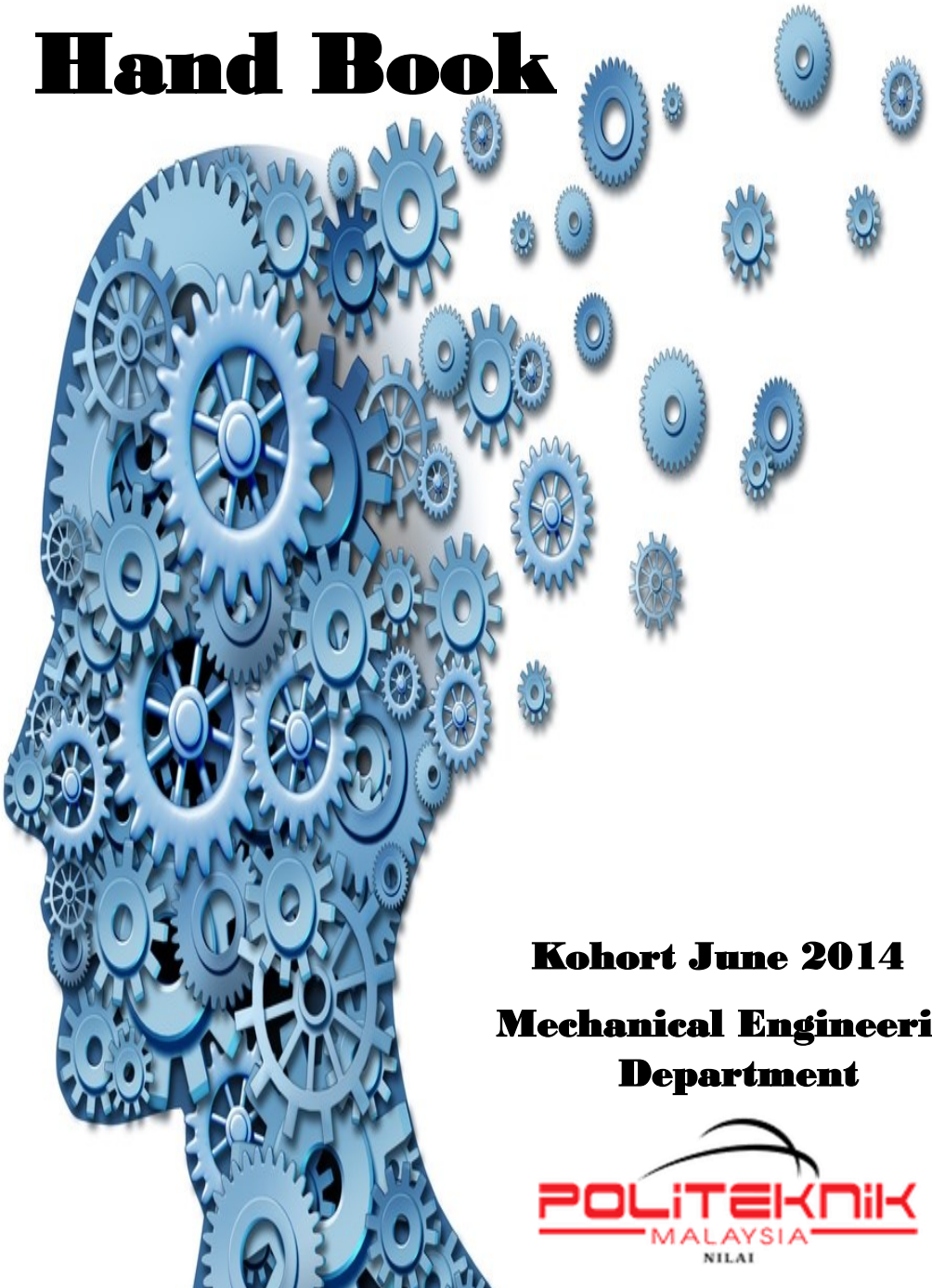
# Student Hand Book



**Kohort June 2014**

**Mechanical Engineering Department**

POLITEKNIK MALAYSIA
NILAI

# UCAPAN KETUA JABATAN KEJURUTERAAN MEKANIKAL

**Generasi Cemerlang, Negara Gemilang**

Assalamualaikum wth wbt dan Selamat Sejahtera.

Alhamdulillah, syukur kita ke hadrat Allah SWT kerana sekali lagi Jabatan Kejuruteraan Mekanikal (JKM) telah berjaya menerbitkan *Student Handbook.* Tahniah dan syabas saya ucapkan kepada semua AJK penerbitan yang telah berganding bahu dan bekerjasama untuk menerbitkan buku ini.

Buku panduan yang disediakan oleh JKM ini bertujuan untuk menyalurkan maklumat berkaitan kursus-kursus yang ditawarkan di JKM, Jabatan Pengajian Am (JPA) serta Jabatan Matematik Sains dan Komputer (JMSK). Begitu juga perkhidmatan dan kemudahan lain yang ditawarkan oleh Politeknik Nilai (PNS) juga dirangkumkan di dalam buku panduan ini.

Saya menyeru pelajar agar menggunakan buku ini sebagai rujukan dan memanfaatkan sepenuhnya kemudahan dan perkhidmatan yang disediakan. Adalah diharapkan saudara saudari lebih berupaya memperoleh kejayaan dalam bidang akademik dan ko-kurikulum semasa di PNS.

Akhir kata saya mengucapkan tahniah kepada semua pelajar yang telah berjaya melanjutkan pengajian dalam bidang Kejuruteraan Mekanikal, Politeknik Seberang Perai. Besar harapan saya agar anda akan beroleh kejayaan dan menjadi insan yang mulia seta menjadi kebangaan ibu bapa, Agama dan Negara.

# CARTA ORGANISASI PENGURUSAN

# JABATAN KEJURUTERAAN MEKANIKAL

**Ts. KAMAL BIN HARON**

**KETUA JABATAN**

**EN.MOHD TAUFIK SYAZELI BIN ZAIDI**

**KETUA PROGRAM DIPLOMA KEJURUTERAAN MEKANIKAL (DKM)**

**EN.MOHD. NAZRULAZLAN BIN ABD. RASID**

**KETUA PROGRAM DIPLOMA KEJURUTERAAN MEKATRONIK (DEM)**

# VISI & MISI POLITEKNIK NILAI

## VISI

*Menjadi Peneraju Intitusi 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.*


To be the Leading– Edge TVET Institution


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

## GLOSSARY

## DEFINITIONS

**Programme Educational Objectives (PEOs)** describe the career and professional developments of graduates, which are to be assessed in a minimum of five years.

**Programme Learning Outcomes (PLO)** explain the knowledge, skills, and values that the students are expected to attain upon graduation.

**Course Learning Outcomes (CLO)** outline the course specifications to be acquired by students.

Course Plan is a lecturer teaching-learning plan throughout a semester.

**Course Syllabus** provides a comprehensive description of a curriculum offered by the respective programme of study.

**Course File** is a lecturer teaching-learning portfolio.

**Engineering Technology Accreditation Council (ETAC)** is a professional body delegated by BEM for accreditation of engineering diplomas.

**Board of Engineers Malaysia (BEM)** registers graduates and professional engineers under the Registration of Engineers Act 1967 (Revised 2002).

**Self Assessment Report (SAR)** is an account of the universities plan, implementation, assessment and evaluation of the programme conducted.

**Continuous Quality Improvement (CQI)** is a process to improve any particular tasks

# TRANSITION IN ACTION

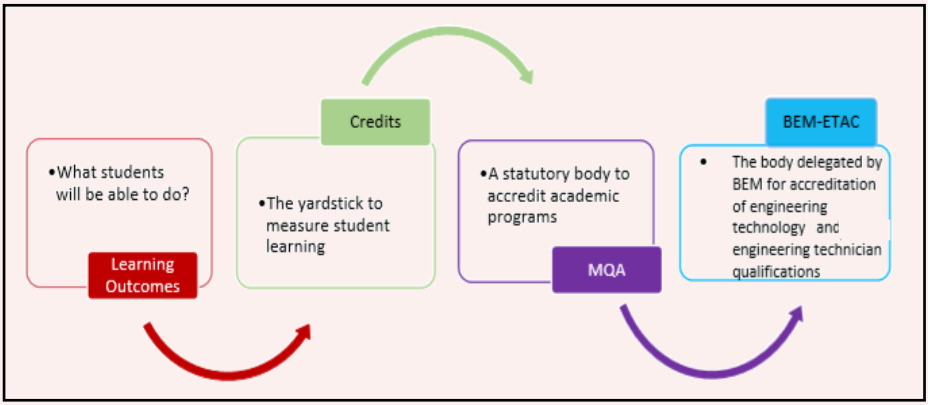



Figure : Accreditation Process

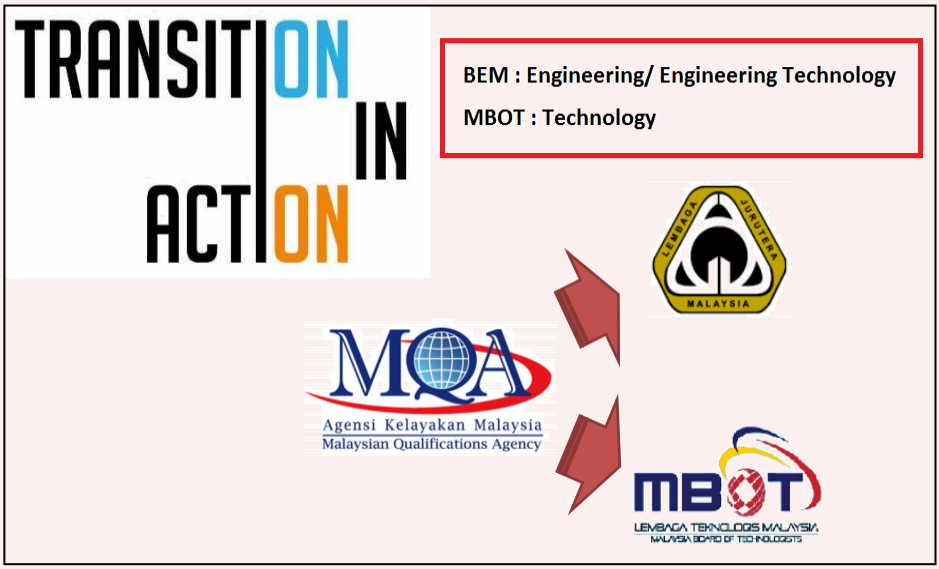



Figure : Transition in Action

# ETAC

## ENGINEERING TECHNOLOGY ACCREDITATION COUNCIL

### WHAT IS ETAC ?

ETAC or Engineering Technology Accreditation Council (ETAC) is a delegated body of the Board of Engineering Malaysia (BEM). ETAC provides smooth transition in the accreditation of engineering Technology and Engineering Technician education programs based on Sydney Accord.

In 2015, BEM established ETAC that comprises seven members which are BEM, learned bodies, industry/employer, Public Services Department (PSD), Malaysian Qualification Agency (MQA), Ministry, and public representatives. ETAC then has become the recognized accrediting body of engineering technology bachelor degree, engineering diploma and engineering technology diploma programs offered in Malaysia.

### ACCREDITATION OBJECTIVES

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

### ADVANTAGES FOR STUDENT AND ORGANIZATION (ETAC)

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

# BOARD OF ENGINEERS MALAYSIA

The ***Board of Engineers Malaysia (BEM)*** is a statutory body constituted under the ***Registration of Engineers Act 1967*** with perpetual succession and a common seal, which may sue and be sued. It was formed in ***23rd August 1972.***

BEM primary role is to facilitate the registration of Engineers, Engineering Technologists, Inspectors of Works, Sole Proprietorships, Partnerships and Bodies Corporate providing professional engineering services and; to regulate the professional conduct and practice of registered person in order to safeguard the safety and interest of the public.

## FUNCTIONS OF BEM

1. Maintain the Register
2. Process Applications for Registration
3. Assessment of Academic Qualifications
   - Engineering Degree Programme by EAC
4. Assessment of Academic Qualifications
   - Engineering Technology and Engineering Technician Programmes by ETAC
5. Regulate the Conduct and Ethics of the Engineering Profession
6. Disputes on Professional Conduct and Ethics
7. Fix the Scale of Fees
8. Stakeholder
9. Publication
10. Promotion of Continued Learning and Education

# INTRODUCTION TO OUTCOME-BASED EDUCATION (OBE)

## WHAT IS OBE?

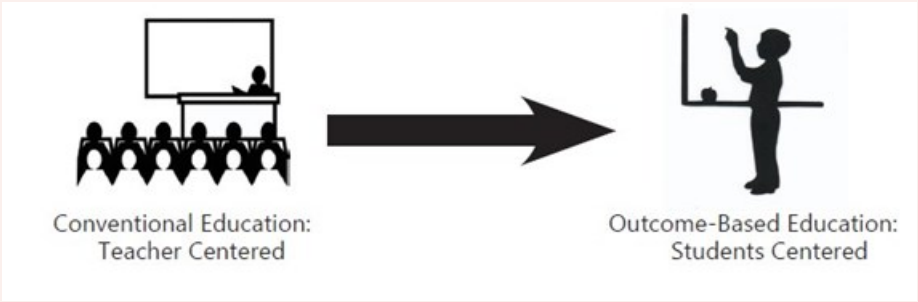
Outcome-Based Education (OBE) is an academic process and approach focuses in developing expected outcomes (i.e. knowledge, skills and values) for the students to achieve prior to graduation.

## WHY IMPLEMENT OBE?

Implementing OBE is important in order:

1. To acquire an accreditation from ETAC for all undergraduate diploma programmes in the Department of Engineering.
2. To ensure a well-structured education system (i.e. PEOs, PLOs, CLOs, course plan, course syllabus, course file and CQI) is achieved.
3. To be advocated by Dublin Accord so that the graduates are internationally recognised for the entry to the practice engineering

4. Transformation in education

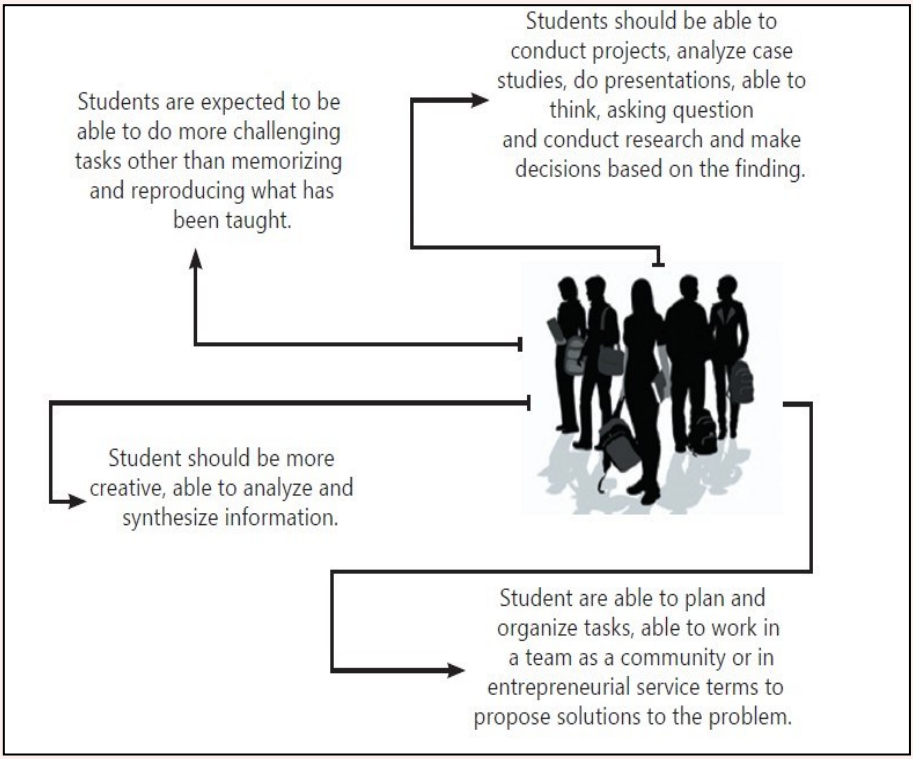



5. Teacher –centered vs student centered

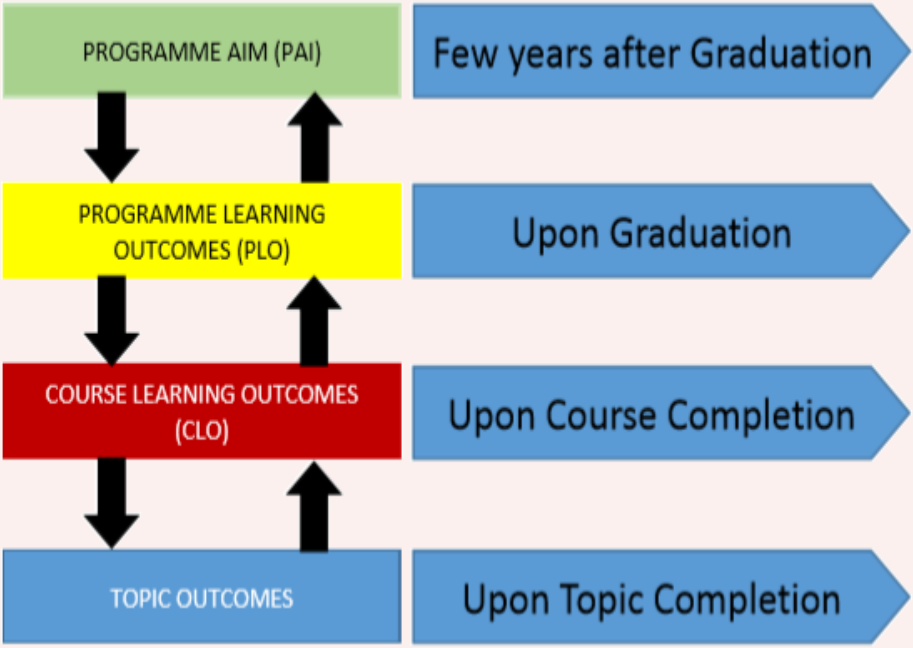
**Teacher– Centered** **VS** **Student– Centered**

| ELEMENTS | TEACHER-CENTERED | STUDENT-CENTERED |
|---|---|---|
| **Knowledge** | Transmitted from instruction | Constructed by students |
| **Student Participation** | Passive | Active |
| **Role of Lecturer** | Leader/Authority | Facilitator/Partner in Learning |
| **Role of Assessment** | Few Test, Mainly for Grading | Many Tests, for Ongoing Feedback |
| **Emphasis** | Learning Correct Answers | Developing Deeper Understanding |
| **Assessment Method** | One-Dimensional testing | Multidimensional testing |
| **Academic Culture** | Competitive, Individualistic | Collaborative, Supportive |

## WHAT IS OUTCOME-BASED EDUCATION [OBE]



## WHAT IS OUTCOME-BASED EDUCATION [OBE]DIFFERENT LEVELS OF OBE



# DIPLOMA IN MECHANICAL ENGINEERING

## PROGRAMME AIMS

**The Diploma in Mechanical Engineering graduates in Polytechnics, Ministry of Education Malaysia will have the 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 Diploma in Mechanical Engineering programme shall produce semi-professionals 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 OUTCOME (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 systems.**

4. **apply appropriate techniques, resources, and engineering tools to well-defined mechanical engineering activities, with an awareness of the limitations.**

5. **demonstrate an 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 needs for professional development and to engage in independent and lifelong learning.**

# DIPLOMA IN MECHANICAL ENGINEERING

## PROGRAMME STRUCTURE

| COMPONENT | COURSE CODE | COURSE NAME | CREDITS |
|---|---|---|---|
| SEMESTER 1 | | | |
| COMPULSORY | DUB 1012 | Pengajian Malaysia | 2 |
| | DUE 1012 | Communicative English 1 | 2 |
| | DRB 1XX0 | Asas Unit Beruniform | 0 |
| COMMON CORE | DBM 1013 | Engineering Mathematics 1 | 3 |
| | DBS 1012 | Engineering Science | 2 |
| | DUW 1012 | Occupational Safety and Health | 2 |
| DISCIPLINE CORE | DJJ 1012 | Engineering Drawing | 2 |
| | DJJ 1032 | Mechanical Workshop Practice 1 | 2 |
| | DJJ 1043 | Workshop Technology | 3 |
| | **TOTAL** | | **18** |
| SEMESTER 2 | | | |
| COMPULSORY | DUA 2012 | Sains, Teknologi dan Kejuruteraan *Dalam Islam* | 2 |
| | DUB 2012 | Nilai Masyarakat Malaysia ** | 2 |
| | DRS 2XX1 | Sukan | 1 |
| | DRB 2XX1 | Unit Beruniform 1 | 1 |
| COMMON CORE | DBM 2013 | Engineering Mathematics 2 | 3 |
| DISCIPLINE CORE | DJJ 2022 | Electrical Technology | 2 |
| | DJJ 2032 | Mechanical Workshop Practice 2 | 2 |
| | DJJ 2062 | Computer Aided Design 1 | 2 |
| | DJJ 2093 | Fluid Machanics | 3 |
| | DJJ 2073 | Thermodynamics 1 | 3 |
| | **TOTAL** | | **18** |
| SEMESTER 3 | | | |
| COMPULSORY | DUE 3012 | Communicative English 2 | 2 |
| | DRK 3XX2 | Kelab/Persatuan | 2 |
| | DRB 3XX2 | Unit Beruniform 2 | 2 |
| COMMON CORE | DBM 3013 | Engineering Mathematics 3 | 3 |
| DISCIPLINE CORE | DJJ 3032 | Mechanical Workshop Practice 3 | 2 |
| | DJJ 3053 | Engineering Mechanics | 3 |
| | DJJ 3103 | Strength of Material | 3 |
| | DJJ 3213 | Material Science | 3 |
| | **TOTAL** | | **18** |

# DIPLOMA IN MECHANICAL ENGINEERING

| COMPONENT | COURSE CODE | COURSE NAME | CREDITS |
|---|---|---|---|
| SEMESTER 4 | | | |
| COMPULSARY | DUE 5013 | Communicative English 3 | 2 |
| DISCIPLINE CORE | DJJ 5032 | Mechanical Workshop Practice 4 | 2 |
| | DJJ 5113 | Mechanics of Machines | 3 |
| | DJJ 5123 | Pneumatic and Hydraulic | 3 |
| | DJJ 5133 | Engineering Design | 3 |
| | DJJ 5141 | Project 1 | 1 |
| ELECTIVE COURSE | | Elective ** | |
| | DJJ 5062 | Computer Aided Design 2 | 2 |
| | DJJ 5172 | Instrumentation and Control | 2 |
| | DJM 2072 | Control System | 2 |
| | **TOTAL** | | **16** |
| SEMESTER 5 | | | |
| COMPULSORY | DUA 6022 | Komunikasi Dan Penyiaran Islam. | 2 |
| COMMON CORE | DPB 2012 | Entrepreneurship | 2 |
| DISCIPLINE CORE | DJJ 6143 | Project 2 | 3 |
| | DJJ 6153 | Mechanical Components & Maintenance | 3 |
| | DJJ 6162 | Maintenance Engineering and Management | 2 |
| ELECTIVE COURSE | | Elective ** | 3 |
| | DJJ 6202 | Diagnosis and Troubleshooting for Mechanical Components | 2 |
| | DJF 6102 | Quality Control | 2 |
| | DJJ 6182 | Engineering Plant Technology | 2 |
| | DJJ 6192 | Industrial Management | 2 |
| | DJM 1022 | C Programming | 2 |
| | DJM 3082 | Programmable Logic Control | 2 |
| | DUA 6042 | Tamadun Islam | 2 |
| | DUA 6012 | Integrasi Malaysia | 2 |
| | DBC 2012 | Computer Application | 2 |
| | **TOTAL** | | **14** |
| SEMESTER 6 | | | |
| | DUT 40110 | Industrial Training | 10 |
| | **TOTAL** | | **10** |

# SYNOPSIS & COURSE LEARNING OUTCOME

SEMESTER 1

## DJJ1032 MECHANICAL WORKSHOP

### 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 :

1. perform fitting , machining and welding works according to Standard Operating 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)

## DJJ1043 WORKSHOP TECHNOLOGY

### 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:

1. apply the knowledge of basic mechanical components and equipment, hand tools and measuring equipment in workshop technology (C3, PLO1)
2. analyze the types of the removal and joining process in mechanical engineering. (C4, PLO2)
3. demonstrate continuous learning and information management skills while engaging in the new knowledge and skills to develop report and presentation. (A3, PLO11)

## DJJ1012 ENGINEERING DRAWING

### SYNOPSIS

The **ENGINEERING DRAWING** course provides the students with the fundamentals 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 OUTCOMES (CLO)

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

1. apply the basic fundamentals of engineering drawing in comply to related problems. (C3, PLO1)
2. construct engineering drawings according to the required standards. (P4, PLO 4 )
3. demonstrate the understanding of engineering norms and practices in engineering drawing. (A3, PLO 8)

## DUW1012 OCCUPATIONAL,SAFETY & HEALTH

### 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 and employees 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 OUTCOMES (CLO)

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

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)

# SYNOPSIS & COURSE LEARNING OUTCOME



## DUB1012 PENGAJIAN MALAYSIA

### SYNOPSIS

**PENGAJIAN MALAYSIA** memupuk penghayatan ke arah 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.

### COURSE LEARNING OUTCOMES (CLO)

Di akhir kursus ini, pelajar akan dapat :

1. Menerangkan dengan baik sejarah bangsa dan negara. (C2, LD1)
2. Menjelaskan Perlembagaan Malaysia dan sistem pemerintahan negara. (C2, LD1)
3. Melaksanakan aktiviti berkaitan kenegaraan ke arah peningkatan patriotisme pelajar. (C3, LD1 : A3,LD6)

## DUE1012 COMMUNICATIVE ENGLISH 1

### 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 OUTCOMES (CLO)

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

1. apply appropriate language and communication skills in discussions and conversations. (C3)
2. apply effective listening skills to demonstrate comprehension of audio recordings in a variety of situations. (C3)
3. comprehend a variety of reading texts by applying effective reading skills. (C2)
4. write in response to a stimulus using appropriate language. (C3)
5. deliver an effective presentation using appropriate visual aids, verbal andnon-verbal communication skills.(C3, A3)

## DBM1013 ENGINEERING MATHEMATICS 1

### 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 formulae. Students also will be introduced to the theory of complex number and matrices method to solve simultaneous equation. This course also introduces students to concept of vector and scalar.

### COURSE LEARNING OUTCOMES (CLO)

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

1. identify mathematical methods in solving the mathematical problems. (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)

## DBS1012 ENGINEERING SCIENCE

### 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 OUTCOMES (CLO)

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

1. solve the basic engineering science problems by using related concept. (C3, LD1)
2. organise an appropriate experiments to prove r related physic principles. (P3, LD2)
3. apply related physic principles in various situations to enhance knowledge. (C3, LD1)

# SYNOPSIS & COURSE LEARNING OUTCOME

SEMESTER 2

## DJJ2073 THERMODYNAMICS

**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 of the experiments in Thermodynamics applications.

**COURSE LEARNING OUTCOMES (CLO)**

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

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)
3. Demonstrate the ability to work in team to complete assigned tasks. (A3)

## DJJ2022 ELECTRICAL TECHNOLOGY

**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.

Exposes the students to practical laboratory experiments in Electrical Technology.

**COURSE LEARNING OUTCOMES (CLO)**

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

1. explain the principles of electrical circuits, electromagnetism, transformers and electrical machines to solve related problems. (C4,PLO2)
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)

## DJJ2093 FLUID MECHANICS

**SYNOPSIS**

**FLUID MECHANICS** provides the fundamentals of fluid mechanics principles related to the fluid properties and behaviour in static and dynamic situations. This course also exposes the experiments in fluids mechanics applications.

**COURSE LEARNING OUTCOMES (CLO)**

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

1. analyze problems related to the fluid mechanics 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 team work skill in assigned task (A3, PLO7)

## DJJ2032 MECAHNICAL WORKSHOP PRACTICE 2

**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 OUTCOMES (CLO)**

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

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)

# SYNOPSIS & COURSE LEARNING OUTCOME

## DJJ2062 COMPUTER AIDED DESIGN 1

### 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 OUTCOMES (CLO)

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

1. Apply the fundamental features of CAD software in producing engineering drawing. (C3, PLO 1)
2. Construct 2D drawing using fundamental features of CAD software. (P4, PLO 4).
3. Demonstrate continuous learning and information management skill while engaging in independent acquisition of new knowledge and skill to solve assigned task.(A3, PLO 11)

## DUA2012 SAINS, TEKNOLOGI & KEJURUTERAAN DALAM ISLAM

### SYNOPSIS

**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.

### COURSE LEARNING OUTCOMES (CLO)

Di akhir kursus ini, pelajar akan dapat :

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)

## DUB2012 NILAI MASYARAKAT MALAYSIA

### SYNOPSIS

**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.

### COURSE LEARNING OUTCOMES (CLO)

Di akhir kursus ini, pelajar akan dapat :

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

## DBM2013 ENGINEERING MATHEMATICS 2

### 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 OUTCOMES (CLO)

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

1. solve the mathematical problems by using appropriate mathematical 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)

# SYNOPSIS & COURSE LEARNING OUTCOME

SEMESTER 3

## DJJ3213 MATERIAL SCIENCE

### 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 OUTCOMES (CLO)

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

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)

## DJJ3032 MECHANICAL WORKSHOP PRACTICE 3

### 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 OUTCOMES (CLO)

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

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

## DJJ3103 STRENGTH OF MATERIALS

### 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 OUTCOMES (CLO)

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

1. Analyze problems related to strength of materials 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)

## DJJ3053 ENGINEERING MECHANICS

### 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 OUTCOMES (CLO)

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

1. Analyze problems related to statics and dynamics based on the concept and principles of engineering mechanics 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)

## DUE3012 COMMUNICATIVE ENGLISH 2

### 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 students to make and reply to enquiries and complaints.

### COURSE LEARNING OUTCOMES (CLO)

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

1. describe products or services related to their field of studies using appropriate language. (C3, A3)
2. transfer information of a process or procedure accurately from linear to non- linear form and vice versa. (C3)
3. listen and respond to enquiries using appropriate language. (C3)
4. make and respond to complaints using appropriate language. (C3)

## DBM3013 ENGINEERING MATHEMATICS 3

### 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 OUTCOMES (CLO)

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

1. solve the mathematical problems by using appropriate techniques and solutions. (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)

# SYNOPSIS & COURSE LEARNING OUTCOME

SEMESTER 4

## DJJ5032 MECHANICAL WORKSHOP PRACTICE 4

### 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 OUTCOMES (CLO)

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

1. construct programs for EDM and CNC machining process using ISO codes and using CADCAM Software. (P4)
2. perform indexing in milling machine and perform machining processes for the surface grinding machine or cylindrical grinding machines. (P4)
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)
4. demonstrate ability to work in team to complete assigned tasks during practical work sessions. (A3)

## DJJ5133 ENGINEERING DESIGN

### 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 OUTCOMES (CLO)

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

1. organize the design process in mechanical engineering design. (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)

## DJJ5113 MECHANICS OF MACHINES

### 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 OUTCOMES (CLO)

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

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)

## DUE5012 COMMUNICATIVE ENGLISH 3

### 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 to present data through the use of graphs and charts. 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 OUTCOMES (CLO)

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

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

# SYNOPSIS & COURSE LEARNING OUTCOME

SEMESTER 4

**SYNOPSIS**

**INSTRUMENTATION & CONTROL** exposes the students to the basic principles in control system and its usage in industrial sector is the main focus in this course. Instrumentation and control also provide knowledge to the students in components measurement in control systems that are normally used in industries.

**COURSE LEARNING OUTCOMES (CLO)**

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

1. apply the concepts of instrumentation and measurement systems in engineering. (C4, PLO2)
2. analyze the concepts of instrumentation and measurement systems in engineering. (C5,PLO3)
3. organize the experiment of the instruments and control system. (P5,PLO4)
4. demonstrate good written communication skill in lab report on assigned topics. (A3, PLO6)

**DJJ5172 INSTRUMENTATION AND CONTROL**

**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 OUTCOMES (CLO)**

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

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, PLO2)
3. Demonstrate good written communication skill in group project report. (A3, PLO6)

**DJJ5062 COMPUTER AIDED DESIGN 2**

**SYNOPSIS**

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

**COURSE LEARNING OUTCOMES (CLO)**

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

1. organize research or project systematically. (C5)
2. demonstrate good communication skill of oral presentation in group. (A3)
3. demonstrate continuous learning and information management skills while engaging in independent acquisition of new knowledge and skill to develop a project. (A3)

**DJJ5141 PROJECT 1**

**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 OUTCOMES (CLO)**

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

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)

**DJJ5123 PNEUMATIC & HYDRAULICS**

# SYNOPSIS & COURSE LEARNING OUTCOME

SEMESTER 5

## DJJ6143 PROJECT 2

**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 OUTCOMES (CLO)**

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

1. develop creative solution to solve the problems in the project design or case study (C5)
2. organize the selected design or case study based on the project planning (P5).
3. demonstrate good communication skills of presentation in group. (A3)
4. demonstrate ability to lead a team to complete assigned project during practical work sessions. (A3)
5. demonstrate awareness of management, business practices and entrepreneurship related to product of project. (A3)
6. demonstrate awareness of social responsibility in practical work procedure and practices. (A3)

## DJJ6153 MECHANICAL COMPONENTS & MAINTENANCE

**SYNOPSIS**

**The 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 OUTCOMES (CLO)**

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

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)

## DJJ6162 MAINTENANCE ENGINEERING & MANAGEMENT

**SYNOPSIS**

**MAINTENANCE 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 OUTCOMES (CLO)**

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

1. analyze the concepts of maintenance organization and strategies to solve related problems. (C4, PLO2)
2. apply the principles of maintenance strategies and elaborate on the significance of a system approach to maintenance. (C6, 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)

## DPB2012 ENTREPRENEURSHIP

**SYNOPSIS**

**ENTREPRENEURSHIP** focuses the principles and concept of entrepreneurship. This course concentrates on the systematic methods of getting business ideas. This course also prepares the students on ways to conduct and control the business including fundamental of management, marketing and financing. It also emphasizes on the preparation of business plan, thus developing their entrepreneurial skills.

**COURSE LEARNING OUTCOMES (CLO)**

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

1. explain clearly the concept of entrepreneurship, process and procedures involved in developing effective business plan. (C2, LD1)
2. work cooperatively in group to complete the assigned project based on entrepreneurial skills. (P3, LD2) (A3, LD7)
3. present business plan creatively using knowledge gained via group. (A2, LD3)

# SYNOPSIS & COURSE LEARNING OUTCOME

## DUA6022 KOMUNIKASI & PENYIARAN ISLAM

### SYNOPSIS

**KOMUNIKASI DAN PENYIARAN ISLAM** memfokuskan kepada penguasaan konsep, kemahiran komunikasi dan penyiaran islam bagi meningkatkan kefahaman pelajar secara holistik terhadap kursus ini.

### COURSE LEARNING OUTCOMES (CLO)

Di akhir kursus ini, pelajar akan dapat :

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

## DJJ6192 INDUSTRIAL MANAGEMENT

### 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 OUTCOMES (CLO)

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

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)

## DUT40110 INDUSTRIAL TRAINING

### SYNOPSIS

**INDUSTRIAL TRAINING** exposes students to related workplace competencies demanded by industries. This course provides exposure to students in terms of technology literacy, effective communication, practice social skills and teamwork, policies, procedures and regulations, professional ethics and reporting. It also equips students with real work experience, thus helping students to perform as novice workers.

### COURSE LEARNING OUTCOMES (CLO)

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

1. apply related knowledge and skills at the workplace. (C3, P2)
2. communicate effectively with others. (A3)
3. practice teamwork. (A5)
4. professionally and ethically comply with policies, procedures and rules of the organization. (A5)
5. explain the tasks assigned (during the industrial training) according to the prescribed format. (P2, A4)

## PROGRAMME AIMS

**The Diploma in Mechatronic Engineering graduates in Polytechnics, Ministry of Education will have the knowledge, technical skills, community service responsibilities and attitude to adapt themselves with new technological advancement and challenges in the mechatronic engineering field.**

## PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

The Diploma in Mechatronic Engineering programme shall produce semi-professionals who are:

1. **competent in knowledge and skills in the field of mechatronic 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 country 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 mechatronic fields.**

## PROGRAMME LEARNING OUTCOME (PLO)

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

1. **apply knowledge of mathematics, science, engineering fundamentals and social science to well-defined mechatronic engineering procedures and practice**

2. **analyze well-defined mechatronic engineering problems with respect to operation and maintenance including troubleshooting.**

3. **conduct investigations and assist in the design of solutions for mechatronic engineering systems.**

4. **apply appropriate techniques, resources, and engineering tools to well-defined mechatronic engineering activities, with an awareness of the limitations.**

5. **demonstrate an 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 and entrepreneurship.**

10. **demonstrate an understanding of the impact of engineering practices, taking into account the needs for sustainable development.**

11. **recognize the needs for professional development and to engage in independent and lifelong learning.**

# DIPLOMA IN MECHATRONIC ENGINEERING

## PROGRAMME STRUCTURE

| COMPONENT | COURSE CODE | COURSE NAME | CREDITS |
|---|---|---|---|
| SEMESTER 1 | | | |
| COMPULSORY | DUB1012 | PENGAJIAN MALAYSIA | 2 |
| | DUE1012 | COMMUNICATIVE ENGLISH 1 | 2 |
| | DRB1XX0 | ASAS UNIT BERUNIFORM | 0 |
| COMMON CORE | DUW1012 | OCCUPATIONAL,SAFETY & HEALTH | 2 |
| | DBM1013 | ENGINEERING MATHEMATICS | 3 |
| | DBS1012 | ENGINEERING SCIENCE | 2 |
| DISCIPLINE CORE | DJJ1012 | ENGINEERING DRAWING | 2 |
| | DJM1012 | MECHATRONIC WORKSHOP PRACTICE 1 | 2 |
| | DJM1022 | C PROGRAMMING | 2 |
| | **TOTAL** | | **17** |
| SEMESTER 2 | | | |
| COMPULSORY | DUA2012 | SAINS,TEKNOLOGI DAN KEJURUTERAAN ISLAM | 2 |
| | DUB2012 | NILAI MASYARAKAT M,ALAYSIA | 2 |
| | DRS2XX1 | SUKAN | 1 |
| | DRB2XX1 | UNIT BERUNIFORM 1 | 1 |
| COMMON CORE | DBM2013 | ENGINEERING MATHEMATICS | 3 |
| DISCIPLINE CORE | DJJ2022 | ELECTRICAL TECHNOLOGY | 2 |
| | DJM2012 | MECHATRONIC WORKSHOP PRACTICE 2 | 2 |
| | DJJ2062 | COMPUTER AIDED DESIGN 1 | 2 |
| | DJM2032 | ELECTRONIC SYSTEM | 2 |
| | DJM2043 | THERMOFLUIDS | 3 |
| | **TOTAL** | | 17 |
| SEMESTER 3 | | | |
| COMPULSORY | DUE3012 | COMMUNICATIVE ENGLISH 2 | 2 |
| | DRK3XX2 | KELAB/PERSATUAN | 2 |
| | DRB3XX2 | UNIT BERUNIFORM 2 | 2 |
| DISCIPLINE CORE | DJM3052 | INDUSTRIAL ELECTRONICS | 2 |
| | DJJ3053 | ENGINEERING MECHANICS | 3 |
| | DJM3072 | PROGRAMMABLE LOGIC CONTROLLER | 2 |
| | DJJ3103 | STRENGTH OF MATERIALS | 3 |
| | DJM3063 | DIGITAL SYSTEM | 3 |
| | **TOTAL** | | **17** |

# DIPLOMA IN MECHATRONIC ENGINEERING

| COMPONENT | COURSE CODE | COURSE NAME | CREDITS |
|---|---|---|---|
| SEMESTER 4 | | | |
| COMPULSORY | DUE5012 | COMMUNICATIVE ENGLISH 3 | 2 |
| COMMON CORE | DBM3013 | ENGINEERING MATHEMATICS | 3 |
| DISCIPLINE CORE | DJJ5123 | PNEUMATICS AND HYDRAULICS | 3 |
| | DJM5092 | CONTROL SYSTEM | 2 |
| | DJM5103 | POWER ELECTRONICS | 3 |
| | DJJ5141 | PROJECT 1 | 1 |
| ELECTIVE | DJM5082 | MICROPROCESSOR | 2 |
| | DJF5032 | CADCAM | 2 |
| | DJF5042 | INDUSTRIAL ROBOTICS | 2 |
| | **TOTAL** | | **16** |
| SEMESTER 5 | | | |
| COMPULSORY | DUA6022 | KOMUNIKASI DAN PENYIARAN ISLAM | 2 |
| COMMON CORE | DPB2012 | ENTREPRENEURSHIP | 2 |
| DISCIPLINE CORE | DJJ6143 | PROJECT 2 | 3 |
| | DJM6113 | INDUSTRIAL AUTOMATION | 3 |
| | DJM6122 | POWER TRANSMISSION | 2 |
| | DJM6132 | EMBEDDED SYSTEM APPLICATION | 2 |
| ELECTIVE | DJJ6192 | INDUSTRIAL MANAGEMENT | 2 |
| | DBC2012 | COMPUTER APPLICATION | 2 |
| | DUA6012 | INTEGRASI MALAYSIA | 2 |
| | DUA6042 | TAMADUN ISLAM | 2 |
| | **TOTAL** | | **16** |
| SEMESTER 6 | | | |
| | DUT40110 | INDUSTRIAL TRAINING | 10 |
| | **TOTAL** | | **10** |

## DJJ1012 ENGINEERING DRAWING

**SYNOPSIS**

The **ENGINEERING DRAWING** course provides the students with the fundamentals 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 OUTCOMES (CLO)**

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

1. apply the basic fundamentals of engineering drawing in comply to related 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)

## DJM1022 C PROGRAMMING

**SYNOPSIS**

**C PROGRAMMING** course provides an introduction to programme design and development. Student will learn to design, code, debug, test and document well-structured programs based on technical and engineering problem. Topic covered; software development principle, programming language basic, data types, input and output operation, the use of selection, loops, arrays and function structure/

**COURSE LEARNING OUTCOMES (CLO)**

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

1. Apply knowledge of basic concepts of C programming to solve given problem using an appropriate data type. (C3)
2. Construct a high level programming language in solving variety engineering and scientific problems. (P4)
3. Demonstrate problem solving skills in assigned project based on programming. (A3)

## DJM1012 MECHATRONIC WORKSHOP PRACTICE 1

**SYNOPSIS**

**MECHATRONIC WORKSHOP PRACTICE 1** exposes the students to basic works in an engineering workshop with emphasis on safety practices. Students are exposed to fitting, welding and machining.

**COURSE LEARNING OUTCOMES (CLO)**

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

1. Practice correct techniques in handling fitting, machining and welding equipments. (P3)
2. Perform fitting, machining and welding works according to Standard Operation Procedure (SOP). (P4)
3. Demonstrate the understanding and awareness of safety procedure in mechanical workshops according to the workshop safety regulations. (A3)

## DBM1013 ENGINEERING MATHEMATICS 1

**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 OUTCOMES (CLO)**

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

1. solve the mathematical problems by using appropriate mathematical 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)

# SYNOPSIS & COURSE LEARNING OUTCOME

## 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 OUTCOMES (CLO)

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

1. solve the basic engineering science problems 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 enhance knowledge. (C3, LD1)

**DBS1012 ENGINEERING SCIENCE**

## SYNOPSIS

**PENGAJIAN MALAYSIA** memupuk penghayatan ke arah 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.

## COURSE LEARNING OUTCOMES (CLO)

Di akhir kursus ini, pelajar akan dapat :

1. Menerangkan dengan baik sejarah bangsa dan negara. (C2, LD1)
2. Menjelaskan Perlembagaan Malaysia dan sistem pemerintahan negara. (C2, LD1)
3. Melaksanakan aktiviti berkaitan kenegaraan ke arah peningkatan patriotisme pelajar. (C3, LD1 : A3,LD6)

**DUB1012 PENGAJIAN MALAYSIA**

## 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 OUTCOMES (CLO)

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

1. apply appropriate language and communication skills in discussions and conversations. (C3)
2. apply effective listening skills to demonstrate comprehension of audio recordings in a variety of situations. (C3)
3. comprehend a variety of reading texts by applying effective reading skills. (C2)
4. write in response to a stimulus using appropriate l anguage. (C3)
5. deliver an effective presentation using appropriate visual aids, verbal andnon-verbal communication skills.(C3, A3)

**DUE1012 COMMUNICATIVE ENGLISH 1**

## 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 and employees 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 OUTCOMES (CLO)

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

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)

**DUW1012 OCCUPATIONAL,SAFETY & HEALTH**

# SYNOPSIS & COURSE LEARNING OUTCOME

SEMESTER 2

## DBM2013 ENGINEERING MATHEMATICS 2

### 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 OUTCOMES (CLO)

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

1. solve the mathematical problems by using appropriate mathematical 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)

## DJJ2022 ELECTRICAL TECHNOLOGY

### 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. exposes the students to practical laboratory experiments in Electrical Technology

### COURSE LEARNING OUTCOMES (CLO)

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

1. explain the principles of electrical circuits, electromagnetism, transformers and electrical machines to solve related problems. (C4,PLO2)
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)

## DJJ2062 COMPUTER AIDED DESIGN 1

### 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 OUTCOMES (CLO)

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

1. Apply the fundamental features of CAD software in producing engineering drawing. (C3, PLO 1)
2. Construct 2D drawing using fundamental features of CAD software. (P4, PLO 4)
3. Demonstrate continuous learning and information management skill while engaging in independent acquisition of new knowledge and skill to solve assigned task.(A3, PLO 11)

## DJM2012 MECHATRONIC WORKSHOP PRACTICE 2

### SYNOPSIS

**MECHATRONICS WORKSHOP PRACTICE 2** enhances knowledge on CNC and EDM and also enables student to carry out related task scopes. This course also emphasizes on how to operate CNC and EDM machines properly.

### COURSE LEARNING OUTCOMES (CLO)

Di akhir kursus ini, pelajar akan dapat :

1. Operate the CNC and EDM machines according to prescribed procedures and manual. (P3)
2. Perform CNC and EDM machine programming. (P4)
3. Demonstrate awareness of safety / health related machine programs to complete certain projects in practical work procedure and practices. (A3)

## DJM2032 ELECTRONIC SYSTEM

### SYNOPSIS

**ELECTRONIC SYSTEM** covers knowledge on basics of electronic concepts and digital systems. The course emphasizes on the electrical characteristics and properties of semiconductor materials, operation of linear DC power supplies, amplifier circuits and sinusoidal wave oscillator circuits.

### COURSE LEARNING OUTCOME (CLO)

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

1. analyze the characteristics and properties of semiconductor materials.(C4)
2. Construct electronic circuit based on schematic diagrams.(P4)
3. Demonstrate understanding of electronic circuit. (A3)

## DJM2043 THERMOFLUIDS

### SYNOPSIS

**THERMOFLUIDS** provides students to the basic concepts of thermodynamics and fluids mechanics into one integrated course. This course emphasizes on concepts of conceptual principles in thermofluids, fluids applications, properties of pure substances, first and second law of thermodynamics. This course also provides knowledge and understanding of theory, concepts and application of principles to solve problems related to thermofluids processes.

### COURSE LEARNING OUTCOMES (CLO)

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

1. Solve problem correctly related thermodynamics and fluid mechanics with appropriate formula and theories. (C3)
2. Study the theory of thermofluids to solve related engineering problems in group. (A3)
3. Conduct experiments on thermofluids application. (P4)

## DUA2012 SAINS,TEKNOLOGI & KEJURUTERAAN ISLAM

### SYNOPSIS

**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.

### COURSE LEARNING OUTCOMES (CLO)

Di akhir kursus ini, pelajar akan dapat :

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)

## DUB2012 NILAI MASYARAKAT MALAYSIA

### SYNOPSIS

**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.

### COURSE LEARNING OUTCOMES (CLO)

Di akhir kursus ini, pelajar akan dapat :

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

## 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 OUTCOMES (CLO)

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

1. Analyze problems related to statics and dynamics based on the concept and principles of engineering mechanics 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)

**DJJ3053 ENGINEERING MECHANICS**

## 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 OUTCOMES (CLO)

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

1. Analyze problems related to strength of materials 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)

**DJJ3103 STRENGTH OF MATERIALS**

## SYNOPSIS

**INDUSTRIAL ELECTRONIC** provides exposure to mechanical, electrical and electronic devices. This course discusses structures of circuits, switches, relays, solenoids, sensors and telemetry systems.

## COURSE LEARNING OUTCOMES (CLO)

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

1. Apply the mechatronic devices, switches, relays, solenoid, electronic control devices, sensor and telemetry system in industrial application. (C3)
2. Construct the circuit of relays and sensors according to operational principle. (P4)
3. Demonstrate the understanding of mechatronic devices. (A3)

**DJM3052 INDUSTRIAL ELECTRONIC**

## SYNOPSIS

**DIGITAL SYSTEM** provides the knowledge on the concepts and basic principles of digital circuits used in computer systems. This course focuses on sequential logic circuits, counters and registers. This course also covers the topics on the methods of signal conversion in electronic circuits.

## COURSE LEARNING OUTCOMES (CLO)

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

1. Distinguish the characteristics and operations of various digital circuits. (C4)
2. Construct digital circuits based on schematic diagrams. (P4)
3. Demonstrate the role of digital circuits in real world applications. (A3)

**DJM3063 DIGITAL SYSTEM**

SEMESTER 3

## DJM3072 PROGRAMMABLE LOGIC CONTROLLER

### SYNOPSIS

**PROGRAMMABLE LOGIC CONTROLLER (PLC)** provides knowledge regarding the concept and basic principle of automation systems as well as PLC. This course emphasizes on the use, design process, programming and maintenance method of automation systems as well as PLC. This course also provides knowledge and skill training to construct automation systems based on the use of PLC systems.

### COURSE LEARNING OUTCOMES (CLO)

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

1. Organize variant type of automation system achievable with proper PLC selection, maintainance and programming. (C5)
2. Develop the PLC program based on the automation requirements. (P4)
3. Systematize troubleshooting and maintenance of PLC system. (A4)

## DUE3012 COMMUNICATIVE ENGLISH 2

### 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 students to make and reply to enquiries and complaints.

### COURSE LEARNING OUTCOMES (CLO)

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

1. describe products or services related to their field of studies using appropriate language. (C3, A3)
2. transfer information of a process or procedure accurately from linear to non- linear form and vice versa. (C3)
3. listen and respond to enquiries using appropriate language. (C3)
4. make and respond to complaints using appropriate language. (C3)

# SYNOPSIS & COURSE LEARNING OUTCOME

## DJJ5123 PNEUMATICS AND HYDRAULICS

### 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 OUTCOMES (CLO)

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

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)

## DJM5092 CONTROL SYSTEM

### SYNOPSIS

**CONTROL SYSTEM** provides knowledge regarding various concepts of feedback control system and the required mathematical methods. The emphasis of the course is on control action, pneumatic control, hydraulic control and frequency response. This course also provides knowledge in analyzing and designing stability and performance test.

### COURSE LEARNING OUTCOMES (CLO)

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

1. Analyze the basic concept of control system including controller principle, transfer function and stability. (C4)
2. Perform stability and performance analysis on the control system based on stability investigation method. (P4)
3. Demonstrate the ability to work in team for completing assigned task during practical work sessions. (A3)

## DJF5032 CADCAM

### SYNOPSIS

**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 learn how to use CAD/CAM software to design an object, produce a code and simulate machining. Besides, students will also be exposed to modern manufacturing system as well as Flexible Manufacturing System (FMS), Computer Integrated Manufacturing (CIM) and Reverse Engineering (RE).

### COURSE LEARNING OUTCOMES (CLO)

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

1. explain briefly CAD, NC,CAM and various type of modern manufacturing system. (C4,PLO2)
2. create NC code for a particular product design by utilizing related CAD/CAM simulation software. (P7,PLO4)
3. demonstrate continuous learning and information management skill while engaging in independent acquisition of new knowledge and skill to develop a project. (A3,PLO11)

## DJF5042 INDUSTRIAL ROBOTICS

### SYNOPSIS

**INDUSTRIAL ROBOTICS** introduces to the robotic system which emphasize on industrial robot components such as actuators, robot sensors, robot end effectors and control system. Topics also discuss on industrial robot application including the advantages and disadvantages of using robots. The course complete with an explanation of the robot classification, robot programming operations, ANSI robotics safety standard and maintenance process.

### COURSE LEARNING OUTCOMES (CLO)

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

1. explain the application of industrial robot in manufacturing process including robot configurations and components. (C4, PLO2)
2. prepare the robot programming and maintenance operations that comply with the standard of industrial robotics safety requirements. (C3, PLO1)
3. demonstrate good communication skills in oral presentation in a group, on the assigned topics within a stipulated time frame. (A3, PLO6)

# SYNOPSIS & COURSE LEARNING OUTCOME

SEMESTER 4

## DJM5103 POWER ELECTRONICS

**SYNOPSIS**

**POWER ELECTRONICS** provides knowledge on widely used motor control concepts especially those in high power industry. The course focuses on basic concepts of Power Electronic and applications with DC and AC motor control covering construction of DC and AC electrical drives

**COURSE LEARNING OUTCOMES (CLO)**

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

1. Distinguish the characteristics and operations of various power electronic devices, AC & DC converters and electrical drives. (C4)
2. Construct power electronic converter and electrical drive circuits based on schematic diagram. (P4)
3. Demonstrate the understanding and awareness of safety procedure in practical work. (A3)

## DJM5082 MICROPROCESSOR

**SYNOPSIS**

**MICROPROCESSOR** covers the concept of microprocessor system based on Intel 8086 microprocessor. Student will learn concept of microprocessor 8086, microprocessor architecture ,the memory system, interfacing, interrupt, microprocessor's programming and its applications

**COURSE LEARNING OUTCOMES (CLO)**

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

1. Explain the concepts of Microprocessor 8086 architecture , memory system , software architecture and assembly language programming for 8086 microprocessor. (C4)
2. Write 8086 Microprocessor Program in assembly language. (P4)
3. Demonstrate interface application of Microprocessor 8086. (A3)

## DJJ5141 PROJECT 1

**SYNOPSIS**

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

**COURSE LEARNING OUTCOMES (CLO)**

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

1. organize research or project systematically. (C5)
2. demonstrate good communication skill of oral presentation in group. (A3)
3. demonstrate continuous learning and information management skills while engaging in independent acquisition of new knowledge and skill to develop a project. (A3)

SEMESTER 4

## DUE5012 COMMUNICATIVE ENGLISH 3

### 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 to present data through the use of graphs and charts. 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 OUTCOMES (CLO)

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

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

## DBM3013 ENGINEERING MATHEMATICS 3

### 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 OUTCOMES (CLO)

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

1. solve the mathematical problems by using appropriate techniques and solutions. (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)

# SYNOPSIS & COURSE LEARNING OUTCOME

SEMESTER 5

## SYNOPSIS

**MANUFACTURING CONTROL** provides knowledge about basic principal and concept on managing an organization and major levels in manufacturing planning and control system (MPC) which help in making forecast, production plan, control production and manage inventory. This course also gives knowledge on how to handle product inventory during manufacturing processes, from ordering raw materials until the completion of the product by looking at supply chain management, Just In Time (JIT) and capacity planning. It also includes knowledge in managing MRP system (material management), production scheduling and inventory management.

## COURSE LEARNING OUTCOMES (CLO)

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

1. analyse the concept and application of Manufacturing Forecasting, Supply Chain Management & Just In Time, Production Schedule, Inventory Control, Productivity & Capacity Planning, and Material Requirement Planning (MRP) in manufacturing management. (C4, PLO2)

2. conduct Material Requirement Planning (MRP) for manufacturing process controlling activities. (C5, PLO3)

3. relate continuous learning and information management skill while engaging in independent acquisition of new knowledge and skill to develop a Material Requirement Planning (MRP) according to inventory system. (A4, PLO11)

## SYNOPSIS

**MANUFACTURING ENGINEERING LABORATORY 2** aims to enable the learners to develop knowledge and skills in Industrial Robot Application, Programmable Logic Control, Statistical Process Control (SPC) and Inventory Control. In Robot Application, learners will learn about programming, hands on training and robot application while in PLC, they will learn about creating a simple program using PLC which is used in manufacturing and mechanical processes. Statistical Process Control (SPC) however, uses statistical tools to observe the performance of the production process in order to predict significant deviations that may later result in rejected product. The inventory control will focus on understanding the quantity discounts and controlling the inventory while rapid prototyping is used in designing complex design shapes which involves in modifying and completing design of a prototype.

## COURSE LEARNING OUTCOMES (CLO)

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

1. organize data and graph control charts in observing the performance of a production process along with appropriate quality improvement tools such as MRP, Pareto Diagram, Cause and Effect diagram and control chart. (C5, PLO3)

2. manipulate robot programming, PLC programming and rapid prototyping design process to complete a specific task based on standard operating procedure. (P2, PLO4)

3. demonstrate ability to work in team to complete assigned tasks during practical work sessions. (A3, PLO7)

## SYNOPSIS

**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 importance of International Standard of Quality Assurance Standard, ISO 9000 for an organization.

## COURSE LEARNING OUTCOME (CLO)

Upon completion of this course, students 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. propose the related quality tools and techniques to control the quality of products or services based on case study. (C5, PLO 3).

3. demonstrate ability to work in team to complete the assigned tasks. (A3, PLO7).

SEMESTER 5

## DJJ6143 PROJECT 2

### 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 OUTCOMES (CLO)

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

1. develop creative solution to solve the problems in the project design or case study (C5)
2. organize the selected design or case study based on the project planning (P5).
3. demonstrate good communication skills of presentation in group. (A3)
4. demonstrate ability to lead a team to complete assigned project during practical work sessions. (A3)
5. demonstrate awareness of management, business practices and entrepreneurship related to product of project. (A3)
6. demonstrate awareness of social responsibility in practical work procedure and practices. (A3)

## DJM6113 INDUSTRIAL AUTOMATION

### SYNOPSIS

**THE INDUSTRIAL AUTOMATION** explains advantages and disadvantages of using automation along with a description of the classification systems. It also gives students an understanding of modern industrial automation technology.

### COURSE LEARNING OUTCOMES (CLO)

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

1. apply the fundamental concept of industrial automation including the mechanical system, actuator control and sensory device. (C3)
2. Develop control structure for industrial automation system based on process specification. (P4)
3. Demonstrate good communication skills in group on assigned topic. (A3)

## DJM6122 POWER TRANSMISSION

### SYNOPSIS

**POWER TRANSMISSION MECHANISM** introduces and reveals element of mechanism movement power and commonly used converter common use. This module includes chain, bearing, gear, cam, followers, coupling, clutch and brake. This module gives knowledge on the working principle of elements power transmission mechanism and students should be able to choose and form power transmission mechanism.

### COURSE LEARNING OUTCOMES (CLO)

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

1. Classify types of power transmission mechanism used in machines. (C3)
2. analyze the physical dimensions and power transmission mechanism based on utilization and design of machine.(C4)
3. demonstrate the understanding of engineering norms and practices in solving power transmission mechanism problem. (A3)

## DUA6022 KOMUNIKASI DAN PENYIARAN ISLAM

### SYNOPSIS

**KOMUNIKASI DAN PENYIARAN ISLAM** memfokuskan kepada penguasaan konsep, kemahiran komunikasi dan penyiaran islam bagi meningkatkan kefahaman pelajar secara holistik terhadap kursus ini.

### COURSE LEARNING OUTCOMES (CLO)

Di akhir kursus ini, pelajar akan dapat :

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

## SYNOPSIS

**ENTREPRENEURSHIP** focuses the principles and concept of entrepreneurship. This course concentrates on the systematic methods of getting business ideas. This course also prepares the students on ways to conduct and control the business including fundamental of management, marketing and financing. It also emphasizes on the preparation of business plan, thus developing their entrepreneurial skills.

## COURSE LEARNING OUTCOMES (CLO)

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

1. explain clearly the concept of entrepreneurship, process and procedures involved in developing effective business plan. (C2, LD1)
2. work cooperatively in group to complete the assigned project based on entrepreneurial skills. (P3, LD2) (A3, LD7)
3. present business plan creatively using knowledge gained via group. (A2, LD3)

**DPB2012 ENTREPRENEURSHIP**

## SYNOPSIS

**EMBEDDED SYSTEM APPLICATION** covers the basic concept and application of microcontroller system. Students will be able to learn software and hardware development on microcontroller development system and understand how to interface.

## COURSE LEARNING OUTCOMES (CLO)

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

1. Explain the theory and basic architecture of microcontroller. (C2)
2. Write program using C language. (A2)
3. Design microcontroller external devices interface. (P5)

**DJM 6132 EMBEDDED SYSTEM APPLICATION**

## 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 OUTCOMES (CLO)

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

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)

**DJJ6192 INDUSTRIAL MANAGEMENT**

## SYNOPSIS

**INDUSTRIAL TRAINING** exposes students to related workplace competencies demanded by industries. This course provides exposure to students in terms of technology literacy, effective communication, practice social skills and teamwork, policies, procedures and regulations, professional ethics and reporting. It also equips students with real work experience, thus helping students to perform as novice workers.

## COURSE LEARNING OUTCOMES (CLO)

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

1. apply related knowledge and skills at the workplace. (C3, P2)
2. communicate effectively with others. (A3)
3. practice teamwork. (A5)
4. professionally and ethically comply with policies, procedures and rules of the organization. (A5)
5. explain the tasks assigned (during the industrial training) according to the prescribed format. (P2, A4)

**DUT 40110 INDUSTRIAL TRAINING**

# SISTEM GRED & PENGIRAAN KEPUTUSAN

| MARKAH | NILAI 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 |

| PENCAPAIAN | KEPUTUSAN | STATUS |
|---|---|---|
| HPNM ≥ 2.00 | Kedudukan Baik (KB) | Meneruskan pengajian dan boleh 'carry' kursus yang gagal sebelumnya |
| 2.00 > HPNM ≥ 1.60 | Kedudukan Bersyarat (KS) | Meneruskan pengajian dan boleh 'carry' kursus yang gagal sebelumnya |
| HPNM ≥ 2.00 dan memenuhi syarat yang ditetapkan. | Lulus Penuh (LP) | Layak dianugerahkan Sijil<br>** Pelajar Semester Akhir sahaja |
| HPNM < 1.60<br>Atau<br>PNM < 1.00 | Gagal Berhenti (GB) | Diberhentikan |

- **Pengiraan Mata Kredit (MK)**

  MK = Nilai Mata x Jam Kredit

- **Pengiraan Purata Nilaian Mata (PNM)**

  $$PNM = \frac{JMKBS}{JJKBS}$$

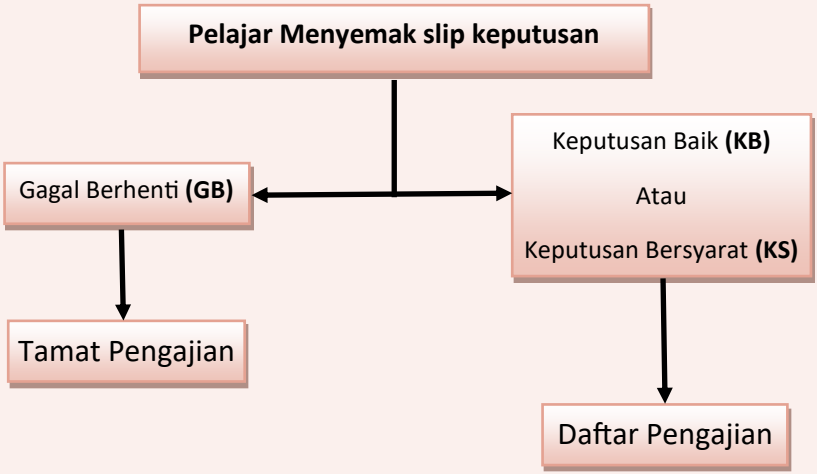
  di mana:
  JMKBS = Jumlah mata kredit yang diperolehi bagi semester
  JJKBS = Jumlah jam kredit yang diambil bagi semester

- **Pengiraan Himpunan Purata Nilaian Mata (HPNM)**

  $$HPNM = \frac{JMKSK}{JJKSK}$$

  di mana:
  JMKSK = Jumlah mata kredit yang diperolehi sehingga kini
  JJKBS = Jumlah jam kredit yang diambil sehingga kini

# PENDAFTARAN PELAJAR



**Cara meminjam/Jumlah pinjaman**

Peminjam perlu menunjukkan kad matrik semasa urusan pinjaman di kaunter perpustakaan. Jumlah pinjaman adalah seperti berikut :

| Peminjam | Jumlah Pinjaman Buku | Tempoh | Pembaharuan |
|---|---|---|---|
| Pensyarah/ Kakitangan Akademik | 10 buah | 1 bulan | 2 kali |
| Kakitangan lain | 10 buah | 1 bulan | 2 kali |
| Pelajar | 5 buah | 2 minggu | 2 kali |
| Rakan Perpustakaan | 7 buah | 2 minggu | 2 kali |
| Alumni | 2 buah | 2 minggu | 2 kali |
| Ahli Keluarga Ka-kitangan PSP | 3 buah | 2 minggu | 2 kali |

**Pembaharuan pinjaman** boleh dibuat melalui telefon atau emel.

**Denda lewat** sebanyak 10 sen sehari akan dikenakan ke atas pinjaman yang telah tamat tempoh.

Penggunaan CD/DVD/Video/*Audio tapes* hanya boleh digunakan di dalam

| Peminjam | Kertas Peperiksaan Lepas | Modul / Kertas Projek |
|---|---|---|
| Pensyarah | 2 jam | 2 jam |
| Pelajar | 2 jam | 2 jam |

**Perkhidmatan Pinjaman**

Semua pengguna berdaftar adalah layak meminjam buku dan bahan lain yang disediakan di perpustakaan.

## Pendaftaran Kursus

**Daftar kursus** di dalam

I-Daftar SPMP,

http://spmp.polinilai.edu.my

** Tatacara pendaftaran diuploadkan di dalam I-Daftar SPMP.

## Aduan & Maklumbalas Pelajar

**Aduan dan MaklumBalas** Pelajar secara online di web PNS, http://aplikasi.polinilai.edu.my/sis_aduanpro/

# PERATURAN AM & PANDUAN PEMAKAIAN DAN RUPADIRI

## AKTA 174 KAEDAH 26A

- **Pakaian dan rupadiri**
- **Kebersihan dalam kampus**
- **Membuat sebarang bunyi bising / gangguan**
- **Tidur di premis / bangunan selain yang dibenarkan (Asrama)**
- **Kad Pelajar**

- Baju
  - Kemeja berlengan panjang / pendek
  - T-shirt berkolar berlengan panjang / pendek
  - Baju yang dimasukkan ke dalam "tuck in"
- Baju Melayu lengkap bersampin dan songkok
- Berseluar panjang jenis slack

- Baju
  - Baju kurung
  - Baju kurung moden
  - Baju kasual
  - T-shirt berlengan panjang
- Kain / skirt labuh dibawah paras lutut
- Bertudung / Rambut yang dirapi
- Berseluar panjang jenis slack

# TINDAKAN YANG DIAMBIL SEKIRANYA MELANGGAR PERATURAN

Notes

Notes