & COURSE LEARNING

SEMESTER	COURSE	CREDIT	SYNOPSIS	CLO
1	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, Fire Safety, Hazard Identification Risk Control and Risk Assessment (HIRARC), Workplace Environment and Ergonomics and guide the students gradually into this multi-disciplinary science.	Upon completion of this course, students should be able to: 1. Explain briefly Occupational Safety and Health (OSH) procedures, regulation and its compliance in Malaysia. (C2, PLO1) 2. Initiates incident hazards, risks and safe work practices in order to maintain health and safe work environment (A3, PLO8) 3. Demonstrate communication skill in group to explain the factor that can lead to accident in workplace. . (A3, PLO10)
	DJJ 10013 ENGINEERING DRAWING	2	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	Upon completion of this course, students should be able to: 1. Apply the fundamentals of technical drawing and features of CAD software in producing engineering drawing. (C3, PLO1) 2. Construct the technical drawing and 2D CAD drawing according to the engineering drawing standards. (P3, PLO5) 3. Propose a project report with following engineering norms and practices in engineering drawing. (A3, PLO8)

SYNOPSIS & COURSE LEARNING

SEMESTER	COURSE	CREDIT	SYNOPSIS	CLO
1	DJJ 10022 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	Upon completion of this course, student should be able to: 1. Measure finished product using appropriate measurement instruments (P3, PLO5) 2. Perform fitting, welding and machining works according to Standard Operational Procedure (SOP). . (P4, PLO5) 3. Demonstrate an understanding of professional ethics, responsibilities and norms of engineering practices according to the workshop safety regulation. (A3, PLO6)
	DJJ 10033 WORKSHOP TECHNOLOGY	2	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).	Upon completion of this course, student should be able to: 1. Apply the knowledge of basic mechanical components and equipment, hand tools and measuring equipment in workshop technology (C3, PLO1) 2. Apply standard practice in operating mechanical tools and component. (C3, PLO8) 3. Demonstrate continuous Learning and information management skills to complete assigned task (A3, PLO12)

SYNOPSIS & COURSE LEARNING

SEMESTER	COURSE	CREDIT	SYNOPSIS	CLO
2	**DJJ20053** ELECTRICAL TECHNOLOGY	**2**	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	Upon completion of this course, students should be able to: 1. Explain the principles and fundamental of electrical circuits, electromagnetism, transformers and electrical machine. (C2, PLO1) 2. Solve the problem related to electrical circuits, electromagnetism, transformers and electrical machine (C3, PLO1) 3. Organize appropriately experiments in groups according to the Standard Operating Procedures(p4, PLO5)
	DJJ 20063 THERMODYNAMICS	**2**	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.	Upon completion of this course students should be able to:- 1. Explain fundamentals concept and properties of pure substances in thermodynamics (C2, PLO1) 2. Apply Laws of thermodynamics and it processes (C3, PLO1) 3. Organize appropriately experiments according to the Standard Operating Procedures (P4, PLO5)

SYNOPSIS & COURSE LEARNING

SEMESTER	COURSE	CREDIT	SYNOPSIS	CLO
2	DJJ 20073 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.	Upon completion of this course students should be able to:- 1. Explain the fundamentals of fluid (C2, PLO1) 2. Solve problems related to fluid properties, fluid statics and fluid dynamics (C3, PLO1) 3. Organize appropriate experiments in groups according to the standard operating procedures (P4, PLO5)
	DJF21012 MANUFACTURING WORKSHOP PRACTICE I	2	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. .	Upon completion of this course students will be able to: 1. Build a project using casting, TIG and MIG welding process based on standard operational procedures and safety. (P3, PLO5) 2. Perform direct indexing operation using indexing head attachment in milling machine processes. (P4, PLO5) 3. Demonstrate an understanding of the responsibilities, societal, health, safety, legal and cultural issues during practical work session. (A3, PLO6)

SYNOPSIS & COURSE LEARNING

SEMESTER	COURSE	CREDIT	SYNOPSIS	CLO
3	DJJ 30113 MATERIAL SCIENCE AND ENGINEERING	2	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.	Upon completion of this course, students should be able to:- 1. Apply the fundamental of material science to identify the materials, properties, behavior, processes and treatment. (C3,PLO1) 2. Performed appropriate material testing according to the Standard Operating Procedures (P4,PLO5) 3. Demonstrate the ability to work individually and in groups to complete assigned tasks during the practical work session. (A3, PLO9)
	DJJ 30093 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.	Upon completion of this course, students should be able to:- 1. Solve problems related to static and dynamics based on the concepts and principle of engineering mechanics (C3,PLO1) 2. Analyze engineering related problems based on fundamentals of static and dynamics (C4, PLO2) 3. Organize appropriately experiment in groups according to Standard Operation Procedures (P4, PLO5)

SYNOPSIS & COURSE LEARNING

SEMESTER	COURSE	CREDIT	SYNOPSIS	CLO
3	DJJ 30122 COMPUTER AIDED DESIGN	2	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	Upon completing this course students should be able to: 1. Apply CAD commands in order to produce engineering (C1, PLO1) 2. Construct 3D drawing of Mechanical Components according Drawing Standards (P4,PLO5) 3. Demonstrate a presentation with following technical standard Communication (A3, PLO10)
	DJF31022 MANUFACTURING WORKSHOP PRACTICE 2	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.	Upon completion of this course, students should be able to:- 1. Build a project using CNC machine, TIG and MIG welding process based on standard operational procedures and safety. (P3,PLO5) 2. Perform contouring cutting operation using rotary table attachment in milling machine processes. (P5,PL05) 3. Demonstrate an understanding of the responsibilities, societal, health, safety, legal and cultural issues during practical work session. (A3,PLO6)

SYNOPSIS & COURSE LEARNING

SEMESTER	COURSE	CREDIT	SYNOPSIS	CLO
4	DJJ 40132 ENGINEERING AND 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.	Upon completion of this course students will be able to: 1. Implement the roles of engineering profession towards the developing of society and its challenges in globalization (C3, PLO6) 2. Determine the important of work ethics, bylaws and professionalism in engineering profession (C4, PLO8) 3. Determine the needs for sustainable and green engineering towards providing the solutions in engineering field (C4, PLO7)
	DJJ 40153 PNEUMATIC & HYDRAULICS	3	PNEUMATIC & HYDRAULICS provides knowledge and understanding to the importance of pneumatics and hydraulics circuits, equipment and design along with its usage in the industry.	Upon completion of this course, the students should be able to: 1. Analyze the basic concept and function of pneumatics and hydraulics system. (C3, PLO1) 2. Design pneumatic, electro-pneumatic and hydraulic circuit according to assigned tasks. (C5, PLO3) 3. Perform experiment on pneumatic, electro-pneumatic and hydraulic circuit during practical session. (P4, PLO5)

SYNOPSIS & COURSE LEARNING

SEMESTER	COURSE	CREDIT	SYNOPSIS	CLO
4	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.	Upon completion of this the course, students should be able to: 1. Apply the concepts of strength of materials to solve related problems. (C3, PLO1) 2. Analyze problems correctly related to strength of materials (C4, PLO2) 3. : organize appropriately experiment in groups according to Standard Operation Procedures (SOP)(P4, PLO5)
	DJJ 40182 PROJECT 1	2	PROJECT 1 provides students with solid foundation on knowledge and skills in formulating project proposal preparation, writing and presentation	Upon completion of this course, the students should be able to: 1. Identify the engineering problems to be solved (C4,PLO2) 2. Analyze methods to solve problems (C4,PLO7) 3. Propose a solution to problems (A5,PLO11)

SYNOPSIS & COURSE LEARNING

SEMESTER	COURSE	CREDIT	SYNOPSIS	CLO
4	DJF41032 MANUFACTURING WORKSHOP PRACTICE 3	2	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.	Upon completion of this course, students should be able to:- 1. Manipulates robot programming and PLC programming process. (P3, PLO5) 2. Perform mini project using additive manufacturing and plastic processing process (P4, PLO5) 3. Demonstrate an understanding of professional ethics, responsibilities, norms and practices during practical work session. (A3, PLO 8)
	DJF41042 CAD/CAM	2	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.	Upon completion of this course, students should be able to: 1. Calibrates machining code (G and M code) from CAD/CAM software to plan and devise holes process and milling/lathe project. (P3, PLO3) 2. Build a project using CNC milling or lathe machine by utilizing related CAD/CAM simulation software (P4, PLO5) 3. Demonstrate continuous learning and information management skill while engaging in independent acquisition of new knowledge and skill to develop a project. (A3, PLO12)

SYNOPSIS & COURSE LEARNING

SEMESTER	COURSE	CREDIT	SYNOPSIS	CLO
4	DJF41052 MANUFACTURING SYSTEM	2	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. .	Upon completing of this course, students should be able to: 1. Apply the basic concepts of manufacturing system, robotic in manufacturing, process analysis, process layout and material handling system (C3, PLO2) 2. Investigate problem solving in Lean system. (C4, PLO4) 3. Demonstrate good communication skills in engineering society (A3, PLO10)
5	DJJ 50193 PROJECT 2	3	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	Upon completion of this course, the students should be able to: 1. Demonstrate appropriate and creative solution in solving project problems (P5, PLO3) 2. Perform project plan to achieve objectives with valid and reliable results (P4, PLO4) 3. Explain the project work and defend project outcomes effectively with good communication skills (A4, PLO10)

SYNOPSIS & COURSE LEARNING

SEMESTER	COURSE	CREDIT	SYNOPSIS	CLO
5	DJF51062 MANUFACTURING CONTROL	2	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 .	Upon completion of this course, student should be able to: 1. Attain the concept and application of Manufacturing Forecasting, Production Scheduling, Inventory Control, Productivity and Capacity Planning. (C3, PLO1) 2. Integrate Material Requirement Planning (MRP) and inventory control for manufacturing process controlling activities. .(C4, PLO3) 3. Adopt project management framework to develop a Material Requirement Planning (MRP) according to inventory management. (A3, PLO8)
	DJF51072 JIG AND FIXTURE DESIGN	3	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.	Upon completion of this course, the students should be able to: 1. Apply the concepts and principles of jigs and fixtures in design. (C3, PLO2) 2. Calibrate the 3D design by using CAD/CAM software to plan and devise mini project . (P4, PLO3) 3. Demonstrate convictions towards environment and sustainability to complete assigned tasks during mini project sessions. (A3, PLO7)

SYNOPSIS & COURSE LEARNING

SEMESTER	COURSE	CREDIT	SYNOPSIS	CLO
5	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.	Upon completion of this course, student should be able to: 1. Apply the relation of statistics and quality management system in understanding of quality control and their application tools (C3, PLO1) 2. Determine the related quality tools and techniques to control the quality of products or services based on case study. (c4, PLO2) 3. Demonstrate ability to work in team to complete the assigned tasks. (A3,PLO9)
	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	Upon completion of this course students should be able to:- 1. Apply appropriately the concepts of tool design method and tooling material selection in designing tools. (C3,PLO2) 2. Perform the simulation of mould, tool and die design using CAD/CAM software (P4,PLO3) 3. Demonstrate conviction towards environment and sustainability to complete assigned tasks during practical work sessions. (A3,PLO7)

HIGHER ACADEMIC PATH-

CAREER PATHWAYS FOR POLYTECHNIC STUDENTS.

Graduates of polytechnics in general are able to advance their studies through these three academic career pathways;

Institution of Higher Learning (Public/Private)

This pathway allows polytechnic students to advance their studies in other public universities, as well as other private learning institutions. Apart from this, students are also able to pursue other non-technical paths, should they desire.

LIST OF UNIVERSITY	PROGRAMME	INFORMATION
UTM UNIVERSITI TEKNOLOGI MALAYSIA	• Bachelor of Mechanical Engineering (Manufacturing) • Bachelor of Mechanical Engineering (Industrial) • Bachelor of Mechanical Engineering (Material)	**Universiti Teknologi Malaysia,** UTM Skudai, 81310 Johor, Malaysia. Tel : (6)07 - 5530370 Fax : (6)07 - 5530388 www.utm.my
UNIVERSITI TEKNOLOGI MARA	• Bachelor of Mechanical Engineering (Mechanical or Manufacturing)	**Universiti Teknologi MARA (UiTM)** 40450 Shah Alam, Selangor Darul Ehsan, Malaysia Tel : (6)03-55442000 www.uitm.edu.my
UPM UNIVERSITI PUTRA MALAYSIA	• Bachelor of Mechanical Engineering	**Universiti Putra Malaysia** 43400 UPM Serdang Selangor Darul Ehsan Malaysia Tel : (6)03.8946.6000 Fax : (6)03.8948.7273 www.upm.ede.my

HIGHER ACADEMIC PATH-

LIST OF UNIVERSITY	PROGRAMME	INFORMATION
Universiti Kebangsaan Malaysia	• Bachelor of Engineering with Honour (Mechanical Engineering)	**Universiti Kebangsaan** Malaysia, 43600 UKM, Bangi Selangor, Malaysia l Tel : (6)03 8921 5555 l Fax : (6)03 8921 5555 www.ukm.my
UTeM Universiti Teknikal Malaysia Melaka	• Bachelor of Manufacturing Enginering • Bachelor of Mechanical Engineering	**Universiti Teknikal Malaysia Melaka** Hang Tuah Jaya, 76100 Durian Tunggal, Melaka, Malaysia Tel: +606-270 2571 Fax: 06 -270 1047 www.utem.edu.my
UTHM Universiti Tun Hussein Onn Malaysia	• Bachelor of Mechanical Engineering	**Universiti Tun Hussein Onn Malaysia (UTHM)** 86400 Parit Raja Batu Pahat Johor Tel : +607-453 7696 Fax : +607-453 6085 www.uthm.edu.my
Universiti Malaysia PAHANG	• Bachelor of Manufacturing Engineering (Hons)	**Universiti Malaysia Pahang** 26600 Pekan Pahang Darul Makmur Tel: **+609 424 5800** Fax: **+609 424 5888** www.upm.edu.my

DEPT. OF MATHEMATICS, SCIENCE

Introduction

The Department of Mathematics, Science & Computer which is also known as JMSK is an academic supporting department. It is responsible for the B code courses in three different fields that are Mathematics, Science and Computer. Besides, it also performs the academic supporting tasks (administration) in PMM.

This department was set up in November 2002 and is currently running with 31 lecturers, one laboratory assistant, one computer technician and one operational assistant.

JMSK is managed by the head of department ; supported by three (3) head of courses of Mathematics, Science and Computer. These head of courses are responsible in monitoring staffs under their supervisions in order to ensure the learning and teaching implementations run effectively. Besides, JMSK also managed a Pre Diploma Science programme which is supervised by a Head of Programme.

This department is equipped with computer laboratories, science laboratories, Technology Enabled Collaborative Classroom (TECC), meeting room, discussion room, prayer room and R & R corner.

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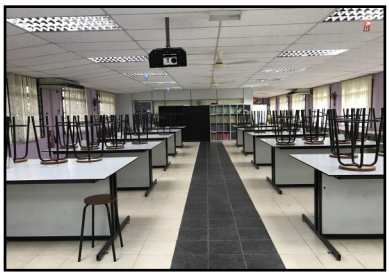
FACILITIES

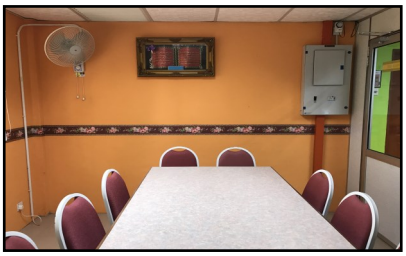
TECC

Computer Laboratory

Classroom



Science Laboratory



Discussion Room

Lecturer Meeting Room

Prayer Room

Gazebo

SYNOPSIS & COURSE LEARNING

SEMESTER	COURSE	CREDIT	SYNOPSIS	CLO
1	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.	Upon completion of this course, students should be able to: CLO1 : Use mathematical statement to describe relationship between various physical phenomena. (C3 , CLS 1) 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)
1	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.	Upon completion of this course, students should be able to: 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)

SYNOPSIS & COURSE LEARNING

SEMESTER	COURSE	CREDIT	SYNOPSIS	CLO
2	DBM20023	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.	Upon completion of this course, students should be able to: 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)
3	DBM30033	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.	Upon completion of this course, students should be able to: 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)

DEPARTMENT OF GENERAL

Introduction

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 two Heads of Course and also lecturers from the English Language Unit and the Islamic Education and Moral Studies Unit. The English Language Unit consists of 12 lecturers while the Islamic Education and Moral Studies unit has a total number of 12 lecturers. Furthermore, the department has two language laboratories and one technology enable classroom (TEC) 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 Merlimau.

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SYNOPSIS & COURSE LEARNING

SEMESTER	COURSE	CREDIT	SYNOPSIS	CLO
1	MPU21032 Penghayatan Etika dan Peradaban	2	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.	CLO1 : membentangkan konsep etika dan peradaban dalam kepelbagaian tamadun. (A2 , CLS 5) CLO2 : menerangkan sistem, tahap perkembangan, kesepaduan sosial dan kebudayaan merentas bangsa di Malaysia. (A2 , CLS 5) CLO3 : mencadangkan sikap yang positif terhadap isu dan cabaran kontemporari dari perspektif etika dan peradaban. (A3 , CLS 4)
	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 nonverbal communication skills (A2 , CLS 4)

SYNOPSIS & COURSE LEARNING

SEMESTER	COURSE	CREDIT	SYNOPSIS	CLO
2	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 sehari-an (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 tanggungja-wab sebagai individu dan nilai perpaduan dalam kehidupan di samping cabaran- cabaran dalam membentuk masyara-kat Malaysia	CLO1 : Membincangkan sejarah dan nilai dalam pembentukan masyarakat di Malaysia (A2 , CLS 4) CLO2 : Menerangkan etika dan profesionalisme terhadap konsep perpaduan bagi meningkatkan seman-gat patriotisme masyarakat Malaysia (A3 , CLS 5) CLO3 : Menghubungkait minda ingin tahu dengan cabarancabaran dalam membentuk masyarakat Malaysia (A4 , CLS 4)

SYNOPSIS & COURSE LEARNING

SEMESTER	COURSE	CREDIT	SYNOPSIS	CLO
3	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)
4	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)

SYNOPSIS & COURSE LEARNING

SEMESTER	COURSE	CREDIT	SYNOPSIS	CLO
1	MPU2042 Bahasa Kenangsaan A	2	BAHASA KEBANGSAAN A menawarkan kemahiran berbahasa dari aspek mendengar, bertutur, membaca dan menulis sesuai dengan tahap intelek pelajar, serta meningkatkan kecekapan berbahasa dalam konteks rasmi dan tidak rasmi.	CLO1 : Menunjukkan cara berinteraksi yang baik dalam pelbagai situasi (A3 , CLS 3b) CLO2 : Menulis pelbagai jenis bentuk penulisan dengan jelas dan bersiste-matik (A2 , CLS 3b) CLO3 : Menunjukkan kaedah bertutur dalam komunikasi lisan dengan sebutan dan intonasi yang betul (A3 , CLS 4)

UNIT OF SPORTS, CO CURRICULUM &

Introduction

Unit of Sports, Co-curriculum and Cultural (USKK) Politeknik Merlimau is responsible for the planning, management and implementation of all activities regarding sports, co curriculum and cultural events in PMM. This unit comprises of three sub-unit, the sports, co-curriculum and also cultural. The activities are designed for every semester based on given schedule and academic calendar.

The sports sub unit is responsible for planning the implementation of sports activities for PMM students. In PMM the sporst sub-unit is directly involved with the Polytechnic Sports Council (MSP) in conducting sports competitions among polytechnics students in other polytechnics in Malaysia.

For the learning and teaching activities, the Co-curriculum sub-unit plays an important role in coordinating, supervising, and monitoring the co-curriculum courses. The co-curriculum sub-unit offers 3 types of courses, the DRB1000, DRS2001 and DRK3002 that is compulsory for every student to enrol.

The cultural and heritage sub-unit is responsible for the management and organization of the implementation of arts and cultural programmes in PMM. This sub-unit also helps students and polytechnics in particular in the handling of protocol and etiquette such as convocation ceremony.

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CARTA ORGANISASI
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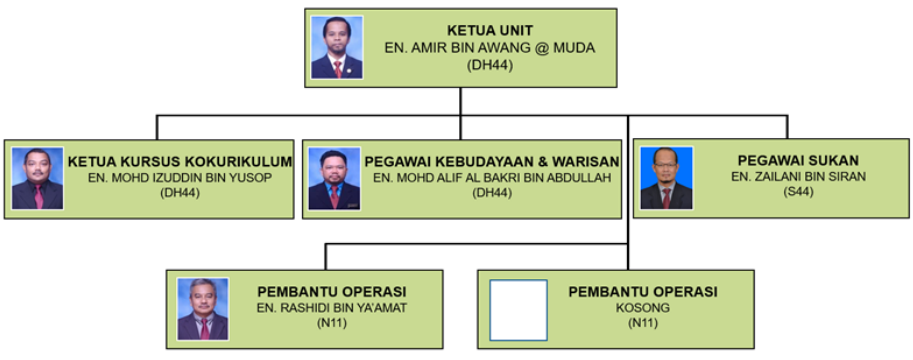
POLITEKNIK MERLIMAU MELAKA 2020



FACILITIES

Basketball Court

Takraw Court

Tennis Court

Futsal Court

Rugby Field

Football Field

Petanque Field

Volleyball Court

FACILITIES

Music Studio

Music set

Squash Court

Table Tennis

Multi Purpose Court (Indoor)

Golf Green

Sport Centre

Multipurpose Court

DEPT. OF STUDENT AFFAIR AND DEVELOP-

Introduction

Department of Student Affair is entrusted for the students' activities and governance under two main sub-officers pertaining to Recruitment & Data and Welfare & Discipline. Thus, this department deals with managing students' registration, updating students' records, managing financial support for students, and also monitoring students' discipline and welfare.

Activities of the Department :-

Recruitment & Data

- Managing students' registration
- Managing students' card (smartcard)
- Managing the record and statistic of student
- Managing recruitment - please log to www.politeknik.edu.my

Welfare & Discipline :-

- Managing students' welfare
- Managing financial aid and support such as students' study loans
- Managing vehicle pass for students
- Monitoring students discipline
- Managing Student representative committee

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Pn Masitah Yaakub Scholarship Officer	Ext : 1187 Email: masitah@pmm.edu.my

P-

UNIT OF EXAMINATION

Introduction

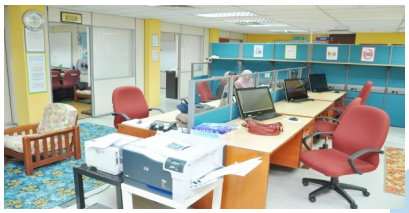
Examination Unit is responsible to coordinate and to handle activities regarding final examination and certification. The unit is fully supported by all departments to fulfil the responsibilities given. Examination Officer is responsible to monitor the whole examination process of polytechnic while Examination Coordinator is to manage things regarding examination for their respective departments. Other than that, Examination Unit also cooperate in organising workshops related to examination such as Assessments and Vetting Workshop which is organised every semester in order to produce high quality examination questions to be applied in the Final Examination of Politeknik KPT.

The unit is led by the Head of Unit who is responsible to coordinate and facilitate the management of the process of assessment and examination. The Head of Unit is supported by two Examination Officers whom one is in charge of the Records, Data and Certifications and the other is in charge in Management, Assessment and Bank Rate question :-

Activities carried out by the Examination Unit

- Preparing examination papers
- Conducting the final examination
- Processing the results of assessments
- Certification and Student Excellence Award
- Enforcement of assessment rules
- Administrating the Examination Unit

CONTACT PERSON	CONTACT NO
Zaidah Binti Abd Umar Head of Unit	Ext :1040 Email : zaidah@pmm.edu.my
Dewi Muhiani binti Tumiran Examination Officer (Records & Certification)	Ext :1041 Email : dewimuhuani@pmm.edu.my
Norarsaliana binti Arbain Examination Officer (Assessment Management)	Ext :1042 Email : norarsaliana@pmm.edu.my



UNIT OF TRAINING & CONTINUING

Introduction

The Unit of Training and Continuing Education (ULPL) is a unit under the office of Deputy Director of Academic Support, Politeknik Merlimau. The unit is responsible for the re-skilling and up-skilling of human capital of Politeknik Merlimau and also for private sector or other government departments / agencies.

The main activities of this unit are to:

1. manage training or courses for staffs.
2. manage part-time programme (*Kursus Secara Sambilan — KSS*) as to provide opportunities for those who want to pursue their diploma whilst working.
3. implement live long training program. The program offers opportunities for private sector or other government departments / agencies to develop their human capital through training and education resources in polytechnic with affordable rates.
4. manage and coordinate the use of polytechnic training facilities for private sector or other government departments / agencies.

CONTACT PERSON	CONTACT NO
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Hazreen bin Othman Training & Continuing Education Officer	Ext : 1151 Email : hazreen@pmm.edu.my

PEMBANGUNAN SUMBER MANUSIA BERHAD (PSMB)
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ULPL PMM

UNIT OF LIBRARY

Introduction

The Library Unit has been established since 2002. The objectives are to:

1. Become the centre of excellence for information and referral centre
2. Support PMM in producing semi-professional, knowledgeable workforce
3. Develop, document and maintain the information sources for the requirements of teaching and learning by:
   a. using the world standard cataloguing classification (Library of Congress Classification Outlines)
   b. using the new technology of cataloguing system (WEBOPAC) and electronic resources
   c. digitizing the documents related to learning such as examination paper, bulletin etc.
4. Provide and manage information services and conducive library facilities such as:
   a. Open shelf Collection
   b. Reference Collection
   c. Serial Collections
   d. Examination paper Collection

CONTACT PERSON	CONTACT NO
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Rominah Binti Ghani Assistant librarian	Ext :1122 Email : rominah@pmm.edu.my




UNIT OF PSYCHOLOGY MAN-

Introduction

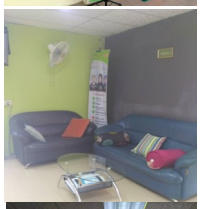
Psychology Management Unit Politeknik Merlimau, Melaka is an academic support unit which works in the development and soft skills for both students and staff.

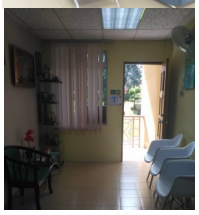
Currently, Management Psychology comprises 3 Psychology Officer and is one unit under the supervision of Head of the Student Affairs Department and the Deputy Director (Academic Support).

The goal of this unit is to help the student progress toward academic excellence, social, personal, spiritual and career;
planning, implementation, evaluation and control of Psychology and Counseling Services Program effectively at the Polytechnic.

What Is Counseling? Counseling is a face to face relationship between normal individuals to understand themselves and the situation, using potential by utilizing the self, family, religion, society and religion also learn how to deal with problems in meeting their needs today and tomorrow.

Counseling Ethics Code is to respect client privacy and confidentiality of information.





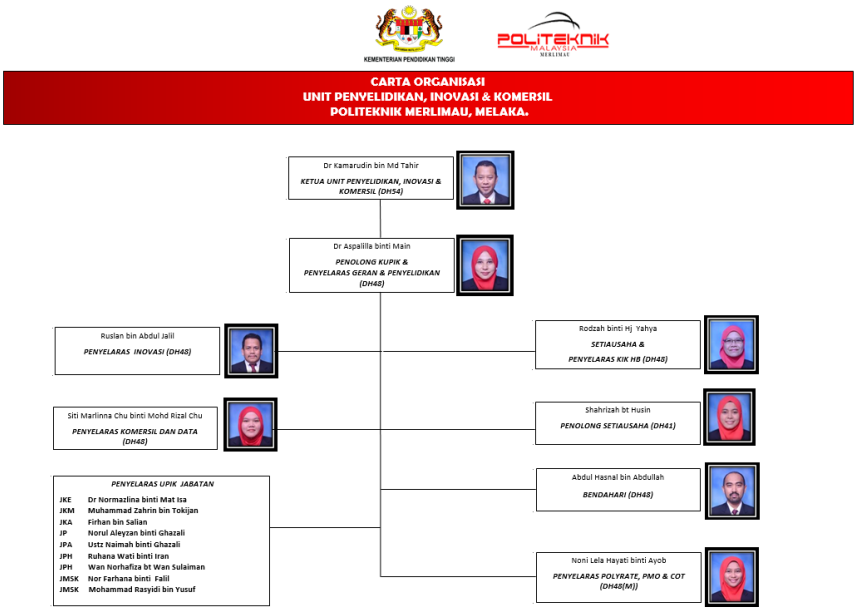
UNIT OF RESEARCH AND INNO-

Introduction

Research Unit, Innovation and Commercial (UPIK) created by the system of Polytechnic Education Department, Ministry of Higher Education to inculcate the culture of research at the polytechnic. UPIK plan an important role as a centre of coordination of research, innovation and commercial lecturers and staff. UPIK also serves as a central collection and scientific writing reference material, material innovations and research institutions, zones, national and international.

The objectives of the unit are to ;

1. become the centre of research, innovation and commercialization activities.
2. coordinate and collaborate with industries and agencies the affairs pertaining to Research & Development (R&D), commercialization and innovation.
3. become the centre of information and data management related to the students' as well as lecturers' products/projects, innovations and commercialisation at polytechnic level.
4. plan, manage and monitor the implementation and data gathering with regard to R&D, educational research and publication.



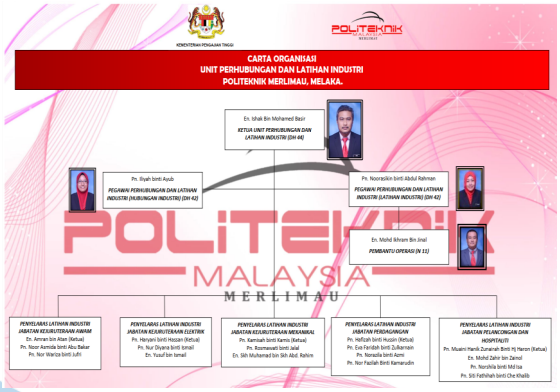
UNIT OF INDUSTRIAL LIAISON

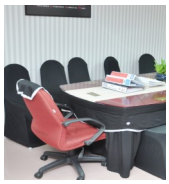
Introduction

Industry Training is a major component of the learning curriculum at polytechnic. Students at diploma level must go through 20 weeks of internship training prior to graduation. The course covers a total of 10 credit hours inclusive of hands work, presentation, oral feedback session and report writing. During the training, students will have the opportunity to gain knowledge and experience on multiple discipline which include engineering, management, account and safety procedure.

Industrial training provides an avenue for students to practice and apply both their knowledge and skills in real working environments. Thus the internship, student should be able to achieve the following objective;

- Perform hands-n task, usage of tools and equipment, adapt a variety of technologies, apply the knowledge gained to perform task, show development in knowledge and skills and think creatively and critically.
- Ability to acquire and understand information, carry out instruction, analyze linear and non-linear information , shows appropriate non-verbal communication, communicate with employees at all levels and have basic negotiation skills.
- Show positive personality traits, participate actively as a members of the team, carry out task in appropriate situation and build and maintain good relationship.
- Comply with the policies and rules of the organization, job procedures and safety and health regulations.
- Report handed-in on time and verified by the supervisor, work independent with minimum supervision, attendance, punctuality and solve problem by taking right action.
- Present ideas and views and task reporting.





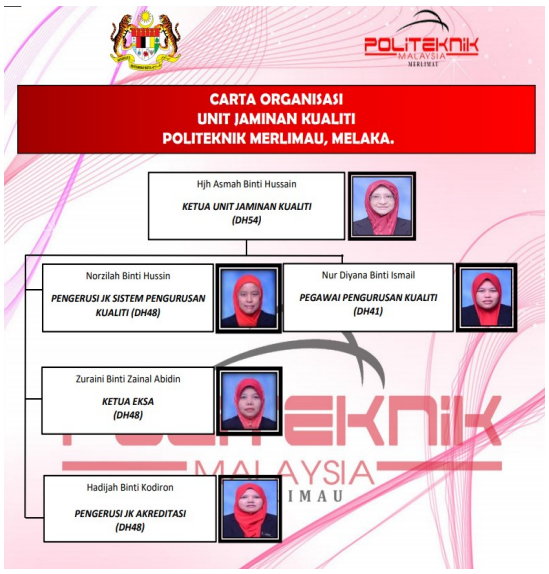
UNIT OF QUALITY ASSUR-

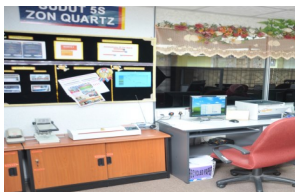
Introduction

Quality Assurance Unit is responsible for planning, implementing and monitoring the effectiveness of the programs related to the quality management system, in addition to being a coordinator (the coordinator) to officials in the department and the quality of the unit. This unit is under the responsibility of the Quality Manager and Deputy Director (Academic).

To further enhance the quality management system in PMM, it's run by two (2) weight of the Working Committee on Quality (JKKQ) chaired by the Quality Manager and comprises all Heads of Department and Head of Unit, while the Secretariat Quality (UQ), chaired by the Chief Executive Officer quality acting as the coordinator of the quality Officer and Administration Department. Both the operator is responsible for applying the values of quality to all citizens PMM through activities that have been planned.

The objective of this unit is to coordinate and implement a quality management system to strengthen the role of citizens PMM is more committed to the continuation of organizational excellence. The main task of the unit is to plan, implement and monitor the effectiveness of programs related to quality management for the excellent work culture and implement continuous improvement practices towards realizing the vision, mission and quality policy PMM. In addition, it is also responsible for coordinating the implementation of quality systems in PMM.





UNIT OF CISEC

Introduction

Establishment of the Corporate Industrial Services & Employability Center (CISEC) in polytechnics as an initiative towards stronger polytechnic and industrial relations. CISEC will be the one-stop center in meeting the needs of the industry interested in working with Polytechnic especially for commercialization projects and the management of facilities or consultancy services. Through CISEC, the process of matching workforce needs in the industry with the job search of polytechnic graduates is expected to be implemented more efficiently and systematically.

The CISEC was set up in July 2010 to support one of the Polytechnic Transformation agenda that enhances the marketability of polytechnic graduates. Therefore, CISEC will be the intermediary of polytechnics and industry in coordinating career development and graduate marketing programs through joint ownership and accountability, governance, student industrial training or training needs.

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Azuan Binti Alias CISEC Officer	Ext : 1163 Email: azuan@pmm.edu.my

UNIT OF KAMSIS

Introduction

Unit Kamsis role is to manage the placement of students. This unit is placed under the Student Affair Department. It is headed by a Assistant Manager Hostels, Senior Supervisor, four Hostel Supervisor and thirteen Warden (total of warden should be twenty eight).

Merlimau Polytechnic Hostel has six blocks of four-storey building that can accommodate a total of 1404 student with each building about 234 students. The capacity of each blocks for male and female student may change following application for each sessions.

FACILITIES PROVIDED

Kamsis provide complete facilities such as mattresses, pillows, beds, wardrobes, tables and chairs, curtains, bookshelves and so on. Other facilities include:

a) Study room;
b) Common Room is equipped with television broadcasts Njoi;
c) In-room ironing;
d) washing machine in every level;
e) Field and playground;
f) The cafeteria operates from 7 am to 11 pm;
g) Islamic Center;
h) Internet (wifi); and
i) Ease of filter machine hot / cold water in every block.

APPLICATION CONDITIONS KAMSIS RANKED

1) Applications can be made online via the Student Information Management System (SPMP) in PMM portal.
2) Completed forms that have been submitted online must also be printed and sent to the Office of Management Kamsis before the closing date, together with other supporting documents such as:

    i. salary slip / income verification letter that was approved by the headman or officer of the Management and Professional Group;
    ii. health report that was confirmed by a physician for students who have serious health problems; and
    iii. Death Certificate for orphans.

UNIT OF KAMSIS

SELECTION CRITERIA FOR STUDENTS OF KAMSIS POLITEKNIK MERLIMAU

Here are the selection criteria's for the Kamsis application:
- Salary and dependents of parents / guardians;
- Orphans;
- Discipline;
- Activities participated in Kamsis / Department;
- Distance home to the Polytechnic;
- Health problems;
- Form complete and the information is correct; and
- On availability

UNIT OF ENTREPRENEURIAL

Introduction

The entrepreneurship unit supports students, alumni, small business and researchers to promote the creation of new businesses in industrial, technological, and social services.

The unit aims to promote the created businesses to be innovative, technology-based, with capacity to grow and commitment to create high-quality jobs in the region. It also promotes self-employment of young graduates and educate them in starting a new business with a proper management.

The Entrepreneurship Unit of Politeknik Merlimau is located at Ground Floor of Commerce Department and open to public every working days from 8.30am to 5.30pm. The main objectives of the entrepreneurship unit are:

- Cultivate entrepreneurial attitudes and skills among students from any field of education;
- Organize entrepreneurship activities among students accordingly;
- Coordinate the creation of start-up business among students
- Provide entrepreneurship facilities for students;
- Build networking with industries and agencies for student's business matching
- Involve professionals, entrepreneurs and agencies in the transmission of the entrepreneurial experience and as sponsors of activities that take place.

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EDITORIAL BOARD

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