

MECHANICAL ENGINEERING DEPARTMENT
Course Outcomes: For B. TECH. 2ndYEAR
[Effective from Session: 2023-24]

Subject Code: BME301	THERMODYNAMICS	L T P : 3 1 0	Credits: 4
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The students will be able to		Blooms Taxonomy
CO-1	To understand the basic terms of thermodynamics:	K2
CO-2	To apply I law to various energy conversion devices:	K3
CO-3	To evaluate the changes in properties of substances in various processes:	K3
CO-4	To understand the difference between high grade and low-grade energies:	K2

Subject Code: BME302	FLUID MECHANICS AND FLUID MACHINES	L T P : 3 1 0	Credits: 4
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Course Outcomes: The student will be able to		Blooms Taxonomy
CO 1	Understand the application of mass and momentum conservation laws for fluid flows.	K2
CO 2	Understand the importance of dimensional analysis.	K2
CO 3	Evaluate the velocity and pressure variations in various types of simple flows.	K3
CO 4	Mathematically analyze the flow in water pumps and turbines.	K3
CO 5	Understand about the functioning of centrifugal and reciprocating pumps.	K2

Subject Code: BME303	MATERIALS ENGINEERING	L T P : 2 1 0	Credits: 3
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Course Outcomes: The student will be able to		Blooms Taxonomy
CO 1	Students will be able to identify the crystal structure and measure the mechanical properties of materials.	K3
CO 2	Students will be able to test the various failures of materials.	K3
CO 3	Students will be able to identify the mechanical properties based on composition of micro-constituents depicted in the phase-diagram.	K3
CO 4	Students will understand the concept of improving the mechanical properties through heat treatment.	K2
CO 5	Students will learn the structure and properties of alloys and composites.	K2

Subject Code: BME351	FLUID MECHANICS LAB	L T P : 0 0 2	Credits: 1
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Course Outcomes: The students will be able to		Blooms Taxonomy
CO1	Students will be able to perform different destructive and non-destructive testing methods to measure various mechanical properties.	K2
CO2	Students will be able to analyse the effect of different heat-treatment processes on the Hardness.	K4
CO3	Students will be able to identify the mechanical properties based on composition of micro-constituents depicted in the phase-diagram.	K3

Subject Code: BME352	MATERIAL TESTING LAB	L T P : 0 0 2	Credits: 1
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Course Outcomes: The students will be able to		Blooms Taxonomy
CO1	Students will be able to perform different destructive and non-destructive testing methods to measure various mechanical properties	K2
CO2	Students will be able to analyse the effect of different heat-treatment processes on the Hardness.	K4
CO3	Students will be able to simulate the material using simulating software / measure the mechanical properties of 3-D printed components	K3

Subject Code: BME 353	COMPUTER AIDED MACHINE DRAWING-I LAB	L T P : 0 0 2	Credits: 1
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The students will be able to		Blooms Taxonomy
CO 1	Understand and apply 2D software to develop a part model	K3
CO 2	Understand about temporary and permanent fasteners	K2
CO 3	Understand the need for free hand sketching, Free hand sketching of foundation bolts etc.	K2
CO 4	Create assembly drawing of simple machine elements like rigid or flexible coupling	K3
CO 5	Create 2D drawings and assemblies of various machine components	K3

Subject Code: BCC 302	PYTHON PROGRAMMING	L T P : 2 0 0	Credits: 2
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The students will be able to		Blooms Taxonomy
CO 1	Interpret the fundamental Python syntax and semantics and be fluent in the use of Python control flow statements.	K1,K2
CO 2	Express proficiency in the handling of strings and functions	K1,K2
CO 3	Determine the methods to create and manipulate Python programs by utilizing the data structures like lists, dictionaries, tuples and sets.	K3
CO 4	Identify the commonly used operations involving file systems and regular expressions.	K1,K2
CO 5	Articulate the Object-Oriented Programming concepts such as encapsulation, inheritance and polymorphism as used in Python	K2,K3

Subject Code: BAS 301	TECHNICAL COMMUNICATION	L T P : 2 1 0	Credits: 3
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The students will be able to		Blooms Taxonomy
CO 1	UNDERSTAND the nature and objective of Technical Communication relevant for the work place as Engineers.	K1
CO 2	DEVELOP an understanding of key concepts of writing, designing and speaking.	K1
CO 3	UTILIZE the technical writing skills for the purposes of Technical Communication and its exposure in various dimensions.	K1
CO 4	BUILD UP interpersonal communication traits that will make the transition from institution to workplace smoother and help them to excel in their jobs.	K1,K2
CO 5	APPLY technical communication to build their personal brand and handle crisis communication.	K1,K2

Subject Code: BME401	APPLIED HERMODYNAMICS	L T P : 3 1 0	Credits: 4
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Course outcomes: The students will be able to		Blooms Taxonomy
CO1	To learn about Air Standard Cycle.	K3
CO2	To learn about of I law for reacting systems and heating value of fuels.	K3
CO3	To learn about gas and vapor cycles	K3
CO4	To learn about gas dynamics of air flow and steam through nozzles.	K3
CO5	To analyze the performance of steam turbines.	K3

Subject Code: BME402	ENGINEERING MECHANICS & STRENGTH OF MATERIAL	L T P : 3 1 0	Credits: 4
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Course outcomes: The students will be able to		Blooms Taxonomy
CO1	Understand the force systems and application of force equilibrium to various two-dimensional problems.	K3
CO2	Understand the concept of stress and strain under different loading conditions.	K3
CO3	Determine the principal stresses and strains in structural members	K3
CO4	Understand and determine the stresses, slope, and deflection of the transversely loaded members	K3
CO5	Apply the concepts of stresses and strain in solving problems related to springs, buckling of columns and thin and thick cylinders.	K3

Subject Code: BME403	MANUFACTURING PROCESSES	L T P : 2 1 0	Credits: 3
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The students will be able to		Blooms Taxonomy
CO1	Students will learn the various conventional manufacturing processes / casting and forming processes.	K2
CO2	Students will comprehend the knowledge of grinding and super finishing processes.	K2
CO3	Students will understand the concepts of metal joining processes.	K2
CO4	Students will learn the concepts of unconventional machining processes.	K2
CO5	Students will learn the various conventional manufacturing processes / casting and forming processes.	K2

Subject Code: BVE401	UNIVERSAL HUMAN VALUES	L T P : 2 1 0	Credits: 3
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The students will be able to		Blooms Taxonomy
CO1	Understand the significance of value inputs in a classroom, distinguish between values and skills, understand the need, basic guidelines, content, and process of value education, explore the meaning of happiness and prosperity, and do a correct appraisal of the current scenario in the society	K1
CO2	Distinguish between the Self and the Body, and understand the meaning of Harmony in the Self and the Co-existence of Self and Body.	K2
CO3	Understand the value of harmonious relationships based on trust, respect, and other naturally acceptable feelings in human-human relationships and explore their role in ensuring a harmonious society	K2
CO4	Understand the harmony in nature and existence, and workout their mutually fulfilling participation in nature.	K2

CO5	Distinguish between ethical and unethical practices, and start working out the strategy to actualize a harmonious environment wherever they work.	K2
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Subject Code: BAS 403	MATHEMATICS IV	L T P : 3 1 0	Credits: 4
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The students will be able to learn		Blooms Taxonomy
CO1	The idea of partial differential equation and its different types of solution	K1
CO2	The concept of method of separation of variables and Fourier transform to solve partial differential equations.	K2
CO3	The basic ideas of statistics including measures of central tendency, correlation, regression and their properties.	K2
CO4	The idea of probability, random variables, discrete and continuous probability distributions and their properties.	K2
CO5	The statistical methods of studying data samples, hypothesis testing and statistical quality control	K2

Subject Code: BME451	APPLIED THERMODYNAMICS LAB	L T P : 0 0 2	Credits: 1
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CO	Course Outcome	Bloom Taxonomy
CO 1	To understand the principles of various boilers	K2
CO 2	To understand the basic principles IC engines and determination of various performance parameters of IC Engines	K2
CO 3	To understand the principles of steam engine and Steam & Gas Turbine	K2

Subject Code: BME452	MANUFACTURING PROCESSES LAB	L T P : 0 0 2	Credits: 1
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CO	Course Outcome	Bloom Taxonomy
CO 1	Students will be able to make the component using casting and finishing methods.	K2
CO 2	Students will be able to make the component using metal cutting / unconventional machining methods.	K2
CO 3	Students will be able to make the component using metal joining processes.	K2

MECHANICAL ENGINEERING DEPARTMENT
Course Outcomes: For B. TECH. 3rd YEAR
[Effective from Session: 2020-21 to till date]

Subject Code: KME 501	Heat and Mass Transfer	L T P : 3 1 0	Credits: 4
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The students will be able to		Blooms Taxonomy
CO-1	Understand the fundamentals of heat and mass transfer.	K2
CO-2	Apply the concept of steady and transient heat conduction.	K3
CO-3	Apply the concept of thermal behavior of fins.	K3
CO-4	Apply the concept of forced and free convection.	K3
CO-5	Apply the concept of radiation for black and non-black bodies.	K3
CO-6	Conduct thermal analysis of heat exchangers.	K4

Subject Code: KME 502	Strength of Material	L T P : 3 1 0	Credits: 4
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Course Outcomes: The student will be able to		Blooms Taxonomy
CO 1	Understand the concept of stress and strain under different conditions of loading	K2
CO 2	Determine the principal stresses and strains in structural members	K3
CO 3	Determine the stresses and strains in the members subjected to axial, bending and torsional loads	K3
CO 4	Apply the concepts of stresses and strain in solving problems related to springs, column and pressure vessels	K3
CO 5	Calculate the slope, deflection and buckling of loaded members	K3
CO 6	Analyze the stresses developed in straight and curved beams of different cross sections	K4

Subject Code: KME 503	Industrial Engineering	L T P : 3 1 0	Credits: 4
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Course Outcomes: The students will be able to		Blooms Taxonomy
CO1	Understand the concept of production system, productivity, facility and process planning in various industries	K2
CO2	Apply the various forecasting and project management techniques	K3
CO3	Apply the concept of break-even analysis, inventory control and resource utilization using queuing theory	K3

CO4	Apply principles of work study and ergonomics for design of work systems	K3
CO5	Formulate mathematical models for optimal solution of industrial problems using linear programming approach	K4

Subject Code: KME 551	Heat and Mass Transfer Lab	L T P : 0 0 2	Credits: 1
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The students will be able to		Blooms Taxonomy
CO1	Apply the concept of conductive heat transfer.	K3
CO2	Apply empirical correlations for both forced and free convection to determine the value of convection heat transfer coefficient	K3
CO3	Apply the concept of radiation heat transfer for black and grey body.	K3
CO4	Analyze the thermal behavior of parallel or counter flow heat exchangers	K4
CO5	Conduct thermal analysis of a heat pipe	K4

Subject Code: KME 552	Python Lab	L T P : 0 0 2	Credits: 1
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Course outcomes: The students will be able to		Blooms Taxonomy
CO1	Apply conditional statement, loops condition and functions in python program	K3
CO2	Solve mathematical and mechanical problems using python program	K3
CO3	Plot various type of chart using python program	K3
CO4	Analyze the mechanical problem using python program	K4

Subject Code: KME 553	Internet of Things Lab	L T P : 0 0 2	Credits: 1
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The students will be able to		Blooms Taxonomy
CO1	Understand Internet of Things and its hardware and software components	K2
CO2	Interface I/O devices, sensors & communication modules	K3
CO3	Remotely monitor data and control devices	K3
CO4	Design prototype of IoT based smart system	K4
CO5	Develop IoT based projects for real life problem	K6

Subject Code: KME 054	I C Engine, Fuel and Lubrication	L T P : 3 0 0	Credits: 3
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CO	Course Outcome	Bloom Taxonomy
CO 1	Explain the working principle, performance parameters and testing of IC Engine.	K 2
CO 2	Understand the combustion phenomena in SI and CI engines and factors Influencing combustion chamber design.	K 2
CO 3	Understand the essential systems of IC engine and latest trends and developments in IC Engines.	K 2
CO 4	Understand the effect of engine emissions on environment and human health and methods of reducing it.	K 2
CO 5	Apply the concepts of thermodynamics to air standard cycle in IC Engines	K 3
CO 6	Analyze the effect of various operating parameters on IC engine performance.	K 4

Subject Code: KME 055	Advance welding	L T P : 3 0 0	Credits: 3
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Course Outcome: Student will be able to		Bloom Taxonomy
CO 1	Understand the physics of arc welding process and various operating characteristics of welding power source.	K2
CO 2	Analyse various welding processes and their applications.	K3
CO 3	Apply the knowledge of welding for repair & maintenance, along with the weldability of different materials.	K3
CO 4	Apply the concept of quality control and testing of weldments in industrial environment.	K3
CO 5	Evaluate heat flow in welding and physical metallurgy of weldments.	K4

Subject Code: KME 601	Refrigeration & Air Conditioning	L T P : 3 1 0	Credits: 4
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The students will be able to		Blooms Taxonomy
CO1	Understand the basics concepts of Refrigeration & Air-Conditioning and its future prospects.	K2
CO2	Explain the construction and working of various components in Refrigeration & Air-Conditioning systems.	K2
CO3	Understand the different types of RAC systems with their respective applications.	K2
CO4	Apply the basic laws to the thermodynamic analysis of different processes involved in Refrigeration and Air-Conditioning.	K3
CO5	Apply the basic concepts to calculate the COP and other performance parameters for different RAC systems	K3
CO6	Analyze the effects of performance parameters on COP.	K4

Subject Code: KME 602	Machine Design	L T P : 3 1 0	Credits: 4
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Course Outcomes: The student will be able to		Blooms Taxonomy
CO 1	Recall the basic concepts of Solid Mechanics to understand the subject.	K2
CO 2	Classify various machine elements based on their functions and applications.	K2
CO 3	Apply the principles of solid mechanics to machine elements subjected to static and fluctuating loads.	K3
CO 4	Analyze forces, bending moments, twisting moments and failure causes in various machine elements to be designed.	K4
CO 5	Design the machine elements to meet the required specification.	K5

Subject Code: KME 603	Theory of Machines	L T P : 3 1 0	Credits: 4
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Course Outcomes: The students will be able to		Blooms Taxonomy
CO1	Understand the principles of kinematics and dynamics of machines.	K2
CO2	Calculate the velocity and acceleration for 4-bar and slider crank mechanism	K3
CO3	Develop cam profile for followers executing various types of motions	K3
CO4	Apply the concept of gear, gear train and flywheel for power transmission	K3
CO5	Apply dynamic force analysis for slider crank mechanism and balance rotating & reciprocating masses in machines.	K3
CO6	Apply the concepts of gyroscope, governors in fluctuation of load and brake & dynamometer in power transmission	K3

Subject Code: KME 061	Nondestructive Testing	L T P : 3 0 0	Credits: 3
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Course Outcome: Student will be able to		Bloom Taxonomy
CO 1	Understand the concept of destructive and Non-destructive testing methods.	K2
CO 2	Explain the working principle and application of die penetrant test and magnetic particle inspection.	K2
CO3	Understand the working principle of eddy current inspection.	K2
CO 4	Apply radiographic techniques for testing.	K3
CO 5	Apply the principle of Ultrasonic testing and applications in medical and engineering areas.	K3

Subject Code: KME 651	Refrigeration & Air Conditioning Lab	L T P : 0 0 2	Credits: 1
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The students will be able to:		Blooms Taxonomy
CO1	Determine the performance of different refrigeration and air-conditioning systems.	K3

CO2	Apply the concept of psychrometry on different air cooling systems.	K3
CO3	Interpret the use of different components, control systems and tools used in RAC systems	K3
CO4	Demonstrate the working of practical applications of RAC systems.	K2

Subject Code: KME 652	Machine Design Lab	L T P : 0 0 2	Credits: 1
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Course Outcomes: The student will be able to		Blooms Taxonomy
CO-1	Apply the principles of solid mechanics to design various machine Elements subjected to static and fluctuating loads.	K3
CO-2	Write computer programs and validate it for the design of different machine elements	K4
CO-3	Evaluate designed machine elements to check their safety.	K5

Subject Code: KME 653	Theory of Machines Lab	L T P : 0 0 2	Credits: 1
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The students will be able to:		Blooms Taxonomy
CO1	Demonstrate various mechanisms, their inversions and brake and clutches in automobiles	K2
CO2	Apply cam-follower mechanism to get desired motion of follower.	K3
CO3	Apply the concepts of gears and gear train to get desired velocity ratio for power transmission.	K3
CO4	Apply the concept of governors to control the fuel supply in engine.	K3
CO5	Determine the balancing load in static and dynamic balancing problem	K3

MECHANICAL ENGINEERING DEPARTMENT
Course Outcomes: For B. TECH. 4th YEAR
[Effective from Session: 2020-21 to till date]

Subject Code: KME 071	Additive manufacturing	L T P : 3 0 0	Credits: 3
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Course Outcome: Student will be able to		Bloom Taxonomy
CO 1	Understanding the basics of additive manufacturing/rapid prototyping and its advantages and disadvantages	K2
CO 2	Understanding the role of additive manufacturing in the design process and the implications for design.	K2
CO 3	Understanding the processes used in additive manufacturing for a range of materials and applications	K2
CO 4	Understand the various software tools, processes and techniques that enable advanced/additive manufacturing and personal fabrication.	K2
CO 5	Apply knowledge of additive manufacturing for various real-life applications	K3

Subject Code: KME 073	Mathematical Modeling of Manufacturing Processes	L T P : 3 0 0	Credits: 3
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Course Outcome: Student will be able to		Bloom Taxonomy
CO 1	Understand the fundamentals of manufacturing processes, mathematical models and their solutions.	K2
CO 2	Understand unconventional and conventional machining, their discrete-time linear and non-linear models and solutions.	K2
CO 3	Apply the principles of casting, powder metallurgy, coating and additive manufacturing.	K3
CO 4	Analyze the mechanism of heat and mass transfer in welding.	K4
CO 5	Evaluate microstructure properties and residual stress of different manufacturing processes.	K5

Subject Code: KOE091	AUTOMATION AND ROBOTICS	L T P : 3 0 0	Credits: 3
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Course Outcome: Student will be able to		Bloom Taxonomy
CO 1	Explain to study the laws & principles of automation	K2, K3
CO 2	Analysis the function of robotics in industry.	K2, K3
CO 3	Explain working of robots Analysis robots program manufacturing.	K2,K3
CO 4	Define robot components and solve the coordinate systems.	K2
CO 5	Explain the study the transmission of robotics parts.	K2,K3

Subject Code: KOE085	QUALITY MANAGEMENT	L T P : 3-1-0	Credits: 3
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Course Outcome: Student will be able to		Bloom Taxonomy
CO 1	Define quality concepts, methods and techniques for manufacturing qualities.	K2
CO 2	Explain the structure and design of an organization, quality cost etc in quality management and basic principles of Total Quality Management.	K2
CO 3	Analyze the different techniques and tools, different types of control charts.	K3
CO 4	Inspect the defects diagnosis and prevention and analyze identification of defects.	K3
CO 5	Explain the ISO and its concept of quality management.	K2

Subject Code: KHU-801	Rural Development : Administration and Planning	L T P : 3-1-0	Credits: 3
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Course Outcome: Student will be able to		Bloom Taxonomy
CO 1	Students can understand the definitions, concepts and components of Rural Development	K2
CO 2	Students will know the importance, structure, significance, resources of Indian rural economy.	K2
CO 3	Students will have a clear idea about the area development programmes and its impact.	K2
CO 4	Students will be able to acquire knowledge about rural entrepreneurship.	K2
CO 5	Students will be able to understand about the using of different methods for human resource planning	K2

Subject Code: KOE-074	Renewable Energy Resources	L T P : 3-1-0	Credits: 3
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Course Outcome: Student will be able to		Bloom Taxonomy
CO 1	Able to understand the renewable energy sources available at present.	K2
CO 2	Able to understand solar energy Principle of working, performance and limitations.	K2
CO 3	Able to understand Geothermal Energy, Magneto-hydrodynamics (MHD) and, Fuel Cells Principle of working, performance and limitations.	K2
CO 4	Able to understand the Thermo-electrical and thermionic Conversion and Wind Energy Principle of working, performance and limitations.	K2
CO 5	Able to understand biomass energy, Ocean Thermal Energy Conversion (OTEC) and Wave and Tidal Wave Principles of working, performance, and limitations	K2