



# ADITYA ENGINEERING COLLEGE

An Autonomous Institution

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Recognised by UGC under sections 2(f) and 12(B) of UGC Act, 1956

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Department of Mechanical Engineering

B.Tech - AR17 - Course Articulation Matrix

Note: Enter Correlation Levels 1 or 2 or 3. Where: 1- Slight(Low), 2 - Moderate(Medium), 3 - Substantial (High).

CO Statements		POs												PSOs	
<b>I SEM</b>															
Course Code	171HS1T01 - ENGLISH – I	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Summarize how Gandhi grew in introspection and the conditions to achieve a higher quality of life, strength and sovereignty of a developed nation.	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO2	Identify that all men can come together and avert the peril.	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO3	Comprehend texts from a literary perspective and familiarise the students with Figures of Speech.	-	-	-	-	-	-	-	-	-	2	-	-	-	-
CO4	Explain the characteristic traits of renowned scientists who contributed enormously to the scientific advancement of India.	-	-	-	-	-	-	-	-	-	2	-	-	-	-
CO5	Demonstrate Writing and basic concepts of Grammar skills.	-	-	-	-	-	-	-	-	-	3	-	-	-	-
Course Code	171BS1T01- MATHEMATICS-I	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Associate linear differential equations of first order to solve various physical problems involving differential equations of first order	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Solve linear differential equations of higher order.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Solve linear systems of equations using the concept of rank, Gauss elimination, Gauss seidel method.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Find the eigen values and eigen vectors of matrices	2	2	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Associate the concepts of Partial Differentiation to maxima and minima of functions of several variables and to solve Partial differential equations.	2	2	-	-	-	-	-	-	-	-	-	-	-	-
Course Code	171HS1T02 - ENVIRONMENTAL STUDIES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Identify the need for protecting the producers and consumers in various ecosystems and their role in the food web.	-	-	-	-	-	1	3	-	-	-	-	-	-	-
CO2	Outline the natural resources and their importance for the sustenance of the life.	-	-	-	-	-	2	3	-	-	-	-	-	-	-







	CO Statements	POs												PSOs	
CO3	Examine the performance of single-phase transformer.	1	2	1	3	-	-	-	-	-	-	-	-	-	-
CO4	Compare the operation of 3-phase alternator and 3-phase induction motors.	1	1	1	3	-	-	-	-	-	-	-	-	-	-
CO5	Distinguish the operation of half wave, full wave bridge rectifiers, and types of transistors.	1	1	3	1	-	-	-	-	-	-	-	-	-	-
<b>Course Code</b>	<b>171HS2L02 - ENGLISH COMMUNICATION SKILLS LAB- II</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
CO1	Make effective use of Body language in all situations and contexts to enhance effective communication in all aspects.	-	-	-	-	-	-	-	-	-	3	-	2	-	-
CO2	Identify communicative competency to respond to others in different situations.	-	-	-	-	-	-	-	-	-	3	-	2	-	-
CO3	Make use of effective delivery strategies to select, compile and synthesize information for oral presentation.	-	-	-	-	-	-	-	-	-	3	-	2	-	-
CO4	Demonstrate in mock interviews, group discussion and public speaking.	-	-	-	-	-	-	-	-	-	3	-	2	-	-
CO5	Illustrate interpersonal skills using English language confidently and effectively for personal and professional growth.	-	-	-	-	-	-	-	-	-	3	-	2	-	-
<b>Course Code</b>	<b>171BS2L02 - ENGINEERING PHYSICS LAB</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
CO1	Use spectrometer, polarimeter, travelling microscope for making measurements.	3	2	-	-	-	-	-	-	3	-	-	1	-	-
CO2	Determine energy gap of a semiconductor, draw characteristic curves to estimate thermal coefficient of a thermistor, Zener diode.	2	2	-	-	-	-	-	-	3	-	-	1	-	-
CO3	Determine the rigidity and determine frequency of an unknown electric vibrator.	3	1	-	-	-	-	-	-	3	-	-	1	-	-
CO4	Determine wavelength of unknown source, the width of narrow slits, spacing Between close rulings using lasers and appreciate the accuracy in measurements.	3	2	-	-	-	-	-	-	3	-	-	1	-	-
CO5	Verify magnetic field along the axis of a circular coil.	3	2	-	-	-	-	-	-	3	-	-	1	-	-
<b>Course Code</b>	<b>171ES2L02 - ENGINEERING WORKSHOP AND IT WORKSHOP(ENGINEERING WORKSHOP)</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
CO1	Prepare carpentry, fitting joints as per the given requirement using Carpentry and Fitting tools	2	1	-	-	-	-	-	-	1	-	-	-	-	-
CO2	Convert the metal rods and sheets into final shape using black smithy and tin smithy tools	2	1	-	-	-	-	-	-	1	-	-	-	-	-
CO3	Prepare the circuit for house wiring applications	2	1	-	-	-	-	-	-	1	-	-	-	-	-
CO4	Install the operating system software, networking and troubleshoot the problems	2	1	-	-	-	-	-	-	1	-	-	1	-	-
CO5	Develop documents using MS-Office and LaTeX tools	2	1	-	-	-	-	-	-	1	-	-	1	-	-

	CO Statements	POs												PSOs	
<b>III SEM</b>															
<b>Course Code</b>	<b>17IES3T13-METALLURGY AND MATERIALS SCIENCE</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
<b>CO1</b>	Explain the concepts of structure of metals and mechanical behavior under different loading conditions	1	-	-	-	-	1	1	-	-	-	-	-	1	-
<b>CO2</b>	Describe the process and advantages of equilibrium diagrams of various binary alloys	1	-	-	-	-	1	1	-	-	-	-	-	1	-
<b>CO3</b>	Discuss the concept of solidification of metal alloys in Iron-Iron carbide equilibrium diagram	1	-	-	-	-	1	1	-	-	-	-	-	1	-
<b>CO4</b>	Apply the heat treatment methods to steels with different composition	1	-	-	-	-	1	1	-	-	-	-	-	1	-
<b>CO5</b>	Use the concepts of non-ferrous metals and alloys in metallurgical areas' applications	1	-	-	-	-	1	1	-	-	-	-	-	1	-
<b>CO6</b>	Summarize the properties and applications of ceramic and composite materials.	1	-	-	-	-	1	1	-	-	-	-	-	1	-
<b>Course Code</b>	<b>17IES3T11-MECHANICS OF SOLIDS</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
<b>CO1</b>	Estimate the stresses and strains in bodies of varying cross-section, Composite bars and loads in various numbers of plain trusses and frames.	3	2	2	-	-	-	1	-	-	-	-	-	1	-
<b>CO2</b>	Sketch the shear force and bending moment diagrams for beams of various supports and loads.	3	2	1	-	-	-	1	-	-	-	-	-	1	-
<b>CO3</b>	Analyze the variation of bending and shear stresses across a beam cross-section	3	2	1	-	-	-	1	-	-	-	-	-	1	-
<b>CO4</b>	Calculate the slope and deflection for beams of various load and support arrangements	3	2	2	-	-	-	1	-	-	-	-	-	1	-
<b>CO5</b>	Compute the shear stresses due to application of twisting moment and buckling loads for various columns	3	2	1	-	-	-	1	-	-	-	-	-	1	-
<b>Course Code</b>	<b>17IES3T12-THERMODYNAMICS</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
<b>CO1</b>	Explain basic concepts, properties of substances and Laws of thermodynamics.	2	1	1	-	-	-	-	-	-	-	-	-	-	1
<b>CO2</b>	Analyse thermodynamic processes using second law of thermodynamics.	3	2	1	-	-	-	-	-	-	-	-	-	-	1
<b>CO3</b>	Analyse thermodynamic properties of pure substances.	3	2	1	1	-	-	-	-	-	-	-	-	-	1
<b>CO4</b>	Analyse the Gas laws for perfect Gas mixtures.	3	2	1	1	-	-	-	-	-	-	-	-	-	1
<b>CO5</b>	Analyse the thermodynamic cycles.	2	-	-	-	-	-	-	-	-	-	-	-	-	1
<b>Course Code</b>	<b>17IHS3T04-MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
<b>CO1</b>	Explain the Managerial Economic concepts for decision making and forward planning.	-	-	-	-	-	-	-	-	1	-	-	-	-	-



	CO Statements	POs												PSOs	
CO 5	Develop rectifier circuits for signal conversion from AC to DC	3	-	1	-	-	-	-	-	-	-	-	-	-	-
CO 6	Explain the simple mathematical operations using Operational Amplifier-IC-741(inverting, non inverting, integrator and differentiator)	2	1	1	-	-	-	-	-	-	-	-	-	-	-
Course Code	<b>171ES3L06-MECHANICS OF SOLIDS AND METALLURGY LAB</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
CO 1	Demonstrate the material mechanical behaviour under various direct loads	2	1	-	-	-	-	2	-	-	-	-	-	1	-
CO 2	Calculate the mechanical strength of spring and cube.	3	2	-	-	-	-	-	-	-	-	-	-	1	-
CO 3	Demonstrate the materials mechanical behaviour under various indirect loads.	2	1	-	-	-	-	2	-	-	-	-	-	1	-
CO 4	Analyze the Structure of pure metals and alloys	1	3	-	-	-	-	-	-	-	-	-	-	1	-
CO 5	Estimate the hardness of various treated and untreated steels	2	1	-	-	-	-	2	-	-	-	-	-	1	-
Course Code	<b>171HS3A09 - PROFESSIONAL ETHICS AND HUMAN VALUES</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
CO1	Make use of values, morals and ethics in their day to day life.	-	-	-	-	-	-	-	2	-	-	-	-	-	-
CO2	Identify what is right and wrong through moral ethics.	-	-	-	-	-	-	-	2	-	-	-	-	-	-
CO3	Analyze experimental learning while developing the society with ethics.	-	-	-	-	-	-	-	2	-	-	-	-	-	-
CO4	Apply ethical principles to resolve the problems that arise in work place.	-	-	-	-	-	-	-	2	-	-	-	-	-	-
CO5	Apply adequate knowledge on global code of conduct.	-	-	-	-	-	-	-	2	-	-	-	-	-	-
Course Code	<b>171HS3A10 - EMPLOYABILITY SKILLS - I</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
CO1	Explain the number and letter series and analogies in different models	1	-	-	-	-	-	-	-	-	-	-	1	-	-
CO2	Demonstrate processes of coding & decoding and direction test	1	-	-	-	-	-	-	-	-	1	-	1	-	-
CO3	Demonstrate the basic grammatical skills using articles and prepositions	-	-	-	-	-	-	-	-	-	1	-	1	-	-
CO4	Use tenses, voice types and conversion rules to deliver an effective speech	-	-	-	-	-	-	-	-	-	1	-	1	-	-
CO5	Demonstrate creative speaking abilities using all forms of sentences	-	-	-	-	-	-	-	-	-	1	-	1	-	-
<b>IV SEM</b>															
Course Code	<b>171ME4T02-KINEMATICS OF MACHINERY</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
CO 1	Explain types of kinematic links, pairs and inversions.	2	1	-	-	-	-	-	-	-	-	-	1	1	-
CO 2	Explain different lower pair mechanisms for exact and approximate straight line motions.	1	1	-	-	-	-	-	-	-	-	-	1	1	-
CO 3	Analyze the velocity and acceleration of various links by using different methods.	2	2	1	-	-	-	-	-	-	-	-	1	1	-
CO 4	Develop the cam profiles at various follower motions.	2	2	1	-	-	-	-	-	-	-	-	1	1	-
CO 5	Solve the various aspects of gear and gear trains.	1	2	1	-	-	-	-	-	-	-	-	1	1	-



	CO Statements	POs												PSOs	
Course Code	171ME4T03-THERMAL ENGINEERING – I	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	Understand the ideal thermodynamic air standard cycles.	2	1	1	-	-	-	-	-	-	-	-	-	-	2
CO 2	Analyze the combustion of CI engine and SI engine.	3	3	2	1	-	-	-	-	-	-	-	-	-	1
CO 3	Estimate energy distribution by conducting heat balance test on IC engines	3	3	3	1	-	-	-	-	-	-	-	-	-	3
CO 4	Explain the working of various types of reciprocating compressor	2	1	1	-	-	1	-	-	-	-	-	-	-	2
CO 5	Evaluate efficiency of various types of rotary compressors	2	1	1	-	-	1	-	-	-	-	-	-	-	1
Course Code	171ME4T04-PRODUCTION TECHNOLOGY	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	Describe the basics of casting and its applications.	1	-	-	-	1	-	-	-	-	-	-	1	1	-
CO 2	Demonstrate various special casting processes.	3	-	-	-	2	-	-	-	-	-	-	1	3	-
CO 3	Distinguish between the different joining techniques.	3	-	-	-	2	-	-	-	-	-	-	1	3	-
CO 4	Explain the basics of sheet metal forming and plastics processing techniques.	3	-	-	-	2	-	-	-	-	-	-	1	2	-
CO 5	Summarize the bulk metal deforming process.	3	-	-	-	2	-	-	-	-	-	-	1	2	-
Course Code	171ME4T05-DESIGN OF MACHINE MEMBERS - I	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	Apply the design procedure to engineering problems, including the consideration of technical and manufacturing constraints.	3	-	1	1	2	-	-	-	-	-	-	-	1	-
CO 2	Evaluate the strength, stiffness and fatigue of machine elements.	-	-	2	2	-	-	-	-	-	-	-	-	1	-
CO 3	Analyze various types of stresses on mechanical components subjected to both static and dynamic loads.	-	-	2	2	-	-	-	-	-	-	-	-	1	-
CO 4	Explain the design of fasteners subjected to eccentric & fluctuating loads.	-	-	2	2	-	-	-	-	-	-	-	-	1	-
CO 5	Calculate the design parameters of various components like springs and pressure vessels.	2	-	1	-	2	3	-	-	-	-	-	-	1	-
Course Code	171ME4T06-INDUSTRIAL ENGINEERING AND MANAGEMENT	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	Identify the role of an industrial engineer and required managerial skill set.	1	-	-	-	-	-	-	-	-	-	-	1	1	-
CO 2	Compare and contrast product layout, process layout and combinational layout in Plant layout	1	-	-	-	-	-	-	-	-	-	-	1	1	-
CO 3	Develop the efficient work system using concepts of Method study and Time study	1	1	-	-	-	-	-	-	-	-	-	1	1	-
CO 4	Analyze the production flow parameters by means of Control charts of Variable and Attributes	1	2	-	-	-	-	-	-	-	-	-	1	1	-
CO 5	Analyze Job evaluation and Wage incentive system in an Industrial Human Resource Environment	1	-	-	-	-	-	-	-	-	-	-	1	1	-
CO 6	Calculate the optimal project duration using CPM and PERT techniques	1	2	-	-	-	-	-	-	-	-	-	1	1	-

	CO Statements	POs												PSOs	
<b>Course Code</b>	<b>171ME4T07-MACHINE DRAWING</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
<b>CO 1</b>	Discuss the conventional representation of materials and machine components	2	-	-	-	-	-	-	-	-	3	-	-	2	-
<b>CO 2</b>	Apply the principles of engineering drawing in machine drawing	3	-	1	-	-	-	-	-	-	3	-	-	2	-
<b>CO 3</b>	<b>Construct various types of temporary fasteners</b>	3	-	1	-	-	-	-	-	-	3	-	-	2	-
<b>CO 4</b>	Sketch various types of permanent fasteners	3	-	1	-	-	-	-	-	-	3	-	-	2	-
<b>CO 5</b>	Practice assembly drawings from the given part drawings for manufacturing	3	-	1	-	-	-	-	-	-	3	-	-	2	-
<b>CO 6</b>	Construct part drawings from the given assembly drawing	3	-	1	-	-	-	-	-	-	3	-	-	2	-
<b>Course Code</b>	<b>171HS4T08-INTELLECTUAL PROPERTY RIGHTS AND PATENTS</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
<b>CO 1</b>	Compare various types of Intellectual Property rights.	-	-	-	-	-	-	-	3	-	-	-	2	-	-
<b>CO 2</b>	Discuss Intellectual Property and infer rights on such Intellectual Property owners	-	-	-	-	-	-	-	3	-	-	-	2	-	-
<b>CO 3</b>	Explain the process of patenting	-	-	-	-	-	-	-	3	-	-	-	2	-	-
<b>CO 4</b>	Apply for Trade marks and Copyrights.	-	-	-	-	-	-	-	3	-	-	-	2	-	-
<b>CO 5</b>	Explain the methods to protect Trade secrets	-	-	-	-	-	-	-	3	-	-	-	2	-	-
<b>CO 6</b>	Interpret the legal issues on Intellectual Property Rights and cyber laws	-	-	-	-	-	-	-	3	-	-	-	2	-	-
<b>Course Code</b>	<b>171ME4L01-PRODUCTION TECHNOLOGY LAB</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
<b>CO 1</b>	Demonstrate mould making process for casting process and sand preparation methods.	3	2	-	-	-	-	-	-	-	3	-	-	-	-
<b>CO 2</b>	Identify basic knowledge of casting defects and their remedies.	2	1	-	-	-	-	-	-	-	-	-	-	2	-
<b>CO 3</b>	Differentiate between various gas welding, arc welding processes and Solid state welding process	2	1	-	-	-	-	-	-	-	3	2	-	2	-
<b>CO 4</b>	Apply the principles of sheet-metal forming process for making a component.	3	2	-	-	-	-	-	-	-	2	2	-	-	-
<b>CO 5</b>	Produce the plastic object through different plastic processing techniques.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
<b>Course Code</b>	<b>171ES4L07-FLUID MECHANICS AND HYDRAULIC MACHINERY LAB</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
<b>CO 1</b>	Calculate the head losses causing decrease in energy of flow experimentally and by the verification of Bernoulli's theorem	3	2	-	-	-	-	1	-	-	-	-	2	-	2
<b>CO 2</b>	Compare which flow meter is better performing when used in pipes of turbines, etc.	2	2	-	-	-	-	1	-	-	-	-	2	-	2
<b>CO 3</b>	Determine efficiencies of Centrifugal and Reciprocating pumps maintaining under similar conditions	3	2	-	-	-	-	1	-	-	-	-	2	-	2

	CO Statements	POs												PSOs	
CO 4	Determine performance characteristic curves and efficiencies of different hydraulic turbines	3	2	-	-	-	-	1	-	-	-	-	2	-	2
CO 5	Calculate the work done and efficiency of various vane shapes for turbine applications	3	2	-	-	-	-	1	-	-	-	-	2	-	2
<b>Course Code</b>	<b>171HS4A11-EMPLOYABILITY SKILLS - II</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
CO1	Examine the symbols, notations and venn diagrams	1	-	-	-	-	-	-	-	-	-	-	1	-	-
CO2	Use verbal adjectives, degree of comparisons in personality development	1	-	-	-	-	-	-	-	-	-	-	1	-	-
CO3	Solve problems of time & date and puzzles	1	-	-	-	-	-	-	-	-	-	-	1	-	-
CO4	Solve problems of cubes & dice and seating arrangements	-	-	-	-	-	-	-	-	-	1	-	1	-	-
CO5	Use word analogy & paragraph writing for effective communication	-	-	-	-	-	-	-	-	-	1	-	1	-	-
<b>V SEM</b>															
<b>Course Code</b>	<b>171ME5T08-DYNAMICS OF MACHINERY</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
CO 1	Analyze the gyroscopic couple effect and friction of mechanical components	1	-	-	-	-	-	-	-	-	-	-	1	2	-
CO 2	Demonstrate the working of various types of clutches, brakes and dynamometers	1	2	-	-	-	-	-	-	-	-	-	1	2	-
CO 3	Explain the working principles of flywheels and governors	1	2	-	-	-	-	-	-	-	-	-	1	2	-
CO 4	Estimate the balancing of rotary and reciprocating masses.	1	1	-	-	-	-	-	-	-	-	-	1	2	-
CO 5	Calculate the natural frequencies of continuous systems starting from the general equation of displacement	2	2	-	-	-	-	-	-	-	-	-	1	2	-
<b>Course Code</b>	<b>171ME5T09-METAL CUTTING AND MACHINE TOOLS</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
CO 1	Apply cutting mechanics to metal machining based on cutting force and power consumption.	1	1	-	-	-	1	-	-	-	-	-	1	1	-
CO 2	Explain working of Lathe, Shaper, Slotter and Planar machine.	1	1	-	-	-	1	-	-	-	-	-	1	1	-
CO 3	Select appropriate machining processes and tool geometries in drilling and milling machines	2	2	-	-	-	1	-	-	-	-	-	1	1	-
CO 4	Classify jigs and fixtures, Principles of location and finishing processes.	1	1	-	-	-	1	-	-	-	-	-	1	1	-
CO 5	Discuss principles of industrial safety and maintenance of machine tools	1	1	-	-	-	1	-	-	-	-	-	1	1	-
<b>Course Code</b>	<b>171ME5T10-THERMAL ENGINEERING - II</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
CO 1	Apply different methods used to improve the efficiency of Rankine Cycle.	3	2	2	2	-	-	-	-	-	-	-	-	-	3
CO 2	Solve problems related to boiler efficiency and chimney height.	3	2	2	2	-	-	-	-	-	-	-	-	-	3
CO 3	Analyze the performance of Steam nozzles and steam turbines	3	2	1	2	-	-	-	-	-	-	-	-	-	2
CO 4	Distinguish different types of condensers used in a steam power plant	3	2	2	2	-	-	-	-	-	-	-	-	-	1
CO 5	Evaluate the performance of Gas Turbines, Jet Engines and Rockets.	2	2	2	2	-	-	-	-	-	-	-	-	-	2

	<b>CO Statements</b>	<b>POs</b>												<b>PSOs</b>	
<b>Course Code</b>	<b>171ME5T11-DESIGN OF MACHINE MEMBERS – II</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
<b>CO 1</b>	Classify the various types of bearings.	2	1	-	-	2	-	-	-	-	-	-	-	1	-
<b>CO 2</b>	Analyze the various engine parts like connecting rod, piston, and etc.	3	2	2	-	-	-	-	-	-	-	-	-	1	-
<b>CO 3</b>	Identify the various stresses in curved beam.	3	2	1	-	-	2	-	-	-	-	-	-	2	-
<b>CO 4</b>	Explain the power transmission systems and power screw.	3	2	-	-	-	2	-	-	-	-	-	-	1	-
<b>CO 5</b>	Inspect the various load factors, strength of spur and helical gear drives.	3	2	2	-	-	-	-	-	-	-	-	-	1	-
<b>Course Code</b>	<b>171ME5T12-OPERATIONS RESEARCH</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
<b>CO 1</b>	Apply mathematical modeling to formulate real-world problems involving decision making.	2	1	-	-	-	1	-	-	-	-	-	1	3	-
<b>CO 2</b>	Solve Linear programming problem, transportation and assignment problems.	2	1	-	-	-	1	-	-	-	-	-	1	3	-
<b>CO 3</b>	Solve sequencing problem, replacement problem and inventory problem.	2	1	-	-	-	1	-	-	-	-	-	1	3	-
<b>CO 4</b>	Apply game theory problems, queuing theory in decision making	2	1	-	-	-	1	-	-	-	-	-	1	3	-
<b>CO 5</b>	Apply dynamic programming & simulation techniques in real-world problems.	2	1	-	-	-	1	-	-	-	-	-	1	3	-
<b>Course Code</b>	<b>171ME5E01-AUTOMOBILE ENGINEERING (Professional Elective – I)</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
<b>CO1</b>	Summarize the Vehicle Chassis Layouts of 4-wheelers and Motor Vehicle Act.	2	1	-	-	-	-	3	-	3	-	-	-	-	3
<b>CO2</b>	Identify the different constructional and working principles of Un-Sprung components of the given vehicle.	2	1	1	-	-	-	3	-	-	-	-	-	-	2
<b>CO3</b>	Identify the different constructional and working principles sprung components of the given vehicle.	2	1	1	-	-	-	2	-	-	-	-	-	-	2
<b>CO4</b>	Summarize the functionalities of various Electrical systems of typical Automobile.	2	1	-	1	-	-	-	-	-	-	-	-	-	2
<b>CO5</b>	Explain the different Active and Passive Vehicle Safety Systems	3	2	3	-	-	-	1	-	-	-	-	-	-	3
<b>Course Code</b>	<b>171ME5E02-MECHANICAL VIBRATIONS (Professional Elective – I)</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
<b>CO1</b>	Solve the natural frequency and time period of simple vibrating mechanical systems.	3	2	-	-	-	-	-	-	-	-	-	-	-	-
<b>CO2</b>	Make use of various formulae and instruments used for measurement of displacement, velocity and accelerations in vibrating system	3	2	-	-	-	-	-	-	-	-	-	-	3	-
<b>CO3</b>	Evaluate the physical response of the various models of the single and multi degrees of freedom systems with & without damping.	3	-	-	-	-	-	-	-	-	2	-	2	-	-
<b>CO4</b>	Apply numerical methods related to mechanical vibrations.	3	2	-	-	-	-	-	-	-	2	-	2	3	-

	CO Statements	POs												PSOs		
<b>CO5</b>	Analyze the vibratory response of the various engineering applications such as strings, beams and shafts.	3	1	-	-	-	-	-	-	-	-	1	-	1	3	-
<b>Course Code</b>	<b>171ME5E03-ADDITIVE MANUFACTURING (Professional Elective – I)</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	
<b>CO1</b>	Summarize the different types of AM technologies.	2	-	-	-	1	-	-	-	-	1	-	-	1	-	
<b>CO2</b>	Explain about liquid based rapid prototyping systems.	2	-	-	-	-	-	-	-	-	1	-	-	1	-	
<b>CO3</b>	Describe various types of solid based rapid prototyping systems.	2	-	-	-	-	-	-	-	-	1	-	-	1	-	
<b>CO4</b>	Illustrate powder based rapid prototyping systems.	3	-	-	-	1	-	-	-	-	1	-	-	1	-	
<b>CO5</b>	Discuss about the rapid tooling methods.	3	-	-	-	1	-	-	-	-	1	-	-	2	-	
<b>CO6</b>	Apply the AM techniques for different case studies.	3	-	-	-	1	-	-	-	1	2	-	-	3	-	
<b>Course Code</b>	<b>171HS5T06-EMPLOYABILITY SKILLS-III</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	
<b>CO1</b>	Calculate the L.C.M and H.C.F of numbers by simple methods.	1	-	-	-	-	-	-	-	-	-	-	1	-	-	
<b>CO2</b>	Discuss about different numbers and its applications.	1	-	-	-	-	-	-	-	-	-	-	1	-	-	
<b>CO3</b>	Breakdown the typical write-up skills.	1	-	-	-	-	-	-	-	-	-	-	1	-	-	
<b>CO4</b>	Apply different types of models on ratio & proportion, average, ages and percentages.	-	-	-	-	-	-	-	-	-	1	-	1	-	-	
<b>CO5</b>	Demonstrate the tools of the soft skills.	-	-	-	-	-	-	-	-	-	1	-	1	-	-	
<b>Course Code</b>	<b>171ME5L02-THEORY OF MACHINES LAB</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	
<b>CO 1</b>	Determine the critical speed of whirling of shaft and the position of sleeve against the controlling force and speed in governors.	3	2	-	-	-	-	-	-	-	2	-	-	3	-	
<b>CO 2</b>	Analyze the motion of motorized gyroscopic couple and cam profiles for various cam follower systems.	3	2	-	-	-	2	2	-	-	-	-	-	3	-	
<b>CO 3</b>	Calculate the frequency of damped as well as un-damped vibrations of a spring mass system and the moment of inertia of flywheel.	3	1	-	-	-	-	-	-	-	-	-	-	3	-	
<b>CO 4</b>	Apply the principles of balancing of masses to various links, mechanisms and engines.	3	2	-	-	-	-	-	-	1	-	-	-	3	-	
<b>CO 5</b>	Analyze the displacement, velocity and acceleration against crank rotation in slider crank mechanism.	3	2	-	-	-	-	-	-	2	1	-	-	2	-	
<b>Course Code</b>	<b>171ME5L03-THERMAL ENGINEERING LAB</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	
<b>CO1</b>	Sketch the Valve and Port Timing diagrams for IC Engines.	2	1	1	-	-	-	-	-	-	3	-	-	-	3	
<b>CO2</b>	Determine the performance of various types of IC Engines and feed balance.	3	2	2	-	-	-	-	-	-	1	-	-	-	3	
<b>CO3</b>	Calculate the frictional power in various types of IC Engines.	3	2	-	-	-	-	1	-	-	1	-	-	-	3	
<b>CO4</b>	Analyze the performance of reciprocating air compressor.	3	2	2	-	-	-	-	-	-	1	-	-	-	2	
<b>CO5</b>	Explain the construction details of various types of boilers.	3	2	2	-	-	-	1	-	-	-	-	-	-	2	





	CO Statements	POs												PSOs	
CO3	Design a simple sampling plan and evaluate its effectiveness on a given sampling process	-	2	1	-	-	-	-	-	-	-	-	-	1	-
CO4	Calculate the system reliability based on the given component connection	-	2	1	-	-	-	-	-	-	-	-	-	1	-
CO5	Calculate the reliability based on the given failure model	-	-	1	-	-	-	-	-	-	-	-	-	1	-
<b>Course Code</b>	<b>171HS6T07-EMPLOYABILITY SKILLS-IV</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
CO1	Solve problems on Profit & Loss, Simple Interest & Compound Interest, Time & Work	1	-	-	-	-	-	-	-	-	-	-	1	-	-
CO2	Solve problems on Pipes & Cisterns, Time & Distance, Boats & Streams	1	-	-	-	-	-	-	-	-	-	-	1	-	-
CO3	Interpret the data collected for effective presentation	1	-	-	-	-	-	-	-	-	-	-	1	-	-
CO4	Apply processes of Group discussion, Phonetics, Leadership skills in real world	-	-	-	-	-	-	-	-	-	2	-	1	-	-
CO5	Apply principles of Group Dynamics, Interview Skills & Evaluation criteria in organizations	-	-	-	-	-	-	-	-	-	2	-	1	-	-
<b>Course Code</b>	<b>171ME6L04-MACHINE TOOLS LAB</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
CO1	Learn about tool geometry and various conventional machining process.	2	2	-	-	-	-	-	-	-	2	-	2	1	-
CO2	Produce models by turning, facing, threading operations on lathe machine	2	2	-	-	-	-	-	-	-	2	-	2	3	-
CO3	Produce different holes using drilling machine.	2	1	-	-	-	-	-	-	-	2	-	2	1	-
CO4	Produce different types of grooves using shaper and slotter machine.	1	1	-	-	-	-	-	-	-	2	-	2	2	-
CO5	Produce surfaces on flat surface machining, milling and grinding operations	1	1	-	-	-	-	-	-	-	2	-	2	2	-
<b>Course Code</b>	<b>171ME6L05-HEAT TRANSFER LAB</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
CO1	Determine the thermal conductivity of various materials.	3	2	-	-	-	-	-	-	2	2	-	-	-	2
CO2	Estimate the convective heat transfer coefficient in various conditions.	3	2	-	-	-	-	-	-	2	2	-	-	-	2
CO3	Evaluate the performance of heat exchanger in various arrangements.	3	2	-	-	-	-	-	-	2	2	-	-	-	2
CO4	Calculate the heat transfer through a pin-fin.	3	2	-	-	-	-	-	-	2	2	-	-	-	2
CO5	Compute the emissivity of different bodies.	3	2	-	-	-	-	-	-	2	2	-	-	-	2
<b>Course Code</b>	<b>171ME6L06 -METROLOGY / INSTRUMENTATION LAB</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
CO1	Measure the bores by internal micrometers and dial bore indicators.	3	-	-	-	-	-	-	-	-	-	3	-	1	-
CO2	Measure the angle and taper using bevel protractor and sine bar	-	3	-	1	-	-	-	-	-	-	-	-	1	-
CO3	Measure screw thread parameters	1	-	-	1	-	-	-	-	-	-	-	-	1	-
CO4	Find the errors and calibrate photo and magnetic pickups	-	-	-	-	-	-	-	-	-	-	3	-	1	-
CO5	Find the errors and calibrate the pressure gauge, temperature detectors and LVDT	-	-	-	-	-	-	-	-	-	-	3	-	1	-





	CO Statements	POs												PSOs	
<b>Course Code</b>	<b>171ME7E11-GREEN ENGINEERING SYSTEMS (Professional Elective – IV )</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
<b>CO1</b>	Describe the principles and working of solar radiation and solar radio Collection	1	1	-	1	-	1	-	-	-	-	-	-	-	1
<b>CO2</b>	Explain the principles and working of solar, wind, biomass, geothermal, Ocean energies	1	1	-	1	-	1	-	-	-	-	-	-	-	1
<b>CO3</b>	Illustrate electrical and mechanical systems	1	-	-	-	-	1	2	-	-	-	-	-	-	1
<b>CO4</b>	Analyze energy efficient processes	1	-	-	-	-	1	-	-	-	-	-	-	-	1
<b>CO5</b>	Explain green buildings	1	-	-	-	-	1	2	-	-	-	-	-	-	1
<b>Course Code</b>	<b>171ME7E12-NANO MATERIALS AND TECHNOLOGY (Professional Elective – V )</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
<b>CO1</b>	Explain the structure and properties of Nano materials.	2	1	-	-	-	-	-	-	-	-	-	-	1	-
<b>CO2</b>	Summarize the classification of Nano materials.	2	1	-	-	-	-	-	-	-	-	-	-	1	-
<b>CO3</b>	Illustrate various methods of synthesizing different Nano materials.	1	1	-	-	-	-	-	-	-	-	-	-	1	-
<b>CO4</b>	Analyze the Nano structure of materials using various characterization techniques.	2	2	1	1	-	-	-	-	-	-	-	-	2	-
<b>CO5</b>	Make use of different Advanced Nano materials for Engineering and Technological applications.	2	2	-	-	-	2	-	2	-	-	-	-	1	-
<b>Course Code</b>	<b>171ME7E13-GAS DYNAMICS (Professional Elective – V )</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
<b>CO1</b>	Illustrate the differences between compressible and incompressible flows.	2	1	-	-	2	-	-	-	-	-	-	-	-	2
<b>CO2</b>	Explain the behavior of isentropic of flow of an ideal gas.	2	1	-	-	2	-	-	-	-	-	-	-	-	2
<b>CO3</b>	Evaluating the performance of area changing devices called nozzles.	3	2	-	-	2	-	2	-	-	-	-	-	-	3
<b>CO4</b>	Describe the knowledge about the governing equations.	2	1	-	-	2	-	-	-	-	-	-	-	-	2
<b>CO5</b>	Analyze the effect of heat transfer on flow parameters using Fanno and Rayleigh lines.	-	3	-	-	-	-	-	-	-	-	-	-	-	1
<b>Course Code</b>	<b>171ME7E14-CONDITION MONITORING (Professional Elective – V )</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
<b>CO1</b>	Distinguish different modes of vibrations and measure them	-	-	3	2	-	-	-	-	-	-	-	-	2	-
<b>CO2</b>	Analyze different types of vibrations	-	3	2	2	-	-	-	-	-	-	-	-	1	-
<b>CO3</b>	Decide faults in bearings, gears, and other mechanical devices and measure the energy loss as heat in machinery	-	3	2	2	-	-	-	-	-	-	-	-	2	-
<b>CO4</b>	Illustrate various oil and wear debris analysis	1	2	1	1	-	-	-	-	-	-	-	-	2	-
<b>CO5</b>	Illustrate various ultrasonic monitoring techniques.	1	2	1	1	-	-	-	-	-	-	-	-	1	-
<b>Course Code</b>	<b>171ME7E15-FLEXIBLE MANUFACTURING SYSTEMS (Professional Elective – IV )</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
<b>CO1</b>	Explain how flexible manufacturing systems can be implemented	-	-	-	-	2	-	3	-	-	-	-	-	2	-
<b>CO2</b>	Analyze various material handling system in FMS	-	-	-	-	2	-	3	-	-	-	-	-	2	-

	CO Statements	POs												PSOs	
CO3	Explain advanced manufacturing systems	-	-	-	-	2	-	3	-	-	-	-	-	2	-
CO4	Compare FMS with cellular manufacturing	-	-	-	-	-	-	-	-	-	-	-	-	1	-
CO5	Evaluate the role of computers in FMS	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Course Code</b>	<b>171ME7L07-CAD/ CFD LAB</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
CO1	Develop the various components using Cad software	-	3	2	-	-	-	-	-	-	2	-	2	-	3
CO2	Explain the concepts of Drafting	-	1	2	-	-	-	-	-	-	1	-	3	-	2
CO3	Analyze deflection and stresses in 2D and 3D Beams	-	3	2	-	1	-	-	-	-	2	-	2	-	2
CO4	Model the temperature distribution in case of Fin by using the BC.	-	3	2	-	1	-	-	-	-	-	-	2	-	2
CO5	Solve heat equations, conduction equation & Parabolic PDE equations	-	3	2	-	1	-	-	-	-	-	-	2	-	3
CO6	Apply the concepts FDM to solve problems in heat transfer.	-	3	2	-	1	-	-	-	-	-	-	2	-	2
<b>Course Code</b>	<b>171ME7L08-CAM/MECHATRONICS LAB</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
CO1	Analyze the different transducers by using DYNA 1750 Transducers Kit.	-	3	-	2	-	-	-	-	-	-	-	-	3	-
CO2	Construct a ladder diagram for logical operations.	3	2	-	1	-	-	-	-	-	-	2	-	3	-
CO3	Develop a Hydraulic circuit in AUTOMATION STUDIO Software.	3	2	-	1	-	-	-	-	-	-	2	-	2	-
CO4	Make use of Automated CNC Tool path & G-Code generation using Pro/E/Master CAM.	3	2	-	1	-	-	-	-	-	-	1	-	2	-
CO5	Construct a CNC programming for turning and milling process.	3	2	-	1	-	-	-	-	-	-	2	-	3	-
<b>Course Code</b>	<b>171ME7P01-INDUSTRY ORIENTED (INTERNSHIP) MINOR PROJECT</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
CO1	Conduct a technical survey to identify a real world engineering problem	1	1	-	-	-	-	-	-	-	1	-	1	1	
CO2	Analyze the industrial plant layout using technical expertise	2	-	-	-	-	1	1	-	-	-	-	1	1	
CO3	Compare theoretical and real work environments in technical perspective	2	-	-	-	-	-	-	-	-	1	1	1	1	
CO4	Identify the challenges in the execution of operations	1	1	1	1	-	-	-	-	-	-	-	-	1	
CO5	Execute the operations and report the results of assigned tasks using modern tools adhering to professional ethics	-	-	-	-	2	-	-	2	1	1	-	-	1	
<b>VIII SEM</b>															
<b>Course Code</b>	<b>171ME8E16-PRODUCTION PLANNING AND CONTROL (Professional Elective – VI )</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>
CO1	Summarize the objectives, functions, applications of PPC	3	-	-	-	1	1	-	-	-	-	-	-	2	-
CO2	Explain different Forecasting techniques	2	2	1	-	-	-	-	-	-	-	-	1	1	-
CO3	Analyse Inventory management methods	2	2	1	-	-	-	-	-	-	-	-	1	2	-
CO4	Evaluate various routing and scheduling techniques	2	2	1	-	-	1	-	-	-	-	-	-	2	-
CO5	Examine various production control techniques	3	-	-	-	2	1	-	-	-	-	-	1	1	-



CO Statements		POs												PSOs		
CO3	Analyze the various feed forward neural networks and Hopfield Network.	2	2	2	--	1	--	--	--	--	--	--	--	--	-	-
CO4	Compare and Contrast Classical and Fuzzy sets.	2	1	--	--	1	--	--	--	--	--	--	--	--	-	-
CO5	Utilize different modules of Fuzzy Logic Controller for rule base and decision making Systems.	2	2	1	--	1	--	--	--	--	--	--	--	--	-	-
CO6	Analyze the application of fuzzy logic control to real time systems.	2	2	2	--	1	--	--	--	--	--	--	--	--	-	-
<b>Course Code</b>	<b>171CE8002-DATABASE MANAGEMENT SYSTEMS (Open Elective)</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	
CO1	Summarize various database characteristics.	2	-	-	-	1	-	-	-	-	-	-	-	-	-	
CO2	Identify various database architectures.	2	-	1	-	1	-	-	-	-	-	-	-	-	-	
CO3	Interpret relational database using SQL.	1	-	1	-	2	-	-	-	-	-	-	-	-	-	
CO4	Examine issues in data storage and query processing for appropriate solutions.	1	2	1	-	2	-	-	-	-	-	-	-	-	-	
CO5	Make use of normalization techniques for database design.	2	2	1	-	3	-	-	-	-	-	-	-	-	-	
CO6	Illustrate the mechanisms of transaction management.	2	2	-	-	1	-	-	-	-	-	-	-	-	-	
<b>Course Code</b>	<b>171ME8003-ENTERPRENEUR RESOURCE PLANNING (Open Elective)</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	
CO1	Make use of Enterprise software, and its role in integrating business function	1	-	-	-	-	1	-	-	-	-	1	-	-	-	
CO2	Analyze the strategic options for ERP identification and adoption	1	-	-	-	-	1	-	-	-	-	1	-	-	-	
CO3	Design the ERP implementation strategies.	1	-	-	-	-	1	-	-	-	-	1	-	-	-	
CO4	Apply reengineering business processes for successful ERP implementation.	1	-	-	-	-	1	-	-	-	-	1	-	-	-	
CO5	Summarize emerging trends in Enterprise Resource Planning	1	-	-	-	-	1	1	-	-	-	1	-	-	-	
<b>Course Code</b>	<b>171ME8004-COMPUTER GRAPHICS (Open Elective)</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	
CO1	List the applications of computer graphics and Video Display devices for implementing Graphical user interface.	3	2	-	-	-	-	-	-	-	-	-	-	-	-	
CO2	Analyze the concepts of output primitives and filled area primitives in implementing various algorithms.	2	3	2	2	-	-	-	-	-	-	-	-	-	-	
CO3	Apply the concepts of Geometric Transformations, Viewing and clipping in 2D & 3D Graphics.	2	2	-	-	-	-	-	-	-	-	-	-	-	-	
CO4	Explain the basic graphics application programs including animation.	2	1	2	-	-	-	-	-	-	-	-	-	-	-	
CO5	Apply OpenGL for General Computer Animations.	3	2	2	-	2	-	-	-	-	-	-	-	-	-	
CO6	Illustrate the concepts of Visual Surface detection Methods in 3D Graphics.	2	1	-	-	-	-	-	-	-	-	-	-	-	-	
<b>Course Code</b>	<b>171ME8P02-MAJOR PROJECT</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	
CO1	Develop technical procedure of planning, scheduling and realize an engineering product	1	2	-	-	-	2	2	-	-	-	1	1	1	1	

	<b>CO Statements</b>	<b>POs</b>												<b>PSOs</b>		
<b>CO2</b>	Acquire the skills of technical report writing and data collection	1	-	-	-	-	-	-	-	2	-	-	1	1	1	1
<b>CO3</b>	Design the solutions for the critical problem areas marked in data analysis	2	2	3	2	-	-	-	-	-	-	-	-	1	1	1
<b>CO4</b>	Build a team of people to work together and communicate well in the critical stages of project progress	-	-	-	-	-	-	-	-	-	1	2	1	1	1	1
<b>CO5</b>	Use modern tools to derive conclusions and communicating the results of the project work effectively	-	-	-	-	3	-	-	-	-	-	2	1	1	1	1