PROGRAMME OBJECTIVES (PEO)

PEO 01
To produce competent Engineering Technologists who are able to apply principles of science, engineering and modern technology in solving current and future problems related to manufacturing engineering technology.

PEO 02
To produce Engineering Technologists in manufacturing engineering field who perform work and duty ethically with high moral values and responsibility to God, nation and societies.

PEO 03
To produce creative and innovative Engineering Technologist in research and development in fulfilling the nation’s requirements.

PEO 04
To produce Engineering Technologists who are able to communicate effectively with good leadership as well as able to function in teamwork environment.

PEO 05
To produce Engineering Technologists that shows enthusiasm in engaging long-life learning through continuity of learning, technical practices and professional development.

PROGRAMME OUTCOMES (PO)

PO1
Apply knowledge of mathematics, science, engineering fundamentals and engineering specialization principles to define and apply engineering procedures, processes, systems or methodologies.

PO2
Solve broadly-defined engineering problems systematically to reach substantiated conclusions, using tools and techniques appropriate to their discipline or area of specialization;

PO3
Design solutions for broadly-defined engineering technology problems, and to design systems, components or processes to meet specified needs with appropriate consideration for public health and safety, as well as cultural, societal, environmental and sustainability concerns;
P04
Plan and conduct experimental investigations of broadly-defined problems, using data from relevant sources;

PO5
Select and apply appropriate techniques, resources and modern engineering tools, with an understanding of their limitations;

PO6
Function effectively as individuals, and as members or leaders in diverse technical teams;

PO7
Communicate effectively with the engineering community and society at large;

PO8
Demonstrate an awareness of and consideration for societal, health, safety, legal and cultural issues and their consequent responsibilities;

PO9
Demonstrate an understanding of professional ethics, responsibilities and norms of engineering technology practices;

PO10
Demonstrate an understanding of the impact of engineering practices, taking into account the need for sustainable development;

PO11
Demonstrate an awareness of management, business practices and entrepreneurship;

PO12
Recognize the need for professional development and to engage in independent and lifelong learning.
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Total units for Graduation = 142
LIST OF COURSES FOR BACHELOR OF MECHANICAL ENGINEERING TECHNOLOGY (HONOURS) (MACHINING):

PDT101/3
Statics and Dynamics

PDT106/3
Engineering Graphics

PDT109/2
Workshop Practice

PDT102/3
Thermofluids

PDT122/3
Material Science

PDT111/3
Manufacturing Process

PDT107/2
Computer Aided Design

PDT120/3
Basic Electrical and Electronic

PDT 112/3
Theory in Machining

PDT209/3
Industrial Safety

PDT210/4
Conventional Machining

PDT202/3
Heat Transfer

PDT203/3
Noise and Vibration

PDT206/3
Jigs and Fixtures Design

PDT 211/4
Advanced Machining Technology I

PDT212/3
Geometric, Dimensioning and Tolerancing
PDT309/3
Manufacturing Economics

PDT311/4
Advanced Machining Technology II

PDT 312/3
Computer Aided Manufacturing

PDT310/3
Quality Control

PDT 313/4
Final Year Project
COURSES SYLLABUS

PDT101/3  Statics and Dynamics

Course synopsis:

This course comprises two parts, namely; statics and dynamics. In statics, the basic principles of engineering mechanics such as forces, moments and friction are introduced. Students are required to apply this basic knowledge in analysing the equilibrium of rigid bodies, as well as the stability of a structure. The subjects of dynamics cover the concept of kinematics and kinetics. Kinematics treats the geometric aspects of the motion, whereas kinetics analyses the forces that cause the motion. Analyses in relation to kinetic problems are solved using acceleration method, principle of work and energy, and principle of impulse and momentum.

References:


PDT106/3  Engineering Graphics

Course synopsis:

This course provides the skills to students the basics of Engineering Drawing, Computer Aided Drafting (CAD) and their engineering applications. The course covers the detail of Engineering Drawing for beginners followed with projection systems, oblique and isometric sketches. The course also introduced the Computer Aided Drafting using dedicated software, AUTOCAD, which focuses on product design in 2D and 3D environment. Fundamental knowledge in dimensioning and geometrical tolerance (GDT) enhances student’s ability in interpreting and assessing information from basic raw data of an engineering drawing.
PDT109/2 Workshop Practice

Course synopsis:
This course is a practice of manufacturing process that is used in the industry to transform from raw material to finished products such as sand casting, vacuum casting, rapid prototyping, powder metallurgy, injection molding and heat treatment processes which covers introduction, processes and application. Practical work will help students to gain effective understanding.

References:

PDT102/3  Thermofluids

Course synopsis:

This course will cover the basic knowledge, comprehension and application of law of thermodynamic to understand the relationship between the properties that matter exhibits as it changes its condition. The first part includes review of thermodynamic concept, heat and energy. The second part covers the hydrostatic pressure, various manometers, and hydrostatic force on a plane surface and curved surface, Newton’s Second Law of fluid motion, static, stagnation, dynamic, total pressure and the Bernoulli equation.

References:


PDT122/3  Material Science

Course synopsis:

This course introduces students to historical perspective of materials science and engineering fundamentals characteristics begin from understanding the atomic structures, atomic bonding in solids, crystal structures, mechanical and physical properties of materials. Students will then apply the understanding on properties of materials through phase diagram, transformations and heat treatment processing on ferrous and non-ferrous alloys, polymer and advanced materials.

References:


PDT111/3 Manufacturing Process

Course synopsis:
This course explores the manufacturing process which used in industry to convert raw material into finished product. This course is divided into five sections. First, the introduction to manufacturing technology will be given, followed by material selection in manufacturing and heat treatment process. Secondly, the casting technology and various metal casting processes will be introduced including sand casting, investment casting, vacuum casting and other casting processes. Thirdly, overview of forming and shaping process will be given on rolling, forging, extrusion, drawing, sheet-metal forming, powder metallurgy, processing of ceramics, injection molding, and rapid prototyping process. Fourthly is about various joining process such as brazing, soldering, adhesive bonding, and mechanical fastening processes.

References:

PDT107/2 Computer Aided Design

Course synopsis:
This course focuses on giving exposure and skill to students about the basics of 3D modeling and its application in engineering field by using 3D Modeling software. This course includes details on 3D modeling followed by producing 2D drawing, assembly
drawing, exploded drawing, surface modeling, rendering and animation. All this skill will help student to produce technical drawing and virtual prototype or model. This skill is very demanding in industry.

**References:**


**PDT120/3  Basic Electrical and Electronic**

**Course Synopsis:**

This course provides basic knowledge of solving DC and AC electrical circuits. It also covers the fundamentals of electrical machines. The electronics section includes basic semiconductor diodes and transistors as well as the fundamentals of digital systems. At the end of the semester students will be able to understand, analyze and apply basic electrical and electronics concept and principles.

**References:**


**PDT 112/3  Theory in Machining**
Course synopsis:
In this course, the students learn the fundamentals and principles of metal cutting/machining processes common to current industrial practises. This includes single point orthogonal and turning operations, multi-point cutting operations, i.e. milling, drilling; and abrasive processes/grinding operations. Key technological principles and mechanisms of chip formations are initially explained. This is followed by discussions and evaluations of various conventional machining operations for different part shape requirements. Basic toolings for machining operations are introduced along with the machine tool structures to perform the cutting operations. Material removal rate, machining time and machining economics are analyzed as part of machinability analyses.

References:

PDT209/3 Industrial Safety

Course synopsis:
This course gives an exposure to students to understand industrial safety standards and guidelines, quality management concept and various quality tools that allow students to understand the general picture of both areas which are being practiced by industries. At the end of this course, students are expected to be able to identify suitable quality techniques and tools to be implemented in production management and can apply Industrial Safety standards in real industrial environment.

References:


PDT210/4 Conventional Machining

Course synopsis:

This course introduce about safety aspects in workshop and fundamental of measurement technique followed by milling, lathe and grinding operation which consists of introduction to basic knowledge of various cutting tools, parts of machine and its functions, machine operations, and numerous calculations involving the operations. Students will practices the conventional machining process that is used in the industry to transform from raw material to finished products. Practical work will help students to gain effective understanding.

References:


PDT202/3  Heat Transfer

Course synopsis:

The main objective of this course is to enable student to understand the concepts of conduction, convection and radiation which form the basics of heat transfer. Student will also perform theoretical calculations such as thermal conductivity, heat loss, and other important theories.

References:


PDT203/3  Noise and Vibration

Course synopsis:

The objective of the course is to introduce the students with the skills and knowledge in vibrations disciplines. The syllabus covers the fundamental of vibration and oscillation motion, free vibration, force vibration, transient vibration, two degree of freedom systems and multiple degree of freedom systems. The students will be well prepared towards industrial application elements such as vibration control, vibration measurement and signal analysis methods.

References:

PDT206/3  Jigs and Fixtures Design

Course synopsis:

This course provides concept and understanding to allow students to find suitable designs for components in designing machine system, jig and fixtures. It focuses on basics of power transmission system, motors, fasteners and fundamental principles of jig and fixtures. Students will be exposed with simple design problems before being assigned to compute design parameters. At the end of this course, students will be analyzed simple designs of machine components by using CAD Aided Engineering (CAE) software.

References:


PDT 211/4  Advanced Machining Technology I

Course Synopsis:

This course enables students to understand the use of conventional and modern machining processes. The course begins with an introduction to machining processes, followed by analyses of machine tools. Then, students are taught about CNC programming, CNC processes, tools and control systems. Students will perform machining processes and learn how to develop programming and solve problems related with it.
References:


PDT212/3 Geometric, Dimensioning and Tolerancing

Course synopsis:

This course introduces the basic knowledge of Geometric Dimensioning and Tolerancing (GD&T) and applies to the drawing. Students will be exposed to GD&T fundamentals, symbols, terms, rules, profile, technique, and strategy for tolerancing parts.

References:


PDT309/3 Manufacturing Economics

Course synopsis:

This course addresses a systematic evaluation of proposed solution to engineering problems. It evaluates the monetary consequences of products, projects and processes that engineers design. The course introduces students to fundamental economics consideration and costs involve in decision making for a production or a project which will be economically acceptable and demonstrate a positive balance of long term benefits over long term costs. The students learn about fundamental cost
concepts and costs involve in a production process. Then, money-time relationship (also called time value of money) and concept of equivalence expose students to the value of investment by estimating future costs or revenues. The application of money-time relationship in comparing different alternatives help to choose best solution before investing.

References:


PDT311/4 Advanced Machining Technology II

Course synopsis:

This course is the introduction for EDM technology (Electrical Discharge Machining) which is used in industries nowadays. It includes topics about introduction to EDM technology, wire-cut and Ram (die-sinker) machining. Students are involved with system and process for both type of machining. Besides that, students are also exposed to other types of EDM process.

References:

1. Carl Sommer, Steve Sommer, Complete EDM Handbook, Advance Pub., 2005
2. Elman C. Jameson. Electrical Discharge Machining, Society of Manufacturing Engineers and Machining Technology Association, 2001
**PDT 312/3  Computer Aided Manufacturing**

**Course synopsis:**

This course introduces principles and application of CAD/CAM system. This course enables student to understand the theory, concept, and application of CAD/CAM in an industry. Students will be exposed to CAD software to illustrate parts and then using CAM software to convert CAD file into numerical control (NC) codes.

**References:**


**PDT310/3  Quality Control**

**Course synopsis:**

This course is offered to introduce quality assurance which refers to all systematic and planned activities in quality systems that are proved to be sufficient enough to build up proper confidence in meeting quality requirements whether for products or services which meet or exceed customer expectations. In this course student will learn the quality management as the key for quality assurance achievement. This course comprise of the quality management’s philosophy and concepts and application of quality tools and techniques in order to achieve quality assurance. By understanding the entire contents of this course, students will be able to interpret the standard for quality assurance and quality management systems, and able to develop, formulate, and organize their works or organization effectively.

**References:**


PDT 313/4  Final Year Project

Course synopsis:

A projects based course that exposes students to solve, analyze, design and research engineering problems in the field of manufacturing engineering, machining or product design.