Department of Mechanical Engineering

Course Outcomes (COs)

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INSTITUTE OF TECHNOLOGY & MANAGEMENT
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Department of Mechanical Engineering

Academic Year 2022-23, 2023-24

B.Tech. ME 3rd Sem		
Course Code & Name	**Course Outcomes**	
BT 301/Engineering Mathematics 3	BT301.1	Ability to Understand and evaluate the zero of algebraic and transcendental equations, simultaneous linear equations with the help of Numerical Methods
	BT301.2	Understand the theoretical principles of numerical techniques and the associated error measures and apply them to find differentiation and integration when numerical values are given.
	BT301.3	Ability to remember operators and use them to estimate the value between the given set of data (interpolation) and hence, apply it to estimate various real-life scenarios.
	BT301.4	Analyse different types of statistical situations in which different probability distributions can be applied.
	BT301.5	Ability to analyse and evaluate the solution of ODE and PDE by using Laplace and Fourier Transform
ME 302/ Thermodynamics	ME302.1	Describe the basics of thermodynamics with heat and work interactions & solve the practical thermodynamic problems by applying first law and steady flow energy equation.
	ME302.2	Analyse the problems on heat engines, refrigeration, and entropy by applying second law of thermodynamics
	ME302.3	Evaluate the thermodynamic properties of the steam
	ME302.4	Evaluate the performance of air standard cycles
	ME302.5	Analyse the fuel combustion process and products of combustion.
ME 303/Materials Technology	ME303.1	Understand the crystal structure and classification of materials.

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	ME303.2	Understand and apply methods of determining mechanical properties and their suitability for applications.
	ME303.3	Interpret the phase diagrams of materials.
	ME303.4	Select suitable heat-treatment process to achieve desired properties of metals and alloys.
	ME303.5	Identify effect of alloying elements on properties of steels
ME 304/ Strength of Materials	ME304.1	Apply the principles of solid mechanics, to determine the behaviour of components for applied load.
	ME304.2	Compute the shear force and bending moment for different types of beams with various load condition and sketch the SF and BM diagram
	ME304.3	Calculate the strain energy, stress distribution & deformation in spring and shaft.
	ME304.4	Solve the problem in mechanical component using maximum normal stress & shear stress theory; maximum normal and shear strain energy theory; maximum distortion energy theory; application of theories to different materials and loading conditions.
	ME304.5	Solve the problem of column and struts application of theories to different materials and End conditions
ME 305/Manufacturing Process	ME305.1	Student will be able to understand about the Pattern & its types, various casting processes and technology related to them.
	ME305.2	Student will be able to classify various types of welding processes and can apply the techniques to do welding

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	ME305.3	Student will be able to identify and describes various forging techniques, sheet metal working processes and their applications to produce various shapes and product
	ME305.4	Student will be able to discuss about the rolling process, its techniques and related defects also be able to design a system, component, or process as per needs & Specification.
	ME305.5	Student will be able to analyse the function and operation of machine tool including lathe, drilling machine, shaper machine, planer machine, milling machine and grinding machine
ME 306/Thermal Engg lab	ME306.1	To describe construction, working & performance calculation of reciprocating air compressors.
	ME306.2	To understand the construction and working principles of Boilers with focus on High Pressure Boilers.
	ME306.3	To verify Laws of Thermodynamics.
BT 107/ Evaluation of Internship-I	BT107.1	Students will gain a fundamental understanding of the industrial environment, including safety protocols, workplace ethics, and the practical application of theoretical engineering concepts.
	BT107.1	Students will be able to apply basic engineering principles, such as measurement, units, and tolerances, to real-world industrial tasks and processes.
	BT107.1	Students will develop problem-solving and critical thinking skills through exposure to practical challenges and the need to find effective solutions within an industrial setting.
	BT107.1	Students will enhance their communication and teamwork abilities by interacting with colleagues, supervisors, and other professionals in a collaborative work environment.

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	BT107.1	CO5: Students will develop a professional attitude and work ethic, essential for success in the field of mechanical engineering, through hands-on experience and interaction with industry professionals
B. Tech. ME 4th Sem		
Course Code & Name	**Course Outcomes**	
ES 401/EEES	BT401.1	Identify and compare different energy resources and systems to analyse energy requirement issues.
	BT401.2	To apply the concept of ecosystem and assess the synergy between the components and functions of an ecosystem
	BT401.3	To demonstrate the critical analysing ability towards the biodiversity, its conservation and need for sustainable development.
	BT401.4	To interpret and summarized the concept of environmental pollution to recognize the need of environmental protection as a lifelong learning.
	BT401.5	To understand, classify and apply professional, social and environmental ethical principles.
ME 402/ Instrumentation and Control	ME402.1	Understand the basic concept of measurement and Static Characteristics of Instruments.
	ME402.2	Acquire knowledge dynamic characteristics of the measuring instruments.
	ME402.3	Learn the concept, Classification, and application of temperature measurement, pressure measurement and flow measurement.
	ME402.4	Able to understand the concept and working of Linear measurement and torque measurement.
	ME402.5	To acquire the knowledge of open-loop and closed-loop systems.

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ME 403/Theory of Machines	ME403.1	Explain different types of mechanisms and their inversions and can calculate their degrees of freedom
	ME403.2	Able to analyse the dynamic motion of mechanisms and machines.
	ME403.3	Able to design a cam for a specified follower motion.
	ME403.4	Students will be able to demonstrate how the power transmission operates
	ME403.5	Able to apply concept of gear terminologies for calculating velocity of gears in a gear train.
ME 404/Fluid Mechanics	ME404.1	Student will be able to state the various fluid properties and explain the mechanics of fluids at rest and in motion by observing the fluid phenomena
	ME404.2	Students will be able to apply various laws like Newton's law of viscosity Pascal's law; Hydro static law, etc. to estimate/calculate the viscosity, force of buoyancy on a partially or fully submerged body and Analyse the stability of a floating body, pressure & communicate the solutions of simple fluid-based engineering problems.
	ME404.3	The students should be able to compare different types of fluid flow and evaluate & drive the velocity and acceleration of the flowing fluids, Euler's Equation of motion and Deduce Bernoulli's equation
	ME404.4	Student will be able to compute Reynolds number, pressure gradient, head loss in turbulent flow (Darcey's equation), friction factor, minor losses, hydraulic and energy gradient etc
	ME404.5	Student will be able to understand description of boundary layer, boundary layer parameters, Von Karman momentum equation, laminar and turbulent boundary conditions, boundary layer separation, compressible flow, Mach number, isentropic flow, stagnation properties etc.

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ME 405/ Manufacturing Technology	ME405.1	Students will be able to describe cutting tool geometry, chip formation and select the right tool material to meet the cutting requirements.
	ME405.2	Students will be able to apply fundamental relations and theories like Merchant Circle theory, Taylor's Tool life equation etc. to estimate/calculate the various forces and power requirements in metal cutting operation, tool life, economic cutting speed etc.
	ME405.3	Students will be able to compare the various non-traditional machining processes and recommend the best process that satisfies a design requirement
	ME405.4	Students will be able to describe different gear manufacturing techniques and gear finishing operation.
	ME405.5	Students will be able to explain the principles of plastic moulding process hot and cold extrusion processes, tube extrusion, sawing, power hacksaw, band saw, circular saw, NC part programming, functions, and coordinate systems
ME 406/Software lab	ME406.1	To understand the role of computers in design and manufacture and drawing software, configuration, function and facilities, parametric representation, examples of drawings and systems.
	ME406.2	To understand the surface modelling, curves and surface representation – composite surfaces, case studies in CAD, parametric representation analytic and synthetic curves, surface manipulation, design and engineering applications.
	ME406.3	To acquire the knowledge of current developments in CAD, feature based modelling, design by feature.
	ME406.4	Ability to understand the Solid modelling, boundary representation, analytic solid modelling, constructive

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		solid geometry. sweep representation, design, and engineering applications.
	ME406.5	Recognize the strategic plan of CAD system design and development, graphic exchange, features recovery.
B.Tech. ME 5th Sem		
Course Code & Name	**Course Outcomes**	
ME 501/I.C. Engines	ME501.1	To Understand different types of engine cycles, it's working and also able to Understand various operating parameters.
	ME501.2	To understand the detailed combustion processes of SI Engines.
	ME501.3	To understand the detailed combustion processes of CI Engines.
	ME501.4	Analyse fuel supply systems, ignition, and governing systems of IC Engines.
	ME501.5	To understand the various methods and effects of turbo charging and supercharging.
ME 502/ Mechanical Vibration	ME502.1	Understand the Fundamentals of Mechanical Vibration.
	ME502.2	Apply different methods for formulating the equation of motion for free and damped vibratory system & their solution cases
	ME502.3	Analyse the response of rotating imbalance & harmonic excitations, and application in vibration isolations.
	ME502.4	To learn different methods for calculating principal modes of vibrations.
	ME502.5	Understand the Basic Phenomena of Sound & Noise.
ME 503/DOM	ME503.1	Understand the basic principles of mechanisms in mechanical systems

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	ME503.2	Apply static and dynamic analysis in simple mechanisms.
	ME503.3	Analyse balancing of rotating and reciprocating masses
	ME503.4	Recognize laws of friction and theories of friction.
	ME503.5	Understand the laws of brakes and dynamometers
ME 504/IE & Ergonomics	ME504.1	An Ability to apply productivity concepts in organizations and identify the importance of work study, method study concepts and identify its procedure and tools.
	ME504.2	Students will be able to rate a worker engaged on a live job and calculate basic, allowed, and standard time for the same.
	ME504.3	An Ability to analyse the existing methods of working for a particular job and develop an improved method through questioning technique.
	ME504.4	An ability to design a system, component, or process to meet accepted human factors and workplace ergonomics standards within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
	ME504.5	An Ability to understand the display systems and anthropometric data.
ME 505/FEM/CFD Lab	ME505.1	To apply the concept of FEM for computing the deflection and stress in 1D and and 2D Problems
	ME505.2	To analyse structural and thermal problem.
	ME505.3	To solve computational problems related to fluid flows.
	ME505.4	An ability to perform CFD analysis of square tube in Open-Foam
	ME505.5	To understand the fundamentals of Sci-Lab.

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ME 506/Python	ME506.1	Identify the basic datatypes, operators, variables, and functions.
	ME506.2	Ability to analyse the importance of object-oriented programming over structural programming.
	ME506.3	Determine the list, tuples, dictionary and set build in container data types.
	ME506.4	Able to Implement object-oriented database and Graphical user interface application using packages.
	ME506.5	Develop the ability to analyse and write database applications in Python programming.
BT 407/ Evaluation of Internship -II	BT407.1	To describe everyday operations of an agency or organization
	BT407.2	Students will be able to identify the ethical standards of behaviour for professionals and interims within the agency/organization
	BT407.3	Student will be able to focus on professional soft skills such as communication, punctuality, and time management
	BT407.4	Students will be able to manage various personal habits or a social skill to deal better with work situations
	BT407.5	Build a professional network that can be a resource for the student
ME 508/ Minor Project-I	ME508.1	Students should be able to use engineering concepts and instruments to envision, design, and analyse a mechanical system or component.
	ME508.2	Using pertinent theories and approaches, students should be able to recognize, evaluate, and resolve engineering challenges associated with the project.
	ME508.3	The project should be successfully managed by the students, showcasing their abilities in resource

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		management, project planning, and timetable adherence."
	ME508.4	Through technical reports, presentations, and documentation, students should successfully convey the goals of their projects as well as their techniques, findings, and conclusions.
	ME508.5	"Students should demonstrate creative and innovative methodology for project problem solution
B.Tech. ME 6th Sem		
Course Code & Name	**Course Outcomes**	
ME 601/TEGD	ME601.1	To understand principle, construction and working of different types of high-pressure boilers used in steam power plants & to perform the testing to find boiler efficiency and heat balance sheet.
	ME601.2	To understand principal and operation of vapour power cycles.
	ME601.3	Describe construction, working of various types of reciprocating and rotary Compressors with performance calculations of positive displacement compressors
	ME601.4	To understand the operation and design of condensers and cooling towers. To Understand the working of different types of steam nozzles and its applications, conditions for maximum discharge of steam through it
	ME601.5	Outline governing equations of compressible fluid flow & to understand concept of Mach number & Mach cone.
ME602/ Machine Component Design	ME602.1	To understand the Stress Concentration, Design Consideration for fatigue and Design for finite life for the machine components.
	ME602.2	Ability to design Shafts, Keys and Coupling for industrial applications.

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	ME602.3	Ability to design various Springs for strength and stiffness.
	ME602.4	Ability to design brakes and clutches.
	ME602.5	To achieve an expertise in design of Sliding contact bearing in industrial applications.
ME603/Turbo Machinery	ME603.1	Recognize typical designs of turbomachines and differentiate from positive displacement machines
	ME603.2	Explain the working principles of turbomachines and apply it to various types of machines
	ME603.3	Perform the preliminary design of turbomachines (pumps, compressors, turbines) on a 1-D basis
	ME603.4	Recognize relations between choices made early in the turbomachinery design process and the final components and operability
	ME603.5	Determine the off-design behaviour of turbines and compressors and relate it to changes in the velocity triangles
ME604/Renewable energy technology	ME604.1	To understand role significance of solar energy
	ME604.2	To provide importance of Wind Energy & Identify wind energy as alternate form of energy and to know how it can be tapped
	ME604.3	To Understand role of biogas & biomass, generation, and its impact on environment
	ME604.4	To Understand the role of micro, mini and small hydro system, tidal & ocean energy & its mechanism of production.
	ME604.5	To get the utilization of geothermal energy
ME605/CAD Lab	ME605.1	To apply usage of steps required for modelling 3D objects by using protrusion, cut, sweep, extrude commands.

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	ME605.2	To apply usage of steps required for modelling 3D objects by using protrusion, cut, sweep, extrude commands.
	ME605.3	To apply usage of steps required for modelling 3D objects by using protrusion, cut, sweep, extrude commands.
ME606/RDBMS	ME606.1	Understand and apply the principles of normalization to design efficient database schemas, ensuring minimal redundancy and improved data integrity by mastering the various forms of normalization including 1NF, 2NF, 3NF, BCNF, 4NF, and 5NF
	ME606.2	Analyse and understand the process of query processing, and implement effective query optimization strategies to enhance database performance, including indexing, query rewriting, cost-based optimization, join optimization, and materialized views.
	ME606.3	Develop proficiency in the study and application of object-oriented and object-relational database management systems, leveraging advanced features such as user-defined types, inheritance, and polymorphism to model complex data structures and relationships effectively.
	ME606.4	Acquire the skills to effectively use the open-source data mining tool WEKA for data analysis and predictive modelling, including data preprocessing, classification, clustering, and association rule mining, to extract meaningful insights from large datasets.
	ME606.5	Gain practical experience in developing and managing web databases using PHP, including establishing database connections, performing CRUD operations, implementing secure data

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		handling practices, and integrating dynamic database-driven content into web applications.
ME 608/Minor Project II	ME608.1	Students should demonstrate the ability to conceptualize, design, and analyse a mechanical system or component using engineering principles and tools.
	ME608.2	Students should be able to identify, analyse, and solve engineering problems related to the project, applying relevant theories and methodologies.
	ME608.3	Students should manage the project effectively, demonstrating skills in project planning, resource management, and adherence to timelines.
	ME608.4	Students should communicate project objectives, methodologies, findings, and conclusions effectively through technical reports, presentations, and documentation
	ME608.5	Students should demonstrate creativity and innovation in proposing and implementing solutions, considering ethical implications in engineering practice
B. Tech. ME 7th Sem		
Course Code & Name	**Course Outcomes**	
ME 701/HMT	ME701.1	To Know about the basic concept of heat transfer and its modes.
	ME701.2	To solve problems based on conduction, convection, and radiation
	ME701.3	To differentiate the modes of heat transfer i.e. conduction, convection, and radiation
	ME701.4	To Understand the working principle and types of heat exchanger

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	ME701.5	To Understand the concept of boiling and condensation, mass transfer
ME702/ Power Plant Engineering	ME702.1	Understand the conversion of renewable energy system into electrical power.
	ME702.2	Design & enhance the performance of fossil fuel-based power plant.
	ME702.3	Analyse the nuclear power plant and its safety.
	ME702.4	Design & enhance the performance of hydro-based power plant.
	ME702.5	Determine economics of the power plant of renewable and non-renewable / nuclear power system.
ME703/OR and Supply Chain	ME703.1	To apply the concept of OR Techniques and optimization methods.
	ME703.2	To predict the role of logistics in the supply chain within a focal firm as well as between organizations linked within a given supply chain network
	ME703.3	To apply various inventory control techniques in practice.
	ME703.4	To estimate system performance using waiting line model and competitive strategy.
	ME703.5	To apply idea of the decision making in network analysis and meta-heuristic algorithm
ME704/CAD/CAM/CIM	ME704.1	Able to use of CAM software for writing CNC programs.
	ME704.2	To Study of automatic and semi automatic control system and writing the electrical analogy.
	ME704.3	Able to writing M & G codes for given operations.
	ME704.4	To implement the modelling and simulation of computer integrated manufacturing system

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	ME704.5	Understand the concept of remote monitoring and operation of Computer integrated manufacturing system
ME705/MATLAB	ME705.1	To study MATLAB environment, data types, variables, operators, and assignment statements in MATLAB and able to use MATLAB for interactive computations
	ME705.2	To implement the arithmetic operations and familiar with vector, matrices and array and their use.
	ME705.3	Able to use basic flow controls (if-else, for, while) to implement the control structures in MATLAB. Able to program scripts and functions using the MATLAB development environment and generate plots and export this for use in reports and presentations.
	ME705.4	Able to learn how to program in R, how to use R for effective data analysis, how to install and configure software necessary for a statistical programming environment and describe generic programming language concepts. Handle practical issues in statistical computing.
ME706 /Major Project-I	ME706.1	To provide students with a comprehensive platform to apply their acquired knowledge from various courses.
	ME706.2	To cultivate an inquisitive mindset and foster confidence in students through engagement with real-world challenges.
	ME706.3	To offer students opportunities for creative expression and to simulate authentic workplace experiences within the academic environment.
	ME706.4	To equip students with the ability to adapt to emerging trends and independently address novel challenges.
	ME706.5	To enhance students' communication and presentation skills.

ME 607/ Evaluation of Internship-III	ME607.1	Students will apply theoretical concepts learned in the classroom to real-world engineering problems and processes.
	ME607.2	Students will gain hands-on experience in various mechanical engineering disciplines and develop practical skills relevant to the industry
	ME607.3	Students will enhance their professional communication, teamwork, and problem-solving abilities through interactions with industry professionals.
	ME607.4	Students will develop an understanding of current industry practices, technologies, and trends to prepare for future career opportunities
	ME607.5	Students will participate in or lead small-scale engineering projects, demonstrating their ability to manage tasks, meet deadlines, and deliver results.
B. Tech. ME 8th Sem		
Course Code & Name	**Course Outcomes**	
ME 801/RAC	ME801.1	Illustrate the fundamental principles and applications of refrigeration and air conditioning system
	ME801.2	Obtain cooling capacity and coefficient of performance by conducting test on vapour compression refrigeration systems
	ME801.3	Present the properties, applications, and environmental issues of different refrigerants.
	ME801.4	Calculate cooling load for air conditioning systems used for various
	ME801.5	Operate and analyse the refrigeration and air conditioning systems

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ME802/ Power Plant Engineering	ME802.1	To apply the various types of chassis, frame and functions of IC engine parts
	ME802.2	To analyse the working of steering system in vehicles.
	ME802.3	To Distinguish between the manual transmissions systems with automatic transmission systems
	ME802.4	To demonstrate how the brakes and the suspension system operate
	ME802.5	To familiarize students with electrical accessories, Emission standards and pollution control in automobile
ME803/ECMA	ME803.1	Understand the concepts of energy management and conservation.
	ME803.2	Able to conduct energy audit and report.
	ME803.3	Concepts of Energy policy its purpose and formation.
	ME803.4	Able to do Electrical Energy Management in different electrical systems
	ME803.5	Ability to analyse the viability of energy conservation projects
ME804/Simulation & Modelling	ME804.1	To apply usage of steps required for modelling 3D objects by using protrusion, cut, sweep, extrude commands and analysis of any object by ANSYS.
	ME804.2	To find Stress analysis and thermal stresses and heat transfer effect.
	ME804.3	To apply the concepts of CFD simulation of various object.
ME805/Project	ME805.1	To provide students with a comprehensive experience for applying the knowledge gained so far by studying various courses.

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	ME805.2	To develop an inquiring aptitude and build confidence among students by working on solutions of small industrial problems.
	ME805.3	To give students an opportunity to do something creative and to assimilate real life work situation in institution.
	ME805.4	To adapt students for latest developments and to handle independently new situations
	ME805.5	To develop good expressions power and presentation abilities in students

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Department of Mechanical Engineering

Academic Year 2020-21, 2021-22

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	ME303.3	Interpret the phase diagrams of materials.
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	ME305.5	Student will be able to analyse the function and operation of machine tool including lathe, drilling machine, shaper machine, planer machine, milling machine and grinding machine
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	BT107.4	Students will enhance their communication and teamwork abilities by interacting with colleagues, supervisors, and other professionals in a collaborative work environment.
	BT107.5	Students will develop a professional attitude and work ethic, essential for success in the field of mechanical engineering, through hands-on experience and interaction with industry professionals
B. Tech. ME 4th Sem		
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	ME402.5	To acquire the knowledge of open-loop and closed-loop systems.
ME-403/Theory of Machines	ME403.1	Explain different types of mechanisms and their inversions and can calculate their degrees of freedom
	ME403.2	Able to analyse the dynamic motion of mechanisms and machines.
	ME403.3	Able to design a cam for a specified follower motion.
	ME403.4	Students will be able to demonstrate how the power transmission operates

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	ME403.5	Able to apply concept of gear terminologies for calculating velocity of gears in a gear train.
ME-404/Fluid Mechanics	ME404.1	Student will be able to state the various fluid properties and explain the mechanics of fluids at rest and in motion by observing the fluid phenomena
	ME404.2	Students will be able to apply various laws like Newton's law of viscosity Pascal's law; Hydro static law, etc. to estimate/calculate the viscosity, force of buoyancy on a partially or fully submerged body and Analyse the stability of a floating body, pressure & communicate the solutions of simple fluid based engineering problems.
	ME404.3	The students should be able to compare different types of fluid flow and evaluate & drive the velocity and acceleration of the flowing fluids, Euler's Equation of motion and Deduce Bernoulli's equation
	ME404.4	Student will be able to compute Reynolds number, pressure gradient, head loss in turbulent flow (Darcey's equation), friction factor, minor losses, hydraulic and energy gradient etc
	ME404.5	Student will be able to understand description of boundary layer, boundary layer parameters, Von Karman momentum equation, laminar and turbulent boundary conditions, boundary layer separation, compressible flow, Mach number, isentropic flow, stagnation properties etc.
ME-405/ Manufacturing Technology	ME405.1	Students will be able to describe cutting tool geometry, chip formation and select the right tool material to meet the cutting requirements.
	ME405.2	Students will be able to apply fundamental relations and theories like Merchant Circle theory, Taylor's Tool life equation etc. to estimate/calculate the various forces and power requirements in metal cutting operation, tool life, economic cutting speed etc.

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	ME405.3	Students will be able to compare the various non-traditional machining processes and recommend the best process that satisfies a design requirement
	ME405.4	Students will be able to describe different gear manufacturing techniques and gear finishing operation.
	ME405.5	Students will be able to explain the principles of plastic moulding process hot and cold extrusion processes, tube extrusion, sawing, power hacksaw, band saw, circular saw, NC part programming, functions, and coordinate systems
ME-406/Software lab	ME406.1	To understand the role of computers in design and manufacture and drawing software, configuration, function and facilities, parametric representation, examples of drawings and systems.
	ME406.2	To understand the surface modelling, curves and surface representation – composite surfaces, case studies in CAD, parametric representation analytic and synthetic curves, surface manipulation, design and engineering applications.
	ME406.3	To acquire the knowledge of current developments in CAD, feature based modelling, design by feature.
	ME406.4	Ability to understand the Solid modelling, boundary representation, analytic solid modelling, constructive solid geometry. sweep representation, design, and engineering applications.
	ME406.5	Recognize the strategic plan of CAD system design and development, graphic exchange, features recovery.
B. Tech ME 5th Sem		
Course Code & Name	**Course Outcomes**	
ME 501/I.C. Engines	ME501.1	To Understand different types of engine cycles, it's working and also able to Understand various operating parameters.

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	ME501.2	To understand the detailed combustion processes of SI Engines.
	ME501.3	To understand the detailed combustion processes of CI Engines.
	ME501.4	Analyse fuel supply systems, ignition, and governing systems of IC Engines.
	ME501.5	To understand the various methods and effects of turbo charging and supercharging.
ME-502/ Mechanical Vibration	ME502.1	Understand the Fundamentals of Mechanical Vibration.
	ME502.2	Apply different methods for formulating the equation of motion for free and damped vibratory system & their solution cases
	ME502.3	Analyse the response of rotating imbalance & harmonic excitations, and application in vibration isolations.
	ME502.4	To learn different methods for calculating principal modes of vibrations.
	ME502.5	Understand the Basic Phenomena of Sound & Noise.
ME-503/DOM	ME503.1	Understand the basic principles of mechanisms in mechanical systems
	ME503.2	Apply static and dynamic analysis in simple mechanisms.
	ME503.3	Analyse balancing of rotating and reciprocating masses
	ME503.4	Recognize laws of friction and theories of friction.
	ME503.5	Understand the laws of brakes and dynamometers
ME-504/IE & Ergonomics	ME504.1	An Ability to apply productivity concepts in organizations and identify the importance of work study, method study concepts and identify its procedure and tools.
	ME504.2	Students will be able to rate a worker engaged on a live job and calculate basic, allowed, and standard time for the same.

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	ME504.3	An Ability to analyse the existing methods of working for a particular job and develop an improved method through questioning technique.
	ME504.4	An ability to design a system, component, or process to meet accepted human factors and workplace ergonomics standards within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
	ME504.5	An Ability to understand the display systems and anthropometric data.
ME 505/FEM/CFD Lab	ME505.1	To apply the concept of FEM for computing the deflection and stress in 1D and 2D Problems
	ME505.2	To analyse structural and thermal problem.
	ME505.3	To solve computational problems related to fluid flows.
	ME505.4	An ability to perform CFD analysis of square tube in Open-Foam
	ME505.5	To understand the fundamentals of Sci-Lab.
ME 506/Python	ME506.1	Identify the basic datatypes, operators, variables, and functions.
	ME506.2	Ability to analyse the importance of object-oriented programming over structural programming.
	ME506.3	Determine the list, tuples, dictionary and set build in container data types.
	ME506.4	Able to Implement object-oriented database and Graphical user interface application using packages.
	ME506.5	Develop the ability to analyse and write database applications in Python programming.
BT 407/ Evaluations of Internship -II	BT407.1	To describe everyday operations of an agency or organization

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	BT407.2	Students will be able to identify the ethical standards of behaviour for professionals and interims within the agency/organization
	BT407.3	Student will be able to focus on professional soft skills such as communication, punctuality, and time management
	BT407.4	Students will be able to manage various personal habits or a social skill to deal better with work situations
	BT407.5	Build a professional network that can be a resource for the student
ME 508/ Minor Project-I	ME508.1	Students should be able to use engineering concepts and instruments to envision, design, and analyse a mechanical system or component.
	ME508.2	Using pertinent theories and approaches, students should be able to recognize, evaluate, and resolve engineering challenges associated with the project.
	ME508.3	The project should be successfully managed by the students, showcasing their abilities in resource management, project planning, and timetable adherence."
	ME508.4	Through technical reports, presentations, and documentation, students should successfully convey the goals of their projects as well as their techniques, findings, and conclusions.
	ME508.5	"Students should demonstrate creative and innovative methodology for project problem solution
B.Tech. ME 6th Sem		
Course Code & Name	**Course Outcomes**	
ME 601/TEGD	ME601.1	To understand principle, construction and working of different types of high-pressure boilers used in steam power

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		plants & to perform the testing to find boiler efficiency and heat balance sheet.
	ME601.2	To understand principal and operation of vapour power cycles.
	ME601.3	Describe construction, working of various types of reciprocating and rotary Compressors with performance calculations of positive displacement compressors
	ME601.4	To understand the operation and design of condensers and cooling towers. To Understand the working of different types of steam nozzles and its applications, conditions for maximum discharge of steam through it
	ME601.5	Outline governing equations of compressible fluid flow & to understand concept of Mach number & Mach cone.
ME 602/ Machine Component Design	ME602.1	To understand the Stress Concentration, Design Consideration for fatigue and Design for finite life for the machine components.
	ME602.2	Ability to design Shafts, Keys and Coupling for industrial applications.
	ME602.3	Ability to design various Springs for strength and stiffness.
	ME602.4	Ability to design brakes and clutches.
	ME602.5	To achieve an expertise in design of Sliding contact bearing in industrial applications.
ME 603/Turbo Machinery	ME603.1	Recognize typical designs of turbomachines and differentiate from positive displacement machines
	ME603.2	Explain the working principles of turbomachines and apply it to various types of machines
	ME603.3	Perform the preliminary design of turbomachines (pumps, compressors, turbines) on a 1-D basis

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	ME603.4	Recognize relations between choices made early in the turbomachinery design process and the final components and operability
	ME603.5	Determine the off-design behaviour of turbines and compressors and relate it to changes in the velocity triangles
ME 604/Renewable energy technology	ME604.1	To understand role significance of solar energy
	ME604.2	To provide importance of Wind Energy & Identify wind energy as alternate form of energy and to know how it can be tapped
	ME604.3	To Understand role of biogas & biomass, generation and its impact on environment
	ME604.4	To Understand the role of micro, mini and small hydro system, tidal & ocean energy & its mechanism of production.
	ME604.5	To get the utilization of geothermal energy
ME 605/CAD Lab	ME605.1	To apply usage of steps required for modelling 3D objects by using protrusion, cut, sweep, extrude commands.
	ME605.2	To apply usage of steps required for modelling 3D objects by using protrusion, cut, sweep, extrude commands.
	ME605.3	To apply usage of steps required for modelling 3D objects by using protrusion, cut, sweep, extrude commands.
ME 606/RDBMS	ME606.1	Understand and apply the principles of normalization to design efficient database schemas, ensuring minimal redundancy and improved data integrity by mastering the various forms of normalization including 1NF, 2NF, 3NF, BCNF, 4NF, and 5NF
	ME606.2	Analyse and understand the process of query processing, and implement effective query optimization strategies to enhance database performance, including indexing, query rewriting, cost-based optimization, join optimization, and materialized views.

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	ME606.3	Develop proficiency in the study and application of object-oriented and object-relational database management systems, leveraging advanced features such as user-defined types, inheritance, and polymorphism to model complex data structures and relationships effectively.
	ME606.4	Acquire the skills to effectively use the open-source data mining tool WEKA for data analysis and predictive modelling, including data preprocessing, classification, clustering, and association rule mining, to extract meaningful insights from large datasets.
	ME606.5	Gain practical experience in developing and managing web databases using PHP, including establishing database connections, performing CRUD operations, implementing secure data handling practices, and integrating dynamic database-driven content into web applications.
ME 608 / Minor Project-II	ME608.1	Students should demonstrate the ability to conceptualize, design, and analyse a mechanical system or component using engineering principles and tools.
	ME608.2	Students should be able to identify, analyse, and solve engineering problems related to the project, applying relevant theories and methodologies.
	ME608.3	Students should manage the project effectively, demonstrating skills in project planning, resource management, and adherence to timelines.
	ME608.4	Students should communicate project objectives, methodologies, findings, and conclusions effectively through technical reports, presentations, and documentation

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	ME608.5	Students should demonstrate creativity and innovation in proposing and implementing solutions, considering ethical implications in engineering practice
B. Tech. ME 7th Sem		
Course Code & Name	**Course Outcomes**	
ME 701/HMT	ME701.1	To Know about the basic concept of heat transfer and its modes.
	ME701.2	To solve problems based on conduction, convection, and radiation
	ME701.3	To differentiate the modes of heat transfer i.e. conduction, convection, and radiation
	ME701.4	To Understand the working principle and types of heat exchanger
	ME701.5	To Understand the concept of boiling and condensation, mass transfer
ME 702/ Advanced Machining Process	ME702.1	To understand the basic concept of mechanical processes like ultrasonic machining, abrasive jet machining, and water jet machining.
	ME702.2	To Acquire the knowledge of Electrochemical and chemical metal removal processes.
	ME702.3	To Learn the concept of Thermal metal removal processes like Electric discharge machining [EDM], spark erosion, mechanism of metal removal, spark erosion generator and electrode feed control
	ME702.4	To Understand the concept and working of Rapid prototyping fabrication methods like Fundamentals, technologies, applications, principles and working of 3D printing, subtractive v/s additive manufacturing process.

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	ME702.5	To Acquire the knowledge of Technologies of micro fabrication; Types of micro system devices, industrial applications, micro fabrication processes, LIGA process. Technologies of Nano fabrication, importance of size, scanning probe microscope, carbon Bucky balls and Nano tubes, Nano fabrication processes.
ME 703/OR and Supply Chain	ME703.1	To apply the concept of OR Techniques and optimization methods.
	ME703.2	To predict the role of logistics in the supply chain within a focal firm as well as between organizations linked within a given supply chain network
	ME703.3	To apply various inventory control techniques in practice.
	ME703.4	To estimate system performance using waiting line model and competitive strategy.
	ME703.5	To apply idea of the decision making in network analysis and meta-heuristic algorithm
ME 704/CAD/CAM/CIM	ME704.1	Able to use of CAM software for writing CNC programs.
	ME704.2	To Study of automatic and semi-automatic control system and writing the electrical analogy.
	ME704.3	Able to writing M & G codes for given operations.
	ME704.4	To implement the modelling and simulation of computer integrated manufacturing system
	ME704.5	Understand the concept of remote monitoring and operation of Computer integrated manufacturing system
ME 705/MATLAB	ME705.1	To study MATLAB environment, data types, variables, operators, and assignment statements in MATLAB and able to use MATLAB for interactive computations
	ME705.2	To implement the arithmetic operations and familiar with vector, matrices and array and their use.

	ME705.3	Able to use basic flow controls (if-else, for, while) to implement the control structures in MATLAB. Able to program scripts and functions using the MATLAB development environment and generate plots and export this for use in reports and presentations.
	ME705.4	Able to learn how to program in R, how to use R for effective data analysis, how to install and configure software necessary for a statistical programming environment and describe generic programming language concepts. Handle practical issues in statistical computing.
ME 706/ Major Project-I	ME706.1	To provide students with a comprehensive platform to apply their acquired knowledge from various courses.
	ME706.2	To cultivate an inquisitive mindset and foster confidence in students through engagement with real-world challenges.
	ME706.3	To offer students opportunities for creative expression and to simulate authentic workplace experiences within the academic environment.
	ME706.4	To equip students with the ability to adapt to emerging trends and independently address novel challenges.
	ME706.5	To enhance students' communication and presentation skills.
ME 607/ Evaluation of Internship-III	ME607.1	Students will apply theoretical concepts learned in the classroom to real-world engineering problems and processes.
	ME607.2	Students will gain hands-on experience in various mechanical engineering disciplines and develop practical skills relevant to the industry
	ME607.3	Students will enhance their professional communication, teamwork, and problem-solving abilities through interactions with industry professionals.

	ME607.4	Students will develop an understanding of current industry practices, technologies, and trends to prepare for future career opportunities
	ME607.5	Students will participate in or lead small-scale engineering projects, demonstrating their ability to manage tasks, meet deadlines, and deliver results.

B. Tech. ME 8th Sem		
Course Code & Name	**Course Outcomes**	
ME 801/RAC	ME801.1	Illustrate the fundamental principles and applications of refrigeration and air conditioning system
	ME801.2	Obtain cooling capacity and coefficient of performance by conducting test on vapour compression refrigeration systems
	ME801.3	Present the properties, applications, and environmental issues of different refrigerants.
	ME801.4	Calculate cooling load for air conditioning systems used for various
	ME801.5	Operate and analyse the refrigeration and air conditioning systems
ME 802/ Power Plant Engineering	ME802.1	To apply the various types of chassis, frame, and functions of IC engine parts
	ME802.2	To analyse the working of steering system in vehicles.
	ME802.3	To Distinguish between the manual transmissions systems with automatic transmission systems
	ME802.4	To demonstrate how the brakes and the suspension system operate
	ME802.5	To familiarize students with electrical accessories, Emission standards and pollution control in automobile

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ME 803/ECMA	ME803.1	Understand the concepts of energy management and conservation.
	ME803.2	Able to conduct energy audit and report.
	ME803.3	Concepts of Energy policy its purpose and formation.
	ME803.4	Able to do Electrical Energy Management in different electrical systems
	ME803.5	Ability to analyse the viability of energy conservation projects
ME 804/Simulation & Modelling	ME804.1	To apply usage of steps required for modelling 3D objects by using protrusion, cut, sweep, extrude commands and analysis of any object by ANSYS.
	ME804.2	To find Stress analysis and thermal stresses and heat transfer effect.
	ME804.3	To apply the concepts of CFD simulation of various object.
ME 805/Project	ME805.1	To provide students with a comprehensive experience for applying the knowledge gained so far by studying various courses.
	ME805.2	To develop an inquiring aptitude and build confidence among students by working on solutions of small industrial problems.
	ME805.3	To give students an opportunity to do something creative and to assimilate real life work situation in institution.
	ME805.4	To adapt students for latest developments and to handle independently new situations
	ME805.5	To develop good expressions power and presentation abilities in students

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Department of Mechanical Engineering

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B.Tech. ME 3rd Sem		
Course Code & Name	**Course Outcomes**	
BT301/ Engineering Mathematics 3	BT301.1	Ability to Understand and evaluate the zero of algebraic and transcendental equations, simultaneous linear equations with the help of Numerical Methods
	BT301.2	Understand the theoretical principles of numerical techniques and the associated error measures and apply them to find differentiation and integration when numerical values are given.
	BT301.3	Ability to remember operators and use them to estimate the value between the given set of data (interpolation) and hence, apply it to estimate various real-life scenarios.
	BT301.4	Analyse different types of statistical situations in which different probability distributions can be applied.
	BT301.5	Ability to analyse and evaluate the solution of ODE and PDE by using Laplace and Fourier Transform
ME 302/ Thermodynamics	ME302.1	Describe the basics of thermodynamics with heat and work interactions & solve the practical thermodynamic problems by applying first law and steady flow energy equation.
	ME302.2	Analyse the problems on heat engines, refrigeration, and entropy by applying second law of thermodynamics
	ME302.3	Evaluate the thermodynamic properties of the steam
	ME302.4	Evaluate the performance of air standard cycles
	ME302.5	Analyse the fuel combustion process and products of combustion.
ME 303/	ME303.1	Understand the crystal structure and classification of materials.

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Materials Technology	ME303.2	Understand and apply methods of determining mechanical properties and their suitability for applications.
	ME303.3	Interpret the phase diagrams of materials.
	ME303.4	Select suitable heat-treatment process to achieve desired properties of metals and alloys.
	ME303.5	Identify effect of alloying elements on properties of steels
ME 304/ Strength of Materials	ME304.1	Apply the principles of solid mechanics, to determine the behaviour of components for applied load.
	ME304.2	Compute the shear force and bending moment for different types of beams with various load condition and sketch the SF and BM diagram
	ME304.3	Calculate the strain energy, stress distribution & deformation in spring and shaft.
	ME304.4	Solve the problem in mechanical component using maximum normal stress & shear stress theory; maximum normal and shear strain energy theory; maximum distortion energy theory; application of theories to different materials and loading conditions.
	ME304.5	Solve the problem of column and struts application of theories to different materials and End conditions
ME305/ Manufacturing Process	ME305.1	Student will be able to understand about the Pattern & its types, various casting processes and technology related to them.
	ME305.2	Student will be able to classify various types of welding processes and can apply the techniques to do welding
	ME305.3	Student will be able to identify and describes various forging techniques, sheet metal working processes and their applications to produce various shapes and product

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	ME305.4	Student will be able to discuss about the rolling process, its techniques and related defects also be able to design a system, component, or process as per needs & Specification.
	ME305.5	Student will be able to analyse the function and operation of machine tool including lathe, drilling machine, shaper machine, planer machine, milling machine and grinding machine
ME306/ Thermal Engg lab	ME306.1	To describe construction, working & performance calculation of reciprocating air compressors.
	ME306.2	To understand the construction and working principles of Boilers with focus on High Pressure Boilers.
	ME306.3	To verify Laws of Thermodynamics.
BT 107 Evaluation of Internship-I	BT 107.1	Students will gain a fundamental understanding of the industrial environment, including safety protocols, workplace ethics, and the practical application of theoretical engineering concepts.
	BT 107.2	Students will be able to apply basic engineering principles, such as measurement, units, and tolerances, to real-world industrial tasks and processes.
	BT 107.2	Students will develop problem-solving and critical thinking skills through exposure to practical challenges and the need to find effective solutions within an industrial setting.
	BT 107.2	Students will enhance their communication and teamwork abilities by interacting with colleagues, supervisors, and other professionals in a collaborative work environment.
	BT 107.2	Students will develop a professional attitude and work ethic, essential for success in the field of mechanical engineering, through hands-on experience and interaction with industry professionals
B. Tech. ME 4th Sem		

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Department of Mechanical Engineering

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Course Code & Name	Course Outcomes	
ES 401/EEES	BT401.1	Identify and compare different energy resources and systems to analyse energy requirement issues.
	BT401.2	To apply the concept of ecosystem and assess the synergy between the components and functions of an ecosystem
	BT401.3	To demonstrate the critical analysing ability towards the biodiversity, its conservation and need for sustainable development.
	BT401.4	To interpret and summarized the concept of environmental pollution to recognize the need of environmental protection as a lifelong learning.
	BT401.5	To understand, classify and apply professional, social and environmental ethical principles.
ME402/ Instrumentation and Control	ME402.1	Understand the basic concept of measurement and Static Characteristics of Instruments.
	ME402.2	Acquire knowledge dynamic characteristics of the measuring instruments.
	ME402.3	Learn the concept, Classification, and application of temperature measurement, pressure measurement and flow measurement.
	ME402.4	Able to understand the concept and working of Linear measurement and torque measurement.
	ME402.5	To acquire the knowledge of open-loop and closed-loop systems.
ME403/Theory of Machines	ME403.1	Explain different types of mechanisms and their inversions and can calculate their degrees of freedom
	ME403.2	Able to analyse the dynamic motion of mechanisms and machines.

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	ME403.3	Able to design a cam for a specified follower motion.
	ME403.4	Students will be able to demonstrate how the power transmission operates
	ME403.5	Able to apply concept of gear terminologies for calculating velocity of gears in a gear train.
ME404/Fluid Mechanics	ME404.1	Student will be able to state the various fluid properties and explain the mechanics of fluids at rest and in motion by observing the fluid phenomena
	ME404.2	Students will be able to apply various laws like Newton's law of viscosity Pascal's law; Hydro static law, etc. to estimate/calculate the viscosity, force of buoyancy on a partially or fully submerged body and Analyse the stability of a floating body, pressure & communicate the solutions of simple fluid-based engineering problems.
	ME404.3	The students should be able to compare different types of fluid flow and evaluate & drive the velocity and acceleration of the flowing fluids, Euler's Equation of motion and Deduce Bernoulli's equation
	ME404.4	Student will be able to compute Reynolds number, pressure gradient, head loss in turbulent flow (Darcey's equation), friction factor, minor losses, hydraulic and energy gradient etc
	ME404.5	Student will be able to understand description of boundary layer, boundary layer parameters, Von Karman momentum equation, laminar and turbulent boundary conditions, boundary layer separation, compressible flow, Mach number, isentropic flow, stagnation properties etc.
ME405/ Manufacturing Technology	ME405.1	Students will be able to describe cutting tool geometry, chip formation and select the right tool material to meet the cutting requirements.
	ME405.2	Students will be able to apply fundamental relations and theories like Merchant Circle theory, Taylor's Tool life equation etc. to estimate/calculate the various forces and

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		power requirements in metal cutting operation, tool life, economic cutting speed etc.
	ME405.3	Students will be able to compare the various non-traditional machining processes and recommend the best process that satisfies a design requirement
	ME405.4	Students will be able to describe different gear manufacturing techniques and gear finishing operation.
	ME405.5	Students will be able to explain the principles of plastic moulding process hot and cold extrusion processes, tube extrusion, sawing, power hacksaw, band saw, circular saw, NC part programming, functions, and coordinate systems
ME406/Software lab	ME406.1	To understand the role of computers in design and manufacture and drawing software, configuration, function and facilities, parametric representation, examples of drawings and systems.
	ME406.2	To understand the surface modelling, curves, and surface representation – composite surfaces, case studies in CAD, parametric representation analytic and synthetic curves, surface manipulation, design and engineering applications.
	ME406.3	To acquire the knowledge of current developments in CAD, feature based modelling, design by feature.
	ME406.4	Ability to understand the Solid modelling, boundary representation, analytic solid modelling, constructive solid geometry. sweep representation, design, and engineering applications.
	ME406.5	Recognize the strategic plan of CAD system design and development, graphic exchange, features recovery.
B. Tech. ME 5th Sem		
Course Code & Name	**Course Outcomes**	

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ME 501/I.C. Engines	ME501.1	To Understand different types of engine cycles, it's working and also able to Understand various operating parameters.
	ME501.2	To understand the detailed combustion processes of SI Engines.
	ME501.3	To understand the detailed combustion processes of CI Engines.
	ME501.4	Analyse fuel supply systems, ignition, and governing systems of IC Engines.
	ME501.5	To understand the various methods and effects of turbo charging and supercharging.
ME 502/ Mechanical Vibration	ME502.1	Understand the Fundamentals of Mechanical Vibration.
	ME502.2	Apply different methods for formulating the equation of motion for free and damped vibratory system & their solution cases
	ME502.3	Analyse the response of rotating imbalance & harmonic excitations, and application in vibration isolations.
	ME502.4	To learn different methods for calculating principal modes of vibrations.
	ME502.5	Understand the Basic Phenomena of Sound & Noise.
ME 503/DOM	ME503.1	Understand the basic principles of mechanisms in mechanical systems
	ME503.2	Apply static and dynamic analysis in simple mechanisms.
	ME503.3	Analyse balancing of rotating and reciprocating masses
	ME503.4	Recognize laws of friction and theories of friction.
	ME503.5	Understand the laws of brakes and dynamometers
ME 504/IE & Ergonomics	ME504.1	An Ability to apply productivity concepts in organizations and identify the importance of work study, method study concepts and identify its procedure and tools.

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	ME504.2	Students will be able to rate a worker engaged on a live job and calculate basic, allowed, and standard time for the same.
	ME504.3	An Ability to analyse the existing methods of working for a particular job and develop an improved method through questioning technique.
	ME504.4	An ability to design a system, component, or process to meet accepted human factors and workplace ergonomics standards within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
	ME504.5	An Ability to understand the display systems and anthropometric data.
ME505/FEM/CFD Lab	ME505.1	To apply the concept of FEM for computing the deflection and stress in 1D and 2D Problems
	ME505.2	To analyse structural and thermal problem.
	ME505.3	To solve computational problems related to fluid flows.
	ME505.4	An ability to perform CFD analysis of square tube in Open-Foam
	ME505.5	To understand the fundamentals of Sci-Lab.
ME506/Python	ME506.1	Identify the basic datatypes, operators, variables, and functions.
	ME506.2	Ability to analyse the importance of object-oriented programming over structural programming.
	ME506.3	Determine the list, tuples, dictionary and set build in container data types.
	ME506.4	Able to Implement object-oriented database and Graphical user interface application using packages.
	ME506.5	Develop the ability to analyse and write database applications in Python programming.

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BT 407/ Evaluation of Internship -II	BT 407.1	To describe everyday operations of an agency or organization
	BT 407.2	Students will be able to identify the ethical standards of behaviour for professionals and interims within the agency/organization
	BT 407.2	Student will be able to focus on professional soft skills such as communication, punctuality, and time management
	BT 407.2	Students will be able to manage various personal habits or a social skill to deal better with work situations
	BT 407.2	Build a professional network that can be a resource for the student
ME 508/ Minor Project-I	ME508.1	Students should be able to use engineering concepts and instruments to envision, design, and analyse a mechanical system or component.
	ME508.2	Using pertinent theories and approaches, students should be able to recognize, evaluate, and resolve engineering challenges associated with the project.
	ME508.3	The project should be successfully managed by the students, showcasing their abilities in resource management, project planning, and timetable adherence."
	ME508.4	Through technical reports, presentations, and documentation, students should successfully convey the goals of their projects as well as their techniques, findings, and conclusions.
	ME508.5	"Students should demonstrate creative and innovative methodology for project problem solution
B.Tech ME 6th Sem		
Course Code & Name	**Course Outcomes**	
ME 601/TEGD	ME601.1	To understand principle, construction and working of different types of high-pressure boilers used in steam power plants &

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		to perform the testing to find boiler efficiency and heat balance sheet.
	ME601.2	To understand principal and operation of vapour power cycles.
	ME601.3	Describe construction, working of various types of reciprocating and rotary Compressors with performance calculations of positive displacement compressors
	ME601.4	To understand the operation and design of condensers and cooling towers. To Understand the working of different types of steam nozzles and its applications, conditions for maximum discharge of steam through it
	ME601.5	Outline governing equations of compressible fluid flow & to understand concept of Mach number & Mach cone.
ME 602/ Machine Component Design	ME602.1	To understand the Stress Concentration, Design Consideration for fatigue and Design for finite life for the machine components.
	ME602.2	Ability to design Shafts, Keys and Coupling for industrial applications.
	ME602.3	Ability to design various Springs for strength and stiffness.
	ME602.4	Ability to design brakes and clutches.
	ME602.5	To achieve an expertise in design of Sliding contact bearing in industrial applications.
ME 603/Turbo Machinery	ME603.1	Recognize typical designs of turbomachines and differentiate from positive displacement machines
	ME603.2	Explain the working principles of turbomachines and apply it to various types of machines
	ME603.3	Perform the preliminary design of turbomachines (pumps, compressors, turbines) on a 1-D basis

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	ME603.4	Recognize relations between choices made early in the turbomachinery design process and the final components and operability
	ME603.5	Determine the off-design behaviour of turbines and compressors and relate it to changes in the velocity triangles
ME 604/ Renewable energy technology	ME604.1	To understand role significance of solar energy
	ME604.2	To provide importance of Wind Energy & Identify wind energy as alternate form of energy and to know how it can be tapped
	ME604.3	To Understand role of biogas & biomass, generation, and its impact on environment
	ME604.4	To Understand the role of micro, mini and small hydro system, tidal & ocean energy & its mechanism of production.
	ME604.5	To get the utilization of geothermal energy
ME 605/CAD Lab	ME605.1	To apply usage of steps required for modelling 3D objects by using protrusion, cut, sweep, extrude commands.
	ME605.2	To apply usage of steps required for modelling 3D objects by using protrusion, cut, sweep, extrude commands.
	ME605.3	To apply usage of steps required for modelling 3D objects by using protrusion, cut, sweep, extrude commands.
ME 606/RDBMS	ME606.1	Understand and apply the principles of normalization to design efficient database schemas, ensuring minimal redundancy and improved data integrity by mastering the various forms of normalization including 1NF, 2NF, 3NF, BCNF, 4NF, and 5NF
	ME606.2	Analyse and understand the process of query processing, and implement effective query optimization strategies to enhance database performance, including indexing, query rewriting,

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		cost-based optimization, join optimization, and materialized views.
	ME606.3	Develop proficiency in the study and application of object-oriented and object-relational database management systems, leveraging advanced features such as user-defined types, inheritance, and polymorphism to model complex data structures and relationships effectively.
	ME606.4	Acquire the skills to effectively use the open-source data mining tool WEKA for data analysis and predictive modelling, including data preprocessing, classification, clustering, and association rule mining, to extract meaningful insights from large datasets.
	ME606.5	Gain practical experience in developing and managing web databases using PHP, including establishing database connections, performing CRUD operations, implementing secure data handling practices, and integrating dynamic database-driven content into web applications.
ME 608/Minor Project-II	ME608.1	Students should demonstrate the ability to conceptualize, design, and analyse a mechanical system or component using engineering principles and tools.
	ME608.2	Students should be able to identify, analyse, and solve engineering problems related to the project, applying relevant theories and methodologies.
	ME608.3	Students should manage the project effectively, demonstrating skills in project planning, resource management, and adherence to timelines.
	ME608.4	Students should communicate project objectives, methodologies, findings, and conclusions effectively through technical reports, presentations, and documentation

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	ME608.5	Students should demonstrate creativity and innovation in proposing and implementing solutions, considering ethical implications in engineering practice"
B. Tech. ME 7th Sem		
Course Code & Name	**Course Outcomes**	
ME 7001/ Mechanical Vibration	ME7001.1	Understand the Fundamentals of Mechanical Vibration.
	ME7001.2	Apply different methods for formulating the equation of motion for free and damped vibratory system & their solution cases
	ME7001.3	Analyse the response of rotating imbalance & harmonic excitations, and application in vibration isolations.
	ME7001.4	To learn different methods for calculating principal modes of vibrations.
	ME7001.5	Understand the Basic Phenomena of Sound & Noise.
ME7002/ Advanced Machining Process	ME7002.1	To understand the basic concept of mechanical processes like ultrasonic machining, abrasive jet machining, and water jet machining.
	ME7002.2	To Acquire the knowledge of Electrochemical and chemical metal removal processes.
	ME7002.3	To Learn the concept of Thermal metal removal processes like Electric discharge machining [EDM], spark erosion, mechanism of metal removal, spark erosion generator and electrode feed control
	ME7002.4	To Understand the concept and working of Rapid prototyping fabrication methods like Fundamentals, technologies, applications, principles and working of 3D printing, subtractive v/s additive manufacturing process.

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	ME7002.5	To Acquire the knowledge of Technologies of micro fabrication; Types of micro system devices, industrial applications, micro fabrication processes, LIGA process. Technologies of Nano fabrication, importance of size, scanning probe microscope, carbon Bucky balls and Nano tubes, Nano fabrication processes.
ME 7003/OR and Supply Chain	ME7003.1	To apply the concept of OR Techniques and optimization methods.
	ME7003.2	To predict the role of logistics in the supply chain within a focal firm as well as between organizations linked within a given supply chain network
	ME7003.3	To apply various inventory control techniques in practice.
	ME7003.4	To estimate system performance using waiting line model and competitive strategy.
	ME7003.5	To apply idea of the decision making in network analysis and meta-heuristic algorithm
ME 7004/ Ergonomics	ME7004.1	An Ability to apply productivity concepts in organizations and identify the importance of work study, method study concepts and identify its procedure and tools.
	ME7004.2	Students will be able to rate a worker engaged on a live job and calculate basic, allowed, and standard time for the same.
	ME7004.3	An Ability to analyse the existing methods of working for a particular job and develop an improved method through questioning technique.
	ME7004.4	An ability to design a system, component, or process to meet accepted human factors and workplace ergonomics standards within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
	ME7004.5	An Ability to understand the display systems and anthropometric data.

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ME 7005/ Power Technology	ME7005.1	Understand the fundamental of nuclear heat energy, nuclear fission and fusion and nuclear reactors
	ME7005.2	Be able to understand solar radiation, thermal energy storage and utilisation and electronics analysis.
	ME7005.3	Be able to put ergonomic assessments and solutions to practical use in the work place at wind turbine
	ME7005.4	Will be capable of initiating evaluations of ergonomic issues and working with an ergonomist and biomass technology
	ME7005.5	Understanding the concept of Hydrogen energy, collection and safety and hydrogen fuel cells.
ME 7006/ Project-I	ME7006.1	To provide students with a comprehensive platform to apply their acquired knowledge from various courses.
	ME7006.2	To cultivate an inquisitive mindset and foster confidence in students through engagement with real-world challenges.
	ME7006.3	To offer students opportunities for creative expression and to simulate authentic workplace experiences within the academic environment.
	ME7006.4	To equip students with the ability to adapt to emerging trends and independently address novel challenges.
	ME7006.5	To enhance students' communication and presentation skills.
ME 7007 / Industrial Training	ME7007.1	To describe everyday operations of an agency or organization
	ME7007.2	Students will be able to identify the ethical standards of behaviour for professionals and interims within the agency/organization
	ME7007.3	Student will be able to focus on professional soft skills such as communication, punctuality, and time management

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	ME7007.4	Students will be able to manage various personal habits or a social skill to deal better with work situations
	ME7007.5	Build a professional network that can be a resource for the student
B. Tech. ME 8th Sem		
Course Code & Name	**Course Outcomes**	
ME 8001/Advance Machine Design	ME8001.1	Apply knowledge of design considerations in fatigue loading and analyse bolts under variable stresses
	ME8001.2	Design the curved beams
	ME8001.3	Design belt, rope, and pulley drive
	ME8001.4	Design spur, helical, bevel and worm gears under dynamic load conditions.
	ME8001.5	Design of Sliding contact bearing and Anti-friction bearing under various load conditions.
ME 8002/ RAC	ME8002.1	Illustrate the fundamental principles and applications of refrigeration and air conditioning system
	ME8002.2	Obtain cooling capacity and coefficient of performance by conducting test on vapour compression refrigeration systems
	ME8002.3	Present the properties, applications, and environmental issues of different refrigerants.
	ME8002.4	Calculate cooling load for air conditioning systems used for various
	ME8002.5	Operate and analyse the refrigeration and air conditioning systems

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ME 8003/Advance Machining Process	ME8003.1	Understand the principles and applications of various advanced machining processes, such as EDM, ECM, USM, and laser cutting.
	ME8003.2	Analyse the advantages and limitations of advanced machining processes in comparison to traditional methods.
	ME8003.3	Select appropriate advanced machining processes for specific applications based on material properties, accuracy requirements, and cost considerations.
	ME8003.4	Design and optimize machining parameters for advanced processes to achieve desired surface finish, dimensional accuracy, and material removal rate.
	ME8003.5	Evaluate the environmental impact and safety considerations associated with advanced machining processes.
ME8004/ Maintenance Management	ME8004.1	Explain the principles and practices of maintenance planning for an organization
	ME8004.2	Discuss maintenance policies with special reference to preventive maintenance
	ME8004.3	Predict appropriate condition monitoring (CM) techniques and instruments
	ME8004.4	Distinguish various repair methods for basic machine elements
	ME8004.5	Summarize repair methods for material handling equipment.
ME8005/Project-II	ME8005.1	To provide students with a comprehensive experience for applying the knowledge gained so far by studying various courses.
	ME8005.2	To develop an inquiring aptitude and build confidence among students by working on solutions of small industrial problems.

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	ME8005.3	To give students an opportunity to do something creative and to assimilate real life work situation in institution.
	ME8005.4	To adapt students for latest developments and to handle independently new situations
	ME8005.5	To develop good expressions power and presentation abilities in students
ME8006/ Automobile Engineering Lab	ME8006.1	Understand the working of common automobile component, single and multi-cylinder engines, valve operating and fuel injection systems.
	ME8006.2	Understand the working principles of clutches and their types.
	ME8006.3	Understand the working principles of gearbox and their types.
	ME8006.4	Understand the working principles of propeller shaft, differential and their types.
	ME8006.5	Understand the working principles of brakes and their types.
ME8007/ Group Discussion	ME8007.1	Students should understand the Introduction to group discussion, structure, and dynamics
	ME8007.2	Students should know Techniques of effective participation in group discussion
	ME8007.3	Students should be able Preparing for group discussion; Ways to carry out group discussion
	ME8007.4	"How to prepare for interviews; Language and style to be used in interview
	ME8007.5	To make them able for effective communication in professional life