COURSE OUTCOMES - 2021 SCHEME

3rd SEMESTER

Subject:	Transform Calculus, Fourier Series And Numerical Techniques		
Subject Code:	21MAT 31	NBA Code:	ME201
CO1	To solve ordinary differential equations using Laplace transform.		
CO2	Demonstrate the Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory.		
CO3	To use Fourier transforms to analyze problems involving continuous-time signals and to apply Z-Transform techniques to solve difference equations.		
CO4	To solve mathematical models represented by initial or boundary value problems involving partial differential equations.		
CO5	Determine the extremals of functional using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.		

Subject:	Metal Casting Forming & Joining Process		
Subject Code:	21ME32	NBA Code:	ME202
CO1	Select appropriate primary manufacturing process and related parameters for obtaining initial shape and size of components.		
CO2	Design and develop adequate tooling linked with casting, welding and forming operations.		
CO3	Appreciate the effect of process parameters on quality of manufactured components		
CO4	Demonstrate various skills in preparation of molding sand for conducting tensile, shear and compression tests using Universal sand testing machine.		
CO5	Demonstrate skills in preparation of forging models involving upsetting, drawing and bending operations and demonstrate skills in preparation of Welding models.		

Subject:	Material Science And Engineering		
Subject Code:	21ME33	NBA Code:	ME203
CO1	Understand the atomic arrangement in crystalline materials and describe the periodic arrangement of atoms in terms of unit cell parameters.		
CO2	Understand the importance of phase diagrams and the phase transformations.		
CO3	Know various heat treatment methods for controlling the microstructure.		
CO4	Correlate between material properties with component design and identify various kinds of defects.		
CO5	Apply the method of materials selection, material data and knowledge sources for computer-aided selection of materials.		

Subject:	**Thermodynamics**		
Subject Code:	**21ME34**	**NBA Code:**	**ME204**
CO1	Describe the fundamental concepts and principles of engineering thermodynamics.		
CO2	Apply the governing laws of thermodynamics for different engineering applications.		
CO3	Analyse the various thermodynamic processes, cycles and results.		
CO4	Interpret and relate the impact of thermal engineering practices to real life problems.		
CO5	Analyse gas power cycles, gas turbine cycles & their efficiencies.		

Subject:	**Machine Drawing And GD&T**		
Subject Code:	**21MEL35**	**NBA Code:**	**ME205**
CO1	Interpret the Machining and surface finish symbols on the component drawings.		
CO2	Apply limits and tolerances to assemblies and choose appropriate fits for given assemblies.		
CO3	Illustrate various machine components through drawings		
CO4	Create assembly drawings as per the conventions.		

Subject:	**Social Connect & Responsibilities**		
Subject Code:	**21UH36**	**NBA Code:**	**ME206**
CO1	Understand social responsibility		
CO2	Practice sustainability and creativity		
CO3	Showcase planning and organizational skills		

Subject:	**Balake Kannada**		
Subject Code:	**21KBK37**	**NBA Code:**	**ME207**
CO1	To understand the necessity of learning of local language for comfortable life.		
CO2	To Listen and understand the Kannada language properly.		
CO3	To speak, read and write Kannada language as per requirement.		
CO4	To communicate (converse) in Kannada language in their daily life with kannada speakers.		
CO5	To speak in polite conservation.		

Subject:	**Introduction To Python**		
Subject Code:	**21ME381**	**NBA Code:**	**ME209**
CO1	Demonstrate proficiency in handling of loops and creation of functions.		
CO2	Identify the methods to create and manipulate lists, tuples and dictionaries.		
CO3	Discover the commonly used operations involving regular expressions and file system.		
CO4	Examine working of PDF and word file formats		

COURSE OUTCOMES - 2021 SCHEME

4th SEMESTER

Subject:	**Complex Analysis, Probability and Linear Programming.**		
Subject Code:	**21ME41**	**NBA Code:**	**ME210**
CO1	Use the concepts of an analytic function and complex potentials to solve the problems arising in fluid flow.		
CO2	Utilize conformal transformation and complex integral arising in aero foil theory, fluid flow visualization and image processing.		
CO3	Apply discrete and continuous probability distributions in analyzing the probability models arising in the engineering field.		
CO4	Analyze and solve linear programming models of real-life situations and solve LPP by the simplex method		
CO5	Learn techniques to solve Transportation and Assignment problems.		

Subject:	**Machining Science And Jigs & Fixtures**		
Subject Code:	**21ME42**	**NBA Code:**	**ME211**
CO1	Demonstrate the Conventional CNC machines and advanced manufacturing process operations		
CO2	Determine tool life, cutting force, and economy of the machining process.		
CO3	Analyze the influence of various parameters on machine tools' performance.		
CO4	Select the appropriate machine tools and process, the Jigs, and fixtures for various applications.		

Subject:	**Fluid Mechanics**		
Subject Code:	**21ME43**	**NBA Code:**	**ME212**
CO1	Understand the basic principles of fluid mechanics and fluid kinematics		
CO2	Acquire the basic knowledge of fluid dynamics and flow measuring instruments		
CO3	Understand the nature of flow and flow over bodies and the dimensionless analysis		
CO4	Acquire the compressible flow fundamental and basics of CFD packages and the need for CFD analysis.		
CO5	Conduct basic experiments of fluid mechanics and understand the experimental uncertainties.		

Subject:	Mechanics Of Materials		
Subject Code:	21ME44	NBA Code:	ME213
CO1	Understand simple, compound, thermal stresses and strains their relations and strain energy.		
CO2	Analyse structural members for stresses, strains and deformations.		
CO3	Analyse the structural members subjected to bending and shear loads.		
CO4	Analyse shafts subjected to twisting loads.		
CO5	Analyse the short columns for stability.		

Subject:	Mechanical Measurements And Metrology Laboratory		
Subject Code:	21MEL46	NBA Code:	ME214
CO1	Understand Calibration of pressure gauge, thermocouple, LVDT, load cell, micrometer.		
CO2	Apply concepts of Measurement of angle, Demonstrate measurements using Optical Projector/Tool maker microscope, Optical flats.		
CO3	Analyse Screw thread parameters using 2-Wire or 3-Wire method, gear tooth profile using gear tooth Vernier/Gear tooth micrometre		
CO4	Understand the concepts of measurement of surface roughness.		
CO5	Demonstrate the use of Coordinate Measuring Machine (CMM) / Laser Scanner		

Subject:	Constitution of India & Professional Ethics		
Subject Code:	21CIP37/47	NBA Code:	ME215
CO1	Analyse the basic structure of Indian Constitution		
CO2	Remember their Fundamental Rights, DPSP's and Fundamental Duties (FD's) of our constitution.		
CO3	know about our Union Government, political structure & codes, procedures.		
CO4	Understand our State Executive & Elections system of India		
CO5	Remember the Amendments and Emergency Provisions, other important provisions given by the constitution.		

Subject:	Universal Human Values		
Subject Code:	21UH49	NBA Code:	ME216
CO1	To help the students appreciate the essential complementarity between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.		
CO2	To facilitate the development of a Holistic perspective among students towards life and profession living in a natural way.		
CO3	To facilitate the development of a Holistic perspective among students towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence. Such a holistic perspective forms the basis of Universal Human Values and movement towards value-based		
CO4	To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct.		
CO5	To highlight plausible implications of such a Holistic understanding in terms of trustful and mutually fulfilling human behaviour and mutually enriching interaction with Nature.		

Subject:	Introduction to AI and ML		
Subject Code:	21ME481	NBA Code:	ME217
CO1	To familiarize basic principles, and applications of AI		
CO2	To guide the students on generalization as a means to capturing patterns in the data		
CO3	To make to understand the of challenges in Artificial Intelligence domain.		
CO4	Draw technical drawing for design ideas		
CO5	To acquaint with the future trends of Artificial Intelligence		

COURSE OUTCOMES - 2021 SCHEME

5th SEMESTER

Subject:	Theory of Machines		
Subject Code:	21ME51	NBA Code:	ME301
CO1	Knowledge of mechanisms and their motion and the inversions of mechanisms		
CO2	Analyse the velocity, acceleration of links and joints of mechanisms..		
CO3	Analyse the mechanisms for static and dynamic equilibrium.		
CO4	Carry out the balancing of rotating and reciprocating masses		
CO5	Analyse different types of governors used in real life situation, free and forced vibration phenomenon.		

Subject:	Thermo-fluids Engineering		
Subject Code:	21ME52	NBA Code:	ME302
CO1	Apply the concepts of testing of I. C. Engines and evaluate their performance, and evaluate the performance of Reciprocating compressor.		
CO2	Apply and analyse the concepts related to Refrigeration and Air conditioning, and get conversant with Psychometric Charts, Psychometric processes, human comfort conditions.		
CO3	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.		
CO4	Classify, explain and analyse the various types of hydraulic turbines and centrifugal pumps.		
CO5	Classify, explain and analyse various types of steam turbines and centrifugal compressor.		

Subject:	Finite Element Analysis		
Subject Code:	21ME53	NBA Code:	ME303
CO1	Identify the application and characteristics of FEA elements such as bars, beams, plane and isoparametric elements.		
CO2	Develop element characteristic equation and generation of global equation.		
CO3	Formulate and solve Axi-symmetric and heat transfer problems.		
CO4	Apply suitable boundary conditions to a global equation for bars, trusses, beams, circular shafts, heat transfer, fluid flow, axi-symmetric and dynamic problems.		

Subject:	Modern Mobility and Automotive Mechanics		
Subject Code:	21ME54	NBA Code:	ME304
CO1	Understand the working of different systems employed in automobile		
CO2	Analyse the limitation of present day automobiles		
CO3	Evaluate the energy sources suitability		
CO4	Apply the knowledge for selection of automobiles based on their suitability		

Subject:	Design lab		
Subject Code:	21MEL55	NBA Code:	ME305
CO1	Compute the natural frequency of the free and forced vibration of single degree freedom systems, critical speed of shafts.		
CO2	Carry out balancing of rotating masses and gyroscope phenomenon & Analyse the governor characteristics.		
CO3	Determine stresses in disk, beams and plates using photo elastic bench.		
CO4	Determination of Pressure distribution in Journal bearing		
CO5	Analyse the stress and strains using strain gauges in compression and bending test & To realize different mechanisms and cam motions.		

Subject:	Research Methodology &Intellectual Property Rights		
Subject Code:	21RMI56	NBA Code:	ME306
CO1	.To know the meaning of engineering research.		
CO2	To know the procedure of Literature Review and Technical Reading.		
CO3	To know the fundamentals of patent laws and drafting procedure .		
CO4	Understanding the copyright laws and subject matters of copyrights and designs		
CO5	Understanding the basic principles of design rights.		

Subject:	Environmental Studies		
Subject Code:	21CIV57	NBA Code:	ME307
CO1	Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale,		
CO2	Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.		
CO3	Demonstrate ecology knowledge of a complex relationship between biotic and a biotic components.		
CO4	Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues.		

Subject:	Basics of MATLAB		
Subject Code:	21ME581	NBA Code:	ME308
CO1	Able to implement loops, branching, control instruction and functions in MATLAB programming environment.		
CO2	Able to program curve fitting, numerical differentiation and integration, solution of linear equations in MATLAB and solve electrical engineering problems.		
CO3	Able to understand implementation of ODE using ode 45 and execute Solutions of nonlinear equations and DFT in MATLAB.		
CO4	Able to simulate MATLAB Simulink examples		

COURSE OUTCOMES - 2021 SCHEME

6th SEMESTER

Subject:	Production And Operations Management		
Subject Code:	21ME61	NBA Code:	ME309
CO1	Apply the necessary tools for decision making in operations management.		
CO2	Examinevariousapproachesforforecastingthesalesdemandforanorganization.		
CO3	Listvariouscapacityandlocationplanstodeterminethesuitablecapacityrequiredformeetingtheforecastdemandofanorganization.		
CO4	Analyse the aggregate plan and master production schedule for an organization, given its periodic demand.		
CO5	Apply MRP, purchasing and SCM techniques into practice.		

Subject:	Heat Transfer		
Subject Code:	21ME62	NBA Code:	ME310
CO1	Solve steady state heat transfer problems in conduction.		
CO2	Solve transient heat transfer problems		
CO3	Solve convection heat transfer problems using correlations		
CO4	Solve radiation heat transfer problems		
CO5	Explain the mechanisms of boiling and condensation. And Determine performance parameters of heat exchangers.		

Subject:	Machine design		
Subject Code:	21ME63	NBA Code:	ME311
CO1	Apply codes and standards in the design of machine elements and select an element based on the Manufacturer's catalogue.		
CO2	Analyse the performance and failure modes of mechanical components subjected to combined loading and fatigue loading using the concepts of theories of failure.		
CO3	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		
CO4	Design different types of gears and simple gear boxes for relevant applications.		
CO5	Apply design concepts of hydrodynamic bearings for different applications and select Anti friction bearings for different applications using the manufacturers, catalogue.		

Subject:	Supply Chain Management & Introduction to SAP		
Subject Code:	21ME641	NBA Code:	ME312
CO1	Understand the framework and scope of supply chain management.		
CO2	Build and manage a competitive supply chain using strategies, models, techniques and information technology.		
CO3	Plan the demand, inventory and supply and optimize supply chain network.		

CO4	Understand the emerging trends and impact of IT on Supply chain.
CO5	Understand the basics of SAP material management system

Subject:	**Occupational Health & Safety**		
Subject Code:	**21CV653**	**NBA Code:**	**ME313**
CO1	Identifyhazardsintheworkplacethatposeadangerorthreattotheirsafetyorhealth,or that of others.		
CO2	Controlunsafeorunhealthyhazardsandproposemethodstoeliminatethehazard.		
CO3	Present a coherent analysis of a potential safety or health hazard both verbally and in writing, citing the occupational Health and Safety Regulations as well as supported legislation.		
CO4	Discuss the role of health and safety in the workplace pertaining to the responsibilities of workers, managers, supervisors		
CO5	Identify the decisions required to maintain protection of the environment, workplace as well as personal health and safety.		

Subject:	**CNC Programming and 3-D Printing Lab**		
Subject Code:	**21MEL66**	**NBA Code:**	**ME314**
CO1	Students will have knowledge of G-code and M-code for machining operations.		
CO2	Students will able to perform CNC programming for turning, drilling, milling and threading operation.		
CO3	Students will able to visualize the 3D models using CAD software's		
CO4	Students will able to use 3D printing technology		
CO5	Students are able to understand robotic programming and FMS		

Subject:	**Mini-project**		
Subject Code:	**21MEMP67**	**NBA Code:**	**ME315**
CO1	Identify and analyse real world problems.		
CO2	Design mechanical Engineering components.		
CO3	Learn to work in a team.		

Subject:	**Internship**		
Subject Code:	**21INT68**	**NBA Code:**	**ME316**
CO1	To Analyse the complex engineering activities.		
CO2	Apply reasoning contextual knowledge		
CO3	To understand by the team work		
CO4	Analyse the various communicate Engg. activities		
CO5	Demonstrate knowledge and recognise the gained knowledge		