DIPLOMA IN MECHANICAL ENGINEERING (MANUFACTURING)
STUDENT STUDY GUIDE

Employability Our Priority
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</table>
1.0 INTRODUCTION

2.0 VISION AND MISSION

**JPP VISION:**

- To be the premier Industry-led TVET institution

**JPP MISSION**

- To provide access to quality and recognized TVET programme.
- To develop industry-led curriculum and enhance graduate readiness through coordinated industry engagement.
- To produce balanced and enterprising graduate through dynamic and sustainable study programme.
- To gain international recognition through collaboration and active participation with TVET community.

**PBS VISION:**

- To become a highly reputable technical training institution by 2020

**PBS MISSION**

- To produce a holistic human capital to ensure high rate of graduate employability
3.0 QUALITY POLICY

PBS is committed to ensuring the delivery of efficient and effective services to customers through teamwork, continuous review and improvement.

4.0 PBS QUALITY OBJECTIVES

Achieve the objectives of the six areas of excellence that has been set as follows:

- Meet the needs and expectations of customers in the service of a quality education and training in engineering and business
- Be prepared to give full commitment to reforms and improvements in the process of enhancing the quality system
- Cooperate in teamwork.
- Produce students who are balanced and harmonious, competent, responsible and able to contribute to society and country.
5.0 ACADEMIC FLOW CHART

WEEK

Week One (W1)
- New students registration
- Industrial Training
- Students’ Registration
- Senior Students’ Registration

Week One (W1)
- Briefing by Program Leader
- Students’ Course Registration

Week 2 (W2)
- Teaching & Learning activities (15 weeks)

Week 5 (W5)

Week 6 (W6)

Week 8 (W8)
- PB 1 observation by lecturer and Program Leader (W1 – W8)

Week 15 (W15)
- PB 2 observation by lecturer and Program Leader (W1 – W15)

1 week before Final Examination begins

1 week before Final Examination begins

Week 17 & 18 T&L
(W17 & W18)

2 weeks after final exam ends

start

Polytechnic Registration

Course Registration at departments

Teaching & Learning Process

80% attendance review by the lecturer (w1 – w7)

Final week to drop course

PB 1 observation by lecturer (w1 – w8)

80% attendance review by the lecturer (w1 – w15)

PB 2 observation by lecturer (15 weeks)

Barred from Final Examination

Appeal to sit for Final Examination

pass

Examination results finalized

END

NOTES

Subject to the current academic calendar
- Industrial Training Unit (UPLI)
- Dept. of Student Affairs (HEP)

Confirmation from the Academic Advisor and Course Lecturer

Attendance is taken according to the lecturer hour

Letter is sent by the Academic Advisor to the students who obtained below 80%

Confirmation from the Academic Advisor and Course Lecturer

Course Lecturer submit the names of students with attendance lower than 80% to the Head of Dept. to be barred from the Final Examination

Examination Officer issues a letter to detain students from Final Examination

Students submit Letter of Appeal to the Examination Officer with relevant supporting evidence

Refer to Final Exam Schedule issued by respective department

Final Exam

Check result from website
6.0 OUTCOME-BASED EDUCATION [OBE]

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

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

6.1 WHAT IS OUTCOME BASED EDUCATION [OBE]

- OBE involves the restructuring of curriculum, assessment and reporting practices in education to reflect the achievement of high order learning and mastery rather than accumulation of course credits.
- It requires that the students demonstrate that they have learnt the required skills and content.
- OBE is an educational process that focuses on what students can do or the qualities they should develop after they taught.
- Discourages traditional education approaches based on direct instruction of facts and standard method.
- Both structures and curricula are designed to achieve those capabilities or qualities.
6.2 ACCREDITATION PROCESS

- **Learning Outcomes**: What students will be able to do?
- **Credits**: The yardstick to measure student learning
- **MQF**: The frame within which students' learning is pegged.
- **MQA**: The Agency that holds it all together

6.3 HOW DOES OBE AFFECT TEACHING-LEARNING.

**Teacher-Centered**
- Course Objective is the Learning Target
- No mapping of learning outcomes
- Student Independent Learning Not Calculated
- Contact hours Reflects Credit Value

**Student-Centered**
- Learning Outcomes is the Learning Target
- Mapping of Learning Outcomes
- Student Independent Learning Time Calculated
- Total SLT Reflects Credit Value
6.4 **EXPECTATIONS ON STUDENTS**

Be more creative, able to analyze and synthesize information

Students are expected to be able to do more challenging tasks other than memorize and reproduce what was taught.

Students should be able to: write project proposals, complete projects, analyze case studies, give case, presentations, show their abilities to think, question, research, and make decisions based on the findings

Able to plan and organize tasks, able to work in a team as a community or in entrepreneurial service teams to propose solutions to problems and market their solutions

6.5 **DURATION STUDY**

For Diploma in Mechanical Engineering (Manufacturing) will be study from semester 1 until semester 6, its equivalence with 3 year and 95 credit hours. All students have to undergo 20 weeks of industrial training at semester 6.

<table>
<thead>
<tr>
<th>COURSES CLASSIFICATION</th>
<th>CREDIT</th>
<th>%</th>
</tr>
</thead>
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<td>15.79</td>
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<td>15.79</td>
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<td>3 Discipline Core</td>
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<td>30.52</td>
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<tr>
<td>4 Specialization</td>
<td>22</td>
<td>23.16</td>
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<td>5 Elective</td>
<td>4</td>
<td>4.21</td>
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<tr>
<td>6 Industrial Training</td>
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<tr>
<td><strong>Total credit</strong></td>
<td>95</td>
<td><strong>100%</strong></td>
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MECHANICAL DEPARTMENT

DIPLOMA IN MECHANICAL ENGINEERING (MANUFACTURING)
7.0 PROGRAMME OVERVIEW

7.1 INTRODUCTION
For the past few decades, industries have evolved and progressed rapidly. The Ninth Malaysia Plan was drawn in response to the current global needs and to enable Malaysia stay competitive in the world market. Thus, to keep abreast with rapid technological advancements and evolving requirements in industries today, Department of Polytechnic Education (DPE) constantly collaborates with major industry players in the country in developing the respective curriculum. One of the most important factors towards the growth of productivity is by having a qualified and talented manpower in order for the industry to develop and remain competitive in the world market. This is equally true in industries where there is a rapidly growing demand for highly competent and technically savvy workforce. The activities of many industries require increasingly competent technician in engineering field, particularly in mechanical engineering and manufacturing.

In response to these issues, Curriculum Development and Evaluation Division of the Department of Polytechnic Education has developed and introduced Diploma in Mechanical Engineering (Manufacturing) for polytechnic. This programme aims to prepare students with knowledge, skills and abilities necessary in the manufacturing industries. To ensure the curriculum content fulfils the industrial requirements, several key players from related industries have been involved in the curriculum development process.

Diploma in Mechanical Engineering (Manufacturing) for polytechnic is developed to give balanced emphasis on theoretical and practical aspects. The programme will take six semesters to complete, relatively three academic semesters at their respective polytechnics and one semester of industrial training at relevant industries during the fourth semester. Students are required to return to their respective institutions for the completion of the programme in the fifth and sixth semester.

7.2 SYNOPSIS
Diploma in Mechanical Engineering (Manufacturing) Programme is designed as a part of mechanical engineering discipline focusing in manufacturing field. The core discipline courses include Engineering Drawing, Computer Aided Design, and Electrical Technology enhances the student knowledge and capabilities. In order to enrich student manufacturing knowledge, the specialized courses such as Manufacturing System, Manufacturing Workshop Practice, Computer Aided Manufacturing Design, Industrial Robotics, Manufacturing Control, Quality Control, Jigs, Fixtures & Tooling Design, Material Technology and Manufacturing Economy are introduced.
7.3  JOB PROSPECTS

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

- Assistant Engineer
- Production/Process Executive
- Procurement Executive
- Quality Officer
- CNC Programmer
- Product Designer
- Technical Specialist
- Production/Process Supervisor
- Technical Assistant
- Precision Machinist

7.4  PROGRAMME AIMS (PAI)

The Diploma in Mechanical Engineering (Manufacturing) graduates in Polytechnics, Ministry of Education will have the knowledge, technical and generic skills to adapt themselves with new technological advancement and challenges in the mechanical and manufacturing engineering field.

7.5  PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

The Diploma in Mechanical Engineering (Manufacturing) programme shall produce semi-professionals who are:

- Competent in knowledge and skills in the field of mechanical and manufacturing engineering according to industry requirements.
- Effective in communication and contribute effectively as a team member with the capability of being a leader.
- Ethically and socially responsible towards developing the country and the community.
- 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 and manufacturing fields.
7.6 PROGRAMME LEARNING OUTCOMES (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 mechanical engineering procedures and practices with specialisation in manufacturing.
2. Analyse well-defined mechanical engineering specializing in manufacturing problems with respect to operation and maintenance including troubleshooting.
3. Conduct investigations and assist in the design of solutions for mechanical specializing in manufacturing engineering systems.
4. Apply appropriate techniques, resources, and engineering tools to well-defined mechanical specializing in manufacturing 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. Recognise the needs for professional development and to engage in independent and lifelong learning.
### 7.7 MATRIX OF PEO vs. PLO

**Programme Educational Objectives (PEO):**

The Diploma in Mechanical Engineering (Manufacturing) programme shall produce semi professionals who are:

<table>
<thead>
<tr>
<th>PEO</th>
<th>PLO1</th>
<th>PLO2</th>
<th>PLO3</th>
<th>PLO4</th>
<th>PLO5</th>
<th>PLO6</th>
<th>PLO7</th>
<th>PLO8</th>
<th>PLO9</th>
<th>PLO10</th>
<th>PLO11</th>
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<td>2. Effective in communication and contribute effectively as a team</td>
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<td>member with the capability of being a leader.</td>
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<td>3. Ethically and socially responsible towards developing the country</td>
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<td>✓</td>
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<td>and the community.</td>
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<td>✓</td>
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<td>4. Able to demonstrate entrepreneurship skills and recognize the</td>
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<td>need of lifelong learning for a successful career advancement and</td>
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<td>able to adapt themselves with new technological challenges in</td>
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**Learning Dominion**

- **LD 1** Knowledge
- **LD 2** Practical Skills
- **LD 3** Communication Skills
- **LD 4** Critical Thinking And Problem Solving Skills
- **LD 5** Social Skills And Responsibilities
- **LD 6** Continuous Learning And Information Management Skills
- **LD 7** Management And Entrepreneurial Skills
- **LD 8** Professionalism, Ethics And Moral
- **LD 9** Leadership And Teamwork Skills
### 7.8 Programme Structure for Diploma in Mechanical Engineering (Manufacturing)

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| **TOTAL**          |             |                                             | 106 | 78 |

This table outlines the course structure for the Diploma in Mechanical Engineering (Manufacturing) program, detailing required courses, their contact hours, and credits for each semester.
### SEMESTER 3

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### COMPULSORY

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## DIPLOMA IN MECHANICAL ENGINEERING (MANUFACTURING)

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Note: LD : Learning Domain
8.0 SYNOPSIS AND COURSE LEARNING OUTCOME (CLO)

8.1 DUB 1012 PENGAJIAN MALAYSIA (Credit: 2.0)

**SYNOPSIS**


**HASIL PEMBELAJARAN KURSUS (CLO)**

Di akhir kursus ini, pelajar akan dapat:

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

8.2 DUE 1012 COMMUNICATIVE ENGLISH 1 (Credit: 2.0)

**SYNOPSIS**

COMMUNICATIVE ENGLISH 1 focuses on speaking skills for students to develop the ability 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:

- apply appropriate communication skills in discussions and conversations. (C3)
- comprehend selected texts using appropriate reading skills.(C2)
- interpret current issues / topics of interest in written form. (C2)
- apply effective presentation skills.(C3, A3)
8.3 DUA 2012 SAINS, TEKNOLOGI DAN KEJURUTERAAN ISLAM (Credit: 2.0)

SINOPSIS

SAINS, TEKNOLOGI DAN KEJURUTERAAN DALAM ISLAM memberi pengetahuan tentang konsep Islam sebagai al-Din dan seterusnya membincangkan konsep sains, teknologi dan kejuruteraan dalam Islam serta impaknya, pencapaian dan dalam tamadun Islam, prinsip serta peranan syariah dan etika Islam, peranan kaedah fiqh serta aplikasinya.

HASIL PEMBELAJARAN KURSUS (CLO)

Di akhir kursus ini, pelajar akan dapat:

- Menghuraikan konsep Islam sebagai cara hidup. (C2, LD1 : P2, LD2)
- Menjelaskan konsep sains, teknologi dan kejuruteraan dalam Islam. (C2, LD1)
- Membincangkan prinsip syariah dan kaedah fiqh dalam sains, teknologi dan kejuruteraan. (C3, LD1 : A3, LD6)

8.4 DUB2012 NILAI MASYARAKAT MALAYSIA (Credit: 2.0)

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-cabarannya dalam membangunkan masyarakat Malaysia.

COURSE LEARNING OUTCOMES (CLO)

Di akhir kursus ini, pelajar akan dapat:

- Menerangkan sejarah pembentukan masyarakat dan nilai agama di Malaysia. (C2:LD1)
- Menghubung kait tanggungjawab individu dalam kehidupan masyarakat dan negara. (C3:LD1, A2:LD5)
- Membincangkan cabaran-cabarannya dalam membangunkan masyarakat Malaysia. (C3:LD1,A3:LD6)
8.5 DUE 3012 COMMUNICATIVE ENGLISH 2 (Credit: 2.0)

PREREQUISITE(S): DUE1012 COMMUNICATIVE ENGLISH 1

SYNOPSIS

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

COURSE LEARNING OUTCOMES (CLO)

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

- describe products or services related to their field of studies using appropriate language. (C3, A3)
- transfer information on processes or procedures using appropriate language from non-linear to linear form. (C3)
- listen and respond to enquiries using appropriate language. (C3)
- make and respond to complaints using appropriate language. (C3)

8.6 DUE 5012 COMMUNICATIVE ENGLISH 3 (Credit: 2.0)

PREREQUISITE(S): DUE 3012 COMMUNICATIVE ENGLISH 2

SYNOPSIS

COMMUNICATIVE ENGLISH 3 aims to develop the necessary skills in students to carry out a mini project as well as job hunting. Students will learn to present ideas 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:

- describe information contained in graphs and charts effectively. (C4, A3)
- apply job hunting mechanics appropriately. (C3)
respond to interview questions using appropriate language when applying for jobs. (C3)

8.7 DUT40110 INDUSTRIAL TRAINING (Credit: 10)

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)

• Apply related knowledge and skills at the workplace. (C3, P2)
• Communicate effectively with others. (A3)
• Practice teamwork. (A5)
• Professionally and ethically comply with policies, procedures and rules of the organization. (A5)
• Explain the tasks assigned (during the industrial training) according to the prescribed format. (P2, A4)

8.8 DBM1013 ENGINEERING MATHEMATICS 1 (Credit: 3.0)

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 OUTCOME (CLO)

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

- identify mathematical methods in solving the mathematical problems. (C2, LD1)
- solve the mathematical problems by using appropriate techniques and solutions. (C3, LD1)
- practice mathematical knowledge and skills in different mathematics problems. (C3, LD1)

8.9 DBS1012 ENGINEERING SCIENCE (Credit: 2.0)

SYNOPSIS

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

COURSE LEARNING OUTCOME (CLO)

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

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

8.10 DUW1012 OCCUPATIONAL SAFETY & HEALTH 1 (Credit: 2.0)

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 OUTCOME (CLO)

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

- identify the OSH legislation and its compliance in Malaysia. (C2, LD1)
explain briefly incident hazards, risks and safe work practices in order to maintain health and safe work environment. (C2, LD1)

- discuss cooperatively in responding to an accident action at workplace. (C3, LD1; A2, LD4)
- adhere to the safety procedures in respective fields. (A3, LD8)

**8.11 DPB2012 ENTREPRENEURSHIP (Credit: 2.0)**

**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:

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

**8.12 DBM2013 ENGINEERING MATHEMATICS 2 (Credit: 3.0)**

**SYNOPSIS**

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

**COURSE LEARNING OUTCOME (CLO)**

Upon completion of this course, students should be able to:
DIPLOMA IN MECHANICAL ENGINEERING (MANUFACTURING)

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

8.13 DBM3013 ENGINEERING MATHEMATICS 3 (Credit: 3.0)

SYNOPSIS

ENGINEERING MATHEMATICS 3 exposes students to the statistical and probability concepts and their applications in interpreting data. The course also introduces numerical methods concept to solve simultaneous equations by using Gaussian Elimination method, LU Decomposition using Doolittle and Crout methods, polynomial problems using Simple Fixed Point Iteration and Newton-Raphson methods. In additional, the course also discusses optimization problems by using Linear Programming. In order to strengthen the students in solving advanced engineering problems, Ordinary Differential Equation (ODE) is also included.

COURSE LEARNING OUTCOME (CLO)

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

- Solve the mathematical problems by using appropriate techniques and solutions. (C3, LD1)
- Show the solution for statistics and probability problems, and linear programming by using appropriate mathematical methods. (C3, LD1)
- Practice mathematical knowledge and skills in different mathematical problem. (C3, LD1)
8.14 DJJ1012 ENGINEERING DRAWING (Credit: 2.0)

SYNOPSIS

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:

- Apply the basic fundamentals of engineering drawing in comply to related problems. (C3, PLO1)
- Construct engineering drawings according to the required standards. (P4, PLO4)
- Demonstrate the understanding of engineering norms and practices in engineering drawing. (A3, PLO8)

ASSESSMENT

Coursework only: Practical Test (40%), Practical Task (60%)

8.15 DJJ2022 ELECTRICAL TECHNOLOGY (Credits: 2.0)

SYNOPSIS

ELECTRICAL TECHNOLOGY exposes students to the basic electrical circuit concepts, the application of electromagnetism in electrical machines and transformers. The course focuses on the different types of electrical circuits, the relationship between current and voltage including the resistance. It also provides the skills on the methods of constructing basic circuits and operation of electrical machines and transformers. This course also exposes the students to the demonstration of experiments in Electrical Technology.

COURSE LEARNING OUTCOMES (CLO)

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

- apply the principles of electrical circuits, electromagnetism, transformers and electrical machines to solve related problems. (C3, PLO1)
organize appropriately experiments in groups according to the Standard Operating Procedures. (P4, PLO4)

demonstrate continuous learning and information management skills while engaging in independent acquisition of new knowledge and skills in laboratory report. (A3, PLO11)

ASSESSMENT

- **Coursework Assessment (CA) - 50%**
  - Test (15%), Quiz (10%), Practical Task (10%), End of Chapter (10%), Report (5%)
- **Final Examination Assessment (FE) - 50%**

8.16 **DJJ1032 MECHANICAL WORKSHOP PRACTICE 1 (Credit: 2.0)**

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:

- perform fitting, machining and welding works according to Standard Operating Procedure (SOP). (P4, PLO4)

- demonstrate the awareness of social responsibility and safety in practical work procedures and practices. (A3, PLO5)

- demonstrate an understanding of professional ethics, responsibilities and norms of engineering practices according to the workshop safety regulation. (A3, PLO8)

ASSESSMENT

Coursework Assessment - **100%** - Practical Task (100%)
8.17 DJJ1043 WORKSHOP TECHNOLOGY (Credit: 3.0)

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:

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

ASSESSMENT

- Coursework Assessment (CA) - 50%
  Test (20%), Quiz (10%), End of Chapter (20%)
- Final Examination Assessment (FE) - 50%

8.18 DJJ3053 ENGINEERING MECHANICS (Credit: 3.0)

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:-
★ Analyze problems related to statics and dynamics based on the concept and principles of engineering mechanics. (C4, PLO2)

★ Organize appropriately experiments in groups according to the Standard Operating Procedures. (P4, PLO4)

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

ASSESSMENT

- Coursework Assessment (CA) - 50%
  Test (20%), Quiz (10%), Practical Task (5%), End of Chapter (10%), Report (5%)

- Final Examination Assessment (FE) - 50%

8.19 DJJ 2062 COMPUTER AIDED DESIGN 1 (Credit: 2.0)
Pre Requisite(s): DJJ1012 ENGINEERING DRAWING

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: -

★ Apply the fundamental features of CAD software in producing engineering drawing. (C3, PLO1)

★ Construct 2D drawing using fundamental features of CAD software. (P4, PLO4)

★ Demonstrate continuous learning and information management skill while engaging in independent acquisition of new knowledge and skill to solve assigned task. (A3, PLO11)

ASSESSMENT

Coursework Assessment 100% - Theoretical Test (15%), Practical Test (15%), Practical Task (60%), Mini Project (10%)
8.20 DJJ2073 THERMODYNAMICS (Credit: 3.0)

SYNOPSIS

THERMODYNAMICS provides knowledge of theory, concept and application of principles to solve problems related to thermodynamics. It emphasizes on concept of non-flow process and flow process, properties of steam, Carnot cycle and Rankine cycle. This course also exposes the students to the demonstration of experiments in Thermodynamics by using the real equipment.

COURSE LEARNING OUTCOMES (CLO)

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

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

ASSESSMENT

- Coursework Assessment (CA) - 50%
  Test (15%), Quiz (10%), Practical Task (15%), End of Chapter (10%)
- Final Examination Assessment (FE) - 50%

8.21 DJJ3093 FLUID MECHANICS (Credit: 3.0)

SYNOPSIS

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

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

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

ASSESSMENT

- Coursework Assessment (CA) - 50%
  Test (15%), Quiz (10%), Practical Task (15%), End of Chapter (10%)
- Final Examination Assessment (FE) - 50%

8.22 DJJ3103 STRENGTH OF MATERIALS (Credit: 3.0)

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:

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

ASSESSMENT

- Coursework Assessment (CA) - 50%
  Test (20%), Quiz (10%), End of Chapter (10%), Practical Task (5%), Report (5%)
- Final Examination Assessment (FE) - 50%
8.23 DJJ3213 MATERIAL SCIENCE (Credit: 3.0)

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:

- 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)
- Organize appropriately experiments in groups according to the Standard Operating Procedures. (P4, PLO4)
- Demonstrate ability to work in team to complete assigned tasks during practical work sessions. (A3, PLO7)

ASSESSMENT

- Coursework Assessment (CA) - 50%
  Test (20%), Quiz (10%), End of Chapter (10%), Practical Task (5%), Report (5%)
- Final Examination Assessment (FE) - 50%

8.24 DJJ5123 PNEUMATIC & HYDRAULICS (Credit: 3.0)

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:

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

ASSESSMENT

- Coursework Assessment (CA) - 50%
  Test (20%), Quiz (10%), End of Chapter (10%), Practical Task (10%)
- Final Examination Assessment (FE) - 50%
8.25 DJF2012 MANUFACTURING WORKSHOP PRACTISE 1 (Credit: 2.0)

SYNOPSIS

MANUFACTURING WORKSHOP PRACTICE 1 exposes the students to the basic principles of manufacturing processes, industrial environment, and hands on experiences. This course enables student to apply knowledge and develop required technical skills on plastic processing, sand casting, conventional machining and TIG/MIG welding. The workshop practice helps the students to practice appropriate safety procedures and standard operation on completing a project. The practical skill also covers the planning skills, supervising the design, inspecting and testing the welding task in order to meet the quality requirement.

COURSE LEARNING OUTCOMES (CLO)

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

- Make a simple project using casting, plastic, TIG/MIG welding and conventional machine process based on standard operational procedures. (P4, PLO 4)
- Demonstrate safety awareness in practical work procedures and practices. (A3, PLO 5)
- Demonstrate an understanding of professional ethics, responsibilities, norms and practices in manufacturing processes during practical work session. (A3, PLO8)

ASSESSMENT

Coursework Assessment 100% - Practical Task (100%)

8.26 DJF3012 MANUFACTURING WORKSHOP PRACTISE 2 (Credit: 2.0)

SYNOPSIS

MANUFACTURING WORKSHOP PRACTICES 2 develop student’s knowledge and skills on welding, conventional and advanced machining. The conventional machining emphasis on handling of milling and grinding while advanced machining exposes the student to EDM, CNC lathe and CNC milling. This module also covers TIG and MIG welding for 3G position and pipe welding.

COURSE LEARNING OUTCOMES (CLO)

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

Coursework Assessment 100% - Practical Task (100%)

8.27 DJF5022 MANUFACTURING SYSTEM (Credit: 2.0)

SYNOPSIS

MANUFACTURING SYSTEM explains the terminologies and concepts that are necessary in the learning of manufacturing system. It provides knowledge regarding fundamental of manufacturing system, process analysis, process layout, scheduling, lean systems and material handling system. It also emphasizes on systematic way to analyze processes, the important of group technology, flexible manufacturing system and scheduling the job shop.

COURSE LEARNING OUTCOMES (CLO)

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

- Apply the basic concept of manufacturing system, process analysis, process layout, scheduling and material handling system. (C3, PLO 1)
- Organize one of lean systems approach (C5, PLO 3)
- Demonstrate good communication skill in group oral presentation, on assigned topics within a stipulated time frame. (A3, PLO 6)

ASSESSMENT

- Coursework Assessment (CA) - 50%
  Test (40%), Quiz (20%), End of Chapter (20%), Case Study (20%)
- Final Examination Assessment (FE) - 50%
8.28 DJF5032 CADCAM (Credit: 2.0)

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:

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

ASSESSMENT

- Coursework Assessment (CA) - 100%
  - Test (30%), End of Chapter (20%), Project (30%), Case Study (20%)

8.29 DJF5042 INDUSTRIAL ROBOTICS (Credit: 2.0)

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:

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

ASSESSMENT

- **Coursework Assessment (CA) - 50%**
  - Test (40%), Quiz (15%), End of Chapter (30%), Case Study (15%)
- **Final Examination Assessment (FE) - 50%**

8.30 DJF5053 JIGS, FIXTURES AND TOOLING DESIGN (Credit: 3.0)

SYNOPSIS

JIG, FIXTURE AND TOOLING DESIGN exposes the students to the knowledge of datum concept, geometric tolerances and fundamentals to build the tooling based on clamping and locating principle. The topics are also covering the principle of tooling applications in metal and non-metal process. All the topics discussed will help the students to understand, able to plan and identified the use of tooling. Students will also be exposed to the application of tooling in related industries.

COURSE LEARNING OUTCOMES (CLO)

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

- apply the concepts of tool design method, tooling material, jig and fixture. (C3, PLO 1)
- perform the simulation of mould, tool and die design. (P4, PLO 4)
- demonstrate ability to work in team to complete the assigned practical task. (A3, PLO 7)
DIPLOMA IN MECHANICAL ENGINEERING (MANUFACTURING)

ASSESSMENT

- Coursework Assessment (CA) - 100%

Test (30%), Quiz (20%), End of Chapter (20%), Practical Task (20%)

8.31 DJJ5141 PROJECTS 1 (Credit: 1.0)

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:

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

ASSESSMENT

- Coursework Assessment (CA) - 100%

Observation (20%), Report (40%), Presentation (40%)

8.32 DJF6081 MANUFACTURING ENGINEERING LABORATORY (Credit: 1.0)

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:

- 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)
- manipulate robot programming, PLC programming and rapid prototyping design process to complete a specific task based on standard operating procedure. (P2, PLO4)
- demonstrate ability to work in team to complete assigned tasks during practical work sessions. (A3, PLO7)

**ASSESSMENT**

- **Coursework Assessment (CA) - 100%**
  
  Practical Report (40%), Practical Task (60%)

**8.33 DJF6092 MANUFACTURING CONTROL (Credit: 2.0)**

**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:

- analyse the concept and application of Manufacturing Forecasting, Supply Chain Management & Just In Time, Production Schedule, Inventory Control, Productivity &
DIPLOMA IN MECHANICAL ENGINEERING (MANUFACTURING)

Capacity Planning, and Material Requirement Planning (MRP) in manufacturing management. (C4, PLO2)

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

- 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)

ASSESSMENT

- Coursework Assessment (CA) - 50%
  Test (40%), Quiz (10%), End of Chapter (20%), Case Study (30%)

- Final Examination Assessment (FE) - 50%

8.34 DJF6102 QUALITY CONTROL (Credit: 2.0)

SYNOPSIS

QUALITY CONTROL provides knowledge on basic principle and concept of quality including statistical method in controlling products quality or services. This course also emphasises 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 OUTCOMES (CLO)

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

- apply the relation of statistics and quality management system in understanding of quality control and their application tools. (C3, PLO1).

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

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

ASSESSMENT

- Coursework Assessment (CA) - 50%
  Test (40%), Quiz (20%), End of Chapter (20%), Case Study (20%)

- Final Examination Assessment (FE) - 50%
8.35 DJJ6143 PROJECT 2 (Credit: 3.0)

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:

- develop creative solution to solve the problems in the project design or case study (C5, PLO3)
- organize the selected design or case study based on the project planning (P5, PLO4).
- demonstrate good communication skills of presentation in group. (A3, PLO6)
- demonstrate ability to lead a team to complete assigned project during practical work sessions. (A3, PLO7)
- demonstrate awareness of management, business practices and entrepreneurship related to product of project. (A3, PLO9)
- demonstrate awareness of social responsibility in practical work procedure and practices. (A3, PLO10)

ASSESSMENT

- Coursework Assessment (CA) - 100%
  
  Observation (30%), Report (30%), Presentation (40%)
8.36 DJJ5172 INSTRUMENTATION & CONTROL (Credit: 2.0)

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:

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

ASSESSMENT

- Coursework Assessment (CA) - 50%
  Test (30%), Quiz (10%), Practical Task (40%), Report (20%)
- Final Examination Assessment (FE) - 50%

8.37 DJF5062 MATERIAL TECHNOLOGY (Credit:2.0)

SYNOPSIS

MATERIAL TECHNOLOGY exposed students on several types of metal, alloy and other non-metal materials that are commonly used in the engineering field. Varieties of components will be covered such as stainless steel, non-ferrous alloy, polymers, environmental effect and electrical features of materials.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:-
Relate the characteristics of stainless steel, nonferrous alloy and polymer materials and electrical features in material engineering (C3,PLO1)

Analyze the environmental effects of mechanic features materials. (C4,PLO2)

Demonstrate ability to work in team to complete assigned topic for case study. (A3,PLO7)

**ASSESSMENT**

- **Coursework Assessment (CA) - 50%**
  - Test (40%), Quiz (15%), End Of Chapter (30%), Case Study (15%)

- **Final Examination Assessment (FE) - 50%**

**8.38 DJF5072 INDUSTRIAL MAINTENANCE (Credit: 2.0)**

**SYNOPSIS**

INDUSTRIAL MAINTENANCE aims to enable students to develop the knowledge in the maintenance of engineering component and assembly. Upon successful completion of this course the students will be able to describe the condition of the machine components/assemblies. Besides, the students will be able to manage the damaged parts by repairing or obtain replacements for the components/assemblies.

**COURSE LEARNING OUTCOMES (CLO)**

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

- Explain the maintenance procedure, power transmission, lubrication and material conveying system used in an industry. (C4,PLO2)
- Outline the preventive maintenance job for electrical and mechanical components. (C5,PLO3)
- Demonstrate the understanding of engineering norms and practices in industrial maintenance in the assigned topics for case study. (A3,PLO8)

**ASSESSMENT**

- **Coursework Assessment (CA) - 100%**
  - Test (30%), Quiz (30%), End Of Chapter (20%), Project (20%)
8.39 DJJ5133 ENGINEERING DESIGN (Credit: 3.0)

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:

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

ASSESSMENT

- Coursework Assessment (CA) - 100%
  
  Test (30%), Quiz (10%), Case Study (20%), Project (40%)

8.40 DJF6112 MANUFACTURING ECONOMY (Credit: 2.0)

SYNOPSIS

MANUFACTURING ECONOMIC provides knowledge and understanding to students on economy aspect which includes concepts, basic element of cost component principle and decision making which involve in manufacturing process. This course also focus on fixed cost, variable cost, direct and indirect cost, labour cost, break-even point analysis, materials and costing and actual cost which leads towards eliminate the wastage in manufacturing.

COURSE LEARNING OUTCOMES (CLO)

Upon completion of this course, students should be able to:
apply knowledge of fixed and variable cost and factors which influence the direct material costs, labor cost, direct expenses cost and actual cost. (C3, PLO1)

analyze correctly the decision making in break-even point concept. (C4, PLO2)

demonstrate the awareness of optimizing cost and eliminating wastage in manufacturing management, business practice and entrepreneurship. (A3, PLO9)

ASSESSMENT

- **Coursework Assessment (CA) - 50%**
  
  Test (30%), Quiz (20%), End of Chapter (30%), Case Study (20%)

- **Final Examination Assessment (FE) - 50%**
9.0 POLYTECHNIC SITE MAP

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42700 Banting, Selangor Darul Ehsan
GPS Coordinates: 101° 27' 45.29" E, 2° 49' 33.38"

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## 10.0 MECHANICAL ENGINEERING ACADEMIC STAFF EMAIL

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11.0 REFERENCES

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