

Course Outcome for B.E. Mechanical Engineering

Class	Semester	Program	Name of the Subject	CO	Course Outcome
FE	I	B.E. Mechanical	Chemistry	812101.1	Analyse microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces.
				812101.2	Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques
				812101.3	Rationalise periodic properties such as ionization potential, electronegativity, oxidation states and electronegativity.
				812101.4	Rationalise bulk properties & processes using thermodynamic considerations
				812101.5	List major chemical reactions that are used in the synthesis of molecules.
FE	I	B.E. Mechanical	Engineering Graphics	812104.1	Introduction to engineering design and its place in society
				812104.2	Exposure to the visual aspects of engineering design
				812104.3	Exposure to engineering graphics standards
				812104.4	Exposure to solid modeling.
FE	I	B.E. Mechanical	English	812103.1	To acquire basic proficiency in English including reading and listening
				812103.2	To demonstrate proficiency in the use of written English, including proper spelling, Grammar and punctuation.
				812103.3	To enhance their ability to use spoken words in interpersonal communication, small group interactions and public speaking Comprehension, writing and
				812103.4	Become accomplished technical communicators.
FE	I	B.E. Mechanical	Mathematics - I	812102.1	Apply differential and integral calculus. Apart from some other applications they will have a basic understanding of Beta and Gamma functions.
				812102.2	The fallouts of Rolle's Theorem that is fundamental to application of analysis to Engineering problems.
				812102.3	The tool of Fourier series for learning advanced Engineering Mathematics.

Class	Semester	Program	Name of the Subject	CO	Course Outcome
				812102.4	To deal with functions of several variables that are essential in most branches of Engineering. The essential tool of matrices and linear algebra in a comprehensive manner.
FE	I	B.E. Mechanical	Chemistry Lab	812106.1	Upon successful completion of lab Course, student will be able to: The chemistry laboratory course will consist of experiments illustrating the principles of chemistry relevant to the study of science and engineering.
				812106.2	Estimate rate constants of reactions from concentration of reactants/products as a function of time
				812106.3	Measure molecular/system properties such as surface tension, viscosity, conductance of solutions, redox potentials, chloride content of water, etc
				812106.4	Synthesize a small drug molecule and analyse a salt sample .
FE	I	B.E. Mechanical	Engineering Graphics Lab	812108.1	Introduction to engineering design and its place in society
				812108.2	Exposure to the visual aspects of engineering design
				812108.3	Exposure to engineering graphics standards
				812108.4	Exposure to solid modeling.
FE	I	B.E. Mechanical	English Lab	812107.1	Students will be sensitized towards recognition of English sound pattern.
				812107.2	The fluency in speech will be enhanced.
FE	I	B.E. Mechanical	Workshop Practices	812105.1	Students will be able to fabricate components with their own hands.
				812105.2	Get practical knowledge of the dimensional accuracies and dimensional tolerances possible
				812105.3	with different manufacturing processes.
				812105.4	Assemble different components, they will be able to produce small devices of their interest.

Class	Semester	Program	Name of the Subject	CO	Course Outcome
FE	II	B.E. Mechanical	Physics	812201.1	To study Bragg's Law and introduced to the principles of lasers, types of lasers and applications
				812201.2	Various terms related to properties of materials such as, permeability, polarization, etc.
				812201.3	Some of the basic laws related to quantum mechanics as well as magnetic and dielectric
				812201.4	properties of materials
				812201.5	Simple quantum mechanics calculations
				812201.6	Nanotechnology and their industrial applications.
FE	II	B.E. Mechanical	Mathematics-II	812202.1	Use mathematical tools needed in evaluating multiple integrals and their usage.
				812202.2	Apply effective mathematical tools for the solutions of differential equations that model physical processes.
				812202.3	Use tools of differentiation and integration of functions of a complex variable that are used in various techniques dealing engineering problems.
FE	II	B.E. Mechanical	Basic Electrical & Electronics	812203.1	Students will be able to demonstrate knowledge of circuit analysis using various basic laws and theorems of electrical circuits
				812203.2	Students will be able to demonstrate and understand definition and relationship of various AC circuits.
				812203.3	Understand working principle of PN junction diode, Zener diode and their applications.
				812203.4	Describe different configuration of Bipolar Junction Transistor.
				812203.5	Describe different configurations of FET
				812203.6	Understand operating principle Power Electronics Devices
				812203.7	Describe use of the Basic gate and Universal gate
FE	II	B.E. Mechanical	Programming for Problem Solving	812204.1	To formulate simple algorithms for arithmetic and logical problems
				812204.2	Understand the fundamentals of C programming.
				812204.3	To test and execute the programs and correct syntax and logical errors

Class	Semester	Program	Name of the Subject	CO	Course Outcome
				812204.4	Choose the loops and decision making statements to solve the problem.
				812204.5	To decompose a problem into functions and synthesize a complete program using divide and conquer approach
				812204.6	To use arrays, pointers and structures to formulate algorithms and programs
FE	II	B.E. Mechanical	Physics Lab	812205.1	To study Bragg's Law and introduced to the principles of lasers, types of lasers and applications
				812205.2	Various terms related to properties of materials such as, permeability, polarization, etc.
				812205.3	Some of the basic laws related to quantum mechanics as well as magnetic and dielectric
				812205.4	properties of materials
				812205.5	Simple quantum mechanics calculations
				812205.6	Nanotechnology and their industrial applications.
FE	II	B.E. Mechanical	Basic Electrical and Electronics Engineering Lab.	812206.1	Identify electrical and electronics components/equipments.
				812206.2	Simplify D.C. network using Superposition Theorem.
				812206.3	Simplify D.C. network using Thevenin's Theorem.
				812206.4	Learn diode V-I Characteristic
				812206.5	Understand BJJ as a switch
				812206.6	Understand LED, JFET, SCR V-I characteristics
FE	II	B.E. Mechanical	Programming for Problem Solving Lab	812207.1	Understand the fundamentals of C programming.
				812207.2	Choose the loops and decision making statements to solve the problem.
				812207.3	Use functions to solve the given problem.
				812207.4	Implement different Operations on arrays.
				812207.5	Understand strings and structures.
				812207.6	Understand the usage of pointers.

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SE	III	B.E. Mechanical	Biology	812301.1	Describe the concepts of modern cell theories and identify the differences in eukaryotic and prokaryotic cells.
				812301.2	Explain the major groups of animal and plant kingdom
				812301.3	Demonstrate the advanced techniques in plant and animal tissue culturing, and able to calculate the growth rate of cells through culturing
				812301.4	Classify the microorganisms through different isolation techniques and illustrate microbial culture techniques
				812301.5	Illustrate mechanism involved in rDNA technology and apply the different aspects of Biotechnology
SE	III	B.E. Mechanical	Engineering Mechanics	812302.1	Use scalar and vector analytical techniques for analysing forces in statically determinate structures
				812302.2	Apply fundamental concepts of kinematics and kinetics of particles to the analysis of simple, practical problems
				812302.3	Apply basic knowledge of maths and physics to solve real-world problems
				812302.4	Understand measurement error, and propagation of error in processed data
				812302.5	Understand basic kinematics concepts – displacement, velocity and acceleration (and their angular counterparts);
				812302.6	Understand basic dynamics concepts – force, momentum, work and energy
				812302.7	Understand and be able to apply Newton’s laws of motion
				812302.8	Understand and be able to apply other basic dynamics concepts - the Work-Energy principle, Impulse-Momentum principle and the coefficient of restitution
				812302.9	Extend all of concepts of linear kinetics to systems in general plane motion (applying Euler's Equation and considering energy of a system in general plane motion, and the work of couples and moments of forces)
				812302.1	Learn to solve dynamics problems. Appraise given information and determine which concepts apply, and choose an appropriate solution strategy
				812302.1	Attain an introduction to basic machine parts such as pulleys and mass-spring systems

Class	Semester	Program	Name of the Subject	CO	Course Outcome
SE	III	B.E. Mechanical	Electrical Drives and Controls	816304.1	Apply basic knowledge of science and engineering to understand electrical machines.
				816304.2	Analyse the construction, working principle and characteristics of motors.
				816304.3	Formulate the complex problems of machines and compare them
				816304.4	Apply the knowledge to selection of different drives for different purpose for the use of society
				816304.5	Perform the professional duties in manufacturing, operation and maintenance of electrical machines.
SE	III	B.E. Mechanical	Thermodynamics	812304.1	To apply energy balance to systems and control volumes, in situations involving heat and work interactions
				812304.2	control volumes, in situations involving heat and work interactions
				812304.3	To evaluate changes in thermodynamic properties of substances
				812304.4	To evaluate the performance of energy conversion devices
				812304.5	To differentiate between high grade and low-grade energies
SE	III	BE Mechanical	Industrial Psychology	812305.1	To be acquainted with Industrial Psychology subject , its nature , scope & importance
				812305.2	To Demonstrate knowledge of concepts like perception , motivation , group behavior , anger & stress management
				812305.3	To Think critically about concepts/issues like recruitment , training , performance appraisal & job satisfaction
				812305.4	To develop effective communication , motivation & other skills
				812305.5	To be able to develop interest & undertake further studies in these areas
SE	III	BE Mechanical	Electrical Drives and Controls Lab	812306.1	Understand constructional details of dc electrical machines and transformer
				812306.2	Understand specifications of machines.
				812306.3	Conduct practical for determination of characteristics of different type of generator, motors and transformers.

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				812306.4	Able to analyze the test data for practical for applications, design and manufacturing processes
				812306.5	Understand methods of speed control and starters for dc motors
SE	III	BE Mechanical	Thermodynamics Lab	812306.1	Understand the constructional parts of domestic refrigerator and Air-Conditioner.
				812306.2	Understand the use and working of 2-stroke and 4-Stroke petrol/diesel engine.
				812306.3	Understand the working and Types of nozzles.
				812306.4	Understand the constructional and working of Air-Compressor and Centrifugal Pump.
				812306.5	Understand the constructional and working of Heat Exchanger.
SE	III	BE Mechanical	Computer Graphics Lab	812308.1	Demonstrate and understand the basic concepts of geometric modeling and computer graphics.
				812308.2	Drafting of mechanical elements.
				812308.3	Programs for mechanical elements in Auto-LISP.
				812308.4	Solve numerical on transformation.
				812308.5	Use of geometric transformations on graphics objects and their application in composite form
S.E.	IV	B.E. Mechanical	Mathematics – III	812401.1	Solve linear differential equations using Laplace transforms.
				812401.2	Evaluate Fourier and Z transforms and improper integrals.
				812401.3	Estimate coefficient of variation between data's
				812401.4	solve the heat wave equation in one,two dimention
				812401.5	Estimate chance of occurrence of events by Normal,Possion distribution
S.E.	IV	B.E. Mechanical	Introduction to Engineering Design Principles	812402.1	Identify needs and formulate design problem
				812402.2	Follow engineering design process with due consideration to all requirements and constraints and make decisions
				812402.3	Apply scientific principles to design problem

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				812402.4	Work in a team and communicate design output
				812402.5	Relate curricular courses to real life engineering
S.E.	IV	B.E. Mechanical	Applied Thermodynamics	812403.1	After completing this course, the students will get a good understanding of various practical power cycles and heat pump cycles.
				812403.2	They will be able to analyze energy conversion in various thermal devices such as engines, nozzles, diffusers
				812403.3	They will be able to comprehend the phenomena of refrigeration and air conditioning system
				812403.4	They will be able to understand phenomena occurring in high speed compressible flows.
				812403.5	They will be able to understand phenomena occurring in reciprocating
S.E.	IV	B.E. Mechanical	Fluid Mechanics and Fluid Machines	812404.1	Upon completion of this course, students will be able to mathematically analyse simple flow situations
				812404.2	They will be able to evaluate the performance of pumps and turbines.
				812404.3	Understand Euler's equation of motion hence to reduce Bernoulli's equation and its application in fluid mechanics.
				812404.4	Examine energy losses in pipes transitions and Evaluate pressure drop in pipe flow using Hagen-Poiseuille's equation.
S.E.	IV	B.E. Mechanical	Industrial Economics	812405.1	To be acquainted with economics as a subject , its nature , scope & importance
				812405.2	To be able to demonstrate knowledge about basic concepts of micro-economics
				812405.3	To be able to think critically about macro-economic issues like economic growth , inflation , Govt's monetary & fiscal policies
				812405.4	To be aware of concepts like trade deficit , foreign exchange rate & appreciate Govt's trade policy
				812405.5	To develop an interest & be able to undertake further study in these areas
S.E.	IV	B.E. Mechanical	Applied Thermodynamics Lab	812406.1	Comprehend the Performance parameters of 4-Stroke petrol/diesel engine

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				812406.2	Analyze the Calorific value of fuel sample by using Bomb calorimeter.
				812406.3	Investigate the Flue Gas analysis using gas analyzer.
				812406.4	Conduct a trial on air compressor.
				812406.5	Understand the difference parameters of refrigeration system and properties of air.
S.E.	IV	B.E. Mechanical	Fluid Mechanics and Fluid Machines Lab	812407.1	Upon completion of this course, students will be able to mathematically analyze simple flow situations
				812407.2	They will be able to evaluate the performance of pumps and turbines.
				812407.3	Understand Euler's equation of motion hence to reduce Bernoulli's equation and its application in fluid mechanics.
				812407.4	Examine energy losses in pipes transitions and Evaluate pressure drop in pipe flow using Hagen-Poiseuille's equation.
S.E.	IV	B.E. Mechanical	Metrology and Quality Control Lab	812408.1	Attain an introduction to basic machine parts such as pulleys and mass-spring systems
				812408.2	Select and use appropriate measurement instrument for a given application
				812408.3	Apply the basics of sampling in the context of manufacturing
				812408.4	Select and apply the seven basic quality tools in well-defined applications.
T.E.	V	B.E. Mechanical	Heat Transfer	812501.1	Formulate and analyze a heat transfer problem involving any of the three modes of heat transfer
				812501.2	Obtain exact solutions for the temperature variation using analytical methods where possible or employ approximate methods or empirical correlations to evaluate the rate of heat transfer
				812501.3	Design devices such as heat exchangers and estimate the insulation needed to reduce heat losses where necessary.
				812501.4	Study convection & radiation concept.
				812501.5	Identify and select type of shell and tube exchanger based on TEMA classification Design double pipe heat exchanger, Shell and tube heat exchanger, finned tube and other compact heat exchangers

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T.E.	V	B.E. Mechanical	Manufacturing Processes	812502.1	Understand metal casting process, calculate pouring time, elements of gating system and defects in it.
				812502.2	Understand principle of metal forming and working of various metal forming processes.
				812502.3	Understand meaning, use of welding, techniques and types of it.
				812502.4	Understand working of machines used in manufacturing and their use.
				812502.5	Understand process of powder metallurgy, use and properties of products.
T.E.	V	B.E. Mechanical	Strength of Materials	812503.1	Recognize various types loads applied on machine components of simple geometry and understand the nature of internal stresses that will develop within the components
				812503.2	Evaluate principal stresses, strains and apply the concept for design and Draw the SFD and BMD for different types of loads and support conditions
				812503.3	Determine the stresses and strains in the members subjected bending and Evaluate the slope and deflection of beams subjected to loads
				812503.4	Determine the stresses and strains in the members subjected to torsional loads.
				812503.5	Determine the stresses and strains in the pressure vessels due to intensity of pressure
T.E.	V	B.E. Mechanical	Energy Conservation & Management	812543.1	utilise the available resources in optimal ways
				812543.2	apply the knowledge of the subject to calculate the efficiency of various thermal utilities.
				812543.3	to design suitable energy monitoring system to analyze and optimize the energy consumption in electrical utilities
				812543.4	handle various measuring devices needed for energy audit
				812543.5	understand and analyse the energy data of industries
T.E.	V	B.E. Mechanical	Industrial & Safety Engineering	812554.1	understand and practice the concepts of industrial safety engineering
				812554.2	apply different assessment techniques to calculate and predict losses

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				812554.3	understand various human error factors and remedies
				812554.4	understand scientific way of investigation of accident
				812554.5	understand the various safety precautions to be taken in various industries and remedies for the same
T.E.	V	B.E. Mechanical	Heat Transfer Lab	812506.1	Determination of thermal conductivity of metal rod / insulating powder / composite wall.
				812506.2	Determination of LMTD, overall heat transfer coefficient and effectiveness of heat exchanger in parallel and counter flow arrangement and compare them.
				812506.3	Determination of temperature distribution, fin efficiency, effectiveness in natural convection and forced convection
				812506.4	Determination of emissivity of a test surface.
				812506.5	Determination of Stefan Boltzmann constant.
T.E.	V	B.E. Mechanical	Manufacturing Processes Lab	812507.1	To understand the sheet metal operations, patterns, casting,lost foam casting, molding, forging,closed die forging,properties of aluminium and powder metallurgy techniques.
				812507.2	To handle the tools,equipments and measuring instruments for a given
				812507.3	To understand the fundamentals of various manufacturing process.
T.E.	V	B.E. Mechanical	Machine Drawing Lab	812508.1	to define terms used to explain abbreviations
				812508.2	to list / name / sketch different types of machine parts, assemblies and their conventions
				812508.3	to read and interpret the given details of production drawing of machine components
				812508.4	to imagine shapes and sizes of components and visualize / draw their views in different directions
				812508.5	to imagine and assemble the given set of components to form a workable machine assembly

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T.E.	V	B.E. Mechanical	Minor Project (Stage – I)	812509.1	To understand the basic concepts & broad principles of projects.
				812509.2	To understand the value of achieving perfection in project implementation & completion
				812509.3	To apply the theoretical concepts to solve problems with teamwork and multidisciplinary approach.
				812509.4	To demonstrate professionalism with ethics; present effective communication skills and relate engineering issues to broader societal context.
T.E.	VI	B.E. Mechanical	Kinematics and Theory of Machines	812601.1	Distinguish kinematic and kinetic motion.
				812601.2	Designing a suitable mechanism depending on application
				812601.3	Drawing displacement diagrams and cam profile diagram for followers executing different types of motions and various configurations of followers,
				812601.4	Drawing velocity and acceleration diagrams for different mechanisms,
				812601.5	Selecting gear and gear train depending on application.
T.E.	VI	B.E. Mechanical	Manufacturing Technology	812602.1	Understand geometry and use of single point cutting tool, forces of machining and different types of tool wear.
				812602.2	Understand working principle of various machining processes their applications.
				812602.3	Understand rapid prototyping, its types and role of automation in manufacturing industry.
				812602.4	Understand different advanced manufacturing process.
				812602.5	Understand aspects product design and manufacturing.
T.E.	VI	B.E. Mechanical	Material Engineering	812603.1	Identify crystal structures for various materials and understand the defects in such structures.
				812603.2	Understand mechanical properties of materials and use.
				812603.3	Interpret phase diagram and understand various reactions on Iron Carbon diagram.
				812603.4	Understand how to tailor material properties of ferrous and non-ferrous alloys with the help of heat treatment.

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				812603.5	Understand composition, properties and use of alloy steel and cast iron.
T.E.	VI	B.E. Mechanical	Mechanical Estimation and Costing	812642.1	Calculate material cost of given component/product
				812642.2	Identify and estimate elements of cost in various processes.
				812642.3	Perform break even analysis to calculate break even quantity
				812642.4	Investigate the problem of cost and suggest their solution using cost reduction techniques.
				812642.5	Interpret given model of balance sheet and profit loss account.
T.E.	VI	B.E. Mechanical	Internal Combustion Engine	812643.1	Understand the Basic Cycles of Internal Combustion Engine
				812643.2	Understand fuel feed systems for petrol and diesel engines
				812643.3	To study and understand of cooling and lubrication system in Internal Combustion System
				812643.4	To study combustion process of SI and CI engines
				812643.5	To study recent trends in Internal combustion Engine
T.E.	VI	BE Mechanical	Piping Engineering	812654.1	To be acquainted with Piping Engg. subject , its nature , scope & importance
				812654.2	To be able to demonstrate knowledge about equipments , control systems , design standards , drawing conventions etc.
				812654.3	To be able to think critically about design parameters , material selection criteria , pipe layout , supports etc.
				812654.4	To be able to develop skills in piping design , P & ID , ISO , fabrication drawings
				812654.5	To be able to develop interest as a career option & undertake further study in this area
T.E.	VI	BE Mechanical	Kinematics and Theory of Machines	812606.1	Distinguish kinematic and kinetic motion.
				812606.2	Identify the basic relations between velocity, and acceleration.

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				812606.3	Use graphical and analytic methods to study the motion of a planar mechanism
				812606.4	design linkage, cam and gear mechanisms for a given motion or a given input/output motion or force relationship.
				812606.5	analyze the motion and the dynamical forces acting on mechanical systems composed of linkages, gears and cams.
T.E.	VI	BE Mechanical	Manufacturing Technology Lab	812607.1	To understand the different advanced production technologies
				812607.2	Able to perform and understand different machining operations using CNC machine
				812607.3	To understand concept of tool life and tool wear
				812607.4	Able to understand concept of lean manufacturing
				812607.5	Able to know the use and working of various material handling devices
T.E.	VI	BE Mechanical	Material Engineering Lab	812608.1	Students who have undergone the course will be able to understand the measurement of mechanical properties of materials
				812608.2	They will be able to characterize the dynamic behavior of mechanical systems
T.E.	VI	BE Mechanical	Minor Project	812609.1	To understand the basic concepts & broad principles of projects.
				812609.2	To understand the value of achieving perfection in project implementation & completion.
				812609.3	To apply the theoretical concepts to solve problems with teamwork and multidisciplinary approach.
				812609.4	To demonstrate professionalism with ethics; present effective communication skills and relate engineering issues to broader societal context.
B.E.	VII	B.E. Mechanical	Design of Machine Elements	712701.1	Apply knowledge of the stress and strain of mechanical components; and understand, identify and quantify factor of safety, failure modes for simple mechanical components (Shaft and Coupling) subjected to direct and bending and combined loading.

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				712701.2	Develop logical and analytical ability to apply knowledge of various theories of failures for design of joints, bolts, springs etc.
				712701.3	The selection of gear types, sizing, analysis and material selection of spur and helical gear systems.
				712701.4	The selection of gear types, sizing, analysis and material selection of bevel and worm gear systems.
				712701.5	Estimate endurance strength of ductile and brittle materials and develop analytical ability to apply fatigue theories for ductile and brittle material in static and dynamic loading.
B.E.	VII	B.E. Mechanical	Operation Research	712722.1	Use methods for solving OR models, OR approach to problem solving
				712722.2	Use the method of the graph simplex in solving linear program and to find the optimal solution
				712722.3	Build and solve Transportation Models and Assignment Models.
				712722.4	Describe the characteristics of different types of decision-making environments and the appropriate decision making approaches and tools to be used in each type.
				712722.5	Build and solve Replacement Models and Sequencing Models.
B.E.	VII	B.E. Mechanical	Power Plant Engineering	712733.1	layout, construction and working of the components of thermal power plant
				712733.2	layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants
				712733.3	layout, construction and working of the components inside nuclear power plant
				712733.4	layout, construction and working of the components of hydroelectric power plant and other renewable sources of power plant
				712733.5	To study economics and environmental issues of power plants
B.E.	VII	B.E. Mechanical	Research Methodology	712744.1	Develop understanding on various kinds of research, objectives of doing research, research process, research designs and sampling.
				712744.2	Apply basic knowledge on qualitative research techniques

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				712744.3	Apply knowledge on measurement & scaling techniques as well as the quantitative data analysis
				712744.4	Perform data analysis-and hypothesis testing procedures
				712744.5	Write and interpret the report and thesis in technical way.
B.E.	VII	B.E. Mechanical	Design of Machine Elements Lab	712705.1	design shaft under various conditions
				712705.2	design Coupling
				712705.3	design Permanent Joints and Temporary Joints
				712705.4	design Leaf spring
				712705.5	convert design dimensions into working/manufacturing drawing and use of design data book/standard codes to standardize the designed dimensions
B.E.	VII	B.E. Mechanical	Computer Aided Design Lab	127102.1	Apply the concepts of Computer Aided Design.
				127102.2	Apply the concepts of Computer Aided Graphics.
				127102.3	Apply the concepts of Computer Aided Modelling & Automation.
				127102.4	Apply the concepts of Computer Aided Manufacturing & C.N.C. Programming
				127102.5	Apply the concepts of Introduction to FMS, GT and Robotics
B.E.	VII	B.E. Mechanical	Project (Stage – I)	712707.1	To understand the basic concepts & broad principles of projects.
				712707.2	To understand the value of achieving perfection in project implementation & completion.
				712707.3	To apply the theoretical concepts to solve problems with teamwork and multidisciplinary approach.
				712707.4	To demonstrate professionalism with ethics; present effective communication skills and relate engineering issues to broader societal context.
B.E.	VIII	B.E. Mechanical	Refrigeration & Air Conditioning	812801.1	Understand the principles of refrigeration and remember the application of air refrigeration

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				812801.2	Learn the working of single stage, multistage and Multi-Evaporator using vapour compression refrigeration system with different type of refrigerants.
				812801.3	Study the working principles and its application of vapor absorption refrigeration system.
				812801.4	Apply the knowledge of psychrometry to various psychrometric processes in Air-conditioning system.
				812801.5	Learn different types of Air-Conditioning system used for Human comfort and Use P-h, T-S and Psychometric charts to solve refrigeration and Air conditioning design problems.
B.E.	VIII	B.E. Mechanical	Renwable Energy sources & Technology	812823.1	describe the use of solar energy and the various components used in the energy production with respect to applications like - heating, cooling, desalination, power generation, drying, cooking etc.
				812823.2	appreciate the need of Wind Energy and the various components used in energy generation and know the classifications.
				812823.3	understand the concept of Biomass energy resources and their classification, types of biogas plants- applications
				812823.4	acquire the knowledge of wave power & tidal power
				812823.5	acquire the knowledge of fuel cells & hydrogen energy
B.E.	VIII	B.E. Mechanical	Automobile Engineering	812832.1	To compare and select the proper automotive system for the vehicle.
				812832.2	To analyze the performance of the vehicle. Demonstrate the working of different types of final drives, steering gears and braking systems
				812832.3	To diagnose the faults of automobile vehicles.
				812832.4	Illustrate the constructional features of wheels, tyres and suspension systems
				812832.5	To apply the knowledge of EVs, HEVs and solar vehicles
B.E.	VIII	B.E. Mechanical	Industrial & System Engineering	812842.1	solve forecasting problem by applying different techniques & understand planning, scheduling and sequencing problems for shop floor

Class	Semester	Program	Name of the Subject	CO	Course Outcome
				812842.2	apply work study techniques and understands its importance for better productivity
				812842.3	demonstrate wage and incentive plans & acquire knowledge of industrial legislation
				812842.4	create know-how on solving open-ended problems, utilizing creativity, problem formulation & generation of need statements.
				812842.5	Apply various realistic aspects such as safety, reliability, manufacturability, operations, aesthetics, ethics and sustainability.
B.E.	VIII	B.E. Mechanical	Refrigeration & Air Conditioning Lab	812805.1	Comprehend the performance parameters of Vapour Compression Refrigeration system and domestic refrigerator.
				812805.2	Evaluate cycle performance and actual coefficient of performance (C.O.P.) of ICE Plant
				812805.3	Analyze the performance parameters of Vapour Absorption refrigeration system.
				812805.4	Apply the knowledge of psychrometry to various psychrometric processes in Air-conditioning system.
				812805.5	Know different types of compressors, expansion and Safety used in Refrigeration and Air-Conditioning system, charging of refrigeration system.
B.E.	VIII	B.E. Mechanical	Finite Element	812806.1	Understand the basic finite element formulation techniques.
				812806.2	Derive equations in finite element methods for 1D problems.
				812806.3	Derive equations in finite element methods for 2D problems.
				812806.4	Derive equations in finite element methods for 3D problems.
				812806.5	Understand the basic concept of Simulation and its techniques
B.E.	VIII	B.E. Mechanical	PROJECT	812807.1	To understand the basic concepts & broad principles of projects.

Class	Semester	Program	Name of the Subject	CO	Course Outcome
				812807.2	To understand the value of achieving perfection in project implementation & completion
				812807.3	To apply the theoretical concepts to solve problems with teamwork and multidisciplinary approach.
				812807.4	To demonstrate professionalism with ethics; present effective communication skills and relate engineering issues to broader societal context.