DEPARTMENT OF MECHANICAL ENGINEERING

DEPARTMENT OF MECHANICAL ENGINEERING			
AcademicYear:2022-2023	Year: I Semester: I	Course: M-1	Regulation: R20
S.No.	Course Outcomes	Description	
1	C101.1	Utilize mean value theorems to real life problems (L3)	
2	C101.2	Solve the differential equations related to various engineering fields (L3)	
3	C101.3	Familiarize with functions ofseveral variables which is useful in optimization (L3)	
4	C101.4	Apply double integration techniques in evaluating areas bounded by region (L3)	
5	C101.5	Students will also learn important tools of calculus in higher dimensions. Students will become familiar with 2- dimensional and 3- dimensional coordinate systems(L5)	

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DEPARTMENT OF MECHANICAL ENGINEERING			
AcademicYear:2022-2023	Year: I Semester: I	Course:Engg. Physics	Regulation: R20
S.No.	Course Outcomes	Description	
1	C102.1	The need of coherent sources and the conditions for sustained interference (L2)	
2	C102.2	The basic concepts ofLASER light Sources (L2)	
3	C102.3	He concept of dielectric constant and polarization in dielectric materials (L2)	
4	C102.4	How sound is propagated in buildings (L2)	
5	C102.5	Various crystalsystems (L2)	
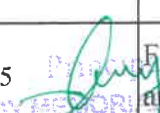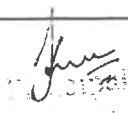
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DEPARTMENT OF MECHANICAL ENGINEERING			
AcademicYear:2022-2023	Year: I Semester: I	Course: Programming for problem solvingusing C	Regulation: R20
S.No.	Course Outcomes	Description	
1	C103.1	To learn about the computer systems, computing environments, developing of a computer program and Structure of a C Program	
2	C103.2	To gain knowledge of the operators, selection, control statements and repetition in C	
3	C103.3	To learn about the design concepts of arrays, strings, enumerated structure and uniontypes. Tolearnaabout their usage.	
4	C103.4	To assimilate about pointers, dynamic memory allocation and know the significance of Preprocessor	
5	C103.5	To assimilate about File I/O and significance of functions	

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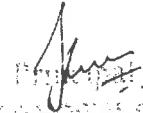| DEPARTMENT OF MECHANICAL ENGINEERING			
AcademicYear:2022-2023	Year: I Semester: I	Course: Communicative English	Regulation: R20
S.No.	Course Outcomes	Description	
1	C104.1	Understand social or transactional dialogues spoken by native speakers of English and identify thecontext, topic, and pieces ofspecific information	
2	C104.2	Ask and answer general questions on familiar topics and introduce oneself/others	
3	C104.3	Employ suitable strategies for skimming and scanning to get the general idea of a text and locatespecific information	
4	C104.4	Recognize paragraph structure and be able to match beginnings/endings/headings with paragraphs	
5	C104.5	Form sentences using proper grammatical structures and correct word forms	

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AcademicYear:2022-2023		**Year: I** **Semester: I**	**Course: Programming for problem solvingusing C laboratory**	**Regulation: R20**
S.No.	**Course Outcomes**	**Description**		
1	C105.1	Gains Knowledge on various concepts of a C language.		
2	C105.2	Able to draw flowcharts and write algorithms.		
3	C105.3	Able design and development of C problem solving skills.		
4	C105.4	Able to design and develop modular programming skills.		
5	C105.5	Able to trace and debug a program		

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AcademicYear:2022-2023		Year: I Semester: II	Course: Linear Algebra & Numerical Methods (M-II)	Regulation: R20
S.No.	Course Outcomes	Description		
1	C106.1	develop the use of matrix algebra techniques that is needed by engineers for practical applications(L6)		
2	C106.2	solve system of linear algebraic equations using Gauss elimination, Gauss Jordan, Gauss Seidel(L3)		
3	C106.3	evaluate the approximate roots of polynomial and transcendental equations by different algorithms (L5)		
4	C106.4	apply Newton's forward & backward interpolation and Lagrange's formulae for equal andunequal		
5	C106.5	apply numerical integral techniques to different Engineering problems (L3)		
6	C106.6	apply different algorithms for approximating the solutions of ordinary differential equations with initial conditions to its analytical computations (L3)		

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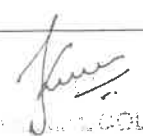| DEPARTMENT OF MECHANICAL ENGINEERING				
AcademicYear:2022-2023		Year: I Semester: II	Course: ENGINEERING CHEMISTRY	Regulation: R20
S.No.	Course Outcomes	Description		
1	C107.1	Analyze the different types of composite plastic materials and interpret the mechanism of conduction in conducting polymers.		
2	C107.2	Utilize the theory of construction of electrodes, batteries and fuel cells in redesigning new engineering products and categorize the reasons for corrosion and study methods to control corrosion.		
3	C107.3	Synthesize nanomaterials for modern advances of engineering technology. Summarize the techniques that detect and measure changes of state of reaction.		
4	C107.4	Differentiate petroleum, petrol, synthetic petrol and have knowledge how they are produced		
5	C107.5	Analyze the suitable methods for purification and treatment of hard water and brackish water.		
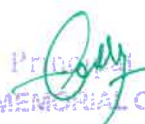
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Academic Year:2022-23		Year: I Semester: II	Course:Engineering mechanics	Regulation: R20
1	C108.1	The student should be able to draw free body diagrams for FBDs for particles and rigid bodies in plane and space and problems to solve the unknown forces, orientations and geometric parameters		
2	C108.2	He should be able to determine centroid for lines, areas and center of gravity for volumes and their composites.		
3	C108.3	He should be able to determine area and mass movement of inertia for composite sections		
4	C108.4	He should be able to analyze motion of particles and rigid bodies and apply the principles of motion, work energy and impulse – momentum		

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Academic Year:2022-23		Year: I Semester: II	Course:BASIC ELECTRICAL & ELECTRONICS ENGINEERING	Regulation: R20
1	C109.1	Analyze various electrical networks		
2	C109.2	Understand operation of DC generators,3-point starter and DC machine testing by Swinburne'sTest and Brake test		
3	C109.3	Analyze performance of single-phase transformer and acquire proper knowledge andworking of3-phase alternator and 3-phase induction motors.		
4	C109.4	Analyze operation of half wave, full wave bridge rectifiers and OP-AMPs		
5	C109.5	Understanding operations of CE amplifier and basic concept of feedback amplifier		

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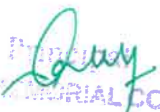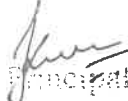| Academic Year:2022-23		Year: I Semester: II	Course: THERMODYNAMICS	Regulation: R20
1	C110.1	Basic concepts of thermodynamics		
2	C110.2	Laws of thermodynamics		
3	C110.3	Concept of entropy		
4	C110.4	Property evaluation of vapors and their depiction in tables and charts		
5	C110.5	Evaluation of properties of perfect gas mixtures.		

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Academic Year 2022-23		Year: I Semester: II	Course:BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB	Regulation: R20
1	C111.1	Compute the efficiency of DC shunt machine without actual loading of the machine.		
2	C111.2	Estimate the efficiency and regulation at different load conditions and power factors forsinglephase transformer with OC and SC tests.		
3	C111.3	Analyze the performance characteristics and to determine efficiency of DC shunt motor &3-Phaseinduction motor.		
4	C111.4	Pre-determine the regulation of an alternator bysynchronous impedance method		
5	C111.5	Control the speed of dc shunt motor using Armature voltage and Field flux control methods		
6	C111.1	Draw the characteristics of PN junction diode & transistor Determine the ripple factor of half wave & full wave rectifiers.		

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Academic Year 2022-23		Year: I Semester: II	Course: CONSTITUTION OF INDIA	Regulation: R20
1	C112.1	Understand historical background of the constitution making and its importance for building a democratic India		
2	C112.2	Understand the functioning of three wings of the government ie., executive, andjudiciary		
3	C112.3	Understand the value ofthe fundamental rights and duties for becoming good citizen ofIndia.		
4	C112.4	Analyze the decentralization of power between central, state and localself-government.		
5	C112.5	Apply the knowledge in strengthening of the constitutional institutions like		
6	C112.1	Draw the characteristics of PN junction diode & transistor Determine the ripple factor of half wave & full wave rectifiers.		
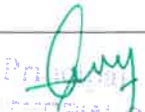
DEPARTMENT OF MECHANICAL ENGINEERING

Academic Year 2022-23		Year: II Semester: I	Course: VECTOR CALCULUS FOURIER TRANSFORMS and PDE (M-III)	Regulation: R20
1	C201.1	Interpret the physical meaning of different operators such as gradient, curl and divergence (L5)		
2	C201.2	Estimate the work done against a field, circulation and flux using vector calculus (L5)		
3	C201.3	Apply the Laplace transform for solving differential equations (L3)		
4	C201.4	Find or compute the Fourier series of periodic signals (L3)		
5	C201.5	know and be able to apply integral expressions for the forwards and inverse Fourier transform to a range of non-periodic waveforms (L3)		
6	C201.6	Identify solution methods for partial differential equations that model physical processes (L3).		

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Academic Year 2022-23		Year: II Semester: I	Course: MECHANICS OF SOLIDS	Regulation: R20
1	C202.1	Model &Analyze the behavior of basic structural members subjected to various loading and support conditions based on principles of equilibrium.		
2	C202.2	Understand the apply the concept of stress and strain to analyze and design structural members and machine parts under axial, shear and bending loads, moment and torsional moment.		
3	C202.3	Students will learn all the methods to analyze beams, columns, frames for normal, shear, and torsion stresses and to solve deflection problems in preparation for the design of such structural components. Students are able to analyze beams and draw correct and complete shear and bending moment diagrams forbeams		
4	C202.4	Students attain a deeper understanding of the loads, stresses, and strains acting on a structure and their relations in the elastic behavior		
5	C202.5	Design and analysis of Industrial components like pressure vessels.		

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Academic Year 2022-23		Year: II Semester: I	Course :FLUID MECHANICS & HYDRAULIC MACHINES	Regulation: R20
1	C203.1	The basic concepts of fluid properties.		
2	C203.2	The mechanics of fluids in static and dynamic conditions.		
3	C203.3	Boundary layer theory, flow separation and dimensional analysis. CO4: Hydrodynamic forces of jet on vanes in different positions.		
4	C203.4	Working Principles and performance evaluation of hydraulic pump and turbines		
5	C203.5	The basic concepts of fluid properties.		

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Academic Year 2022-23		Year: II Semester: I	Course: PRODUCTION TECHNOLOGY	Regulation: R20
1	C204.1	Able to design the patterns and core boxes for metal casting processes CO2: Able to design the gating system for different metallic components CO3: Know the different types of manufacturing processes		
2	C204.2	Be able to use forging, extrusion processes		
3	C204.3	Learn about the different types of welding processes used for special fabrication		
4	C204.4	Able to design the patterns and core boxes for metal casting processes CO2: Able to design the gating system for different metallic components CO3: Know the different types of manufacturing processes		
5	C204.5	Be able to use forging, extrusion processes		

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Academic Year 2022-23		Year: II Semester: I	Course: KINEMATICS OF MACHINERY	Regulation: R20
1	C205.1	Contrive a mechanism for a given plane motion with single degree of freedom.		
2	C205.2	Suggest and analyze a mechanism for a given straight line motion and automobile steering motion.		
3	C205.3	Suggest and analyze mechanisms for a prescribed intermittent motion like opening and closing of IC engine valves etc.		
4	C205.4	Select a power transmission system for a given application and analyze motion of different transmission systems		
5	C205.5	Analyze the motion (velocity and acceleration) of a plane mechanism.		

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Academic Year 2022-23		Year: II Semester: I	Course: COMPUTER AIDED ENGINEERING DRAWING PRACTICE	Regulation: R20
1	C206.1	Student get exposed on working of sheet metal with help of development ofsurfaces		
2	C206.2	Student understands how to know the hidden details of machine components with the help of sections and interpenetrations ofsolids .		
3	C206.3	Student shall exposed to modeling commands for generating 2D and 3D objects using computer aided drafting tools which are useful to create machine elements for computer aidedanalysis.		

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Academic Year 2022-23		II Year - II Semester	Course: MATERIALS SCIENCE & METALLURGY	Regulation: R20
1	C207.1	Understand the crystalline structure of different metals and study the stability of phases in different alloy systems.		
2	C207.2	Study the behavior of ferrous and non ferrous metals and alloys and their application in different domains		
3	C207.3	Able to understand the effect of heat treatment, addition of alloying elements on properties of ferrous metals.		
4	C207.4	Grasp the methods of making of metal powders and applications of powder metallurgy Comprehend the properties and applications of ceramic, composites and other advanced methods.		
5	C207.5	Understand the crystalline structure of different metals and study the stability of phases in different alloy systems.		

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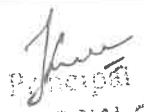| Academic Year 2022-23		II Year - II Semeste	Course: COMPLEX VARIABLES AND STATISTICAL METHODS	Regulation: R20
1	C208.1	infer the statistical inferential methods based on small and large sampling tests		
2	C208.2	apply Cauchy-Riemann equations to complex functions in order to determine whether a given continuous function is analytic (L3)		
3	C208.3	find the differentiation and integration of complex functions used in engineering problems (L5)		
4	C208.4	make use of the Cauchy residue theorem to evaluate certain integrals (L3)		
5	C208.5	apply discrete and continuous probability distributions (L3)		
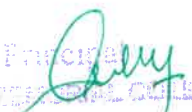
DEPARTMENT OF MECHANICAL ENGINEERING

Academic Year 2022-23		II Year - II Semester	Course: DYNAMICS OF MACHINERY	Regulation: R20
1	C209.1	To determine the natural frequencies of discrete systems undergoing longitudinal, torsional and transverse vibrations		
2	C209.2	To compute the frictional losses and transmission in clutches, brakes anddynamometers		
3	C209.3	To determine the effect of gyroscopic couple in motor vehicles, ships andaeroplanes		
4	C209.4	To analyze the forces in four bar and slider crank mechanisms and design aflywheel		
5	C209.5	To determine the rotary unbalanced mass in reciprocatingequipment		
6	C209.1	To determine the unbalanced forces and couples in reciprocating and radialengines		

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Academic Year 2022-23		II Year - II Semester	Course: THERMAL ENGINEERING - I	Regulation: R20
1	C210.1	Derive the actual cycle from fuel-air cycle and air- standard cycle for all practical applications.		
2	C210.2	Explain combustion phenomenon of CI and SI engines and their impact on engine variables. Analyze the performance of an IC engine based on the performance parameters.		
3	C210.3	Derive the actual cycle from fuel-air cycle and air- standard cycle for all practical applications. Explain working principle and various components of IC engine		
4	C210.4	Explain combustion phenomenon of CI and SI engines and their impact on engine variables. Analyze the performance of an IC engine based on the performance parameters.		
5	C210.5	Derive the actual cycle from fuel-air cycle and air- standard cycle for all practical applications.		

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Academic Year 2022-23		II Year – II Semester	Course: INDUSTRIAL ENGINEERING AND MANAGEMENT	Regulation: R20
1	C211.1	Design and conduct experiments, analyse, interpret data and synthesize validconclusions		
2	C211.2	Design a system, component, or process, and synthesize solutions to achieve desiredneeds		
3	C211.3	Use the techniques, skills, and modern engineering tools necessary for engineering practice with appropriate considerations for public health and safety, cultural, societal, and environmental constraints		
4	C211.4	Function effectively within multi-disciplinary teams and understand the fundamental precepts of effective project management		

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Academic Year 2022-23		II Year - II Semester	Course: MACHINE DRAWING PRACTICE	Regulation: R20
1	C212.1	Draw and represent standard dimensions of different mechanical fasteners and joints and Couplings.		
2	C212.2	Draw different types of bearings showing different components.		
3	C212.3	Assemble components of a machine part and draw the sectional assembly drawing showing the dimensions of all the components of the assembly as per bill of materials		
4	C212.4	Select and represent fits and geometrical form of different mating parts in assembly drawings. To prepare manufacturing drawings indicating fits, tolerances, surface finish and surface treatment requirements		
5	C212.5	Draw and represent standard dimensions of different mechanical fasteners and joints and Couplings.		

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Academic Year 2022-23		III Year-I Semester	Course: thermal engineering-2	Regulation: R20
1	C301.1	Explain the basic concepts of thermal engineering and boilers.		
2	C301.2	Discuss the concepts of steam nozzles and steam turbines.		
3	C301.3	Gain knowledge about the concepts of reaction turbine and steam condensers.		
4	C301.4	Discuss the concepts of reciprocating and rotary type of compressors.		
5	C301.5	Acquire knowledge about the centrifugal and axial flow compressors.		

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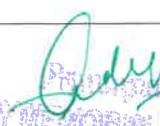| Academic Year 2022-23		III Year-I Semester	Course: DESIGN OF MACHINE MEMBERS-I	Regulation: R20
1	C302.1	Judge about materials and their properties along with manufacturing considerations.		
2	C302.2	Gain knowledge about the strength of machine elements.		
3	C302.3	Apply the knowledge in designing the riveted and welded joints, keys,		
4	C302.4	cotters and knuckle joints.		
5	C302.5	Apply the knowledge in designing the shafts and shaft couplings.		

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Academic Year 2022-23		III Year-I Semester	Course: MACHINING, MACHINE TOOLS & METROLOGY	Regulation: R20
1	C303.1	Discuss the concepts of machining processes.		
2	C303.2	Apply the principles of lathe, shaping, slotting and planning machines.		
3	C303.3	Apply the principles of drilling, milling and boring processes.		
4	C303.4	Analyze the concepts of finishing processes and the system of limits and fits.		
5	C303.5	Learn the concepts of surface roughness and optical measuring instruments.		

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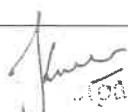| Academic Year 2022-23		III Year-I Semester	Course: SUSTAINABLE ENERGY TECHNOLOGIES	Regulation: R20
1	C304.1	Explain the importance of solar energy collection and storage.		
2	C304.2	Apply the principles of wind energy and biomass energy.		
3	C304.3	Analyze knowledge on geothermal and ocean energy.		
4	C304.4	Justify the knowledge about energy efficient systems.		
5	C304.5	Discuss the concepts of green manufacturing systems.		
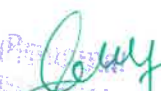
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Academic Year 2022-23		III Year-I Semester	Course: OPERATIONS RESEARCH	Regulation: R20
1	C305.1	Apply the basics of operations research and linear programming problems.		
2	C305.2	Apply the knowledge in solving problems of transportation, assignment and sequencing.		
3	C305.3	Apply the knowledge in solving problems of dynamic programming and simulation		
4	C305.4	Judge the replacement and game theories and apply the knowledge to solve problems.		
5	C305.5	Discuss the waiting line models and project management techniques.		

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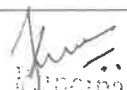| Academic Year 2022-23		III Year-I Semester	Course: NANO TECHNOLOGY	Regulation: R20
1	C306.1	Explain about nano-structured materials and their applications.		
2	C306.2	Apply knowledge about the nano crystalline materials, their properties and defects.		
3	C306.3	Justify various techniques of nanofabrication.		
4	C306.4	Apply the tools to characterize nano materials.		
5	C306.5	Analyze the applications of nano materials		

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Academic Year 2022-23		III Year-I Semester	Course: THERMAL MANAGEMENT OF ELECTRONIC SYSTEMS	Regulation: R20
1	C307.1	Apply the basics of heat transfer and analyze heat transfer through fins		
2	C307.2	Analyze the basics of convection and radiation modes of heat transfer.		
3	C307.3	Analyze knowledge about the thermal analysis of printed circuit boards and their cooling.		
4	C307.4	Explain the principles of two-phase cooling and heat pipes.		
5	C307.5	Justify knowledge about the thermoelectric coolers		

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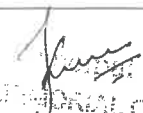| Academic Year 2022-23		III Year-I Semester	Course: FINITE ELEMENT METHODS	Regulation: R20
1	C308.1	Apply basic principles of finite element methods.		
2	C308.2	Analyze about discretization principles and apply to analyse the trusses.		
3	C308.3	Apply the finite element method to analyze and solve beam problems.		
4	C308.4	Judge the knowledge about two dimensional stress analysis.		
5	C308.5	Apply steady state and dynamic analysis		

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Academic Year 2022-23		III Year-I Semester	Course: INDUSTRIAL ROBOTICS	Regulation: R20
1	C309.1	Perceive the concepts of robotics and its sytems.		
2	C309.2	Apply knowledge about the motion analysis and manipulator kinematics.		
3	C309.3	Analyze the differential transformations.		
4	C309.4	Apply the basics about path description and generation.		
5	C309.5	Judge about the actuators, feedback components and robotic applications.		

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Academic Year 2022-23		III Year-I Semester	Course: ADVANCED MATERIALS	Regulation: R20
1	C310.1	Justify the knowledge about metals and alloys and their utility in different environments.		
2	C310.2	Judge about polymers and ceramics and their applications.		
3	C310.3	Analyze composite materials along with reinforcements and their applications.		
4	C310.4	Utilize shape memory alloys and functionally graded materials for different applications.		
5	C310.5	Justify about the nanomaterials and their applications		

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Academic Year 2022-23		III Year-I Semester	Course: RENEWABLE ENERGY SOURCES	Regulation: R20
1	C311.1	Explain the importance of, solar energy collection and storage.		
2	C311.2	Discuss the wind energy principles.		
3	C311.3	Analyze about biomass energy concepts.		
4	C311.4	Apply the principles of tidal energy.		
5	C311.5	Utilize the concepts of geothermal energy.		

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Academic Year 2022-23		III Year-I Semester	Course: Mechanics of comoposites	Regulation: R20
1	C312.1	Discuss the composite materials and their classification.		
2	C312.2	Apply the micro mechanical analysis of a lamina.		
3	C312.3	Learn about two dimensional angle lamina.		
4	C312.4	Apply the macro mechanical analysis of a lamina.		
5	C312.5	Utilize knowledge in designing the laminates		

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Academic Year 2022-23		III Year-I Semester	Course: PROFESSIONAL ETHICS AND HUMAN VALUES	Regulation: R20
1	C313.1	Judge the concepts of human values.		
2	C313.2	Justify knowledge about the principles of engineering ethics.		
3	C313.3	Interpret engineering as social experimentation.		
4	C313.4	Realize engineers' responsibility for safety and risk.		
5	C313.5	Learn about the engineers' rights and responsibilities		

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Academic Year 2022-23		III Year - II Semester	Course: HEAT TRANSFER	Regulation: R20
1	C314.1	Apply knowledge about mechanism and modes of heat transfer.		
2	C314.2	Understand the concepts of conduction and convective heat transfer.		
3	C314.3	Learn about forced and free convection.		
4	C314.4	Analyze the concepts of heat transfer with phase change and condensation along with heat exchangers		
5	C314.5	Interpret the knowledge about radiation mode of heat transfer		

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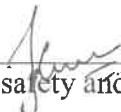| Academic Year 2022-23		III Year - II Semester	Course: DESIGN OF MACHINE MEMBERS-II	Regulation: R20
1	C315.1	Apply knowledge about the design of bearings.		
2	C315.2	Explain the concepts in designing various engine parts.		
3	C315.3	Utilize the knowledge to design curved beams and power screws.		
4	C315.4	Justify power transmission systems and to design pulleys and gear drives.		
5	C315.5	Apply the concepts in designing various machine tool elements		
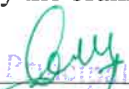
DEPARTMENT OF MECHANICAL ENGINEERING

Academic Year 2022-23		III Year - II Semester	Course: INTRODUCTION TO ARTIFICIAL INTELLIGENCE & MACHINE LEARNING	Regulation: R20
1	C316.1	Discuss basic concepts of artificial intelligence, neural networks and genetic algorithms.		
2	C316.2	Apply the principles of knowledge representation and reasoning.		
3	C316.3	Learn about bayesian and computational learning and machine learning.		
4	C316.4	Utilize various machine learning techniques.		
5	C316.5	Apply the machine learning analytics and deep learning techniques		

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Academic Year 2022-23		III Year - II Semester	Course: AUTOMOBILE ENGINEERING	Regulation: R20
1	C317.1	Discuss various components of four wheeler automobile.		
2	C317.2	Apply the knowledge of different parts of transmission system.		
3	C317.3	Judge about steering and suspension systems.		
4	C317.4	Justify the braking system and electrical system used in automobiles.		
5	C317.5	Analyze the concepts about engine specifications and service, safety and electronic		
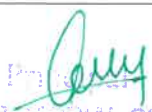
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Academic Year 2022-23		III Year - II Semester	Course: ADVANCED MATERIALS	Regulation: R20
1	C318.1	Explain the metals and alloys and their utility in different environments.		
2	C318.2	Learn about polymers and ceramics and their applications.		
3	C318.3	Analyze composite materials along with reinforcements and their applications.		
4	C318.4	Apply the basics of shape memory alloys and functionally graded materials.		
5	C318.5	Analyze the knowledge about the nanomaterials and their applications.		

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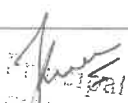| Academic Year 2022-23		III Year - II Semester	Course: ADVANCED MATERIALS	Regulation: R20
1	C319.1	Explain the metals and alloys and their utility in different environments.		
2	C319.2	Learn about polymers and ceramics and their applications.		
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4	C319.4	Apply the basics of shape memory alloys and functionally graded materials.		
5	C319.5	Analyze the knowledge about the nanomaterials and their applications.		

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Academic Year 2022-23		IV Year - I Semester	Course: INDUSTRIAL MANAGEMENT	Regulation: R19
1	C401.1	Upon successful completion of this course you should be able to		
2	C401.2	Design and conduct experiments, analyse, interpret data and synthesize valid conclusions		
3	C401.3	Design a system, component, or process, and synthesize solutions to achieve desired needs		
4	C401.4	Use the techniques, skills, and modern engineering tools necessary for engineering practice with appropriate considerations for public health and safety, cultural, societal, and environmental constraints		
5	C401.5	Function effectively within multi-disciplinary teams and understand the fundamental precepts of effective project management		

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Academic Year 2022-23		IV Year - I Semester	Course: FINITE ELEMENT METHODS	Regulation: R19
1	C402.1	Able to apply the FE procedure to field problems like heat transfer		
2	C402.2	Understand the concepts behind variational methods and weighted residual methods in FEM		
3	C402.3	Identify the application and characteristics of FEA elements such as bars, beams, plane and isoparametric elements, and 3-D element .		
4	C402.4	Develop element characteristic equation procedure and generate global equations.		
5	C402.5	Able to apply Suitable boundary conditions to global equations, and reduce it to a solvable form.		

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Academic Year 2022-23		IV Year - I Semester	Course: **RENEWABLE ENERGY SOURCES**	Regulation: R19
1	C403.1	1) To understand the principles and working of solar, wind, biomass, geo thermal, ocean energies.		
2	C403.2	(2) To understand the principles and working and green energy systems and appreciate their		

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Academic Year 2022-23		IV Year - I Semester	Course: **POWER PLANT ENGINEERING**	Regulation: R19
1	C404.1	1) Understand various conventional methods of power generation		
2	C404.2	(2) To understand the principle of operation and performance of respective prime movers along with their		
3	C404.3	economics and their impact on environment.		

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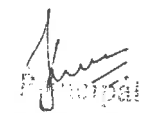| Academic Year 2022-23		IV Year - II Semester	Course: **ADDITIVE MANUFACTURING**	Regulation: R19
1	C405.1	The student shall be able to identify the use of Rapid Prototyping Techniques in the manufacturing of complex components that are otherwise very difficult to manufacture		

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Academic Year 2022-23		IV Year - II Semester	Course: NON - DESTRUCTIVE EVALUATION	Regulation: R19
1	C406.1	1. Comprehensive, theory based understanding of the techniques and methods of non		
2	C406.2	destructive testing		

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Academic Year 2022-23		IV Year - II Semester	Course: TOTAL QUALITY MANAGEMENT	Regulation: R19
1	C407.1	To realize the importance of significance of quality		
2	C407.2	Manage quality improvement teams		
3	C407.3	Identify requirements of quality improvement programs		