



METHODIST COLLEGE OF ENGINEERING & TECHNOLOGY

[Autonomous Institution]

Accredited by NAAC with A+ and NBA
Affiliated to Osmania University & Approved by AICTE

DEPARTMENT OF MECHANICAL ENGINEERING BE III SEM COURSE OUTCOMES

A.Y: 2024-25

Code	subject	COs	Course Outcomes	Taxonomy
6PC301ME	Thermodynamics	CO1	Understand the concept of temperature and temperature scales in thermodynamic applications	Understand
		CO2	Apply the first law of thermodynamics to analyze energy interactions in simple open and closed systems under both steady and unsteady conditions	Apply
		CO3	Apply the second law of thermodynamics to open and closed systems, and evaluate entropy and availability	Apply
		CO4	Formulate fundamental thermodynamic relationships for ideal and real gases	Analyze
		CO5	Analyze the Rankine cycle for steam power plants and compare methods for cycle improvement	Analyze
6PC302ME	Strength of material	CO1	Define stresses and strains, explain stress-strain diagram and classify the beams, loads and springs.	Understand
		CO2	Apply basic concepts to find various types of stresses, strain energy and properties of beams and also to select suitable spring for the application	Apply
		CO3	Analyze stresses in cylinders, beams and springs for the given loading conditions	Analyze
		CO4	Measure stresses, torque, slope, deflection, shear force and bending moment for various types of beams under loading conditions	Apply
		CO5	Construct stress- strain diagram, Shear force and bending moment diagrams for the given material under given loading conditions.	Create
6PC303ME	Metallurgy and Material science	CO1	Discuss crystal structure, mechanical behaviour and heat treatment methods applied to ferrous and non ferrous materials.	Understand
		CO2	Analyse mechanical failure, crack growth and crack propagation in ductile and brittle materials under static and dynamic loading.	Understand
		CO3	Sketch and interpret Iron-Iron Carbide and other equilibrium diagrams.	Apply
		CO4	Compare and select suitable material and heat treatment process for a particular requirement.	Analyze
		CO5	Discuss properties and applications of ferrous and non ferrous alloys, polymers, ceramics and composite materials.	Understand

6PC301CS	Programming for Problem solving	CO1	Formulate algorithms and learn fundamental program methodologies of C programming.	Create
		CO2	Understand control statements and interpret derived data types with mathematical and engineering problems.	Understand
		CO3	Develop modular programming techniques to solve searching, sorting and file system problems	Analyze
		CO4	Identify pre-processor directives and user defined usage.	Identifying
		CO5	Interpret Arrays (1-D, 2-D), Strings and its library functions	Evaluate
6BS303HS	Numerical Methods and Partial differential Equation	CO1	Find the solution of algebraic and transcendental equations using numerical methods.	Understand
		CO2	Apply numerical techniques to solve ordinary differential equations and definite integrals.	Apply
		CO3	Apply numerical methods to interpolate values and fit different curves from given data	Apply
		CO4	Find solutions of first order linear and non linear partial differential equations	Apply
		CO5	Apply the solution of partial differential equations to physical problems	Apply
6HS303HS	Human Value and Professional Ethics	CO1	Understand the Significance of value inputs in a classroom and start applying them in their life and profession	Understand
		CO2	Assess their own ethical values and the social context of problems.	Understand
		CO3	Distinguish between values and skills, happiness and accumulation of physical facilities, the Self and the Body, Intention and Competence of an individual, etc.	Understand
		CO4	Understand the role of a human being in ensuring harmony in society and nature.	Understand
		CO5	Distinguish between ethical and unethical practices and start working out the strategy to actualize a harmonious environment wherever they work.	Understand
6PC351ME	Metallurgy and Material Testing lab	CO1	Apply the procedure for preparing the sample for metallographic observation and Identify different materials by examining the phases in their	Apply
		CO2	Analyze the effects of various heat treatment by studying the grain structure	Analyze
		CO3	Determine the tensile, compressive and impact strength for various materials	Evaluate
		CO4	Measure hardness, shear strength for various materials	Evaluate
		CO5	Determine the shear force, bending moment and Young's modulus of different beams under various loading conditions.	Evaluate

6PC352ME	Computer Aided Machine Drawing	CO1	Develop the skills in drafting various machine components using Auto Cad software	Understand
		CO2	Interpret the conventions & symbols used in technical drawings into their physical meanings & vice versa	Understand
		CO3	Construct orthographic views of simple machine components	Apply
		CO4	Demonstrate the working knowledge in solidworks to model, assemble and generate orthographic views.	Understand
		CO5	Develop 3D models, assemble and generate drawings of components using Solidworks. Observe 3D interactive CAD models and determine the steps used in modelling them.	Evaluate
6ES351CS	Programming for Problem solving Lab	CO1	Understand the fundamentals of programming in C Language.	Understanding
		CO2	Write, compile and debug programs in C.	Creating
		CO3	Formulate solution to problems and implement in C.	Creating
		CO4	Effectively choose programming components to solve computing problems	Applying
		CO5	Program illustrating using Command Line Arguments	Understanding
6MC351ME	Solid Edge certification course	CO1	Make 3D mechanical part models in Solid Edge by employing ordered and synchronous modelling techniques.	Apply
		CO2	Use Solid Edge to assemble, identify interference, and analyze the motion of complicated equipment.	Analyze
		CO3	Adjust imported geometries in neutral formats such as IGES, STEP, and Para-solid in accordance with specifications.	Apply
		CO4	Use Solid Edge to analyze and optimize parts and assemblies through simulations.	Create
		CO5	Recognize how production drawings and tools are developed in order to create rendered pictures of products.	Understand

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BE IV SEM COURSE OUTCOMES

A.Y: 2024-25

Code	Course Name	CO No.	Course Outcomes	Taxonomy Level
6ES403CS	Python Programming	CO1	How to be able to introduce core programming basics	Remembering
		CO2	Design program with functions using Python programming language.	Creating
		CO3	Summarize a range of Object-Oriented Programming.	Understanding
		CO4	Organize in-depth data and information processing techniques.	Applying
		CO5	Match the high-performance programs designed to strengthen the practical expertise	Remembering
6PC404ME	Applied Thermodynamics	CO1	Understand the principles and types of air compressors, internal combustion engines, combustion in IC engines, steam boilers, steam power plants and nozzles	Understand
		CO2	Demonstrate the safe operation and maintenance of air compressors, IC engines, steam power plants, boilers and nozzles	Apply
		CO3	Apply the principles of thermodynamics and fluid mechanics to analyze the thermodynamic cycles of IC engines and evaluate their efficiency.	Apply
		CO4	Apply knowledge of IC engine design and operation to perform basic maintenance and repair tasks safely and effectively.	Apply
		CO5	Analyze and evaluate the performance of different types of air compressors, types of steam boilers, nozzles, condensers, IC engines and factors affecting combustion in IC engines	Analyze
E	Processes	CO1	Describe the basic principle and working of various types of basic manufacturing processes.	Understand
		CO2	Discuss the materials, equipment and tooling used in various manufacturing processes.	Understand

6PC405M	Manufacturing P.	CO3	State the advantages and limitations of various manufacturing processes.	Remember
		CO4	State the advantages and limitations of various manufacturing processes.	Evaluate
		CO5	Select appropriate manufacturing process based on the type of industrial use/application.	Apply
6PC406ME	Fluid Mechanics & Hydraulic Machines	CO1	Understand fluid properties and pressure measurement concepts.	Understand
		CO2	Analyze different types of fluid flow and apply Bernoulli's and Euler's equations to solve real-life flow problems.	Analyze
		CO3	Evaluate forces on vanes due to jet impact and solve pipe flow problems including losses and boundary layer effects.	Evaluate
		CO4	Understand and analyze performance characteristics and classifications of hydraulic turbines and hydro power systems.	Analyze
		CO5	Apply knowledge of working principles and design features of different types of hydraulic pumps.	Apply
		CO1	Define and explain fundamental kinematic and gear terminologies, classifications of mechanisms, cams, and followers, as well as different types of planar and steering mechanisms.	Remember
6PC407ME	Kinematics of Machines	CO2	Illustrate and describe the working principles of various mechanisms, cam profiles, gear trains, and velocity and acceleration analysis techniques used in planar mechanisms.	Understand
		CO3	Apply kinematic principles to analyze linkages, velocity and acceleration in mechanisms, synthesize cam profiles, and compute gear parameters such as contact ratio and interference conditions.	Apply
		CO4	Compare different mechanisms, evaluate motion parameters of cams and gears, and differentiate between straight-line mechanisms, steering systems, and gear trains based on their performance and applications.	Analyze
		CO5	Design and optimize mechanisms, cams, and gear trains for specific applications, ensuring efficient motion transfer, minimal losses, and practical feasibility in industrial applications.	Evaluate
		CO1	Understand and evaluate the evolution and role of Indian culture and civilization across historical periods.	Understand
MC402HS	in Traditional Knowledge	CO2	Analyze and appreciate the contributions of Indian languages, Sanskrit literature, and philosophies to cultural unity.	Analyse
		CO3	Examine the development and impact of Indian religious and philosophical traditions from ancient to modern times	Apply

	Essence of India	CO4	Evaluate the integration of Indian fine arts, architecture, and traditional technologies across time.	Understand and Analyse
		CO5	Analyze and apply the principles of traditional Indian education to contemporary learning systems.	Analyse
6ES453CS	Python Programming Lab	CO1	Develop solutions to simple computational problems using Python programs	Creating
		CO2	Solve problems using conditionals and loops in Python	Applying
		CO3	Develop Python programs by defining functions and calling them.	Applying
		CO4	Make use of Python lists, tuples and dictionaries for representing compound data.	Analyzing
		CO5	Develop Python programs for GUI applications	Applying
6PC453ME	Applied Thermodynamics Lab	CO1	Conduct experiments on air compressors and determine their performance parameters like volumetric efficiency and isothermal efficiency.	Evaluate
		CO2	Perform performance tests on various internal combustion engines and analyze their efficiency using experimental data.	Evaluate
		CO3	Draw and interpret valve and port timing diagrams for 2-stroke and 4-stroke engines to understand their working cycles.	Apply
		CO4	Determine fuel and lubricating oil properties such as flash point, fire point, and viscosity using standard test methods.	Evaluate
		CO5	Prepare heat balance sheets and evaluate energy distribution in IC engines; demonstrate teamwork, reporting, and presentation skills.	Create
6PC454ME	Manufacturing Processes Lab	CO1	Explain the design of patterns, mould making procedures and testing the sand properties.	Understand
		CO2	Demonstrate the ability to make different types of welded joints using Arc, TIG, Gas, and Spot welding methods	Remember
		CO3	Demonstrate the blanking and piercing operations for simple components..	Remember
		CO4	Classify the Applications of plastics and manufacture a simple component by using injection and blow moulding processes..	Apply
		CO5	Evaluation of formability using Erichsen cupping test	Evaluate

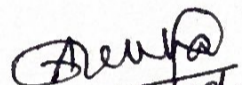
6PC455ME

Fluid Mechanics & Hydraulic Machines Lab

CO1	analyze the performance and characteristic curves of various pumps like centrifugal, reciprocating, self-priming, and gear pumps	Analyze
CO2	Evaluate the impact force of a fluid jet on flat and curved vanes and relate experimental data to theoretical predictions	Evaluate
CO3	Determine the coefficient of discharge for Venturi and Orifice meters and apply fluid flow equations for real-time measurements	Apply
CO4	Assess the performance of turbines like Pelton, Francis, and Kaplan through characteristic curves and interpret specific speed and efficiency	Analyze
CO5	Explain the working of hydraulic and pneumatic circuits and demonstrate basic control applications using fluid power systems.	Understand

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BE V SEM COURSE OUTCOMES

A.Y: 2024-25

6PC508ME	Computer aided design and Manufacturin	CO1	Recall the fundamental concepts, components, and terminology related to CAD/CAM, wireframe and surface modeling, numerical control systems, and flexible manufacturing systems, automated retrieval systems and guided vehicles.	Remember
		CO2	Explain the core principles and structures of CAD/CAM systems, data exchange formats, geometric modeling methods, wire frame entities, solid modeling entities, NC part programming, and designing and objectives of flexible manufacturing layouts in the context of modern manufacturing.	Understand
		CO3	Apply suitable modeling techniques, NURBS properties, group technology methods, and flexible manufacturing layouts and automated production systems.	Apply
		CO4	Contrast geometric and surface modeling techniques, with curve and surface behaviors, and compare automation strategies like part classification and material handling systems for efficient CAD-based manufacturing solutions.	Analyze
		CO5	Asses the 2D&3D transformation methods, parametric and non-parametric curve representations and computer assisted part programming, Group Technology, for their effectiveness in complex design and production environments.	Evaluate
6PC509ME	DME - Design of Machine Elements	CO1	Recognize the norms, codes, theories of failure, power screws, joint design considerations, stress, stresses, and mechanical components such as couplings, shafts, keys, and joints.	Remember
		CO2	For a specific application, choose the right shafts, keys, couplings, and permanent and temporary joints.	Apply
		CO3	Demonstrate the ability to apply the fundamentals of stress analysis, theories of failure and material science in the design of Mechanical components of shafts, keys, couplings, Joints and power screws.	Apply
		CO4	Examine and assess power screws, joints, shafts, and important couplings that are subjected to both static and dynamic loads.	Analyze
		CO5	Using a variety of empirical relations, design keys, couplings, and permanent and temporary joints for a certain application	Create

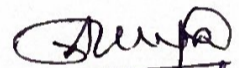
6PC510ME	Metrology and Machine Tool	CO1	Recall fundamental concepts of metrology, types of comparators and surface roughness instruments, lathe specifications and chip formation, drilling/boring machine operations, and milling/grinding processes.	Remember
		CO2	Explain the principles of linear and angular measurement, working of comparators and thread metrology, lathe operations and tool geometry, machining time calculations, and indexing/grinding theory.	Understand
		CO3	Use slip gauges and sine bars, profilometers and gear measurement tools, taper turning techniques, drilling/shaping time formulas, and milling/grinding wheel selection.	Apply
		CO4	Compare tolerance systems, thread measurement methods, cutting forces in machining, boring vs. milling setups, and abrasive processes.	Analyze
		CO5	Design limit gauges, improve surface finish strategies, optimize lathe tool layouts, plan complex machining operations, and recommend grinding parameters.	Evaluate
6PE501ME	Automobile Engineering	CO1	Understand the diverse components and construction details of automobile engines	Understand
		CO2	Understand the operations of various systems, including the engine lubrication system and cooling system, as well as comprehend the types of ignition systems and diverse batteries utilized in automobiles.	Understand
		CO3	Apply knowledge to analyze the working principles of steering and suspension systems, along with examining the constructional details of automobile wheels and tires.	Apply
		CO4	Comprehend the construction and functioning of the braking system in automobile engines and understand the transmission of power from the engine to wheels through clutch plates and the differential gearbox.	Understand
		CO5	Identify the environmental implications of automobile emissions and strong base for understanding future developments in the automobile industry.	Apply
6HS502HS	Management Economics and Financial Account	CO1	Apply economic principles to management decisions and understand the nature & scope of managerial economics, its relationship with other disciplines.	Apply
		CO2	Describe how changes in demand and price affects market, estimate demand and forecasting of demand in the market.	Understand
		CO3	Understanding the basic concepts of accounting, Classify various books of accounts	Understand
		CO4	Analyze and Interpret financial statements by applying ratios	Analyze
		CO5	Apply traditional and modern techniques of capital budgeting in longterm investments, to test whether to invest in a particular project or not	Apply
6HS503HS	Effective Technical Communication	CO1	Handle Technical communication effectively by overcoming barriers of communication.	Remember
		CO2	Use different types of Professional correspondence to communicate effectively.	Understand
		CO3	Use different types of business and Interoffice correspondence.	Analyze
		CO4	Acquire adequate skills to draft reports efficiently.	Evaluate

		E		
OE501CE	Disaster Mitigation	CO5	Enhance their skills of information transfer.	Apply
		CO1	Demonstrate the concepts of Disaster Management, Role of NDMA in Disaster Management	Understanding
		CO2	Identify different types of disasters, Mitigation measures of each disaster, case studies of disasters	Understanding
		CO3	Explain the disaster management cycle and disaster response, use of technology in disaster mitigation	Understanding
		CO4	Illustrate the acts and policies of disaster management in India	Understanding
		CO5	Explain the concepts of communication and public awareness along with case studies.	Understanding
OE501AD	Artificial Intelligence	CO1	Introduction to Artificial Intelligence, its applications and Problem solving techniques. Also the knowledge representation methods, Planning, Expert systems and their algorithms in AI	Understanding
		CO2	Analyzing different searching algorithms and game playing programs to solve given problems.	Analyzing
		CO3	Apply basic principles of AI in solutions that require problem solving, inference, perception, planning, knowledge representation, and learning.	Applying
		CO4	Demonstrate awareness and a fundamental understanding of various applications of AI techniques in intelligent agents, expert systems, probability, artificial neural networks and other machine learning models.	Evaluating
		CO5	To explore the understanding of agent based AI Planning, logical based agents and Expert systems	Creating
		CO1	Use Vernier callipers, height gauges, inside, outside, and depth micrometers to apply measurement principles and techniques.	Apply
6PC556ME	Metrology and Machine Tool Lab	CO2	Make use of the concepts and methods for calculating ovality and roundness errors using dial bore gauges and V-blocks.	Apply
		CO3	Use a sine bar and a bevel protractor to precisely calculate the angles. Using a Tool Maker's Microscope, measure linear and angular dimensions accurately.	Analyze
		CO4	Accurately and successfully apply shaping, drilling, gear cutting, thread cutting, and lathe machine operations to work parts.	Apply
		CO5	Use a lathe tool dynamo meter to analyze the cutting force during machining operations.	Analyze
		CO1	Create the models of the components using solid modelling package.	Create
6PC557ME	CAD/CAM Lab	CO2	Demonstrate proficiency in generating 3D part models from assembly drawings using a solid modeling package.	Understand
		CO3	Understand and effectively apply geometric dimensioning, tolerance representation on part drawings as well apply the conventional practices to indicate dimensional, form, and position tolerances on engineering drawings.	Understand
		CO4	Interpret and calculate limits, suggest suitable fits for mating parts, and detect interference in assemblies.	Understand

6PW551ME	Internship	CO5	Compile the simple part programs to perform machining on a CNC machine and to create various machine components by performing different machining operations.	Create
		CO1	To improve and develop technical abilities.	Apply
		CO2	To put into practice the theoretical knowledge they have learned in their classes.	Apply
		CO3	To acquire practical abilities pertinent to their academic programs.	Apply
		CO4	To acquire knowledge relevant to their academic courses that is industry-specific.	Understand
6MCS52ME	Skill Development Lab -2	CO5	To cooperate and communicate professionally with co-workers, managers, and business associates.	Evaluate
		CO1	Recall & Gain insights into the professional aspects of mechanical engineering.	Remembering
		CO2	Hands-on experience experimenting with tools, equipment, and software used in the industry.	Analysing
		CO3	Collaborate, communicate & Illustrate ideas, and work effectively as part of a team.	Understanding
		CO4	Improve the critical thinking abilities and adapt to the evolving demands of the industry.	Creating
		CO5	Solve complex problems, and make informed decisions.	Applying

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BE VI SEM COURSE OUTCOMES

A.Y: 2024-25

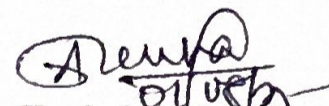
Code	Course Name	CO No.	Course Outcomes	Taxonomy Level
6PC611ME	Dynamics of Machine	CO1	Define key concepts related to force analysis, including principles of gyroscopes, governors, brakes, flywheels, balancing, and vibrations.	Remember
		CO2	Explain the working principles of gyroscopic motion, centrifugal governors, flywheels, and braking systems, and discuss their applications.	Understand
		CO3	Apply static and dynamic force analysis to mechanisms like single slider crank and four-bar linkages, and analyze braking systems.	Apply
		CO4	Perform balancing of rotating and reciprocating masses, including static and dynamic balancing, and analyze forces and couples in machinery.	Analyze
		CO5	Evaluate vibration characteristics, determine critical speeds, and design flywheels to control energy fluctuation in various applications.	Evaluate
6PC612ME	Heat Transfer	CO1	Explain the fundamental principles and laws of conduction, convection, radiation, and phase change processes.	Understand
		CO2	Apply analytical and empirical methods to solve steady and transient heat transfer problems in different geometries.	Apply
		CO3	Analyze the influence of material properties, boundary conditions, and geometry on thermal system	Analyze
		CO4	Evaluate thermal system performance such as fins, insulation, and heat exchangers under various operational conditions.	Evaluate
		CO5	Design practical heat transfer components like fins, enclosures, and exchangers using theoretical and graphical tools.	Create
6PC613ME	Design of Machine Element-II	CO1	State the function of springs, gears, Bearings, IC Engine parts and bending theory of members with initial curvature.	Remember
		CO2	Summarize the Materials for springs, Gears, Bearings, IC Engine components and curved beams.	Understand
		CO3	Select various types of springs, Bearing, Gear drives and curved beams for specific application.	Apply
		CO4	Analyze the design of helical coil springs, leaf springs Gear drives, IC Engine components and curved beams for mechanical systems.	Analyze
		CO5	Design various types springs, Gear drives, Bearings, IC Engine components and curved beams.	Create

OE	Electrical vehicle Technology	CO1	To identify and describe the history and evolution of electric & hybrid electric vehicles to emphasize on the need and importance of EV/HEV for sustainable future	Understand
		CO2	To identify and describe the principles of various EV/HEVs drive train topologies along with their power flow control and fuel efficiency estimation	Analyze
		CO3	To design and select electric propulsion system components for EV/HEV drives suitability for the desirable performance and control	Understand
		CO4	To compare and evaluate various energy sources and energy storage components for EV and HEV applications	Analyze
		CO5	Select various types of propulsion units and their control depending upon the application	Apply
6PE608ME	Entrepreneurship	CO1	Understand the fundamentals of entrepreneurship, its characteristics, and the linkages among small, medium, and large industries.	Understand
		CO2	Analyze the Indian industrial environment and evaluate opportunities and challenges for first-generation and women entrepreneurs	Analyze
		CO3	Develop a basic business plan including market demand analysis, financial feasibility, and project formulation techniques.	create
		CO4	Apply project management tools such as CPM and PERT during the construction phase of a project.	Apply
		CO5	Understand behavioral aspects of entrepreneurs including leadership, motivation, and time management techniques.	Understand
6PE612ME	Industrial Engineering	CO1	Explain the concepts of personal management, production planning & control, inventory, quality control charts, OC curve and Decision theory.	Understanding
		CO2	Interpret the knowledge of scientific system approach in to production planning & control and Calculate Economic order quantity models with shortage and without shortage in industrial environment.	Evaluating
		CO3	Analyze the job evaluation and merit rating , inventory model in management and single, double and multi sampling plans in manufacturing industry.	Analysing
		CO4	Plot the quality control limits of manufactured goods by using X and R charts	Applying
		CO5	Apply the concept of decision theory in to practical situation	Applying
6C603HS	Indian Constitution	CO1	Read, Remember, understand the background and making of Indian constitution and Its importance.	Remember
		CO2	Remember and understand the working of the Central, state and provincial levels of administration.	Understand
		CO3	Remember and understand the fundamental duties, responsibilities and rights as an ideal citizen of India.	Apply
		CO4	Understand and interpret the functioning and distribution of resources between Union and state.	Understand
		CO5	Understand the existing hierarchy of the social structure, election process and Grievance redressal in a democracy	Understand

6HS653HS	Soft Skill Lab	CO1	Listen to a variety of speakers and texts and will be able to comprehend and perform the required tasks.	Understand
		CO2	Interacting a group professionally and communicate confidently in terms of both the spoken and written communication.	Understand
		CO3	Develop the skills and strategies of reading and writing.	Apply
		CO4	Face any Interview confidently by managing time, making decisions by speaking appropriately according to the context.	Analyze
		CO5	Demonstrate right attitude and right skills to cope with team and communicate professionally.	Evaluate
6PC658ME	Theory of machine Lab	CO1	Understand the function of Governors, Gyroscope, Various types of vibrations and kinematic mechanisms	Understand
		CO2	Summarize various types of governors, vibrations and kinematic mechanisms	Understand
		CO3	Select Various types of governors, kinematic mechanisms and vibrations based on industrial applications	Apply
		CO4	Analyze forces acting on governors, vibrations and kinematic mechanisms	Analyze
		CO5	Evaluate the balancing of forces in rotating masses, gyroscopic couple due to centrifugal force, Height of governor with respect to speed, Natural frequencies of free and forced vibrations	Evaluate
6PC659ME	Heat Transfer Lab	CO1	Recall and explain fundamental concepts of conduction, convection, radiation, and thermodynamics through hands-on experimentation.	Understand
		CO2	Apply experimental methods to determine thermal and flow parameters such as thermal conductivity, emissivity, heat transfer coefficients, efficiency, and COP.	Apply
		CO3	: Analyze experimental results to study performance characteristics of heat exchangers, fins, fans, and refrigeration systems.	Analyze
		CO4	Evaluate the efficiency and effectiveness of different thermal systems using performance metrics and graphical interpretations.	Evaluate
		CO5	Design basic thermal experimental setups or propose modifications based on test results to enhance performance and reliability.	Create

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BE VII SEM COURSE OUTCOMES

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6HS704HS	Operations Research	CO1	Define and explain fundamental concepts and scope of Operations Research, including Linear Programming and Game Theory.	Understand
		CO2	Formulate and apply mathematical models for solving LPPs, replacement, sequencing, transportation, and queuing problems.	Apply
		CO3	Analyze the results of operations research models to assess system performance, optimality, feasibility, and economic impacts.	Analyze
		CO4	Evaluate strategies in project management, cost reduction, mixed strategies in games, and queuing performance metrics.	Evaluate
		CO5	Create and propose solutions to complex operations research problems using tools such as CPM, PERT, MODI, and graphical methods.	Create
PC714ME	Finite Element Analysis	CO1	Recall core FEM terminology (stress, strain, BCs, shape functions, eigenvalues) and explain its theoretical basis including stress-strain relations, potential energy, assembly, and convergence.	Remember & Understand
		CO2	Apply FEM procedures to formulate stiffness matrices, assemble equations, and solve 1D bars, trusses (2D), beams (Hermite), CST, axisymmetric elements, and 1D heat transfer (cable/fin).	Apply
		CO3	Analyze differences in formulation, capabilities, and limitations of element types (1D linear/quadratic, CST, axisymmetric, 4-node iso-parametric) and differentiate appropriate choices/integration for 2D stress and steady-state heat transfer.	Analyze
		CO4	Evaluate and justify the application/treatment of essential and natural boundary conditions across domains: structural mechanics (bars, trusses, beams, 2D, axisymmetric) and heat transfer.	Evaluate
		CO5	Formulate mass/stiffness matrices for dynamics and construct solutions for eigenvalues/eigenvectors (stepped bar, beam) and time-dependent problems (1D heat flow).	Create
PC716ME	Product Design and Development	CO1	Recall fundamental concepts of product design including life cycle stages, ergonomic principles, DFMA methods, value engineering techniques, and modern development processes	Remember
		CO2	Explain key product design strategies, man-machine interaction concepts, sustainable design principles, value analysis approaches, and concurrent engineering tools	Understand
		CO3	Utilize product design considerations, anthropometric data, assembly guidelines, value engineering checklists, and digital design tools (QFD/CAM) in practical design	Apply
		CO4	Evaluate product strategies against market needs, assess ergonomic designs, compare value engineering methods, and critique development plans	Analyze
		CO5	Develop innovative product concepts integrating ergonomic principles, manufacturing considerations, value optimization techniques, and modern design tools while addressing intellectual property requirements	Create

20E703CE	Essential of Road Safety Engineering	CO1	Understand Fundamental principles of road safety	Understand
		CO2	Analyse traffic safety data using statistical methods and engineering techniques	Analyze
		CO3	Apply Geometric design principles and integrate safety features into road infrastructure	Apply
		CO4	Master traffic management systems to enhance road safety	Understand
		CO5	Conduct road safety audits and develop comprehensive safety management	Understand
50E704EC	Industrial Electronics	CO1	Understand Industrial Semiconductor devices SCR, DIAC, TRIAC, and MOSFET	Understand
		CO2	Comprehend DC amplifiers, Operational amplifier and Instrumentation amplifier	Understand
		CO3	Design and analysis of DC to DC converters and DC to AC converters and different	apply
		CO4	Develop skills to build and troubleshoot power electronic circuits	apply
		CO5	Synthesis of PWM Inverters, UPS and Switched mode regulators	understand
6PC760E	FEA LAB	CO1	Describe the fundamental concepts of structural, thermal, and fluid analysis in static, dynamic, and thermal loading conditions using FEM tools.	Understand
		CO2	Perform simulations on mechanical components like beams, trusses, plates, and shells using 1D, 2D, and 3D elements for various types of loads.	Apply
		CO3	Interpret simulation results to assess stress distribution, deformation, natural frequencies, buckling modes, and heat transfer in mechanical structures.	Analyze
		CO4	Evaluate engineering designs under real-world boundary conditions using advanced analyses like modal, harmonic, buckling, thermal, and nonlinear simulations	Evaluate
		CO5	Develop optimized and innovative finite element models integrating structural, thermal, and fluid domains using coupled field and multiphysics approaches.	Create
6PC761ME	Automation and Robotics	CO1	Understand the fundamentals of robotic systems:	Understand
		CO2	Develop practical skills in robot design and programming:	Apply
		CO3	Apply theoretical in developing various path planning techniques.	Apply
		CO4	Illustrate the working of innovative robotic devices	Understand
		CO5	Apply simulation software to perform engineering analysis.	Apply

6PW752ME	Internship II	CO1	Able to design a small and simple product in hardware or software.	Create
		CO2	Able to complete the task or realize a pre specified target, with limited scope, rather than taking up a complex task and leave it.	Apply
		CO3	Able to learn to find alternate viable solutions for a given problem and evaluate these alternatives with reference to prespecified criteria	Evaluate
		CO4	Able to implement the selected solution and document the same	Apply
		CO5	Able to develop a small and simple product in hardware or software	Create

Dept. Assessment
Coordinator




Head of the Department



METHODIST

COLLEGE OF ENGINEERING & TECHNOLOGY

[Autonomous Institution]

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DEPARTMENT OF MECHANICAL ENGINEERING

BE VIII SEM COURSE OUTCOMES

A.Y: 2024-25

Code	Course Name	CO No.	Course Outcomes	Taxonomy Level
6PE818E	Autoation in Production System	CO1	Recall the basic ideas of automation like production systems, flow lines, assembly lines, inspection methods, and PLC parts.	remember
		CO2	Explain how automation works, how flow lines and assembly systems function, how inspections are done, and the basics of PLCs.	Understand
		CO3	Use automation concepts to study production systems, design flow lines, carry out assembly tasks, use inspection methods, and work with PLCs.	apply
		CO4	Check and compare different automation methods, flow line setups, assembly systems, inspection tools, and how PLCs work.	analyze
		CO5	Build full automation solutions using production systems, well-planned flow lines, balanced assembly systems, inspection setups, and working PLC programs.	evaluate
6PE821ME	ating Ventilation and Air Condition	CO1	Analyse the effects of relative humidity in building ventilation.	Analyzing
		CO2	Understand the necessity of indoor air quality and need for building Ventilation	Understanding
		CO3	Develop air conditioning system for summer and winter load calculation.	Applying
		CO4	Identifying the selection of outside and inside design conditions of air conditioning systems.	Applying
		CO5	Design an HVAC system for a residential or commercial building.	Creating
6PW853ME	Project Work	CO1	Demonstrate the ability to synthesize and apply the knowledge and skills acquired in the Academic program to the real-world problems	Apply
		CO2	Evaluate different solutions based on economic and technical feasibility	Evaluate
		CO3	Effectively plan a project and confidently perform all aspects of project management.	Analyze
		CO4	Demonstrate effective written and oral communication skills	Apply
		CO5	Present effective outcome/result of the research work carried out for the project	Evaluate

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