

**LEVEL 4 & 5 HIGHER INTERNATIONAL DIPLOMA
IN
MECHANICAL ENGINEERING**



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PROGRAMME OUTCOMES:

- I. Apply the Knowledge of Technical Science, Applied Mathematics, Mechanical Fundamental and Principle to solve Engineering problems.
- II. Possess applied Knowledge of Design, Manufacture, Safety and Maintenance of Mechanical Systems, Subsystem and Components.
- III. Identify, Formulate, Analyze and solve Engineering and Industrial complex problems using applied Engineering Mathematics, Science and Engineering Principles.
- IV. An ability to develop a component, Product and Process to encounter desired needs by considering various factor such as Health and Safety, Economic, Ethical, Manufacturability and Sustainability.
- V. Understand the Impact and Safety Practices of Engineering Solutions in Societal, Environmental, Global and Economic contexts.
- VI. Apply the knowledge of Basic Principles, Tools and Techniques to Perform Repair, Maintenance and Service Operation in Mechanical System.
- VII. Apply the appropriate IT skills, modern Engineering tools and Techniques for engineering practice.
- VIII. Effective communication by reading blueprint designs and drawing, resource and material requirement according to Mechanical components manufacturing needs.
- IX. Engage themselves in life-long learning by recognizing the need and technological changes.
- X. Apply engineering and management principles to manage projects in multidisciplinary environments.

PROGRAMME GUIDELINES	
PROGRAMME TITLE	Level 4 & 5 Higher International Diploma in Mechanical Engineering
QUALIFICATION CODE	701/6023/1
LEVEL	LEVEL – 4
TOTAL CREDITS	240
TOTAL LEARNING HOURS	2400 HOURS
GUIDED LEARNING HOURS	960 HOURS

Total learning hour 2400 Hours

1 Credit = 10 hours of effort (10 hours of learning time which includes everything a learner has to do to achieve the outcomes in a qualification including the assessment procedures and practical's).

Guided Learning Hour for first year is 480 hours and second year is 480 hours.

Total Guided Learning Hours for Higher International Diploma in Mechanical Engineering is 960 hours.

HID IN MECHANICAL ENGINEERING COURSE STRUCTURE

YEAR	SCHEDULE	UNIT SPECIFICATION	NO. OF. UNITS	UNIT CREDIT	CREDIT/YEAR
I	SCHEDULE 1	Common unit	3	36	120
		Essential unit	2	24	
		Elective (or) Open unit	-	-	
	SCHEDULE 2	Common unit	-	-	
		Essential unit	3	36	
		Elective (or) Open unit	2	24	
II	SCHEDULE 3	Common unit	-	-	120
		Essential unit	2	30	
		Elective (or) Open unit	2	30	
	SCHEDULE 4	Common unit	-	-	
		Essential unit	1	15	
		Special Unit (Essential)*	1	30	
		Elective (or) Open unit	1	15	
	TOTAL				

FIRST YEAR	Common unit carries	12 credit
	Essential unit carries	12 credit
	Elective unit carries	12 credit
SECOND YEAR	Essential unit carries	15 credit
	Elective unit carries	15 credit
	Special unit (Essential)* carries	30 credit

LIST OF UNITS

S. No.	Subject Code	UNIT	UNIT SPECIFICATION	CREDIT
1	CUP001	Technical Drawings with Engineering Graphics	Common unit	12
2	CUP002	Workshop and General Safety	Common unit	12
3	CUP003	IT Application for Engineers	Common unit	12
4	MEP001	Strength of Materials	Essential unit	12
5	MEP002	Computer Aided Design and Drafting	Essential unit	12
6	MEP003	Principle and Operation of Fluid Machinery	Essential unit	12
7	MEP004	Mechanical Workshop Practice	Essential unit	12
8	MEP005	Applied Mathematics	Essential unit	12
9	MEP006	Modeling and Simulation of Mechanical Systems	Essential unit	15
10	MEP007	Basic Electrical and Electronics Engineering	Essential unit	15
11	MEP008	Welding Principles and Application	Essential unit	15
12	SU001	Project	Special unit (Essential)*	30
I YEAR ELECTIVE UNITS				
13	MEP009	Manufacturing and Processing of Engineering Materials.	Elective (or) Open unit	12
14	MEP010	Thermal Science for Mechanical Application	Elective (or) Open unit	12
15	MEP011	Fundamentals of Mechatronics Systems	Elective (or) Open unit	12
16	MEP012	Engineering Economics	Elective (or) Open unit	12
17	MEP013	Materials and Industrial Engineering	Elective (or) Open unit	12
18	GU001	Professional Ethics and Human Values	Elective (or) Open unit	12
II YEAR ELECTIVE UNITS				
19	MEP014	Production Design and Development	Elective (or) Open unit	15
20	MEP015	Design and Applied Mechanics	Elective (or) Open unit	15
21	MEP016	Quality Management Techniques	Elective (or) Open unit	15
22	MEP017	Power Plant Engineering	Elective (or) Open unit	15
23	MEP018	Advanced mechanical engineering systems	Elective (or) Open unit	15
24	AEP010	Control Systems and Industrial Automation	Elective (or) Open unit	15
25	MEP019	Process Planning and Cost Estimation	Elective (or) Open unit	15

26	GU002	Environmental Engineering	Elective (or) Open unit	15
27	GU003	Numerical Methods	Elective (or) Open unit	15

Schedule : **I**
Year : 1
Credit : 60

UNIT CODE	UNIT	UNIT SPECIFICATION	CREDIT
CUP001	Technical Drawings with Engineering Graphics	Common unit	12
CUP002	Workshop and General Safety	Common unit	12
CUP003	IT Application for Engineers	Common unit	12
MEP001	Strength of Materials	Essential unit	12
MEP002	Computer Aided Design and Drafting	Essential unit	12

Schedule : **II**
Year : 1
Credit : 60

UNIT CODE	UNIT	UNIT SPECIFICATION	CREDIT
MEP003	Principle and Operation of Fluid Machinery	Essential unit	12
MEP004	Mechanical Workshop Practice	Essential unit	12
MEP005	Applied Mathematics	Essential unit	12
GU001	Professional Ethics and Human Values	Elective (or) Open unit	12
MEP010	Thermal Science for Mechanical Application	Elective (or) Open unit	12

Schedule : **III**
Year : 2
Credit : 60

UNIT CODE	UNIT	UNIT SPECIFICATION	CREDIT
MEP006	Modeling and Simulation of Mechanical Systems	Essential unit	15
MEP007	Basic Electrical and Electronics Engineering	Essential unit	15
MEP014	Production Design and Development	Elective (or) Open unit	15
MEP015	Design and Applied Mechanics	Elective (or) Open unit	15

Schedule : **IV**
Year : 2
Credit : 60

UNIT CODE	UNIT	UNIT SPECIFICATION	CREDIT
MEP008	Welding Principles and Application	Essential unit	15
MEP016	Quality Management Techniques	Elective (or) Open unit	15
SU001	Project	Special unit(Essential)*	30

UNIT CODE : CUP001
 UNIT TITLE : Technical drawings with Engineering Graphics
 CREDIT : 12
 SPECIFICATION : Common Unit

UNIT DESCRIPTION

This unit develops students to understand technical drawing and importance. This unit teaches the vital role of technical drawings in engineering documents and communication. This unit covers angle of projection, multi-view, section, detail drawing and symbol.

UNIT LEARNING OUTCOMES

ULO1 - Use appropriate tool to develop technical drawings

ULO2 - Ability to understand and interpret technical drawings.

ULO3 - Ability to provide required information in technical drawing according to process and operation.

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1	M	M		M			M	M		
ULO2		M	M	M			M	M		
ULO3		M		M			M	M		

UNIT CODE : CUP002
 UNIT TITLE : Workshop and General Safety
 CREDIT : 12
 SPECIFICATION : Common Unit

UNIT DESCRIPTION

This unit helps to know about tools used for diverse application in engineering workshop. This unit helps to learn skill-oriented experience in manufacturing process and production technology. This unit teaches safety procedure and workshop safety in various workshop practice.

UNIT LEARNING OUTCOME

ULO1 – Ability to select appropriate tool and process for required application

ULO2 – Ability to understand basic operation in manufacturing and production

ULO3 - Ability to maintain safety procedure and use safety tools and equipment in engineering practice.

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1		M		M	M	M	M			
ULO2		M		M	M			M		
ULO3		M		M	M	M				

UNIT CODE : CUP003
 UNIT TITLE : IT Application for Engineers
 CREDIT : 12
 SPECIFICATION : Common Unit

UNIT DESCRIPTION

This unit covers foundation concept in Information technology and develop usage IT skills in engineering practices. This unit guide to simplify complex data work using IT software tools and helps in synthesis of information for engineering needs.

UNIT LEARNING OUTCOME

- ULO1 - Ability to create, select or apply appropriate software tool to improve the performance.
- ULO2 - Develop documents and report preparation skill for various engineering activity such as approval, quotation, design and estimation.
- ULO3 - Ability to performance analytical calculation, synthesis and interpret the data.

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1		M	M	M			M		M	
ULO2	M		M	M			M	M		
ULO3	M		M				M			M

UNIT CODE : MEP001
 UNIT TITLE : Strength of Materials
 CREDIT : 12
 SPECIFICATION : Essential Unit

UNIT DESCRIPTION

This unit covers mechanical properties, loads, free body diagram, stress, strain and application to real world problems. This unit helps to develop the knowledge of problem solving in the mechanical and industrial problems.

UNIT LEARNING OUTCOME

ULO1 - Ability to formulate the problem and determined member's deflection under various load and support

ULO2 - Ability to compute the stresses of members subjected to load.

ULO3 - Ability to performance analytical calculation, synthesis and interpret the data.

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1	M	M	M						M	
ULO2	M			M			M		M	M
ULO3	M	M	M				M			M

UNIT CODE : MEP002
 UNIT TITLE : Computer Aided Design and Drafting
 CREDIT : 12
 SPECIFICATION : Essential Unit

UNIT DESCRIPTION

This unit covers mechanical properties, loads, free body diagram, stress, strain and application to real world problems. This unit helps to develop the knowledge of problem solving in the mechanical and industrial problems.

UNIT LEARNING OUTCOME

ULO1 - Ability to create two dimensional components sketches using CAD software.

ULO2 - Ability to edit, modify and develop virtual parts using CAD packages.

ULO3 - Ability to prepare technical drawings and communicate effectively to all levels of organization

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1		M				M	M	M		
ULO2						M	M	M		
ULO3		M					M	M	M	M

UNIT CODE : MEP003
 UNIT TITLE : Principle and Operation of Fluid Machinery
 CREDIT : 12
 SPECIFICATION : Essential Unit

UNIT DESCRIPTION

This unit covers physical properties, principles, operation, laws and application of Bernoulli’s equation to determine flow rate and velocity of fluid. They also learn the working of hydraulic machines, turbo machines, water turbines and hydraulic pumps.

UNIT LEARNING OUTCOME

ULO1- Understand basic concepts of fluids mechanics; perform fluid flow problems in engineering application.

ULO2 - Understand the importance of measurement and applications in Industries.

ULO3 - Understand working of fluid machinery and application of momentum and energy equations.

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1	M	M	M							
ULO2		M	M	M	M				M	M
ULO3	M	M	M			M				

UNIT CODE : MEP004
 UNIT TITLE : Mechanical Workshop Practice
 CREDIT : 12
 SPECIFICATION : Essential Unit

UNIT DESCRIPTION

This unit covers safety rules and regulations, machine tools, manufacturing equipment’s process, operation and demonstration. Practice on welding, sheet metal and various fabrication processes.

UNIT LEARNING OUTCOME

- ULO1 - Understand workshop safety rules, regulations, standards and codes.
- ULO2 – Ability to perform bend allowance and manufacturing calculation.
- ULO3 – Ability to handle machine tools and perform manufacturing process.

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1	M	M		M	M					
ULO2	M	M	M	M						M
ULO3		M	M	M		M		M		M

UNIT CODE : MEP005
 UNIT TITLE : Applied Mathematics
 CREDIT : 12
 SPECIFICATION : Essential Unit

UNIT DESCRIPTION

This unit aims to develop various analytical skills in applied mathematics and extensive experience with the tactics of problem solving and logical thinking applicable for the students that covers matrix theory, calculus of variations, probability, linear programming and Fourier series.

UNIT LEARNING OUTCOME

ULO1 – Develop problem solving skills.

ULO2 – To deal with matrix theory and calculus of variations

ULO3 – To deal with linear programming and Fourier series.

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1	M		M				M			M
ULO2	M	M	M						M	
ULO3	M		M				M			

UNIT CODE : MEP006
 UNIT TITLE : Modeling and Simulation of Mechanical Systems
 CREDIT : 15
 SPECIFICATION : Essential Unit

UNIT DESCRIPTION

This unit covers basic concepts of modeling and simulation. Evaluate designs and simulate the impacts of alternative approaches. Practice on designing a model representation, verification and validation process of the mechanical components, system and operation.

UNIT LEARNING OUTCOME

ULO1 – Ability to develop real life systems and in order to visualize dynamic behavior.

ULO2 – Develop the skill to use simulation packages; to study the response of system.

ULO3 – Apply the simulation techniques to develop and optimize the system and components

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1	M	M	M				M	M		M
ULO2				M		M	M	M		
ULO3							M	M		

UNIT CODE : MEP007
 UNIT TITLE : Basic Electrical and Electronics Engineering
 CREDIT : 15
 SPECIFICATION : Essential Unit

UNIT DESCRIPTION

This unit covers electrical principles, basic concepts, circuit analysis and measuring instruments. This unit also explains electronic operation, DC circuit, microprocessor and sensor used in mechanical application.

UNIT LEARNING OUTCOME

ULO1 – Ability to understand fundamentals of AC & DC circuit and basic concepts of magnetic.

ULO2 – Understand principles, working and operation of electrical machines.

ULO3 – Ability to choose appropriate electronics devices and sensor for mechanical application.

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1	M	M	M	M						
ULO2	M	M	M			M	M	M		
ULO3		M		M		M	M	M		M

UNIT CODE : MEP008
 UNIT TITLE : Welding Principles and Application
 CREDIT : 15
 SPECIFICATION : Essential Unit

UNIT DESCRIPTION

This unit covers principle, operation and working of welding operation. This unit explains different type of welding operation adopted in manufacturing processes and welding producer specification for welding process based on weld standards.

UNIT LEARNING OUTCOME

ULO1 – Ability to perform welding operation under specified operating parameter

ULO2 – Ability to read and interpret welding symbol and communicate effectively to production phase

ULO3 – Ability to prepare welding procedure specification for manufacturing project according to standards

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1	M	M		M	M		M			M
ULO2		M		M		M	M	M		M
ULO3		M		M			M		M	M

UNIT CODE : SU001
 UNIT TITLE : Project
 CREDIT : 30
 SPECIFICATION : Special unit (Essential)*

UNIT DESCRIPTION

This unit supports the students to identify, formulate, organize, develop and implement a successful project by applying the skills and knowledge that they acquired through various units finished in previous and current SCHEDULE.

UNIT LEARNING OUTCOME

ULO1 - Ability to design and built project in mechanical engineering

ULO2 - Evaluate design options with respect to accuracy and efficiency of the design and effectively demonstrate the built design.

ULO3 - Apply the basic engineering design concepts and solve problems by being a part of a small design group.

ULO4 - Understand to function effectively in a team as a leader, manger and/ or team member.

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1	M	M	M	M	M	M		M	M	M
ULO2	M	M	M	M						M
ULO3				M			M	M		M
ULO4							M	M	M	M

UNIT CODE : MEP009
 UNIT TITLE : Manufacturing and Processing of Engineering Materials.
 CREDIT : 12
 SPECIFICATION : Elective (or) Open unit

UNIT DESCRIPTION

This unit covers principles and operation of metal casting, joining and metal forming. This unit also explains manufacturing properties and behavior of engineering materials; basic concepts of foundry and casting processes.

UNIT LEARNING OUTCOME

ULO1 – Understand various manufacturing processes, materials and their properties.

ULO2 – Ability to choose correct manufacturing process based on engineering application.

ULO3 – Ability to apply manufacturing techniques for safety and economic production.

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1		M	M	M		M	M	M	M	
ULO2		M	M	M						M
ULO3		M		M	M					M

UNIT CODE : MEP010
 UNIT TITLE : Thermal Science for Mechanical Application
 CREDIT : 12
 SPECIFICATION : Elective (or) Open unit

UNIT DESCRIPTION

This unit covers heat transfer fundamental, heat exchangers, heat pipes – types, fluids and applications, operating principle, direct contact heat transfer, cooling towers and performance evaluation. Also, it helps to understand laws of thermodynamics and thermo fluids and their application to engineering thermodynamic systems

UNIT LEARNING OUTCOME

ULO1 - Ability to identify, formulate and solve thermal science problems.

ULO2 - Understand various thermodynamics process in mechanical system.

ULO3 - Ability to Analyze steady and turbulent fluid flow

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1	M	M	M		M					
ULO2	M	M	M			M	M			M
ULO3	M	M				M	M		M	

UNIT CODE : MEP011
 UNIT TITLE : Fundamentals of Mechatronics Systems
 CREDIT : 12
 SPECIFICATION : Elective (or) Open unit

UNIT DESCRIPTION

This unit covers electronics, microcontrollers, data acquisition and serial interfacing, PC timing and control, sensors, actuators, feedback control for mechatronics and robotic systems. Also, it helps to understand the development, building and programming of a basic robot.

UNIT LEARNING OUTCOME

ULO1 - Understand mechatronics system based on electro-mechanical model working and operation

ULO2 - Ability to Determine whether a system is controllable and observable

ULO3 – Ability to understand C language and Demonstrate how to use Robolab programming software

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1	M	M	M	M						M
ULO2		M		M				M	M	M
ULO3		M		M				M		

UNIT CODE : MEP012
 UNIT TITLE : Engineering Economics
 CREDIT : 12
 SPECIFICATION : Elective (or) Open unit

UNIT DESCRIPTION

This unit helps to understand the principles of economic evaluation of decision alternatives in engineering applications.

UNIT LEARNING OUTCOME

ULO1 - Understand fundamental concepts of economics.

ULO2 - Understand the ways to calculate depreciations and the impact of inflation.

ULO3 - Perform before and after-tax analysis.

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1	M	M	M	M			M			
ULO2			M	M		M	M	M		M
ULO3	M		M							M

UNIT CODE : MEP013
 UNIT TITLE : Materials and Industrial Engineering
 CREDIT : 12
 SPECIFICATION : Elective (or) Open unit

UNIT DESCRIPTION

This unit covers mechanical and physical properties of materials used in engineering application. This unit also covers design of work system, facility, automation, planning and control, engineering economy and costing.

UNIT LEARNING OUTCOME

ULO1 - Ability to select material based on engineering application and requirements

ULO2 - Perform work system design, facility arrangement, planning and control in industrial operation

ULO3 - Ability to use various automated equipment for material handling and storage of materials in industry

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1	M	M	M						M	
ULO2		M		M		M	M	M	M	M
ULO3				M		M	M			M

UNIT CODE : GU001
 UNIT TITLE : Professional Ethics and Human values
 CREDIT : 12
 SPECIFICATION : Elective (or) Open unit

UNIT DESCRIPTION

This unit aims to create an awareness on Engineering Ethics and Human Values to impart Moral and Social Values and Loyalty and to appreciate the rights of others.

UNIT LEARNING OUTCOME

ULO1 - Ability to create an awareness on Engineering Ethics and Human Values.

ULO2 - Ability to create an awareness on Human Values.

ULO3 - Ability to follow Social Values and Loyalty and to appreciate the rights of others

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1	M	M	M							M
ULO2			M						M	
ULO3	M	M		M					M	M

UNIT CODE : MEP014
 UNIT TITLE : Production Design and Development
 CREDIT : 15
 SPECIFICATION : Elective (or) Open unit

UNIT DESCRIPTION

This unit covers product life cycle, product development process, identifying customer needs, product specifications, concept generation, selection and testing, product architecture, design for manufacturing and managing projects.

UNIT LEARNING OUTCOME

ULO1 - Ability to develop product through prepared process plan.

ULO2 - Develop product specifications from the collected information.

ULO3 - Understand the concepts of product architecture, project planning and execution processes

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1	M	M	M	M				M		M
ULO2		M	M	M			M	M	M	M
ULO3		M		M				M	M	M

UNIT CODE : MEP015
 UNIT TITLE : Design and Applied Mechanics
 CREDIT : 15
 SPECIFICATION : Elective (or) Open unit

UNIT DESCRIPTION

This unit's covers scalar and vector quantity, coplanar, concurrent, non-concurrent forces, centroid and center of gravity, friction, work power and energy, principle of machines, pulley, blocks, simple and compound lever.

UNIT LEARNING OUTCOME

ULO1 - Ability to classify scalar and vector quantity and differentiate the unit systems.

ULO2 - Understand support reaction, resultant and equilibrium forces to design the mechanical components.

ULO3 - Ability to apply the principle and evaluate the efficiencies of simple machine.

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1	M	M	M							
ULO2		M	M		M				M	
ULO3	M	M	M	M						M

UNIT CODE : MEP016
 UNIT TITLE : Quality Management Techniques
 CREDIT : 15
 SPECIFICATION : Elective (or) Open unit

UNIT DESCRIPTION

This unit's covers classical and modern management approaches, quality management techniques, statistical tools, continuous improvement, strategic management, total quality tools, problem solving and quality function deployment.

UNIT LEARNING OUTCOME

ULO1 - Ability to apply quality management concepts for effective quality control

ULO2 - Ability to find out current trends and organizations benchmarking

ULO3 - Ability to solve problem and apply methods and tools for quality improvement

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1							M		M	M
ULO2				M	M		M			M
ULO3	M	M	M	M		M	M			M

UNIT CODE : MEP017
 UNIT TITLE : Power Plant Engineering
 CREDIT : 15
 SPECIFICATION : Elective (or) Open unit

UNIT DESCRIPTION

This unit's covers principle, operations, process and component of different types of power plant. Also, it is designed to understand the energy science and its applications in industry context and to develop the ability to carry out an energy audit in power plant independently

UNIT LEARNING OUTCOME

ULO1 - Understand various application, operations and components of power plant and different types of energy sources

ULO2 - Understand principle, process of energy sources and conversion technologies.

ULO3 - Familiar with the basic concepts of energy audit and energy management

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1	M	M							M	
ULO2		M	M							
ULO3					M	M	M			M

UNIT CODE : MEP018
 UNIT TITLE : Advanced mechanical engineering systems
 CREDIT : 15
 SPECIFICATION : Elective (or) Open unit

UNIT DESCRIPTION

This unit helps to develop the knowledge and understanding of advanced mechanical engineering systems and practically integrated complex engineering systems. The students are to be given in-depth knowledge and practical exposure on industry level engineering simple to moderately complex real applications

UNIT LEARNING OUTCOME

ULO1 - Design and analyze a simple to moderately complex mechanical engineering systems

ULO2 - Apply advanced curve modelling techniques for computer graphics

ULO3 - Demonstrate understanding of programming for Computer Numerically Controlled (CNC) machines

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1		M	M	M		M	M		M	M
ULO2		M		M		M	M	M		
ULO3		M		M		M	M			M

UNIT CODE : AEP010
 UNIT TITLE : Control Systems and Industrial Automation
 CREDIT : 15
 SPECIFICATION : Elective (or) Open unit

UNIT DESCRIPTION

This unit will provide understanding of a range of control systems that are used in industrial and domestic environments and enable them to produce specifications for mechatronic products thereby obtaining the ability to design and implement simple automated systems in industrial context.

UNIT LEARNING OUTCOME

ULO1 - Understand the analysis of linear continuous time system.

ULO2 – To Explain the role or sensors and actuators in control systems

ULO3 – To Demonstrate understanding of State-space control design and analysis of feedback control systems

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1	M			M	M					M
ULO2				M	M	M	M	M	M	M
ULO3				M	M			M		M

UNIT CODE : MEP019
 UNIT TITLE : Process Planning and Cost Estimation
 CREDIT : 15
 SPECIFICATION : Elective (or) Open unit

UNIT DESCRIPTION

This unit covers production documentation, arrangement drawing, drafting standards geometric dimension and tolerance. This unit help to estimate various cost incurred in manufacturing components. Also, it Assess the impact of health and safety, industrial, labor and consumer laws and regulations on organization productivity and functionality

UNIT LEARNING OUTCOME

ULO1 - Ability to impart the knowledge of engineering drawing rules and manufacturing details.

ULO2 - Ability to perform tolerance analysis.

ULO3 - Assess the impact of health and safety, industrial, labor and consumer laws and regulations on organization productivity and functionality

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1				M				M	M	
ULO2		M						M		M
ULO3	M	M	M		M					

UNIT CODE : GU002
 UNIT TITLE : Environmental Engineering
 CREDIT : 15
 SPECIFICATION : Elective (or) Open unit

UNIT DESCRIPTION

This unit covers ecosystems and biodiversity, roles of an individual in conservation of natural resources, social issues and the environment. This unit also explains environmental pollution causes, effects, impact assessment and control measures.

UNIT LEARNING OUTCOME

ULO1 – Inspect the impact of engineering solutions in global, societal and environmental context.

ULO2 – Understand the important of health environment and conservation of resources

ULO3 – Ability to examine sustainable development and environmental issues in professional undertakings

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1				M	M	M		M		M
ULO2			M		M	M				M
ULO3				M	M	M				M

UNIT CODE : GU003
 UNIT TITLE : Numerical Methods
 CREDIT : 15
 SPECIFICATION : Elective (or) Open unit

UNIT DESCRIPTION

The aim of this unit is to solve numerical Differentiation and integration in various engineering discipline.

UNIT LEARNING OUTCOME

ULO1 – To introduce solutions of equations and Eigen values.

ULO2 – To acquaint knowledge of finite differences and interpolation

ULO3 – To introduce numerical differentiation and integration.

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1					M	M				M
ULO2			M						M	
ULO3	M				M	M				M

ASSESSMENT METHODS AND TECHNIQUES FOR HID IN MECHANICAL ENGINEERING

Assessment technique	Type of Assessment	Description	Formative or Summative
Case studies	Oral/ Problem based/ Practical	Students are required to work through a case study to identify the problem(s) and to offer potential solutions; useful for assessing students' understanding and for encouraging students to see links between theory and practice. Case studies could be provided in advance of a time-constrained assessment.	Formative
Concept maps	Written/ Oral	Students map out their understanding of a particular concept. This is a useful (and potentially quick) exercise to provide feedback to staff on students' understanding.	Formative
'Doing it' exam	Written	An exam which requires students to do something, like read an article, analyze and interpret data etc.	Formative / Summative
Field report	Written/ Oral	Students are required to produce a written/ oral report relating to a field/ site visit.	Formative
Laboratory books / Reports	Practical/ Written	Students are required to write a report for all (or a designated sample) of practical's in a single lab book. A sample of lab books will be collected each week to mark any reports of labs done in previous weeks; this encourages students to keep their lab books up to date. Each student should be sampled the same number of times throughout the module with a designated number contributing to the assessment mark.	Summative
Multiple choice questions (MCQs)	Written	Can be useful for diagnostic, formative assessment, in addition to summative assessment. Well-designed questions can assess more than factual recall of information, but do take time to design.	Formative / Summative
Online discussion boards	Written	Students are assessed on the basis of their contributions to an online discussion for example, with their peers; this could be hosted on a virtual learning environment (VLE).	Formative
Open book exams	Written	Students have the opportunity to use any or specified resources to help them answer set questions under time constraints. This method removes the over-reliance on memory and recall and models the way that professionals manage information.	Summative
	Oral / Written	Students are asked to give an oral presentation on a particular topic for a specified length of time and could also be asked to prepare	Summative

Oral presentations		associated handout(s). Can usefully be combined with self- and peer-assessment.	
Problem sheets	Written	Students complete problem sheets, e.g. on a weekly basis. This can be a useful way of providing students with regular formative feedback on their work and/or involving elements of self- and peer assessment.	Formative
Research projects / Group projects	Written/ Practical/ Oral/ Performance/ Problem based/ Work placement	Potential for sampling wide range of practical, analytical and interpretative skills. Can assess wide application of knowledge, understanding and skills.	Formative / Summative
Short answer questions	Written	Useful to assess a wide range of knowledge/skills across a module.	Summative
Simulations	Practical/ Written/ Oral/ Problem-based	Text or virtual computer-based simulations are provided for students, who are then required to answer questions, resolve problems, perform tasks and take actions etc. according to changing circumstances within the simulation. Useful for assessing a wide range of skills, knowledge and competencies.	Formative
Viva voce	Oral	Often used for assessing 'borderline' degree classifications but also useful to explore students' understanding of a wide range of topics. Depending on class size however, they can be time consuming for staff.	Summative