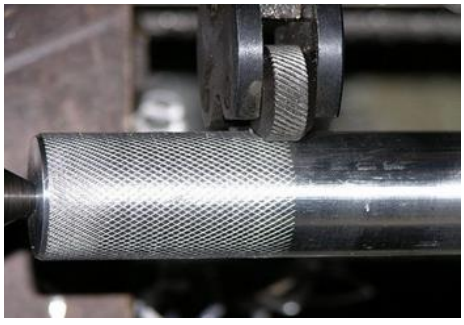
POLITEKNIK MALAYSIA
Sultan Azlan Shah

Diploma in Mechanical Engineering

STUDENT'S STUDY GUIDE



Politeknik Sultan Azlan Shah
35950 Behrang
Perak

Zahiran bin Hamzah
Zaharina binti Abu Hassan
Musalmah binti Kamaruddin

STUDENT'S STUDY GUIDE

Diploma in Mechanical Engineering
(DKM)

Zahiran bin Hamzah
Zaharina binti Abu Hassan
Musalmah binti Kamaruddin

Mechanical Engineering Department.
Politeknik Sultan Azlan Shah
35950 Behrang
Perak

Publisher:

Politeknik Sultan Azlah Shah
Behrang Stesen
35950 Behrang, Perak
Tel : 05-4544431
Fax:05-4544993
Email: http://www.psas.edu.my

Perpustakaan Negara Malaysia

Dicetak oleh :
Politeknik Sultan Azlan Shah

Table of Contents

1.0 INTRODUCTION
- 1.1 Synopsis 5
- 1.2 Job Prospect 5
- 1.3 Vision and Mision 6
- 1.4 Programme Aims 7
- 1.5 Programme Education Objectives 7
- 1.6 Programme Learning Outcomes (PLO) 8

2.0 PROGRAMME STRUCTURE
- 2.1 Programme Structure For Diploma in Mechanical Engineering 10
- 2.2 Relationship between the PLOs and the Courses 11

3.0 COURSES LIST
- 3.1 Synopsis and Course Learning Outcome (CLO) 13

4.0 MAKLUMAT AM DAN PERATURAN PEPERIKSAAN
- 4.1 Sistem Gred 29
- 4.2 Peraturan Am Kaedah Penilaian 29
- 4.3 Peraturan Pendaftaran Kursus 29
- 4.4 Mengulang Kursus 30
- 4.5 Syarat kelayakan untuk menduduki peperiksaan akhir 30
- 4.6 Tempoh Pengajian 30

SYNOPSIS
JOB PROSPECT
VISION AND MISION
PROGRAMME AIMS
PROGRAMME EDUCATION OBJECTIVES
PROGRAMME LEARNING OUTCOMES

SYNOPSIS

Diploma in Mechanical Engineering at Polytechnic's Ministry of Education Malaysia is designed to cover the current wide discipline of mechanical engineering with added specialization subjects in the field of mechanical engineering. Core courses offered include Engineering Mechanics, Electrical Technology, Engineering Drawing, Mechanical Workshop Practice, Workshop Technology, Computer Aided Design, Thermodynamics, Fluid Mechanics, Strength of Materials, Pneumatic & Hydraulics, Project, Maintenance Engineering & Management, Material Science, Mechanic of Machines, Engineering Design and Mechanical Components & Maintenance. The elective courses are Computer Aided Design 2,Quality Control and Industrial Management. Common core courses included in the programme are Engineering Mathematics, Engineering Science, Occupational Safety & Health and Entrepreneurship. Compulsory courses offered include Communicative English, Pengajian Malaysia, Komunikasi dan Penyiaran Islam, Nilai Masyarakat Malaysia, Sains Teknologi Dan Kejuruteraan Dalam Islam and Ko-Kurikulum would provide students with interpersonal ability, attitude and professionalism towards their career.

JOB PROSPECT

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

- *Technical Assistant*
- *Assistant Service Manager*
- *Service Advisor*
- *Supervisor*
- *Assistant Engineer*
- *Junior Engineer*
- *Technical Instructor or Lecturer*
- *Technical Sales Executive*

VISION
Department of Polytechnic Education

To be the Premier Industry-led TVET institution.

MISSION
Department of Polytechnic Education

This mission can be divided into four important components which are:

1. **To provide access to quality and recognised TVET programme.**
2. **To develop industry-led curriculum and enhance graduate readiness through coordinated industry engagement.**
3. **To produce balanced and enterprising graduate through dynamic and sustainable study programme.**
4. **To gain international recognition through collaboration and active participations in TVET community.**

VISION
Politeknik Sultan Azlan Shah

To become a premier industry-led TVET institution by 2020

MISSION
Politeknik Sultan Azlan Shah

To produce holistic, entrepreneurial and balanced graduates via globally recognized industry-led curriculum through an innovative, dynamic and quality teaching and learning ecosystem.

PROGRAMME AIMS

Graduates of diploma in mechanical engineering programme at Polytechnics will have knowledge, technical skills, softskills and attitude to adapt themselves with new technological advancement and challenges in the mechanical engineering field.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

The Graduates who are:

1. Competent in knowledge and skills in the field of mechanical engineering according to industry requirements.
2. Effective in communication and contribute effectively as a team member with the capability of being a leader.
3. Ethically and socially responsible towards developing the community and the nation
4. Able to demonstrate entrepreneurship skills and recognize the need of lifelong learning for a successful career advancement and able to adapt themselves with new technological challenges in mechanical fields

PROGRAMME LEARNING OUTCOMES (PLO)

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

1. Apply knowledge of mathematics, science, engineering fundamentals and social sciences to well defined mechanical engineering procedures and practices.
2. Analyse well defined mechanical engineering problems with respect to operation and maintenance, including troubleshooting
3. Conduct investigations and assist in the design of solutions for mechanical engineering system
4. Apply appropriate techniques, resources, and engineering tools to well defined mechanical engineering activities, with an awareness of the limitations
5. Demonstrate awareness and consideration for societal, health, safety, legal and cultural issues and their consequent responsibilities
6. Communicate effectively with the engineering community and society at large
7. Function effectively as an individual and as a member in diverse technical teams
8. Demonstrate an understanding of professional ethics, responsibilities and norms of engineering practices
9. Demonstrate an awareness of management, business practices and entrepreneurship
10. Demonstrate an understanding of the impact of engineering practices, taking into account the needs for sustainable development
11. Recognise the need for professional development and engage in independent and lifelong learning

Programme Structure For Diploma in Mechanical Engineering
Relationship between the PLOs and the Courses

Programme Structure For Diploma in Mechanical Engineering

NO.	COURSE CODE	COURSE	STATUS	CREDIT HOUR
SEMESTER SATU				**18**
1.	DUB1012	PENGAJIAN MALAYSIA	C	2
2.	DUE1012	COMMUNICATIVE ENGLISH 1	C	2
3.	DRB1XX0	ASAS UNIT BERUNIFORM	C	0
4.	DUW1012	OCCUPATIONAL, SAFETY AND HEALTH	CC	2
5.	DBM1013	ENGINEERING MATHEMATICS 1	CC	3
6.	DBS1012	ENGINEERING SCIENCE	CC	2
7.	DJJ1012	ENGINEERING DRAWING	DC	2
8.	DJJ1032	MECHANICAL WORKSYOP PRACTICE 1	DC	2
9.	DJJ1043	WORKSHOP TECHNOLOGY 1	DC	3
SEMESTER DUA				**18**
1	DUA2012	SAINS TEK DAN KEJ DALAM ISLAM	C	2
	DUB2012	NILAI MASYARAKAT MALAYSIA		
2	DRS2XX1	SUKAN	C	1
	DRB2XX1	UNIT BERUNIFORM 1		
3	DBM2013	ENGINEERING MATHEMATICS 2	CC	3
4	DJJ2022	ELECTRICAL TECHNOLOGY	DC	2
5	DJJ2032	MECHANICAL WORKSHOP PRACTICE 2	DC	2
6	DJJ2062	COMPUTER AIDED DESIGN 1	DC	2
7	DJJ2073	THERMODYNAMICS	DC	3
8	DJJ2093	FLUID MECHANICS	DC	3
SEMESTER 3				**18**
1	DUE3012	COMMUNICATIVE ENGLISH 2	C	2
2.	DRK3XX2	KELAB/PERSATUAN	C	2
	DRB3XX2	UNIT BERUNIFORM 2		
3.	DBM3013	ENGINEERING MATHEMATICS 3	CC	3
4.	DJJ3032	MECHANICAL WORKSHOP PRACTICE 3	DC	2
5.	DJJ3053	ENGINEERING MECHANICS	DC	3
6.	DJJ3103	STRENGTH OF MATERIALS	DC	3
7.	DJJ3213	MATERIAL SCIENCE	DC	3
SEMESTER 4				**16**
1.	DUE5012	COMMUNICATIVE ENGLISH 3	C	2
2.	DJJ5032	MECHANICAL WORKSHOP PRACTICE 4	DC	2
3.	DJJ5113	MECHANICS OF MACHINES	DC	3
4.	DJJ5123	PNEUMATICS & HYDRAULICS	DC	3
5.	DJJ5133	ENGINEERING DESIGN	DC	3
6.	DJJ5141	PROJECT 1	DC	1
7.		*Elective	E	2
SEMESTER 5				**14**
1.	DUA6022	KOMUNIKASI DAN PENYIARAN ISLAM	C	2
2.	DPB2012	ENTREPRENEURSHIP	CC	2
3.	DJJ6143	PROJECT 2	DC	3
4.	DJJ6153	MECHANICAL COMPONENTS & MAINTENANCE	DC	3
5.	DJJ6162	MAINTENANCE ENGINEERING & MANAGEMENT	DC	2
		*Elective	E	2
SEMESTER 6				**10**
1.	DUT40110	INDUSTRIAL TRAINING		10
ELECTIVE				
1.	DJJ5062	Computer Aided Design 2	E	2
6.	DJJ6192	Industrial Management	E	2
7.	DJF6102	Quality Control	E	2

NO	COMPONENTS	Total Credit
i	Compulsory	15
ii	Common Core	15
iii	Discipline Core	50
iv	Elective	4
v	Industrial Training	10
	Total	94

Relationship between the PLOs and the Courses

NO	CODE		COURSES	PROGRAMME LEARNING OUTCOME (PLO)										
				PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11
				LD1	LD1	LD4	LD2	LD5	LD3	LD9	LD8	LD7	LD5	LD6
COMPULSORY														
1	DUA	2012	Sains Teknologi Dan Kejuruteraan Dalam Islam*	1										1
2	DUA	6012	Komunikasi dan Penyiaran Islam	1				1						1
3	DUB	1012	Pengajian Malaysia	1										1
4	DUB	2012	Nilai Masyarakat Malaysia**	1										1
5	DUE	1012	Communicative English 1	1					1					
6	DUE	3012	Communicative English 2	1					1					
7	DUE	5012	Communicative English 3	1					1					
8	DRB	1XX0	Asas Unit Beruniform			1	1			1				
9	DRB	2XX1	Unit Beruniform 1			1	1			1				
10	DRB	3XX1	Unit Beruniform 2			1	1			1				
11	DRK	3XX2	Kelab/Persatuan			1	1			1				
12	DRS	2XX1	Sukan			1	1			1				
13	DUT	40110	Industrial Training				1		1	1	1			1
COMMON CORE														
14	DUW	1012	Occupational Safety and Health	1		1					1			
15	DPB	2012	Entrepreneurship	1			1		1			1		
16	DBM	1013	Engineering Mathematics 1	1										
17	DBM	2013	Engineering Mathematics 2	1										
18	DBM	3013	Engineering Mathematics 3	1										
19	DBS	1012	Engineering Science	1			1							
DISCIPLINE CORE														
20	DJJ	1012	Engineering Drawing	1			1				1			
21	DJJ	2022	Electrical Technology	1			1							1
22	DJJ	1032	Mechanical Workshop Practice 1				1	1			1			
23	DJJ	2032	Mechanical Workshop Practice 2				1			1	1			
24	DJJ	3032	Mechanical Workshop Practice 3				1	1				1		
25	DJJ	5032	Mechanical Workshop Practice 4				1			1			1	
26	DJJ	1043	Workshop Technology	1										1
27	DJJ	3053	Engineering Mechanics		1		1			1				
28	DJJ	2062	Computer Aided Design 1	1			1							1
29	DJJ	2073	Thermodynamics 1	1			1			1				
30	DJJ	2093	Fluid Mechanics	1			1			1				
31	DJJ	3103	Strength of Materials		1		1			1				
32	DJJ	3213	Material Science	1			1			1				
33	DJJ	5113	Mechanics of Machines		1		1			1				
34	DJJ	5123	Pneumatic and Hydraulic		1	1	1				1			
35	DJJ	5133	Engineering Design		1	1			1					
36	DJJ	5141	Project 1			1			1					1
37	DJJ	6143	Project 2			1	1		1	1		1	1	
38	DJJ	6153	Mechanical Components and Maintenance		1		1				1			
39	DJJ	6162	Maintenance Engineering and Management		1	1						1		1
ELECTIVE														
40	DJJ	5062	Computer Aided Design 2	1			1		1					
45	DJF	6102	Quality Control	1		1				1				
48	DJJ	6192	Industrial Management	1	1				1					

Course
Synopsis
Course learning Outcome (CLO)

Course	**DJJ1012 - Engineering Drawing**
Credit	**2**
Pre requisite	**None**

Synopsis
ENGINEERING DRAWING course provides the student with the fundamental of engineering drawings. It emphasizes on the practical knowledge of drawing instruments and drawing techniques that will be applied in workshop practical activities and in Computer Aided Design courses.

Course learning Outcome (CLO)
1. Apply the basic fundamentals of engineering drawing in comply to telated problems (C3, PLO1)
2. Construct engineering drawings according to the required standards (P4, PLO4)
3. Demonstrate the understanding of engineering norms and practices in engineering drawing (A3, PLO8)

Course	**DJJ1032 - Mechanical Workshop Practice 1**
Credit	**2**
Pre requisite	**None**

Synopsis
MECHANICAL WORKSHOP PRACTICE 1 exposes the students to welding, machining and fitting which involves 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 Outcome (CLO)
1. Perform fitting , machining and welding works according to Standard Operation Procedure (SOP) (P4. PLO4)
2. Demonstrate the awareness of social responsibility and safety in practical work procedures and practices (A3, PLO5)
3. Demonstrate an understanding of professional ethics, responsibilities and norms of engineering practices according to the workshop safety regulation. (A3, PLO8)

Course	**DJJ1043 - Workshop Technology**
Credit	**3**
Pre requisite	**None**

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 Outcome (CLO)
1. Apply the knowledge of basic mechanical components and equipment, hand tools and measuring equipment in workshop technology (C3, PLO1)
2. Explain the types of the removal and joining process in mechanical engineering. (C3, PLO1)
3. Demonstrate continuous learning and information management skills to complete assigned task. (A3, PLO11)

Course	**DJJ2022 - Electrical Technology**
Credit	**2**
Pre requisite	**None**

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 Technology.

Course learning Outcome (CLO)
1. Apply the principles of electrical circuits, electromagnetism, transformers and electrical machines to solve related problems. (C3, PLO1)
2. Organize appropriately experiments in groups according to the Standard Operating Procedures. (P4, PLO4)
3. Demonstrate continuous learning and information management skills while engaging in independent acquisition of new knowledge and skills in laboratory report. (A3, PLO11)

Course	**DJJ2032 - Mechanical Workshop Practice 2**
Credit	**2**
Pre requisite	**DJJ1032 - Mechanical Workshop Practice 1**

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

Course learning Outcome (CLO)
1. Perform welding, foundry and lathe machining according to Standard Operating Procedure (SOP). (P4, PLO4)
2. Demonstrate the ability to work in team to complete assigned tasks during practical work sessions. (A3, PLO7)
3. Demonstrate an understanding of professional ethics, responsibilities and norms of engineering practices according to the workshop safety regulation. (A3, PLO8)

Course	**DJJ2062 - Computer Aided Design 1**
Credit	**2**
Pre requisite	**None**

Synopsis
COMPUTER AIDED DESIGN 1 provides a comprehensive introduction to Computer-Aided Design software. It is an introductory level where the students will learn to navigate and use the software to create two-dimensional design in engineering. Students shall be able to demonstrate competency in using some standard available features of a CAD application to create and manipulate objects or elements and to modify them. They should be able to change object properties and to undertake printing or plotting activity associated with the delivery outputs. In addition, students are required to use some advanced features of CAD software, such as inserting objects from other applications.

Course learning Outcome (CLO)

1. Apply the fundamental features of CAD software in producing engineering drawing. (C3, PLO1)
2. Construct 2D drawing using fundamental features of CAD software. (P4, PLO4)
3. Demonstrate continuous learning and information management skill while engaging in independent acquisition of new knowledge and skill to solve assigned task. (A3, PLO11)

Course	**DJJ2073 - Thermodynamics**
Credit	**3**
Pre requisite	**None**

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)

1. Apply the fundamentals of thermodynamics to solve related problems. (C3, PLO1)
2. Organize appropriately experiments in groups according to the Standard Operating Procedures. (P4, PLO4)
3. Demonstrate the ability to work in team to complete assigned tasks during practical work sessions. (A3, PLO7)

Course	**DJJ2093 - Fluid Mechanics**
Credit	**3**
Pre requisite	**None**

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 Outcome (CLO)

1. Apply the fundamentals of fluid mechanics to solve related problems. (C3, PLO1)
2. Organize appropriately experiments in groups according to the Standard Operating Procedures. (P4, PLO4)
3. Demonstrate ability to work in team to complete assigned tasks during practical work sessions. (A3, PLO7)

Course	**DJJ3032 - Mechanical Workshop Practice 3**
Credit	**2**
Pre requisite	**DJJ2032 - Mechanical Workshop Practice 2**

Synopsis

MECHANICAL WORKSHOP PRACTICE 3 exposes the students to the use of Tungsten Inert Gas (TIG) and Metal Inert Gas (MIG) welding machines. Students also will perform a task by using lathe and milling machine. In addition students will be exposed in entrepreneurships. Safety procedures practice will be emphasized in workshop.

Course learning Outcome (CLO)

1. Perform welding and machining tasks according to workshop Standard Operating Procedure.(P4, PLO4)
2. Demonstrate awareness of entrepreneurship while performing practical tasks. (A3, PLO9)
3. Demonstrate awareness of social responsibility and safety procedures in the workshop according to the workshop safety regulations.(A2, PLO5)

Course	**DJJ3053 - Engineering Mechanics**
Credit	**3**
Pre requisite	**None**

Synopsis

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.

Course learning Outcome (CLO)

1. Analyze problems related to statics and dynamics based on the concept and principles of engineering mechanics. (C4, PLO2)
2. Organize appropriately experiments in groups according to the Standard Operating Procedures. (P4, PLO4)
3. Demonstrate ability to work in team to complete assigned tasks during practical work sessions. (A3, PLO7)

Course	**DJJ3103 – Strength of Material**
Credit	**3**
Pre requisite	**None**

Synopsis

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.

Course learning Outcome (CLO)

1. Apply the concepts of strength of materials to solve related problems. (C3, PLO1)
2. Organize appropriately experiments in groups according to the Standard Operating Procedures. (P4, PLO4)
3. Demonstrate ability to work in team to complete assigned tasks. (A3, PLO7)

Course	**DJJ3213 – Material Science**
Credit	**3**
Pre requisite	**None**

Synopsis

MATERIAL SCIENCE provides students with an understanding of material science and engineering which emphasizes on atomic and crystal structure, material properties and behaviour including material classification and its application in the engineering field. The topic also covers the processes of metal work used to produce engineering components and apply basic principles of material testing and processing through practical.

Course learning Outcome (CLO)

1. Explain the fundamental of material science including identification of various types of materials, mechanical behavior, metal production processes, and various principles of material testing. (C3, PLO1)
2. Organize appropriately experiments in groups according to the Standard Operating Procedures. (P4, PLO4)
3. Demonstrate ability to work in team to complete assigned tasks during practical work sessions. (A3, PLO7)

Course	**DJJ5032 – Mechanical Workshop Practice 4**
Credit	**2**
Pre requisite	**DJJ3032 MECHANICAL WORKSHOP PRACTICE 3**

Synopsis

MECHANICAL WORKSHOP PRACTICES 4 course allows the students to operate machine tools, extend their experiences on indexing, precision grinding, CNC machine and able to work in a clean and safe workshop environment.

Course learning Outcome (CLO)

1. Construct programs for EDM and CNC machining process using ISO codes and using CADCAM Software. (P4, PLO4)
2. Perform indexing in milling machine and perform machining processes for the surface grinding machine or cylindrical grinding machines. (P4, PLO4)
3. Demonstrate safety procedures in the workshop according to the workshop safety regulation correctly to create a secured environment in an organization while doing practical work. (A3, PLO10)
4. Demonstrate ability to work in team to complete assigned tasks during practical work sessions. (A3, PLO7)

Course	**DJJ5113 – Mechanics of Machines**
Credit	**3**
Pre requisite	**DJJ3053 - Engineering Mechanics**

Synopsis

MECHANICS OF MACHINES exposes the students with knowledge on techniques and concepts of mechanics of machines and analyzing problems related to hoists, friction, simple harmonic motion, velocity and acceleration diagram, friction and belt drives. This course also exposes the students to the demonstration of experiments in Mechanics of Machines by using the real equipment.

Course learning Outcome (CLO)

1. Analyze problems related to the mechanics of machines and data from the experiments in relation to the theoretical aspects. (C4, PLO2)
2. Organize appropriately experiments in groups according to the Standard Operating Procedures. (P4, PLO4)
3. Demonstrate ability to work in team to complete assigned tasks during practical work sessions. (A3, PLO7)

Course	**DJJ5123 – Pneumatics & Hydraulics**
Credit	**3**
Pre requisite	**None**

Synopsis
PNEUMATICS & HYDRAULICS provides knowledge and understanding to the importance of pneumatics and hydraulics circuits, equipment and design along with its usage in the industry.

Course learning Outcome (CLO)
1. Analyze the basic concept and function of pneumatics and hydraulics system.(C4,PLO2)
2. Construct pneumatic, electro-pneumatic and hydraulic circuit according to assigned tasks.(C5, PLO3 & P4, PLO4)
3. Demonstrate understanding of engineering norm and practices in pneumatics and hydraulics during practical work sessions. (A3, PLO8)

Course	**DJJ5133 – Engineering Design**
Credit	**3**
Pre requisite	**None**

Synopsis
ENGINEERING DESIGN provides knowledge on basic engineering design. It emphasizes on mathematical analysis for simple component designs in engineering such as key, rivet and welding joint. It also provides knowledge on gear design and selection of bearing.

Course learning Outcome (CLO)
1. Analyze well-defined the concept of design process and stress in an engineering product or component. (C4, PLO2)
2. Conduct investigations in the design of simple engineering components by using mathematical analysis, taking into consideration the safe load limitation. (C5, PLO3)
3. Demonstrate good written communication skills of case study in group, on assigned topic. (A3,PLO6)

Course	**DJJ5141 – Project 1**
Credit	**1**
Pre requisite	**None**

Synopsis
PROJECT 1 provides students with solid foundation on knowledge and skills in preparing project proposal, writing and presentation of proposal.

Course learning Outcome (CLO)
1. Organize research or project systematically. (C4, PLO3)
2. Demonstrate good communication skill of oral presentation in group. (A3, PLO6)
3. Demonstrate continuous learning and information management skills while engaging in independent acquisition of new knowledge and skill to develop a project. (A3, PLO11)

Course	**DJJ6143 – Project 2**
Credit	**3**
Pre requisite	**DJJ5141 – Project 1**

Synopsis
PROJECT 2 introduces the students to the concepts of conducting a design or case study. The students select a project, list the project's needs, the processes involved, cost estimation, project schedule by applying appropriate methodology in the project planning. It also involves project implementation, project report and presentation.

Course learning Outcome (CLO)
1. Develop creative solution to solve the problems in the project design or case study (C5, PLO3)
2. Organize the selected design or case study based on the project planning (P5, PLO4).
3. Demonstrate good communication skills of presentation in group. (A3, PLO6)
4. Demonstrate ability to lead a team to complete assigned project during practical work sessions. (A3, PLO7)
5. Demonstrate awareness of management, business practices and entrepreneurship related to product of project. (A3, PLO9)
6. Demonstrate awareness of social responsibility in practical work procedure and practices. (A3, PLO10)

Course	**DJJ6153 Mechanical Components & Maintenance**
Credit	**3**
Pre requisite	**None**

Synopsis
MECHANICAL COMPONENTS AND MAINTENANCE course covers necessary mechanical components needed in Industries. The topics include maintenance principles and procedures, lubrication, power transmission, bearing, clutches and brake, and also pumps, valves and compressor. This course also provides knowledge and skills regarding maintenance of mechanical components as well as assembly and disassembly of compressors.

Course learning Outcome (CLO)
1. Analyze the concept of mechanical components to solve related problems. (C4, PLO2)
2. Assemble selected mechanical components based on service manual maintenance in groups. (P5, PLO4)
3. Demonstrate understanding of engineering norm and practices in mechanical components and maintenance during practical work sessions. (A3, PLO8)

Course	**DJJ6162 – Maintenance Engineering & Management**
Credit	**2**
Pre requisite	**None**

Synopsis
MAINTENANCE ENGINEERING & MANAGEMENT covers topics such as maintenance organization, maintenance strategies system, system approach to maintenance, maintenance planning and scheduling and computerized maintenance management system (CMMS). This course also provides student with knowledge regarding maintenance of facilities and equipment in good working condition and help them develop good management knowledge.

Course learning Outcome (CLO)

1. Analyze the concepts of maintenance organization and strategies to solve related problems. (C4, PLO2)
2. Relate the principles of maintenance strategies and elaborate on the significance of a system approach to maintenance. (C5, PLO3)
3. Demonstrate an awareness of management, business practices and entrepreneurship related to maintenance management. (A3, PLO9)
4. Organize maintenance management plan and schedule that integrates the whole management processes and procedures by group in actual workplace. (A4, PLO11)

Course	**DJJ5062 Computer Aided Design 2**
Credit	**2**
Pre requisite	**DJJ25062 Computer Aided Design 1**

Synopsis

COMPUTER AIDED DESIGN 2 exposes the students to learn the fundamental principles of 3D parametric part design and production-ready part drawings using 3D CAD software. Students will know the various method of creating a solid model using extrude, revolve, swept, assembly, simulation and animation. Hands-on exercises representing real-world, industry-specific design of mechanical engineering will also be covered in this course.

Course learning Outcome (CLO)

1. Apply the function of CAD commands in producing engineering drawing. (C3, PLO1)
2. Create drawing of mechanical component in 3D according to drawing standard. (P3, PLO4)
3. Demonstrate good written communication skill in group project report. (A3, PLO6)

Course	**DJJ6192 Industrial Management**
Credit	**2**
Pre requisite	**None**

Synopsis

INDUSTRIAL MANAGEMENT provides students with a strong fundamental understanding of industrial management prospect and production system planning such as inventory, scheduling, production system operation, facilities, plan location, layout and line balancing. This course also provides knowledge in quality control and human resource management.

Course learning Outcome (CLO)

1. Apply the basic concepts of industrial management system in Industry to solve related problems. (C3, PLO1)
2. Analyze problems related to industrial management. (C4, PLO2)
3. Demonstrate good written communication skills in case study on assigned topics in groups. (A3, PLO6)

Course	**DJF6102 Quality Control**
Credit	**2**
Pre requisite	**None**

Synopsis

QUALITY CONTROL provides knowledge on basic principle and concept of quality including statistical method in controlling products quality or secvices. This course also emphasizes on the application of Control Chart and Quality Control tools and also explains the importance of International Standard of Quality Assurance Standard, ISO 9000 for an organization

Course learning Outcome (CLO)

1. Apply the relation of statistics and quality management system in understanding of quality control and their application tools. (C3, PLO1)
2. Propose the related quality tools and techniques to control the quality of products or services based on case study. (C5, PLO3)
3. Demonsstrate ability to work in team to complete the assigned tasks. (A3, PLO7)

Course	**DBM1013 – Engineering Matematics 1**
Credit	**3**
Pre requisite	**None**

Synopsis

ENGINEERING MATHEMATICS 1 expose students to the basic algebra including perform partial fractions. This course also exposes the concept of trigonometry and the method to solve trigonometry problems by using basic identities, compound angle and double angle formula. Students also will be introduced to the theory of complex number and matrics method to solve simultaneous equation. This course also introduces students to concept of vector and scalar

Course learning Outcome (CLO)

1. Identify mathematical methods in solving the mathematical problems.(C2, LD1). (C2, LD1)
2. Solve the mathematical problems by using appropriate techniques and solutions. (C3, LD1)
3. Practice mathematical knowledge and skills in different mathematics problem. (C3, LD1)

Course	**DBM2013 – Engineering Matematics 2**
Credit	**3**
Pre requisite	**None**

Synopsis

ENGINEERING MATHEMATICS 2 exposes students to the basic laws of exponents and logarithms. This course also introduces the basic rules of differentiation concept to solve problems that relate maximum, minimum and calculate the rates of changes. This course also discuss integration concept in order to strengthen student knowledge for solving area and volume bounded region problems. In addition, students also will learn application of both techniques of differentiation and integration.

Course learning Outcome (CLO)

1. Solve the mathematical problems by using appropriate techniques and solutions. (C3, LD1)
2. Show the solution for differentiation and integration problem by using appropriate method. (C3,LD1)
3. Practice mathematical knowledge and skills in different mathematics problem. (C3, LD1)

Course	**DBM3013 – Engineering Matematics 3**
Credit	**3**
Pre requisite	**DBM2013 – Engineering Matematics 2**

Synopsis
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 additional, the course also discusses optimization problems by using Linear Programming. In order to strengthen the students in solving advanced engineering problems, Ordinary Differential Equation (ODE) is also included.

Course learning Outcome (CLO)
1. Solve the mathematical problem by using appropriate techniques and solution. (C3,LD1)
2. Show the solution for statistics and probability problems and linear programming by using appropriate mathematical methods. (C3, LD1)
3. Practice mathematical knowledge and skills in different mathematical problem. (C3,LD1)

Course	**DBS1012 – Engineering Science**
Credit	**2**
Pre requisite	**None**

Synopsis
ENGINEERING SCIENCE is an applied science with theoretical concepts and practical learning sessions that can be applied in the engineering fields. This course focuses on the Physical Quantities, Measurement, Linear Motion, Force, Work, Energy, Power, Solid, Fluid, Temperature and Heat.

Course learning Outcome (CLO)
1. Solve the basic engineering science problem by using related concept. (C3,LD1)
2. Organise an appropriate experiments to prove related physic principles. (P3,LD2)
3. Apply related physic principles in various situations to enhancec knowledge. (C3,LD1)

Kursus	**DUA2012 – Sains Tek dan Kej dalam Islam**
Kredit	**2**
Prasyarat	**Tiada**

Sinopsis
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.

Hasil Pembelajaran Kursus (CLO)
1. Menghuraikan konsep Islam sebagai cara hidup. (C2,LD1 : P2,LD2)
2. Menjelaskan konsep sains, teknologi dan kejuruteraan dalam Islam. (C2,LD1)
3. Membincangkan prinsip syariah dan kaedah fiqh dalam sains, teknologi dan kejuruteraan. (C3,LD1 :A3,LD6)

Kursus	**DUA6022 – Komunikasi dan Penyiaran Islam**
Kredit	**2**
Prasyarat	**Tiada**

Sinopsis
KOMUNIKASI DAN PENYIARAN ISLAM memfokuskan kepada penguasaan konsep, kemahiran komunikasi dan penyiaran Islam bagi meningkatkan kefahaman pelajar secara holistic terhadap kursus ini.

Course learning Outcome (CLO)
1. Menjelaskan konsep, bentuk komunikasi dan hubungannya dalam Islam (C2,LD1)
2. Menunjukkan kemahiran pengurusan komunikasi dalam bidang penyiaran Islam. (C3, LD1 : A4,LD5)
3. Menghubung kait isu-isu semasa dalam komunikasi dan penyiaran Islam. (C3,LD1 : A3,LD6)

Kursus	**DUB1012 - Pengajian Malaysia**
Kredit	**2**
Prasyarat	**Tiada**

Sinopsis
PENGAJIAN MALAYSIA memupuk penghayatan kea rah melahirkan generasi yang cintakan negara. Kursus ini juga dapat mendidik kelompok masyarakat yang mempunyai daya juang yang tinggi dan mampu menghadapi cabaran di peringkat antarabangsa. Kursus ini memberi penghayatan tentang sejarah dan politik, perlembagaan Malaysia, kemasyarakatan dan perpaduan, pembangunan negara dan isu-isu keprihatinan negara. Objektif kursus ini adalah untuk melahirkan warganegara yang setia dan cintakan negara, berwawasan serta bangga menjadi rakyat Malaysia

Hasil Pembelajaran Kursus (CLO)
1. Menerangkan dengan baik sejarah bangsa dan negara (C2, LD1)
2. Menjelaskan Perlembagaan Malaysia dan system pemerintahan negara (C2, LD1)
3. Melaksanakan aktiviti berkaitan kenegaraan kea rah peningkatan patriotism pelajar (C3, LD1, A3, LD6)

Kursus	**DUB2012 – Nilai Masyarakat Malaysia**
Kredit	**2**
Prasyarat	**Tiada**

Sinopsis
NILAI MASYARAKAT MALAYSIA membincangkan aspek sejarah pembentukan masyarakat Malaysia, nilai-nilai agama serta adat resam dan budaya masyarakat majmuk. Selain itu, pelajar diberi kefahaman mengenai tanggungjawab individu dalam kehidupan dan cabaran-cabaran dalam membangunkan masyarakat Malaysia.

Hasil Pembelajaran Kursus (CLO)
1. Menerangkan sejarah pembentukan masyarakat dan nilai agama di Malaysia. (C2,LD1)
2. Menghubung kait tnggungjawab individu dalam kehidupan masyarakat dan negara. (C3,LD1 :A2,LD5)
3. Membincangkan cabaran-cabaran dalam membangunkan masyarakat Malaysia. (C3,LD1 :A3,LD6)

Course	**DUE1012 – Communicative English 1**
Credit	**2**
Pre requisite	**None**

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. It is also aimed to equip students with effective presentation skills.

Course learning Outcome (CLO)
1. Apply appropriate language and communication skills in discussions and conversations. (C3, LD3)
2. Apply effective listening skills to demonstrate comprehension of audio recordings in a variety of situations. (C3, LD1)
3. Comprehend a variety of reading texts by applying effective teading skills. (C2, LD1)
4. Write in response to a stimulus using appropriate language. (C3, LD1)
5. Deliver an effective presentation using appropriate visual aids, verbal and non-verbal communication skills. (C3, A3, LD3)

Course	**DUE3012 – Communicative English 2**
Credit	**2**
Pre requisite	**DUE1012 – Communicative English 1**

Synopsis
COMMUNICATIVE ENGLISH 2 emphasises the skills required at the workplace to describe products or services as well as processes or procedures. It also focuses on the skills to give and respond to instructions. This course will also enable studeents to make and reply to enquiries and complaints

Course learning Outcome (CLO)
1. Describe products or services related to their field of studies using appropriate language. (C3,A3, LD3)
2. Transfer information of a process or procedure accurately from linear to non-linear form and vice versa. (C3, LD1)
3. Listen and respond to enquiries using appropriate language. (C3,LD1)
4. Make and respond to complaints using appropriate language. (C3,LD3)

Course	**DUE5012 – Communicative English 3**
Credit	**2**
Pre requisite	**DUE3012 – Communicative English 2**

Synopsis
COMMUNICATIVE ENGLISH 3 aims to develop the necessary skills in students to analyse and interpret graphs and charts from data collected as well as job hunting mechanics. Students will learn the process of job hunting which includes job search strategies and making enquiries. They will also learn to write resumes and cover letters. The students will develop skills to introduce themselves, highlight their strengths and abilities, present ideas, express opinions and respond appropriately during job interviews.

Course learning Outcome (CLO)

1. Describe and analyze information contained in graphs and charts clearly and accurately based on a mini project. (C4,LD1 : A3,LD3)
2. Write an effective resume and a supporting cover letter for a relevant job opening. (C3, LD1)
3. Handle a job interview effectively and confidently. (C3,LD3)

Course	**DPB2012 – Entrepreneurship**
Credit	**2**
Pre requisite	**None**

Synopsis

ENTREPRENEURSHIP focuses the principles and concept of entrepreneurship. This course concentrates on the systematic methods of getting business ideas. This course also prepares students on conducting online business using social media marketing. It also emphasizes a preparation of business plan and developing their entrepreneurial skills.

Course learning Outcome (CLO)

1. Explain clearly the concept of entrepreneurship and process of developing an effective business.(C2, LD1)
2. Prepare completely a business plan according to standard format. (P2,LD2)
3. Build the online business presence using the social media marketing. (P3,LD2: A4, LD7)

Course	**DUW1012 - Occupational Safety and Health**
Credit	**2**
Pre requisite	**None**

Synopsis

OCCUPATIONAL SAFETY AND HEALTH 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 employers in implementing and complying with the safety procedures at work. This course provide an understanding of the key issues in OSH management, incident prevention, Emergency Preparedness and Response (EPR), fire safety, occupational first aid, Hazard Identification, Risk Assessment and Risk Control (HIRARC) and guide the students gradually into this multi-disciplinary science

Course learning Outcome (CLO)

1. Identify the OSH legislation and its compliance in Malaysia. (C2, LD1)
2. Explain briefly incident hazards, risks and safe work practices in order to maintain health and safe work environment. (C2, LD1)
3. Discuss cooperatively in responding to an accident action at workplace. (C3, LD1 : A2, LD4
4. Adhere to the safety procedures in respective fields. (A3,LD8)

Course	**DPB2012 – Entrepreneurship**
Credit	**2**
Pre requisite	**None**

Synopsis
ENTREPRENEURSHIP focuses the principles and concept of entrepreneurship. This course concentrates on the systematic methods of getting business ideas. This course also prepare the students on conducting business using social media marketing. It also emphasizes a preparation of business plan, thus developing their entrepreneurial skills.

Course learning Outcome (CLO)

1. Explain clearly the concept of entrepreneurship and process of developing an effective business. (C2,LD1)
2. Preepare completely a business plan according to standard format. (P2, LD2)
3. Build the online business presence using the social media marketing. (P3, LD2 : A4,LD7)

CLO bagi kokurikulum

Kursus	**DRB1060 – Pengakap Kelana**
Kredit	**0**
Prasyarat	**Tiada**

Sinopsis
PENGAKAP KELANA memfokuskan kepada penguasaan pengetahuan dan kemahiran khusus secara holistik bagi mengukuhkan pembentukan kemahiran insaniah pelajar yang positif

Hasil Pembelajaran (CLO)

1. Menunjukkan kemahiran khusus yang dipelajari (P2, LD2)
2. Melaksanakan aktiviti-aktiviti berdasarkan penguasaan kemahiran yang dipelajari (A2, LD4, LD9)

Kursus	**DRB2061 – Pengakap Kelana 1**
Kredit	**1**
Prasyarat	**DRB1060 – Pengakap Kelana**

Sinopsis
PENGAKAP KELANA 1 memfokuskan kepada penguasaan pengetahuan dan kemahiran khusus secara holistik bagi mengukuhkan pembentukan kemahiran insaniah pelajar yang positif

Hasil Pembelajaran (CLO)

1. Mempamerkan kompetensi kemahiran khusus yang dipelajari (P2, LD2)
2. Melaksanakan aktiviti-aktiviti berdasarkan penguasaan kemahiran yang dipelajari (A2, LD4, LD9)

Kursus	**DRB3061 – Pengakap Kelana 2**
Kredit	**2**
Prasyarat	**DRB2061 – Pengakap Kelana 1**

Sinopsis
PENGAKAP KELANA 2 memfokuskan kepada penguasaan pengetahuan dan kemahiran khusus secara holistik bagi mengukuhkan pembentukan kemahiran insaniah pelajar yang positif

Hasil Pembelajaran (CLO)
1. Mempamerkan kompetensi kemahiran khusus yang dipelajari (P3, LD2)
2. Melaksanakan aktiviti-aktiviti berdasarkan penguasaan kemahiran yang dipelajari (A3, LD4, LD9)

Kursus	**DRS2131 – Memanah**
Kredit	**1**
Prasyarat	**Tiada**

Sinopsis
MEMANAH memfokuskan kepada penguasaan pengetahuan dan kemahiran khusus secara holistik bagi mengukuhkan pembentukan kemahiran insaniah pelajar yang positif
Hasil Pembelajaran (CLO)
1. Mempamerkan kompetensi kemahiran khusus yang dipelajari (P2, LD2)
2. Melaksanakan aktiviti-aktiviti berdasarkan penguasaan kemahiran yang dipelajari (A2, LD4, LD9)

Kursus	**DRK3052 – Fottografi**
Kredit	**2**
Prasyarat	**Tiada**

Sinopsis
FOTOGRAFI memfokuskan kepada penguasaan pengetahuan dan kemahiran khusus secara holistik bagi mengukuhkan pembentukan kemahiran insaniah pelajar yang positif

Hasil Pembelajaran (CLO)
1. Mempamerkan kompetensi kemahiran khusus yang dipelajari (P3, LD2)
2. Melaksanakan aktiviti-aktiviti berdasarkan penguasaan kemahiran yang dipelajari (A3, LD4, LD9)

Senarai kursus kokurikulum yang ditawakan boleh di rujuk dengan Jabatan Sukan kebudayaan dan Kokurikulum

KURSUS DRS	
Badminton	Futsal
Bola keranjang	Softbol
Sepaktakraw	Golf
Bola Jaring	Ragbi
Bola Tampar	Silat
Memanah	Bowling
Tae Kwan Do	Tenis
Skuasy	Hoki

KURSUS DRK	
Kembara	Bahasa Inggeris
Nasyid	Audio Visual
Amalan 5S	Inovasi & Rekacipta
Fotografi	Study Circle
Kompang	Mesra Alam
Komputer	Tarian Tradisional
Kaunseling	Keusahawanan
Pengguna	

KURSUS DRB
PISPA
WATANIAH
PENGAKAP KELANASISWA
RELASIS

PERATURAN PEPERIKSAAN
(Hendaklah dibaca bersama dengan buku Arahan-arahan Peperiksaan dan Kaedah Penilaian Edisi 5 Dis 2015)

4.1 SISTEM GRED

Markah	Nila Mata	Gred	Status
90-100	4.00	A+	Sangat Cemerlang
80-89	4.00	A	Cemerlang
75-79	3.67	A-	Kepujian
70-74	3.33	B+	Kepujian
65-69	3.00	B	Kepujian
60-64	2.67	B-	Lulus
55-59	2.33	C+	Lulus
50-54	2.00	C	Lulus
47-49	1.67	C-	Lulus
44-46	1.33	D+	Lulus
40-43	1.00	D	Lulus
30-39	0.67	E	Gagal
20-29	0.33	E-	Gagal
0-19	0.00	F	Gagal

4.2 PERATURAN AM KAEDAH PENILAIAN

Pelajar hendaklah memenuhi syarat-syarat berikut sebelum layak untuk dinilai prestasi akademiknya:

i. Telah mendaftar/melapor diri untuk mengikuti pengajian
ii. Telah mendaftar kursus berkenaan
iii. Kehadiran kuliah mencapai 80% seperti yang ditetapkan bagi sesuatu kursus

4.3 PERATURAN PENDAFTARAN KURSUS

i. Pendaftaran kursus akan dilaksanakan pada setiap awal semester dalam tempoh selewat-lewatnya **TUJUH** hari dari tarikh rasmi seis pengajian.
ii. Pelajar perlu mendapat nasihat daripada **Penasihat Akademik** sebelum mendaftar
iii. **Jumlah kredit** yang perlu diambil oleh pelajar bagi setiap semester adalah diantara **12 hingga 20 jam kredit** atau seperti yang ditetapkan di dalam Dokumen Kurikulum dan Struktur Program.
iv. **Pindah kredit** dan pengecualian kursus boleh dipohon dalam tempoh **TIGA minggu** semester pertama perkuliahan
v. **MENAMBAH DAN MENGGUGURKAN KURSUS** boleh dibuat pada pinggu ke **TIGA** hingga minggu ke **ENAM** sesi pengajian. Pelajar hendaklah mendapatkan nasihat dan sokongan Penasihat Akademik serta mendapat kelulusan Ketua Jabatan.

4.4 MENGULANG KURSUS

i. Pelajar hendaklah mendaftarkan kursus yang gagal pada semester sebelumnya sebelum mendaftar kursus-kursus program bagi semester semasa.
ii. Bagi pelajar semester akhir yang gagal **DUA** kursus atau lebih dikehendaki mengulang kursus yang gagal pada semester semasa.
iii. Bagi pelajar yang lulus kursus dengan gred **C-, D+ dan D** dibenarkan untuk memperbaiki gred kursus hanya sekali sahaja sepanjang pengajian bagi kursus tersebut. Keputusan yang diambil kira adalah dari gred terbaik.

4.5 SYARAT KELAYAKAN UNTUK MENDUDUKI PEPERIKSAAN AKHIR

i. Telah mendaftar kursus berkenaan
ii. Telah menghadiri 80% atau lebih kuliah/tutorial /amali bagi jangkasama yang telah ditetapkan.
Peratus kehadiran pelaajr dikira seperti berikut ;

$$\%\text{kehadiran} = \frac{\text{Jumlah kehadiran sebenar (jam)}}{\text{Jumlah kehadiran sepatutnya (jam)}} \times 100\%$$

iii. Pelajar yang kehadirannya kurang 80% adalah tidak layak untuk menduduki peperiksaan akhir. Pelajarr akan diberi gred F bagi kursus sersebut. Kaedah ini juga terpakai bagi kursus yang dinilai secara kerja kursus sahaja.

4.6 TEMPOH PENGAJIAN

i. Tempoh pengajian bagi program sepenuh masa adalah

Minimum – **LIMA** Semester
Maksimum – **SEMBILAN** Semester

ii. Pelajar yang dikenakan tindakan disiplin (digantung pengajian mengikut akta 174) adalah termasuk dalam pengiraan tempoh pengajian.
iii. Pelajar yang tidak mendaftar kursus tanpa sebarang sebab yang munasabah, semester tersebut diambilkira sebagai tempoh pengajian
iv. Sebarang penangguhan pengajian yang diluluskan oleh Pengarah tidak diambilkira sebagai tempoh pengajian.