Course Name: - Calculus & Differential Equations
Subject Code: - 21MAT11, C101, Year of Study 2021-22

CO Code	NBA Code	Course Outcomes
21MAT11.1	C101.1	Apply the knowledge of calculus to solve problems related to polar curves and its applications in determining the bentness of a curve.
21MAT11.2	C101.2	Learn the notion of partial differentiation to calculate rate of change of multivariate functions and solve problems related to composite functions and Jacobian.
21MAT11.3	C101.3	Solve first-order linear/nonlinear ordinary differential equations analytically using standard method
21MAT11.4	C101.4	Demonstrate various models through higher order differential equations and solve such linear ordinary differential equations.
21MAT11.5	C101.5	Test the consistency of a system of linear equations and to solve them by direct and iterative methods.

Course Name: - Engineering Physics
Subject Code: - 21PHY12, C102, Year of Study 2021-22

CO Code	NBA Code	Course Outcomes
21PHY12.1	C102.1	Interpret the types of mechanical vibrations and their applications, the role of Shock waves in various fields.
21PHY12.2	C102.2	Demonstrate the quantisation of energy for microscopic system
21PHY12.3	C102.3	Apply LASER and Optical fibers in opto electronic system
21PHY12.4	C102.4	Illustrate merits of quantum free electron theory and applications of Hall effect.
21PHY12.5	C102.5	Analyse the importance of XRD and Electron Microscopy in Nano material characterization.

Course Name: - Basic Electrical Engineering
Subject Code: - 21ELE13, C103, Year of Study 2021-22

CO Code	NBA Code	Course Outcomes
21ELE13.1	C103.1	Analyse basic DC and AC electric circuits.
21ELE13.2	C103.2	Explain the working principles of transformers and electrical machines
21ELE13.3	C103.3	Explain the concepts of electric power transmission and distribution of power.
21ELE13.4	C103.4	Understand the wiring methods, electricity billing, and working principles of circuit protective devices and personal safety measures.

Course Name: - Elements of Civil Engineering and Mechanics
Subject Code: - 21CIV14, C104, Year of Study 2021-22

CO Code	NBA Code	Course Outcomes
21CIV14.1	C104.1	Understand the various fields of civil engineering
21CIV14.2	C104.2	Compute the resultant of a force system and resolution of a force
21CIV14.3	C104.3	Comprehend the action for forces, moments, and other types of loads on rigid bodies and compute the reactive forces
21CIV14.4	C104.4	Locate the centroid and compute the moment of inertia of regular and built-up sections.
21CIV14.5	C104.5	Analyze the bodies in motion.

Course Name: - Engineering Visualization
Subject Code: - 21EVN15, C105, Year of Study 2021-22

CO Code	NBA Code	Course Outcomes
21EVN15.1	C105.1	Understand and visualize the objects with definite shape and dimensions
21EVN15.2	C105.2	Analyze the shape and size of objects through different views
21EVN15.3	C105.3	Develop the lateral surfaces of the object
21EVN15.4	C105.4	Create a 3D view using CAD software.
21EVN15.5	C105.5	Identify the interdisciplinary engineering components or systems through its graphical representation.

Course Name: - Engineering Physics Laboratory
Subject Code: - 21PHYL16, C106, Year of Study 2021-22

CO Code	NBA Code	Course Outcomes
21PHYL16.1	C106.1	Understand the measuring techniques
21PHYL16.2	C106.2	Operate different instruments and be capable to analyse the experimental results.
21PHYL16.3	C106.3	Construct the circuits and their analysis.

Course Name: - Basic Electrical Engineering Laboratory
Subject Code: - 21ELE17, C107, Year of Study 2021-22

CO Code	NBA Code	Course Outcomes
21ELE17.1	C107.1	Verify KCL and KVL and maximum power transfer theorem for DC circuits
21ELE17.2	C107.2	Compare power factors of different types of lamps
21ELE17.3	C107.3	Demonstrate the measurement of the impedance of an electrical circuit and power consumed by a 3-phase load.
21ELE17.4	C107.4	Analyze two-way and three-way control of lamps.
21ELE17.5	C107.5	Explain the effects of open and short circuits in simple circuits.
21ELE17.6	C107.6	Interpret the suitability of earth resistance measured.

Course Name: - Communicative English
Subject Code: - 21EGH18, C108, Year of Study 2021-22

CO Code	NBA Code	Course Outcomes
21EGH18.1	C108.1	Understand and apply the Fundamentals of Communication Skills in their communication skills.
21EGH18.2	C108.2	Identify the nuances of phonetics, intonation and enhance pronunciation skills.
21EGH18.3	C108.3	To impart basic English grammar and essentials of language skills as per present requirement.
21EGH18.4	C108.4	Understand and use all types of English vocabulary and language proficiency.
21EGH18.5	C108.5	Adopt the Techniques of Information Transfer through presentation.

Course Name: - Innovation and Design Thinking
Subject Code: - 21IDT19, C109, Year of Study 2021-22

CO Code	NBA Code	Course Outcomes
21IDT19.1	C109.1	Appreciate various design process procedure
21IDT19.2	C109.2	Generate and develop design ideas through different technique
21IDT19.3	C109.3	Identify the significance of reverse Engineering to Understand products
21IDT19.4	C109.4	Draw technical drawing for design ideas

Course Name: - Advanced Calculus and Numerical Methods
Subject Code: - 21MAT21, C110, Year of Study 2021-22

CO Code	NBA Code	Course Outcomes
21MAT21.1	C110.1	Apply the concept of change of order of integration and change of variables to evaluate multiple integrals and their usage in computing the area and volume.
21MAT21.2	C110.2	Illustrate the applications of multivariate calculus to understand the solenoidal and irrotational vectors and also exhibit the inter dependence of line, surface and volume integrals.
21MAT21.3	C110.3	Formulate physical problems to partial differential equations and to obtain solution for standard practical PDE's
21MAT21.4	C110.4	Apply the knowledge of numerical methods in modelling of various physical and engineering phenomena..
21MAT21.5	C110.5	Solve first order ordinary differential equations arising in engineering problems

Course Name: - Engineering Chemistry
Subject Code: - 21CHE22, C111, Year of Study 2021-22

CO Code	NBA Code	Course Outcomes
21CHE22.1	C111.1	Discuss the electrochemical energy systems such as electrodes and batteries.
21CHE22.2	C111.2	Explain the fundamental concepts of corrosion, its control and surface modification methods namely electroplating and electroless plating

21CHE22.3	C111.3	Enumerate the importance, synthesis and applications of polymers. Understand properties and application of nanomaterials.
21CHE22.4	C111.4	Describe the principles of green chemistry,understand properties and application alternative fuels.
21CHE22.5	C111.5	Illustrate the fundamental principles of water chemistry, applications of volumetric and analytical instrumentation.

Course Name: - Problem-Solving through Programming
Subject Code: - 21PSP23, C112, Year of Study 2021-22

CO Code	NBA Code	Course Outcomes
21PSP23.1	C112.1	Elucidate the basic architecture and functionalities of a computer and also recognize the hardware parts.
21PSP23.2	C112.2	Apply programming constructs of C language to solve the real world problem
21PSP23.3	C112.3	Explore user-defined data structures like arrays in implementing solutions to problems like searching and sorting
21PSP23.4	C112.4	Explore user-defined data structures like structures, unions and pointers in implementing solutions
21PSP23.5	C112.5	Design and Develop Solutions to problems using modular programming constructs using functions

Course Name: - Basic Electronics & Communication Engineering
Subject Code: - 21ELN24, C113, Year of Study 2021-22

CO Code	NBA Code	Course Outcomes
21ELN24.1	113.1	Describe the concepts of electronic circuits encompassing power supplies, amplifiers and oscillators.
21ELN24.2	113.2	Present the basics of digital logic engineering including data representation, circuits and the microcontroller system with associated sensors and actuators.
21ELN24.3	113.3	Discuss the characteristics and technological advances of embedded systems.
21ELN24.4	113.4	Relate to the fundamentals of communication engineering spanning from the frequency spectrum to the various circuits involved including antennas.
21ELN24.5	113.5	Explain the different modes of communications from wired to wireless and the computing involved

Course Name: - Elements of Mechanical Engineering
Subject Code: - 21EME25, C114, Year of Study 2021-22

CO Code	NBA Code	Course Outcomes
21EME25.1	C114.1	Understand basic concepts of mechanical engineering in the fields of energy and its utilization, materials technology, manufacturing techniques, and transmission systems through demonstrations.
21EME25.2	C114.2	Understand the application of energy sources in Power generation and utilization, Engineering materials, manufacturing, and machining techniques leading to the latest advancements and transmission systems in day to day activities
21EME25.3	C114.3	Apply the skills in developing simple mechanical elements and processes

Course Name: - Engineering Chemistry Laboratory
Subject Code: - 21CHEL26, C115, Year of Study 2021-22

CO Code	NBA Code	Course Outcomes
21CHEL26.1	C115.1	Determine the pKa and coefficient of Viscosity of a given organic liquid.
21CHEL26.2	C115.2	Estimate the amount of substance present in the given solution using Potentiometer Conductometric and Colorimetric.
21CHEL26.3	C115.3	Determine the total hardness and chemical oxygen demand in the given solution by volumetric analysis method
21CHEL26.4	C115.4	Estimate the percentage of Nickel, copper and Iron in the given analyte solution by titration method.
21CHEL26.5	C115.5	Demonstrate flame photometric estimation of sodium & potassium and the synthesis of nanomaterials by Precipitation method.

Course Name: - Computer Programming Laboratory
Subject Code: - 21CPL27, C116, Year of Study 2021-22

CO Code	NBA Code	Course Outcomes
21CPL27.1	C116.1	Define the problem statement and identify the need for computer programming
21CPL27.2	C116.2	Make use of C compiler, IDE for programming, identify and correct the syntax and syntactic errors in programming
21CPL27.3	C116.3	Develop algorithm, flowchart and write programs to solve the given problem
21CPL27.4	C116.4	Demonstrate use of functions, recursive functions, arrays, strings, structures and pointers in problem solving.
21CPL27.5	C116.5	Document the inference and observations made from the implementation.

Course Name: - Professional Writing Skills in English
Subject Code: - 21EGH28, C117, Year of Study 2021-22

CO Code	NBA Code	Course Outcomes
21EGH28.1	C117.1	To understand and identify the Common Errors in Writing and Speaking
21EGH28.2	C117.2	To Achieve better Technical writing and Presentation skills.
21EGH28.3	C117.3	To read Technical proposals properly and make them to Write good technical reports.
21EGH28.4	C117.4	Acquire Employment and Workplace communication skills.
21EGH28.5	C117.5	To learn about Techniques of Information Transfer through presentation in different level

Course Name: - Scientific Foundations of Health
Subject Code: - 21SFH29, C118, Year of Study 2021-22

CO Code	NBA Code	Course Outcomes
21SFH29.1	C118.1	To understand Health and wellness (and its Beliefs).
21SFH29.2	C118.2	To acquire Good Health & It's balance for positive mindset

21SFH29.3	C118.3	To inculcate and develop the healthy lifestyle habits for good health.
21SFH29.4	C118.4	To Create of Healthy and caring relationships to meet the requirements of MNC and LPG world
21SFH29.5	C118.5	To adopt the innovative & positive methods to avoid risks from harmful habits in their campus & outside the campus.
21SFH29.6	C118.6	To positively fight against harmful diseases for good health through positive mindset

Course Name: - Transform Calculus, Fourier series And Numerical Techniques
Subject Code: - 21MAT31, C201, Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21MAT31.1	C201.1	To solve ordinary differential equations using Laplace transform.
21MAT31.2	C201.2	Demonstrate the Fourier series to study the behaviour of periodic functions and their communications, digital signal processing and field theory.
21MAT31.3	C201.3	To use Fourier transforms to analyze problems involving continuous-time signals and to apply Z-Transform techniques to solve difference equations
21MAT31.4	C201.4	To solve mathematical models represented by initial or boundary value problems involving partial differential equations
21MAT31.5	C201.5	Determine the extrenals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.

Course Name: Metal casting, Forming and Joining Processes
Subject Code: - 21ME32, C202 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21ME32.1	C202.1	Select appropriate primary manufacturing process and related parameters for obtaining initial shape and size of components.
21ME32.2	C202.2	Design and develop adequate tooling linked with casting, welding and forming operations.
21ME32.3	C202.3	Appreciate the effect of process parameters on quality of manufactured components
21ME32.4	C202.4	Demonstrate various skills in preparation of molding sand for conducting tensile, shear and compression tests using Universal sand testing machine.
21ME32.5	C202.5	Demonstrate skills in preparation of forging models involving upsetting, drawing and bending operations.
21ME32.6	C202.6	Demonstrate skills in preparation of Welding models.

Course Name: Material Science and Engineering
Subject Code: - 21ME33, C203 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21ME33.1	C203.1	Understand the atomic arrangement in crystalline materials and describe the periodic arrangement of atoms in terms of unit cell parameters.
21ME33.2	C203.2	Understand the importance of phase diagrams and the phase transformations.
21ME33.3	C203.3	Know various heat treatment methods for controlling the microstructure..
21ME33.4	C203.4	Correlate between material properties with component design and identify various kinds of defects.
21ME33.5	C203.5	Apply the method of materials selection, material data and knowledge sources for computer-aided selection of materials.

Course Name: Thermodynamics
Subject Code: - 21ME34, C204 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21ME34.1	C204.1	Describe the fundamental concepts and principles of engineering thermodynamics.
21ME34.2	C204.2	Apply the governing laws of thermodynamics for different engineering applications
21ME34.3	C204.3	Analyse the various thermodynamic processes, cycles and results.
21ME34.4	C204.4	Interpret and relate the impact of thermal engineering practices to real life problems

Course Name: Machine Drawing and GD & T
Subject Code: - 21MEL35, C205 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21MEL35.1	C205.1	Interpret the Machining and surface finish symbols on the component drawings.
21MEL35.2	C205.2	Apply limits and tolerances to assemblies and choose appropriate fits for given assemblies.
21MEL35.3	C205.3	Illustrate various machine components through drawings
21MEL35.4	C205.4	Create assembly drawings as per the conventions.

Course Name: Social Connect and Responsibility
Subject Code: - 21SCR36, C206 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21SCR36.1	C206.1	Understand social responsibility
21SCR36.2	C206.2	Practice sustainability and creativity
21SCR36.3	C206.3	Showcase planning and organizational skills

Course Name: - Samskrutika Kannada
Subject Code: - 21KSK37, C207 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21KSK37.1	C207.1	ಕನ್ನಡ ಭಾಷೆ, ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡದ ಸಂಸ್ಕೃತಿಯ ಪರಿಚಯವಾಗುತ್ತದೆ.
21KSK37.2	C207.2	ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳು ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಆಸಕ್ತಿಯು ಮೂಡುತ್ತದೆ.
21KSK37.3	C207.3	ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯವಾಗುತ್ತದೆ.
21KSK37.4	C207.4	ಕನ್ನಡ ಭಾಷಾಭ್ಯಾಸ, ಸಾಮಾನ್ಯ ಕನ್ನಡ ಹಾಗೂ ಆಡಳಿತ ಕನ್ನಡದ ಪದಗಳ ಪರಿಚಯವಾಗುತ್ತದ

Course Name: - Balake Kannada (Kannada for Usage)
Subject Code: -21KBK37, C208 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21KBK37.1	C208.1	To understand the necessity of learning of local language for comfortable life.
21KBK37.2	C208.2	To Listen and understand the Kannada language properly.
21KBK37.3	C208.3	To speak, read and write Kannada language as per requirement
21KBK37.4	C208.4	To communicate (converse) in Kannada language in their daily life with kannada speakers
21KBK37.5	C208.5	To speak in polite conservation.

Course Name: Introduction to PYTHON
Subject Code: - 21ME381, C209 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21ME381.1	C209.1	Demonstrate proficiency in handling of loops and creation of functions.
21ME381.2	C209.2	Identify the methods to create and manipulate lists, tuples and dictionaries.
21ME381.3	C209.3	Discover the commonly used operations involving regular expressions and file system.
21ME381.4	C209.4	Examine working of PDF and word file formats

Course Name: Complex Analysis, Probability and Linear Programming.
Subject Code: - 21MATME41, C210 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21MATME41.1	C210.1	Use the concepts of an analytic function and complex potentials to solve the problems arising in fluid flow.
21MATME41.2	C210.2	Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing.
21MATME41.3	C210.3	Apply discrete and continuous probability distributions in analyzing the probability models arising in the engineering field.
21MATME41.4	C210.4	Analyze and solve linear programming models of real-life situations and solve LPP by the simplex method

21MATME41.5	C210.5	Learn techniques to solve Transportation and Assignment problems.

Course Name: Machining Science and Jigs & Fixtures (IPCC)
Subject Code: - 21ME42, C211 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21ME42.1	C211.1	Demonstrate the Conventional CNC machines and advanced manufacturing process operations
21ME42.2	C211.2	Determine tool life, cutting force, and economy of the machining process.
21ME42.3	C211.3	Analyze the influence of various parameters on machine tools' performance.
21ME42.4	C211.4	Select the appropriate machine tools and process, the Jigs, and fixtures for various applications.

Course Name: Fluid Mechanics
Subject Code: - 21ME43, C212 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21ME43.1	C212.1	Understand the basic principles of fluid mechanics and fluid kinematics
21ME43.2	C212.2	Acquire the basic knowledge of fluid dynamics and flow measuring instruments
21ME43.3	C212.3	Understand the nature of flow and flow over bodies and the dimensionless analysis
21ME43.4	C212.4	Acquire the compressible flow fundamental and basics of CFD packages and the need for CFD analysis
21ME43.5	C212.5	Conduct basic experiments of fluid mechanics and understand the experimental uncertainties.

Course Name: Mechanics of Materials
Subject Code: - 21ME44, C213 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21ME44.1	C213.1	Understand simple, compound, thermal stresses and strains their relations and strain energy.
21ME44.2	C213.2	Analyse structural members for stresses, strains and deformations.
21ME44.3	C213.3	Analyse the structural members subjected to bending and shear loads.
21ME44.4	C213.4	Analyse shafts subjected to twisting loads.
21ME44.5	C213.5	Analyse the short columns for stability.

Course Name: Biology for Engineers
Subject Code: - 21BE45, C214 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21BE45.1	C214.1	Elucidate the basic biological concepts via relevant industrial applications and case studies
21BE45.2	C214.2	Evaluate the principles of design and development, for exploring novel bioengineering projects
21BE45.3	C214.3	Corroborate the concepts of biomimetics for specific requirements
21BE45.4	C214.4	Think critically towards exploring innovative biobased solutions for socially relevant problems

Course Name: Mechanical Measurements and Metrology Lab
Subject Code: - 21MEL46, C215 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21MEL46.1	C215.1	Understand Calibration of pressure gauge, thermocouple, LVDT, load cell, micrometer
21MEL46.2	C215.2	Apply concepts of Measurement of angle
21MEL46.3	C215.3	Demonstrate measurements using Optical Projector/Tool maker microscope, Optical flats.
21MEL46.4	C215.4	Analyse Screw thread parameters using 2-Wire or 3-Wire method, gear tooth profile using gear tooth Vernier/Gear tooth micrometre
21MEL46.5	C215.5	Understand the concepts of measurement of surface roughness
21MEL46.6	C215.6	Demonstrate the use of Coordinate Measuring Machine (CMM) / Laser Scanner

Course Name: Constitution of India and Professional Ethics
Subject Code: - 21CIP47, C216 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21CIP47.1	C216.1	Analyse the basic structure of Indian Constitution
21CIP47.2	C216.2	Remember their Fundamental Rights, DPSP's and Fundamental Duties (FD's) of our constitution.
21CIP47.3	C216.3	Know about our Union Government, political structure & codes, procedures.
21CIP47.4	C216.4	Understand our State Executive & Elections system of India.
21CIP47.5	C216.5	Remember the Amendments and Emergency Provisions, other important provisions given by the constitution

Course Name: Spread Sheets for Engineers
Subject Code: - 21ME481, C217 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21ME481.1	C217.1	To create different plots and charts
21ME481.2	C217.2	To compute different functions, conditional functions and make regression analysis

21ME481.3	C217.3	To carryout iterative solutions for roots, multiple roots, optimization and non-linear regression analysis
21ME481.4	C217.4	To carryout matrix operations
21ME481.5	C217.5	To Understand VBA and UDF
21ME481.6	C217.6	To understand VBA subroutines and Macros
21ME481.7	C217.7	To carryout numerical integration and solving differential equations using different methods

Course Name: Universal Human Values/ UNDERSTANDING HARMONY and ETHICAL HUMAN CONDUCT

Subject Code: - 21UHV49, C218 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21UHV49.1	C218.1	By the end of the course, students are expected to become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind. They would have better critical ability. They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society). It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction. 1. Holistic vision of life 2. Socially responsible behaviour 3. Environmentally responsible work 4. Ethical human conduct 5. Having Competence and Capabilities for Maintaining Health and Hygiene 6. Appreciation and aspiration for excellence (merit) and gratitude for all

Course Name: Inter/Intra Institutional Internship

Subject Code: - 21INT49, C219 Year of Study 2022-23

CO Code	NBA Code	Course Outcomes
21INT49.1	C219.1	Use what they have learned in class to do real work in a company or institute.
21INT49.2	C219.2	Work well in a team and communicate clearly with others.
21INT49.3	C219.3	Find and solve technical problems using tools and technologies used in the industry.
21INT49.4	C219.4	Understand the importance of being responsible, ethical, and aware of how engineering affects society
21INT49.5	C219.5	Write and present a report explaining what they did and learned during the internship.

Course Name: Theory of Machines
Subject Code: - 21ME51, C301 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21ME51.1	C301.1	Knowledge of mechanisms and their motion and the inversions of mechanisms
21ME51.2	C301.2	Analyse the velocity, acceleration of links and joints of mechanisms.
21ME51.3	C301.3	Analyse the mechanisms for static and dynamic equilibrium.
21ME51.4	C301.4	Carry out the balancing of rotating and reciprocating masses
21ME51.5	C301.5	Analyse different types of governors used in real life situation.
21ME51.6	C301.6	Analyze the free and forced vibration phenomenon

Course Name: Thermo-fluids Engineering
Subject Code: - 21ME52, C302 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21ME52.1	C302.1	Apply the concepts of testing of I. C. Engines and evaluate their performance, and evaluate the performance of Reciprocating compressor
21ME52.2	C302.2	Apply and analyse the concepts related to Refrigeration and Air conditioning, and get conversant with Psychrometric Charts, Psychrometric processes, human comfort conditions.
21ME52.3	C302.3	Explain the construction, classification and working principle of the Turbo machines and apply of Euler's turbine equation to evaluate the energy transfer and other related parameters. Compare and evaluate the performance of positive displacement pumps.
21ME52.4	C302.4	Classify, explain and analyse the various types of hydraulic turbines and centrifugal pumps.
21ME52.5	C302.5	Classify, explain and analyse various types of steam turbines and centrifugal compressor

Course Name: Finite Element Analysis
Subject Code: - 21ME53, C303 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21ME53.1	C303.1	Identify the application and characteristics of FEA elements such as bars, beams, plane and iso parametric elements.
21ME53.2	C303.2	Develop element characteristic equation and generation of global equation.
21ME53.3	C303.3	Formulate and solve Axi-symmetric and heat transfer problems.
21ME53.4	C303.4	Apply suitable boundary conditions to a global equation for bars, trusses, beams, circular shafts, heat transfer, fluid flow, axi-symmetric and dynamic problems.

Course Name: Modern Mobility and Automotive Mechanics
Subject Code: - 21ME54, C304 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21ME54.1	C304.1	Understand the working of different systems employed in automobile
21ME54.2	C304.2	Analyse the limitation of present day automobiles
21ME54.3	C304.3	Evaluate the energy sources suitability
21ME54.4	C304.4	Apply the knowledge for selection of automobiles based on their suitability

Course Name: Design lab
Subject Code: - 21MEL55, C305 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21MEL55.1	C305.1	Compute the natural frequency of the free and forced vibration of single degree freedom systems, critical speed of shafts
21MEL55.2	C305.2	Carry out balancing of rotating masses and gyroscope phenomenon
21MEL55.3	C305.3	Analyse the governor characteristics.
21MEL55.4	C305.4	Determine stresses in disk, beams and plates using photo elastic bench
21MEL55.5	C305.5	Determination of Pressure distribution in Journal bearing
21MEL55.6	C305.6	Analyse the stress and strains using strain gauges in compression and bending test
21MEL55.7	C305.7	To realize different mechanisms and cam motions

Course Name: Research Methodology & Intellectual Property Rights
Subject Code: - 21RMI56, C306 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21RMI56.1	C306.1	To know the meaning of engineering research.
21RMI56.2	C306.2	To know the procedure of Literature Review and Technical Reading
21RMI56.3	C306.3	To Know the fundamentals of patent law and drafting procedure.
21RMI56.4	C306.4	Understanding the copyright laws and subject matters of copyrights and designs
21RMI56.5	C306.5	Understand the basic principle of Design rights.

Course Name: Environmental Studies
Subject Code: - 21CIV57, C307 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21CIV57.1	C307.1	Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale,

21CIV57.2	C307.2	Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment
21CIV57.3	C307.3	Demonstrate ecology knowledge of a complex relationship between biotic and a biotic components.
21CIV57.4	C307.4	Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues

Course Name: Digital Marketing
Subject Code: - 21ME582, C308 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21ME582.1	C308.1	To identify the importance of the digital marketing for marketing success
21ME582.2	C308.2	To manage customer relationships across all digital channels and build better customer relationships
21ME582.3	C308.3	To create a digital marketing plan, starting from the SWOT analysis and defining a target group, then identifying digital channels, their advantages and limitations
21ME582.4	C308.4	To perceive ways of the integration taking into consideration the available budget

Course Name: Production and Operations Management
Subject Code: - 21ME61, C309 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21ME61.1	C309.1	Apply the necessary tools for decision making in operations management.
21ME61.2	C309.2	Examine various approaches for forecasting the sales demand for an organization.
21ME61.3	C309.3	List various capacity and location plans to determine the suitable capacity required for meeting the forecast demand of an organization.
21ME61.4	C309.4	Analyse the aggregate plan and master production schedule for an organization, given its periodic demand.
21ME61.5	C309.5	Apply MRP, purchasing and SCM techniques into practice.

Course Name: Heat Transfer
Subject Code: - 21ME62, C310 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21ME62.1	C310.1	Solve steady state heat transfer problems in conduction.
21ME62.2	C310.2	Solve transient heat transfer problems
21ME62.3	C310.3	solve convection heat transfer problems using correlations
21ME62.4	C310.4	Solve radiation heat transfer problems
21ME62.5	C310.5	Explain the mechanisms of boiling and condensation and Determine performance parameters of heat exchangers.

Course Name: Machine design
Subject Code: - 21ME63, C311 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21ME63.1	C311.1	Apply codes and standards in the design of machine elements and select an element based on the Manufacturer's catalogue.
21ME63.2	C311.2	Analyse the performance and failure modes of mechanical components subjected to combined loading and fatigue loading using the concepts of theories of failure.
21ME63.3	C311.3	Demonstrate the application of engineering design tools to the design of machine components like shafts, springs, couplings, fasteners, welded and riveted joints, brakes and clutches.
21ME63.4	C311.4	Design different types of gears and simple gear boxes for relevant applications.
21ME63.5	C311.5	Apply design concepts of hydrodynamic bearings for different applications and select Anti friction bearings for different applications using the manufacturers, catalogue.

Course Name: Mechatronic System Design
Subject Code: - 21ME642, C312 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21ME642.1	C312.1	Discuss about Mechatronic design process and select the sensor and Actuator for a Mechatronic application
21ME642.2	C312.2	Explain Modelling and Simulation of mechanical Elements, electrical Elements and fluid system the sensors in Mechatronics systems and Fault detection techniques in Mechatronics.
21ME642.3	C312.3	Understand the elements of Data Acquisition and Control System, Convert the data in real time interfacing
21ME642.4	C312.4	Model the dynamic response of first order and second order systems

Course Name: Renewable Energy resources
Subject Code: - 21EE652, C313 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21EE652.1	C313.1	Discuss causes of energy scarcity and its solution, energy resources and availability of renewable energy
21EE652.2	C313.2	Outline energy from sun, energy reaching the Earth's surface and solar thermal energy applications.
21EE652.3	C313.3	Discuss types of solar collectors, their configurations, solar cell system, its characteristics and their applications
21EE652.4	C313.4	Explain generation of energy from hydrogen, wind, geothermal system, solid waste and agriculture refuse.
21EE652.5	C313.5	Discuss production of energy from biomass, biogas
21EE652.6	C313.6	Summarize tidal energy resources, sea wave energy and ocean thermal energy.

Course Name: CNC Programming and 3-D Printing Lab
Subject Code: - 21MEL66, C314 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21MEL66.1	C314.1	Students will have knowledge of G-code and M-code for machining operations
21MEL66.2	C314.2	Students will able to perform CNC programming for turning, drilling, milling and threading operation.
21MEL66.3	C314.3	Students will able to visualize the 3D models using CAD software's
21MEL66.4	C314.4	Students will able to use 3D printing technology
21MEL66.5	C314.5	Students are able to understand robotic programming and FMS

Course Name: Mini Project
Subject Code: - 21MEMP67, C315 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21MEMP67.1	C315.1	To apply their acquired knowledge within their chosen area of technology to project development
21MEMP67.2	C315.2	To identify, discuss, and justify the technical aspects of their chosen project using a comprehensive and systematic approach
21MEMP67.3	C315.3	To produce, improve, and refine the technical aspects of engineering projects.
21MEMP67.4	C315.4	To work individually or as a part of a team on the development of technical projects.
21MEMP67.5	C315.5	To communicate and report project related activities and findings effectively.

Course Name: -Innovation/Entrepreneurship/Societal Internship
Subject Code: - 21INT68, C316 Year of Study 2023-24

CO Code	NBA Code	Course Outcomes
21INT68.1	C316.1	Apply theoretical knowledge to practical engineering problems in a real-world industrial or research setting.
21INT68.2	C316.2	Gain hands-on experience with tools, equipment, and techniques relevant to mechanical engineering practices
21INT68.3	C316.3	Analyze and solve industry-specific problems by employing critical thinking and innovative approaches.
21INT68.4	C316.4	Demonstrate professionalism, effective communication, and teamwork skills in a workplace environment.
21INT68.5	C316.5	Prepare a comprehensive report and presentation detailing the internship experience, including learnings, challenges, and contributions.

Course Name: Automation and Robotics
Subject Code: - 21ME71, C401 Year of Study 2024-25

CO Code	NBA Code	Course Outcomes
21ME71.1	C401.1	Translate and simulate a real time activity using modern tools and discuss the Benefits of automation.
21ME71.2	C401.2	Identify suitable automation hardware for the given application.
21ME71.3	C401.3	Recommend appropriate modelling and simulation tool for the given manufacturing Application.
21ME71.4	C401.4	Explain the basic principles of Robotic technology, configurations, control and Programming of Robots
21ME71.5	C401.5	Explain the basic principles of programming and apply it for typical Pick & place, Loading & unloading and palletizing applications

Course Name: Control Engineering
Subject Code: - 21ME72, C402 Year of Study 2024-25

CO Code	NBA Code	Course Outcomes
21ME72.1	C402.1	Identify the type of control and control actions and develop the mathematical model of the physical systems
21ME72.2	C402.2	Estimate the response and error in response of first and second order systems subjected standard input signals
21ME72.3	C402.3	Represent the complex physical system using block diagram and signal flow graph and obtain transfer function
21ME72.4	C402.4	Analyse a linear feedback control system for stability using Hurwitz criterion, Routh's criterion and root Locus technique in complex domain.
21ME72.5	C402.5	Analyse the stability of linear feedback control systems in frequency domain using polar plots, Nyquist and Bode plots.

Course Name: Additive Manufacturing
Subject Code: - 21ME731, C403 Year of Study 2024-25

CO Code	NBA Code	Course Outcomes
21ME731.1	C403.1	Demonstrate the knowledge of the broad range of AM processes, devices, capabilities and materials that are available.
21ME731.2	C403.2	Understand the various software tools, processes and techniques that enable advanced/additive manufacturing.
21ME731.3	C403.3	Apply the concepts of additive manufacturing to design and create components that satisfy product development/prototyping requirements, using advanced/additive manufacturing devices and processes.
21ME731.4	C403.4	Understand characterization techniques in additive manufacturing.
21ME731.5	C403.5	Understand the latest trends and business opportunities in additive manufacturing

Course Name: Theory and Design of IC Engines
Subject Code: - 21ME742, C404 Year of Study 2024-25

CO Code	NBA Code	Course Outcomes
21ME742.1	C404.1	Understand various types of I.C. Engines, Cycles of operation and Identify fuel metering, fuel supply systems for different types of engines.
21ME742.2	C404.2	Understand combustion phenomena in SI and CI engines and Analyze the effect of various operating variables on engine performance.
21ME742.3	C404.3	Evaluate performance Analysis of IC Engine and Justify the suitability for different applications
21ME742.4	C404.4	Understand the conventional and non-conventional fuels and effects of emission formation of IC engines, its effects, and the legislation standards

Course Name: Environmental protection and Management
Subject Code: - 21CV753, C405 Year of Study 2024-25

CO Code	NBA Code	Course Outcomes
21CV753.1	C405.1	Appreciate the elements of Corporate Environmental Management systems complying to international environmental management system standards
21CV753.2	C405.2	Lead pollution prevention assessment team and implement waste minimization options
21CV753.3	C405.3	Develop, Implement, maintain and Audit Environmental Management systems for Organisations

Course Name: Project work
Subject Code: - 21MEP76, C406 Year of Study 2024-25

CO Code	NBA Code	Course Outcomes
21MEP76.1	C406.1	Identify and investigate open-ended problems in mechanical engineering requiring innovative solutions.
21MEP76.2	C406.2	Select appropriate methods, materials, and tools for effective project execution.
21MEP76.3	C406.3	Collaborate and manage tasks within a team to achieve project objectives.
21MEP76.4	C406.4	Develop and implement creative solutions addressing social and environmental challenges.
21MEP76.5	C406.5	Analyze project outcomes, compile findings into a technical report, and deliver professional presentations.

Course Name: Technical Seminar
Subject Code: - 21ME81, C407 Year of Study 2024-25

CO Code	NBA Code	Course Outcomes
21ME81.1	C407.1	Comprehend and effectively present engineering activities using modern tools and techniques.
21ME81.2	C407.2	Efficiently utilize quality information from diverse and credible resources for seminar preparation.
21ME81.3	C407.3	Deliver well-structured presentations within the stipulated duration, adhering to time constraints.
21ME81.4	C407.4	Justify the presentation content effectively during group discussions and Q&A sessions.
21ME81.5	C407.5	Demonstrate professionalism and critical thinking in presenting technical topics to a technical audience.

Course Name: Industrial Internship
Subject Code: - 21INT822, C408 Year of Study 2024-25

CO Code	NBA Code	Course Outcomes
21INT822.1	C408.1	Apply theoretical knowledge to practical engineering problems in a real-world industrial or research setting.
21INT822.2	C408.2	Gain hands-on experience with tools, equipment, and techniques relevant to mechanical engineering practices
21INT822.3	C408.3	Analyze and solve industry-specific problems by employing critical thinking and innovative approaches.
21INT822.4	C408.4	Demonstrate professionalism, effective communication, and teamwork skills in a workplace environment.
21INT822.5	C408.5	Prepare a comprehensive report and presentation detailing the internship experience, including learnings, challenges, and contributions.