

STUDENT STUDY GUIDE

DIPLOMA IN MECHANICAL ENGINEERING (DKM)

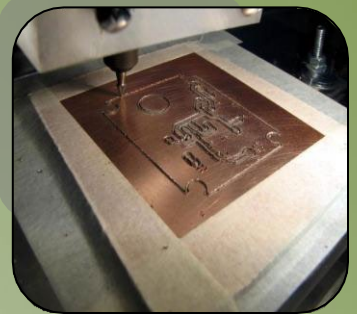
employability

academic

generic skill

collaboration

Employability Our Priority



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1.0 INTRODUCTION

Mechanical Engineering Department is led by a Head of Department and supported by two Head of Programmes. The department offers two main programmes which are Diploma in Mechanical Engineering and Diploma in Mechanical Engineering (Manufacturing).

DKM programme has been offered at Mechanical Engineering Department since the year of 2012. It is led by a Head of Programme and supported by competent staff. There are two academic sessions in a year, namely June session and December session by referring to the academic calendar.



2.0 VISION AND MISSION



POLITEKNIK
MALAYSIA
BANTING

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.

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3.0 QUALITY POLICY



DASAR KUALITI

Bertekad untuk membangunkan kecemerlangan pelajar bagi memastikan pelajar memperoleh nilai kebolehpasaran dan tahap kesediaan kerjaya yang tinggi serta memenuhi kehendak pelanggan melalui proses penambahbaikan berterusan.

P:00 23-01-2023


MOTO

EMPLOYABILITY OUR PRIORITY

$E = f\{A + G + C\}$



4.0 PBS QUALITY OBJECTIVES



OBJEKTIF KUALITI

Melaksanakan tugas bagi mencapai objektif kualiti yang memberi fokus kepada 3 kecemerlangan berikut :

KECEMERLANGAN PELAJAR

1. 30% pelajar mencapai skor minimum 40% markah kecemerlangan pelajar secara holistik semasa bergraduat.
2. Sekurang-kurangnya 90% graduat bekerja dalam tempoh 6 bulan setelah tamat pengajian.
3. Sekurang-kurangnya 25% graduan memperoleh Himpunan Purata Nilai Mata (HPNM) 3.0 dan ke atas.
4. 55% pelajar memperoleh sekurang-kurangnya 50% setiap Hasil Pembelajaran Program (PLO).

KECEMERLANGAN STAF

5. 100% staf menghadiri program pembangunan kompetensi dalam tahun semasa.

KECEMERLANGAN INSTITUSI

6. Mencapai sekurang-kurangnya 90% Petunjuk Prestasi Utama (KPI) Politeknik.
7. Menjalankan kolaborasi berimpak tinggi dengan sekurang-kurangnya 4 industri.

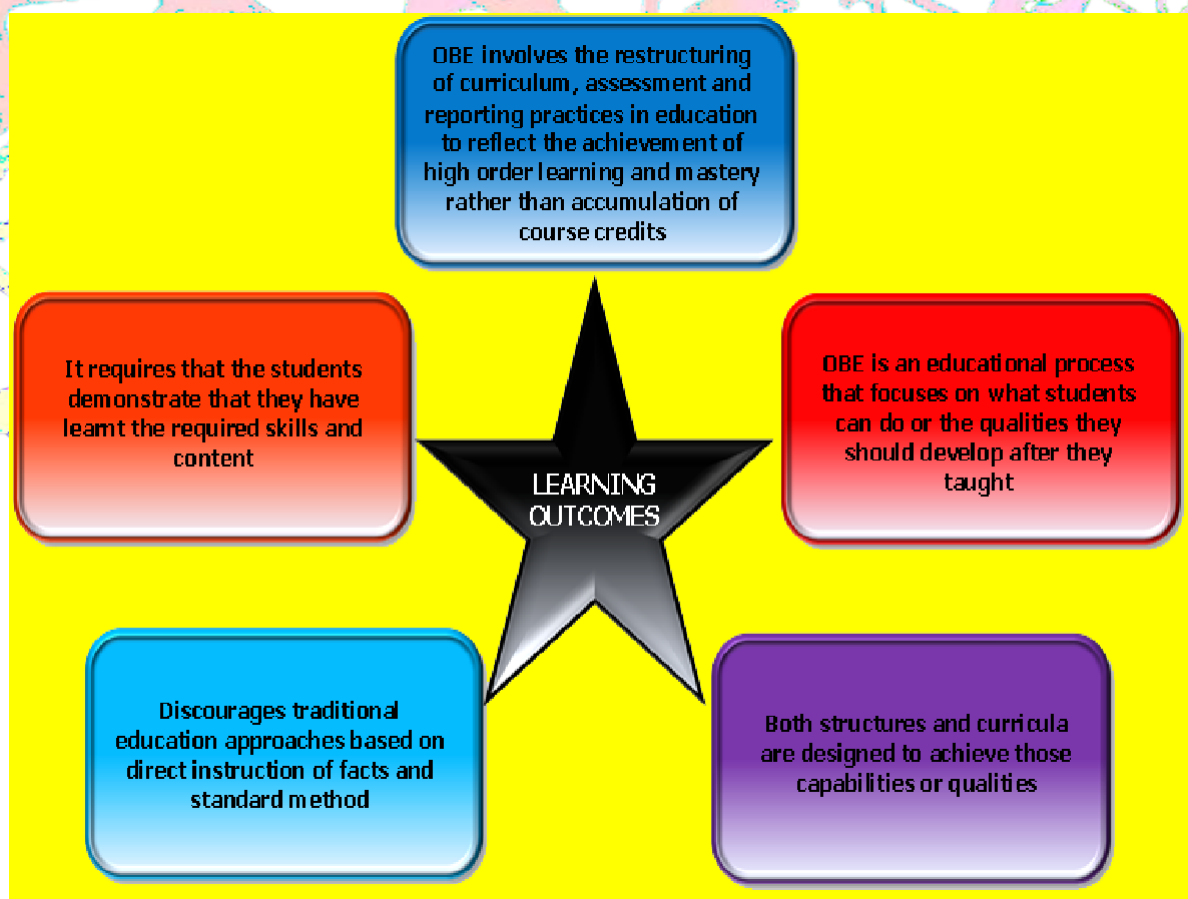
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5.0 OUTCOME-BASED EDUCATION [OBE]

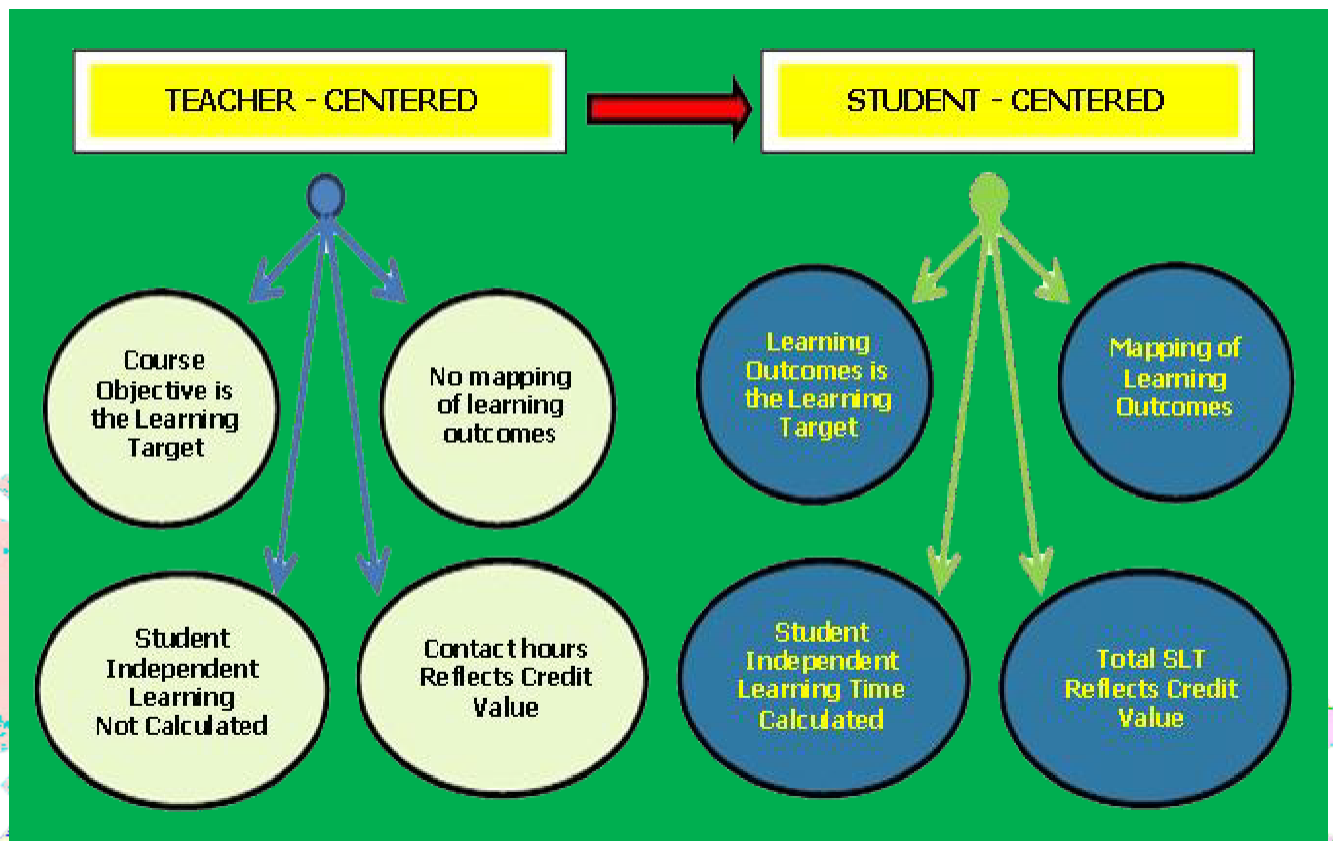
Outcome-based education (OBE) is an educational model for students to demonstrate their knowledge and able to perform according to the required outcomes. It is a student-centred approach that focuses on students' learning. It starts with a clear picture of what students should know, what they should be able to do, and what desirable attitudes and values needed to organize the curriculum, instruction, and assessment to ensure an ultimate learning (Spady,1994:1). Thus, OBE involves the restructuring of curriculum and assessment that reflects achievement of high learning order and mastery learning.

OBE helps students to be aware of what they should learn, aware of what they are learning and the control over their own learning. It leads to successful student learning and encourages lecturers to be well prepared. It also provides students with *appropriate, purposeful* learning experiences and opportunities for students to develop originality, self-motivation and independence while acquiring useful knowledge and skills.

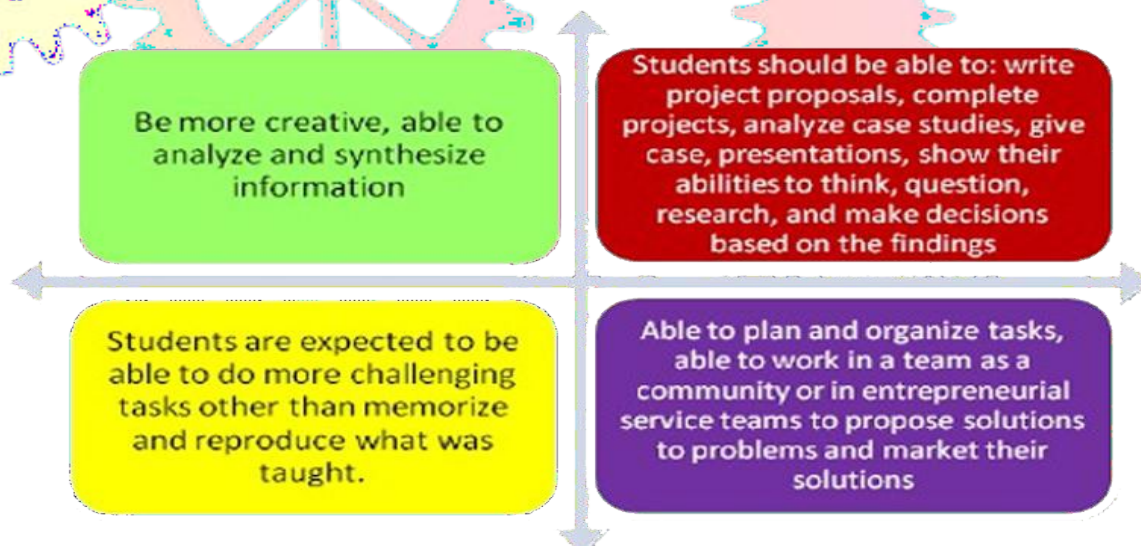
5.1 WHAT IS OUTCOME BASED EDUCATION [OBE]



5.3 HOW DOES OBE AFFECT TEACHING-LEARNING.



5.4 EXPECTATIONS ON STUDENTS



5.5 DURATION STUDY AND TOTAL CREDIT HOURS

For Diploma in Mechanical Engineering will be study from semester 1 until semester 6, its equivalence with 3 year and 94 credit hours. All students have to undergo 20 weeks of industrial training at semester 6.

NO	COURSES CLASSIFICATION	CREDITS	%
1	Compulsory	14	14.9%
2	Common Core	15	16%
3	Discipline Core	53	56.4%
4	Elective	2	2.1%
5	Industrial Training	10	10.6%
Total CREDIT HOURS		94	100%

MECHANICAL ENGINEERING DEPARTMENT



DIPLOMA IN MECHANICAL ENGINEERING

6.0 PROGRAMME INFORMATION

6.1 INTRODUCTION

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

6.2 SYNOPSIS

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

6.3 JOB PROSPECTS

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

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

6.4 PROGRAMME AIMS (PAI)

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

6.5 PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

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

- 1** **EQUIPPED WITH INDUSTRY-RELEVANT KNOWLEDGE AND SKILLS IN MECHANICAL ENGINEERING FIELD**
- 2** **ENGAGING ON LIFELONG AND CONTINUOUS LEARNING TO ENHANCE KNOWLEDGE AND SKILLS**
- 3** **INSTILLED WITH ENTREPRENEURIAL SKILLS AND MIND SET IN THE REAL WORKING ENVIRONMENT**
- 4** **ESTABLISHED STRONG LINKAGE WITH SOCIETY AND PLAYERS IN THE INDUSTRY**

6.6 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



PLO	KEYWORD
PLO1	KNOWLEDGE
PLO2	PROBLEM ANALYSIS
PLO3	DESIGN/DEVELOPMENT OF SOLUTION
PLO4	INVESTIGATION
PLO5	MODERN TOOLS USAGE
PLO6	THE ENGINEER AND SOCIETY
PLO7	ENVIRONMENT AND SUSTAINABILITY
PLO8	ETHIC
PLO9	INDIVIDUAL AND TEAMWORK
PLO10	COMMUNICATION
PLO11	PROJECT MANAGEMENT AND FINANCE
PLO12	LIFELONG LEARNING

6.7 MATRIX OF PEO vs. PLO

Programme Educational Objectives (PEO):

No	PEO	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12
		CLS1	CLS2	CLS2	CLS2	CLS3a/3C	CLS3b	CLS5	CLS5	CLS3d	CLS3b	CLS4	CLS4
1	Equipped with industry-relevant knowledge and skills in mechanical engineering field	✓	✓	✓	✓	✓							
2	Engaging on lifelong and continuous learning to enhance knowledge and skills												✓
3	Instilled with entrepreneurial skills and mind set in the real working environment											✓	
4	Established strong linkage with society and players in the industry						✓	✓	✓	✓	✓		

Clusters:

- CLS1: Knowledge & Understanding
- CLS2: Cognitive Skills
- CLS3a: Practical Skills
- CLS3b: Interpersonal & Communication Skills
- CLS3c: Digital & Numeracy Skills
- CLS3d: Leadership, Autonomy & Responsibility
- CLS4: Personal & Entrepreneurial Skills
- CLS5: Ethics & Professionalism

6.8 PROGRAMME STRUCTURE

CLASSIFICATION	COURSE CODE	COURSE	CONTACT HOURS				CREDIT VALUES
			L	P	T	O	
SEMESTER 1							
Compulsory	DUE10012	Communication English 1	1	0	2	0	2
	MPU24XX1	Sukan	0	2	0	0	1
	MPU24XX1	Unit Beruniform 1					
Common Core	DUW10022	Occupational, Safety and Health for Engineering	2	0	0	0	2
	DBS10012	Engineering Science	2	1	0	0	2
	DBM10013	Engineering Mathematics 1	2	0	2	0	3
Discipline Core	DJJ10013	Engineering Drawing	1	3	0	0	3
	DJJ10022	Mechanical Workshop Practice 1	0	4	0	0	2
	DJJ10033	Workshop Technology	3	0	0	0	3
TOTAL			25				18
SEMESTER 2							
Compulsory	MPU23052	Sains, Teknologi dan Kejuruteraan Dalam Islam*	1	0	2	0	2
	MPU23042	Nilai Masyarakat Dalam Islam**					
	MPU24XX1	Kelab/Persatuan	0	2	0	0	1
	MPU24XX1	Unit Beruniform 2					
Common Core	DBM20023	Engineering Mathematics 2	2	0	2	0	3
Discipline Core	DJJ20042	Mechanical Workshop Practice 2	0	4	0	0	2
	DJJ20053	Electrical Technology	2	2	0	0	3
	DJJ20063	Thermodynamics	2	2	0	0	3
	DJJ20073	Fluid Mechanics	2	2	0	0	3
TOTAL			25				17
SEMESTER 3							
Compulsory	DUE30012	Communicative English 2	1	0	2	0	2
Common Core	DBM30033	Engineering Mathematics 3	2	0	2	0	3
Discipline Core	DJJ30082	Mechanical Workshop Practice 3	0	4	0	0	2
	DJJ30093	Engineering Mechanics	2	2	0	0	3
	DJJ30103	Strength of Materials	2	2	0	0	3
	DJJ30113	Material Science and Engineering	2	2	0	0	3
	DJJ30122	Computer Aided Design	1	2	0	0	2
TOTAL			26				18

SEMESTER 4							
Common core	DJJ40132	Engineering and Society	2	0	0	0	2
Discipline Core	DJJ40142	Mechanical Workshop Practice 4	0	4	0	0	2
	DJJ40153	Pneumatic and Hydraulics	2	2	0	0	3
	DJJ40163	Mechanics of Machines	2	2	0	0	3
	DJJ40173	Engineering Design	2	2	0	0	3
	DJJ40182	Project 1	2	0	0	0	2
Elective		Elective***					
TOTAL			20				15
SEMESTER 5							
Compulsory	MPU21032	Penghayatan Etika dan Peradaban	1	0	2	0	2
	DUE50032	Communicative English 3	1	0	2	0	2
	MPU22012	Entrepreneurship	1	0	2	0	2
Discipline Core	DJJ50193	Project 2	0	4	0	0	3
	DJJ50203	Troubleshooting and Maintenance for Mechanical Componen	2	2	0	0	3
	DJJ50212	Maintenance Engineering and Management	2	0	0	0	2
Elective		Elective***					
TOTAL			19				14
SEMESTER 6							
Industrial Training	DUT600610	Engineering Industrial Training	0	0	0	0	10
TOTAL			0				10
ELECTIVES COURSES							
1	DJJ42022	Industrial Management	2	0	0	0	2
2	DJJ42032	Instrumentation And Control	2	0	0	0	
3	DJJ52012	Engineering Plant Technology	2	0	0	0	
4	DJJ52052	Railway Track System	2	0	0	0	
4	DJM20032	C Programming	1	2	0	0	
5	DJM40082	Programmable Logic Control	1	2	0	0	
6	DJM40092	Control System	2	1	0	0	
7	DJF51082	Quality Control	2	0	0	0	
FREE ELECTIVES*							
1	DUD10012	Design Thinking	1	0	0	1	2

Legend:

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

*For Muslim Student

**For Non Muslim Student

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

6.9 MATRIX OF COURSES VS PROGRAMME LEARNING OUTCOME (PLO)

CLASSIFICATION	COURSE CODE	COURSE	PROGRAMME LEARNING OUTCOME (PLO)											
			PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12
			Knowledge	Problem Analysis	Design/Development Solution	Investigation	Modern Tool Usage	The Engineer and Society	Environment and Sustainability	Ethic	Individual and Teamwork	Communication	Project Management and Finance	Lifelong Learning
			CLS1	CLS2	CLS2	CLS2	CL3a/3c	CLS3b	CLS5	CLS5	CLS3d	CLS3B	CLS4	CLS4
SEMESTER 1														
Compulsory	DUE10012	Communication English 1										√		√
	MPU24XX1	Sukan									√			√
	MPU24XX1	Unit Beruniform 1									√			√
Common Core	DUW10022	Occupational, Safety and Health for Engineering	√							√		√		
	DBS10012	Engineering Science	√				√					√		
	DBM10013	Engineering Mathematics 1	√				√					√		
Discipline Core	DJJ10013	Engineering Drawing	√				√			√				
	DJJ10022	Mechanical Workshop Practice 1					√	√						
	DJJ10033	Workshop Technology	√							√				√
SEMESTER 2														
Compulsory	MPU23052	Sains, Teknologi dan Kejuruteraan Dalam Islam*								√				√
	MPU23042	Nilai Masyarakat Dalam Islam**												
	MPU24XX1	Kelab/Persatuan									√			√
	MPU24XX1	Unit Beruniform 2												
Common Core	DBM20023	Engineering Mathematics 2	√				√					√		
Discipline Core	DJJ20042	Mechanical Workshop Practice 2					√				√			
	DJJ20053	Electrical Technology	√				√							
	DJJ20063	Thermodynamics	√				√							
	DJJ20073	Fluid Mechanics	√				√							

DIPLOMA IN MECHANICAL ENGINEERING (DKM)

SEMESTER 3														
Compulsory	DUE30012	Communicative English 2											√	√
Common Core	DBM30033	Engineering Mathematics 3	√				√						√	
Discipline Core	DJJ30082	Mechanical Workshop Practice 3					√	√						
	DJJ30093	Engineering Mechanics	√	√			√							
	DJJ30103	Strength of Materials	√	√			√							
	DJJ30113	Material Science and Engineering	√				√					√		
	DJJ30122	Computer Aided Design	√				√						√	
SEMESTER 4														
Common core	DJJ40132	Engineering and Society						√	√	√				
Discipline Core	DJJ40142	Mechanical Workshop Practice 4			√		√		√					
	DJJ40153	Pneumatic and Hydraulics	√		√		√							
	DJJ40163	Mechanics of Machines	√	√			√							
	DJJ40173	Engineering Design	√		√		√		√					
	DJJ40182	Project 1		√					√				√	
Elective		Elective***												
SEMESTER 5														
Compulsory	MPU21012	Pengajian Malaysia								√				√
	DUE50032	Communicative English 3										√		√
	MPU22012	Entrepreneurship										√	√	
Discipline Core	DJJ50193	Project 2			√	√						√	√	
	DJJ50203	Troubleshooting and Maintenance for Mechanical Componen	√			√	√							
	DJJ50212	Maintenance Engineering and Management	√						√				√	
Elective		Elective***												

DIPLOMA IN MECHANICAL ENGINEERING (DKM)

SEMESTER 6														
Industrial Training	DUT600610	Engineering Industrial Training						√			√	√	√	√
ELECTIVES COURSES														
1	DJJ42022	Industrial Management		√							√		√	
2	DJJ42032	Instrumentation And Control												
3	DJJ52012	Engineering Plant Technology												
4	DJJ52052	Railway Track System												
4	DJM20032	C Programming	√		√									√
5	DJM40082	Programmable Logic Control	√	√	√									
6	DJM40092	Control System		√	√						√			
7	DJF51082	Quality Control	√	√							√			
FREE ELECTIVES*														
1	DUD10012	Design Thinking										√		

7.0 SYNOPSIS AND COURSE LEARNING OUTCOME (CLO)**SEMESTER 1****7.1 DUE10012-COMMUNICATIVE ENGLISH 1 (Credit: 2)****SYNOPSIS:**

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.

COURSE LEARNING OUTCOME (CLO):

Upon completion of this course, students should be able to:

- CLO1: Participate in a discussion using effective communication and social skills to reach an amicable conclusion by accommodating differing views and opinions
- CLO2: Demonstrate awareness of values and opinions embedded in texts on current issues
- CLO3: Present a topic of interest that carries identifiable values coherently using effective verbal and nonverbal communication skills

7.2 DBM10013-ENGINEERING MATHEMATICS 1 (Credit: 3)**SYNOPSIS:**

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.

COURSE LEARNING OUTCOME (CLO):

Upon completion of this course, students should be able to:

- CLO1: Use mathematical statement to describe relationship between various physical phenomena.
- CLO2: Show mathematical solutions using the appropriate techniques in mathematics.
- CLO3: Use mathematical expression in describing real engineering problems precisely, concisely and logically.

7.3 DBS10012-ENGINEERING SCIENCE (Credit: 2)**SYNOPSIS:**

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.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:

- CLO1: Use basic physics concept to solve engineering physics problems
- CLO2: Apply knowledge of fundamental physics in activities to mastery physics concept
- CLO3: Perform appropriate activities related to physics concept

7.4 DUW100220-CCUPATIONAL SAFETY AND HEALTH FOR ENGINEERING (Credit: 2)**SYNOPSIS:**

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.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:

- 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, PLO10)

7.5 DJJ 10013-ENGINEERING DRAWING (Credit: 3)**SYNOPSIS**

ENGINEERING DRAWING course provides the students with the fundamentals of technical drawings and the application Computer Aided Design (CAD) software. For technical drawing, it emphasizes on the practical knowledge of drawing instruments and drawing techniques while for CAD the student will learn to navigate and use the software to create 2D drawing design in engineering. Students shall be able to demonstrate competency in using some standard available features of technical drawing and CAD application to create and manipulate objects or elements in engineering drawing.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:

- 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)

7.6 DJJ 10022-MECHANICAL WORKSHOP PRACTICE 1 (Credit: 2)**SYNOPSIS**

MECHANICAL WORKSHOP PRACTICE 1 exposes the students to welding, machining and fitting which involve the use of arc 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.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:

- 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)

7.7 DJJ 10033-WORKSHOP TECHNOLOGY (Credit: 3)**SYNOPSIS**

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).

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:

- 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)

SEMESTER 2

7.8 DJJ20042-MECHANICAL WORKSHOP PRACTICE 2 (Credit: 2)**SYNOPSIS**

MECHANICAL WORKSHOP PRACTICE 2 exposes the students to arc and gas welding, foundry and machining works. Safety procedure practice is heavily emphasized in the workshop.

COURSE LEARNING OUTCOME (CLO)

Upon completion of this course, students should be able to:

- CLO 1: Follow the appropriate procedure for welding, foundry and lathe machining. (P3, PLO5)
- CLO 2: Perform welding, foundry and lathe machining according to Standard Operating Procedure (SOP). (P4, PLO5)
- CLO 3: Demonstrate the ability to work as individual and as a team to complete assigned tasks. (A3, PLO9)

7.9 DJJ20053-ELECTRICAL TECHNOLOGY (Credit: 3)**SYNOPSIS**

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.

COURSE LEARNING OUTCOME (CLO)

Upon completion of this course, students should be able to:

- 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)

7.10 DJJ20063 THERMODYNAMICS (Credit: 3)**SYNOPSIS**

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.

COURSE LEARNING OUTCOME (CLO)

Upon completion of this course, students should be able to:

- CLO1: Explain fundamentals concept and properties of pure substances in thermodynamics (C2, PLO1)
- CLO2: Apply Laws of thermodynamics and its processes (C3, PLO1)
- CLO3: Organize appropriately experiments according to the Standard Operating Procedures (P4, PLO5)

7.11 DJJ20073-FLUID MECHANICS (Credit: 3)**SYNOPSIS**

FLUID MECHANICS provides students with a strong understanding of the fundamentals of fluid mechanics principles related to the fluid properties and behaviour in static and dynamic situations. This course also exposes the students to the demonstration at the real equipment of fluid mechanics.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:

- 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)

8.0 POLYTECHNIC SITE MA



9.0 REFERENCES

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