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Course code & title: MA 101 Calculus	
Course outcome	
C01	Check convergence of infinite series.
C02	Acquire a basic knowledge of phenomena involving continuous change of variable
C03	Understand differential calculus of functions of one or more variables and of vector functions.
C04	Find areas and volumes using integrals.
C05	Analyse the application of vector valued functions in physical applications.
C06	Understand integral calculus of functions of one or more variables and of vector functions.
Course code & title: CY 100 Engineering Chemistry	
Course outcome	
C01	To elucidate the structures of organic molecules from spectral data.
C02	To understand the fundamental and applied concepts of Electrochemistry.
C03	Develop understanding of the theories of instrumental methods in analytical chemistry
C04	To understand the properties andapplications of engineering materials.
C05	To compute the property of fuels and lubricating oils.
C06	To make technology choice to deal with water quality issues.

Course code & title: BE 110 Engineering Graphics	
Course outcome	
C01	Draw the projection of points and lines located in different quadrants
C02	Prepare Multi view orthographic projections of objects by visualizing them in different positions Draw sectional views and develop surfaces of a given object
C03	Prepare pictorial drawings using the principles of isometric and perspective projections to visualize objects in three dimensions
C04	Convert 3D views to orthographic views and vice versa
C05	Obtain Multi view projections and solid models of objects using CAD tools
Course code & title: BE 101-02 Introduction to Mechanical Engineering Sciences	
Course outcome	
C01	Acquire knowledge on Fundamentals concepts of Thermodynamics and laws of Thermodynamics
C02	Use energy conservation devices from the knowledge of the energy conversion devices
C03	Select and use an appropriate refrigeration and Air conditioning system
C04	Develop and implement basic ideas of the different parts working of automobile and fundamentals of aerodynamics
C05	Preparation and ability to engage in independent and life long learning in the context of knowledge on engineering materials
C06	Select and use the different manufacturing methods

Course code & title: BE 103: Introduction to Sustainable Engineering	
Course outcome	
C01	To understand the different types of environmental pollution problems and their sustainable solutions
C02	To acquire attitudes of care and concern for ecologically sustainable development.
C03	To recognize the implications of the ways to feed and provide one self.
C04	To develop skills to investigate and solve issues in the environment.
C05	To work in the area of sustainability for research and education.
C06	Having a broader perspective in contributing for sustainable practices by utilizing the engineering knowledge and principles gained from this course.
Course code & title: EE 100: Basics of Electrical Engineering	
Course outcome	
C01	Define the fundamental laws of electrical and magnetic circuit
C02	: Design a circuit to suit the need and apply nodal and mesh analysis
C03	Analyze simple Ac circuits with sources and passive elements
C04	Explain the generation, transmission and distribution of electrical energy and about different renewable energy sources
C05	Analyze the performance of different type of Dc motors
C06	Describe the principle of operation of different type of AC motors

Course code & title: Me 110: Mechanical Engineering Workshop	
Course outcome	
C01	Construct different moulds
C02	Prepare different tyes of fitting using MS plate.
C03	Sheet metal components.
C04	Types of joints using wooden materials.
C05	Different joints by arc-welding.
Course code & title: EE 110 : Electrical Engineering Workshop	
Course outcome	
C01	Understand the different supply arrangements and their limitations, standard voltages and their tolerances.
C02	Familiarize with safety aspects of electrical systems and importance of protective measures in wiring systems.
C03	Select the suitable wires, cables and other accessories used in wiring.
C04	Work in the area of creating awareness of energy conservation in electrical systems.
C05	Wire up simple lighting circuits for domestic buildings, distinguish between light and power circuits.
C06	Measure electrical circuit parameters and current, voltage and power in a circuit.

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Course code & title: MA 102: DIFFERENTIAL EQUATIONS	
Course outcome	
C01	Identify and solve homogeneous differential equations.
C02	Solve non-homogeneous differential equations.
C03	Evaluation of Fourier series.
C04	Identify and solve problems in partial differential equations.
C05	Apply one dimensional wave equation to solve problems in different domain.
C05	Apply one dimensional heat equation to solve problems in different domain.
Course code & title: PH 100: ENGINEERING PHYSICS	
Course outcome	
C01	Differentiate different types of oscillations and apply knowledge in engineering systems
C02	Differentiate interference, diffraction and polarization and apply knowledge in daily life situations
C03	Distinguish between different types of superconductors.
C04	Explain the principles of physics using theories of quantum mechanics statistical mechanics and optics.
C05	Apply the knowledge of acoustics in the construction of buildings.
C06	Apply the knowledge of acoustics in the construction of buildings.

Course code & title: EC100: BASICS OF ELECTRONICS ENGINEERING	
Course outcome	
C01	Understand the types, specification and standard values and applications of various passive and active components.
C02	Get an idea about the working and applications of different types of semiconductors, diodes and transistors.
C03	Understand the working of rectifiers, amplifiers and oscillators.
C04	Get a basic idea of analog and digital integrated circuits and various measuring instruments.
C05	: Understand the concepts of radiocommunication and satellite communication
C06	Get a fundamental idea about mobile and optical communication and entertainment electronics.

Course code & title: BE 100: ENGINEERING MECHANICS	
Course outcome	
C01	Identify all the forces associated with a static frame work and to draw free body diagrams.
C02	Compute the reactions necessary to ensure static equilibrium
C03	Compute Centre of Gravity and Moment of Inertia.
C04	Solve mechanics problems associated with friction forces.
C05	Describe the motion of a particle in terms of its position, velocity and acceleration in different frames of reference and to define the forces causing the motion of a particle.
C06	Explain the concept of mechanical vibrations.

Course code & title: BE 102: DESIGN & ENGINEERING	
Course outcome	
C01	Appreciate the different elements involved in good designs and to apply them in practice.
C02	: Aware of the product oriented and user oriented aspects that make the design a success.
C03	Think of innovative designs incorporating different segments of knowledge gained in the course.
C04	A boarder perspective of design covering function, cost, environmental sensitivity, safety and other factors other than engineering analysis.
C05	Gain an ability to design a system, component or process to meet desired needs within realistic constraints.
C06	Capable to apply knowledge of mathematics, science and engineering.

Course code & title: CE 100: BASIC CIVIL ENGINEERING	
Course outcome	
C01	Discuss the fundamental aspects of civil engineering.
C02	Discuss the fundamentals for planning and setting out a building.
C03	Understand the concepts of surveying for making horizontal & vertical measurements.
C04	Discuss the uses of various building materials.
C05	Explain the method of construction of different components of a building.
C06	Discuss about various services in a building.

Course code & title:CE 110: CIVIL ENGINEERING WORKSHOP	
Course outcome	
C01	To set out a building using tape and cross staff
C02	To determine area and mass moment of inertia
C03	To construct one and a half and two brick walls using English bond
C04	To calculate the area and volume of various features of a building
C05	To determine and vertical distance between points
C06	To determine areas of irregular shapes.

Course code & title:EC110: ELECTRONICS ENGINEERING WORKSHOP	
Course outcome	
C01	Identify different electronic components like resistors, capacitors, inductors, transformers
C02	Familiarize testing and measuring instruments like the multimeter, function generator, power supply & CRO.
C03	Assemble and connect different circuits on a breadboard.
C04	Acquire soldering and desoldering skills, useful in electronic circuit interconnections
C05	Familiarize EDA tool and public addressing electronic systems
C06	Assemble electronic circuits/systems on general purpose PCB.

Mechanical Engineering: Course outcomes		
Course Number	**Subject**	**Course Outcomes**
EN010 301A	Engineering Mathematics II	CO1-Solve first, second order homogeneous and non-homogeneous partial differential equations
		CO2-Find the Fourier series of a given function satisfying Dirchlet's condition
		CO3-Apply Fourier series to solve one dimensional way, one and two dimensional heat equation
		CO4-Determine Fourier transform for a given function and use them to evaluate certain definite integrals
		CO5-Determine z transforms of standard functions and use them to solve difference equations.
EN010 302	Economics and Communication Skills	CO1-Understand elementary principles of Economics and Business Economics.
		CO2-Analyse the various market situations with good grasp on the effect of trade cycle.
		CO3-Anlayse the basic macro-economic concepts and monetary theory.
		CO4-Undestand macro- economic concepts to improve their ability to analyse the business climate.
		CO5-Analyse their employability by combining their technical knowledge with appropriate economic models.

ME010 303	Fluid Mechanics	CO 1-Students will be able to understand basic knowledge of the definition and the fundamental concepts of fluid mechanics including continuum, velocity field , surface tension, flow visualization etc.
		CO 2-Students will able to apply the basic equation of fluid statics to determine forces on planer and curved surfaces that are submerged in a static fluid.
		CO 3-Students will able to use conservation laws in integral form and apply them to determine forces and moments on surfaces of various shapes and simple machines
		CO 4-Students will able to use Euler's and Bernoulli's equations and the conservation of mass to determine velocities, pressures, and accelerations for incompressible and in viscid fluids
		CO 5- Students will able design simple pipe systems to deliver fluids under specified conditions and also the loosed during the flow of the fluid.
ME 010 305	Programming in C	CO 1-Explain the components of computer and logical operations.
		CO2-Convert the number system and their representation.
		CO3-Discuss hardware and software devices
		CO-4Summarize network fundamentals.
		CO-5Plan the logic using flowchart and develop algorithm to write a C Program.
ME 010 304	Metallurgy & Material Science	CO1-Be able to apply core concepts of Engineering Metallurgy to solve engineering problems.
		CO2-Interpret about the basic concepts of Metal Structure.
		CO3-Understand the Fundamentals of Metallography and different characterization technique
		CO4-Impart a fundamental knowledge of Ferrous Metal.
		CO5-Articulate and utilize different heat treatment processes.

ME 010 306(CE)	Strength of Materials & Structural Engineering	CO1-Students will be able to Predict mechanical behavior of the member by determining the stresses, strains and deflections produced by the loads up to the elastic limit.
		CO2- Students will be able to solve the stresses in determinate and indeterminate, homogeneous and composite bars under concentrated loads, self weight and thermal loads.
		CO3-Students will be proficient to construct Shear Force and Bending Moment diagrams for statically determinate beam due to concentrated load, uniformly distributed load, uniformly varying load and couple.
		CO4-Students will be able to determine bending and shear stresses in machine elements
		CO5-Students will be able to Evaluate Slope and Deflection of Statically Determi0te beams subjected to concentrated load, uniformly distributed load, uniformly varying load and couple and also strain energy in members subjected to Gradual, sudden and impact loads
ME 010 307	*Computer ProgrammingLab*	CO1-Prepare data using MS-word & Excel to visualize graphs, charts in MS-Excel.
		CO2-Outline the logic using flowchart for a given problem and to program using Switch case & Control structures
		CO3-Develop logic using decision making & looping statements
		CO4-Apply passing parameters using Arrays & Functions
		CO5-Construct structure and Union for a given database and to bring out the importance of Unions over structure

ME 010 308	*Fluid Mechanics Lab*	CO1-Calculate fluid properties and characteristics of flow using mathematical knowledge.
		CO2-Compute loses in circular conduits using conservation laws.
		CO3-Perform dimensional analysis of a given set of variables using Buckingham's π theorem and relate the model and prototype.
		CO4-Analyze the performance of pumps.
		CO5-Analyze the performance of hydraulic machines.

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Course code & title: ME 220 Manufacturing Technology	
Course outcome	
C01	Will you be able to summarise an various moulding techniques to produce engineering components
C02	Will you be able to describe the principles and procedures behind rolling
C03	Can you be able to summarise various process parameters in forging
C04	Can select proper location method as per mechanical design
C05	Will you be able to differntiate various sheet metal working operation
C06	Will you be able to select a suitable welding method considering various factors in real life
Course code & title: ME 202 Advanced Mechanics of Solids	
Course outcome	
C01	Apply the concept of stress and strain analysis in solids
C02	Use the procedure in theory of elasticity at a basic level
C03	Compute hoop stress radial stress and radial displacement for thick cylinders subjected to internal and external pressure and rotating discs
C04	General Bending problems
C05	Demonstrate the usage of energy methods for solving structural problems
C06	solve problems on torsion of noncircular shaft including solid bars,thin walled tubes, rectanglar sections, rolled sections and multiply connction sections

Course code & title: ME403:ADVANCED ENERGY ENGINEERING	
Course outcome	
C01	Listing of conventional energy sources and survey of the global and Indian energy scenario
C02	Illustrate different power plants like thermal, steam, hydro, gas turbine and nuclearpower plants and its components with the restating of its working principle withtheketching of components by symbols
C03	To explain the basic working of solar photovoltaic systems, aerodynamics of windturbines and chemical conversion of biomass
C04	Application of solar, wind and biomass energy
C05	Analyzing the importance and basic working principle and types of solar, wind andbiomass energy renewable power systems and other renewable energy sources
C06	Evaluating the environmental impact of energy conversions
Course code & title: ME 230 Fluid Machinery	
Course outcome	
C01	Students will be able to calibrate flow measuring devices such as orifice, nozzle, venturimeter and V- Notch .
C02	Students will be able to determine coefficient of friction, minor losses in flow through the pipes.
C03	Students will have the ability to test the performance of turbines like pelton wheel, Francis turbine.
C04	To determine the efficiency and plot the characteristic curves of pumps.
C05	To verify Bernoulli's equation and apply it in flow measurement devices.

Course code & title: HS 210 Life Skills	
Course outcome	
C01	Communicate effectively.
C02	Make effective presentations.
C03	Write different types of reports.
C04	Face interview & group discussion.
C05	Critically think on a particular problem.
C06	Solve problems.
Course code & title: ME 232 Thermal Engineering Lab	
Course outcome	
C01	Discussion on various types of internal combustion engines and their parts
C02	Analysis of performance of 4 stroke IC engines (single and twin cylinder) including the effect of engine cooling and sketching of valve timing diagram
C03	Learning and analysis of performance of compressors (single and double stage) and centrifugal blowers with experimentation
C04	Understanding of and practical exercises with equipment (redwood viscometer) used for measuring viscosity of petroleum products
C05	Learning of and practical exercises with equipment (Cleveland's apparatus) used for flash and fire point of petroleum products

Course code & title: ME 230 Fluid Mechanics Lab	
Course outcome	
C01	Students will be able to select an appropriate pump/turbine with reference to given application/situation.
C02	Students will be able to estimate the optimum efficiency of a given pump/turbine under different load and (or) speed conditions
C03	Students will be able to apply the fundamental principles of fluid mechanics in calculations involving basic flow measuring devices in both closed and open channel flows
C04	Students will be able to analyse the trends depicted by characteristic curves obtained from the experiments
C05	Students will be able to predict the stability of a floating vessel following the principles of metacentric height and radius of gyration
Course code & title: Prob. Dis,Transforms & Num. Methods- MA 202	
Course outcome	
C01	Have you acquired the concept of random variable ,discrete probability distributions with practical applications in various engineering and social life situation.
CO2	Have you acquired the concept of continuous probability distributions with practical applications in various engineering and social life situation.
CO3	Understand Fourier transforms which has wide applications in all engineering courses.
CO4	Understand Laplace transforms which has wide applications in all engineering courses.
CO5	Solve various engineering problems using interpolation and iteration.
CO6	Solve various engineering problems using numeric integration

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Course code & title: ME 201 Mechanics of Solids	
Course outcome	
C01	Understand and learn basic concepts of stress and strain in solids.
C02	Assessments of stresses and strains in simple structural members such as bars, tubes, shafts, beams, columns, struts etc. and applying these results in simple design problems also application of structural members subjected to tension, compression, torsion bending and combined stresses using the fundamental concepts of stress, strain and elastic behavior of materials.
C03	Practice exercises of stresses and strain in simple structural members such as bars, tubes, shafts, beams, columns, struts etc. and applying these results in simple design problems
C04	Discussion on the principal planes and stresses and demonstrate the results to combined loading case.
C05	Evaluate the shear force and bending moment diagrams of beams and analyze them
C06	Design columns and struts to support a given load.
Course code & title: ME 231 COMPUTER AIDED MACHINE DRAWING LAB	
Course outcome	
C01	Are you able to determine the various standards, engineering drawings and specifications about standard machine components.
C02	Will you be able to create drawings of assemblies when the part drawings are given.
C03	Can you select, configure and synthesize mechanical components into assemblies.
C04	Will be able apply the knowledge of fits and tolerances for various applications
C05	Are you able to model components of their choice using CAD software
C06	Can get exposure to advanced CAD packages.

Course code & title: Linear algebra & Complex Analysis (MA 201)	
Course outcome	
C01	Solve any given system of linear equations.
C02	Find the eigen values of a matrix and how to diagonalise a matrix.
C03	Identify analytic functions and harmonic functions.
C04	Evaluate real definite integrals as application of residue theorem.
C05	Identify conformal mappings
C06	Find regions that are mapped under certain transformation.

Course code & title: Business Economics HS 200	
Course outcome	
C01	Understand elementary principles of Economics and Business Economics.
C02	Analyse the various market situations with good grasp on the effect of trade cycle.
C03	Anlayse the basic macro-economic concepts and monetary theory.
C04	Undestand macro- economic concepts to improve their ability to analyse the business climate.
C05	Analyse their employability by combining their technical knowledge with appropriate economic models.
C06	Attain knowledge of elementary accounting concepts used for prepairing balance sheet and interpretation of balace sheets.

Course code & title: ME 210 Metallurgy and Materials Engineering	
Course outcome	
C01	Identify the crystal structures of metallic materials.
C02	Analyze the binary phase diagrams of alloys Fe-Fe3C, etc.
C03	Correlate the microstructure with properties, processing and performance of metals.
C04	Recognize the failure of metals with structural change.
C05	Select materials for design and construction.
C06	Apply core concepts in materials science to solve engineering problems.

Course code & title: Mechanics of fluids (ME203)	
Course outcome	
C01	Understand the basic concepts of fluids with the aid of Newton's law of viscosity and buoyancy equations
C02	Ability to calculate pressure variations in accelerating fluids using Euler's and Bernoulli's equation.
C03	Become conversant with the concepts of flow measurements and flow through pipes and be able to describe them.
C04	Apply momentum and energy equations to fluid flow problems based on analysis of various system specifications.
C05	Evaluate head loss in pipes and conduits and recommend suitable engineering criteria for fluid flow, power transmission etc.
C06	Use dimensional analysis to design physical or numerical experiments applying dynamic similarity.

Course code & title: Thermodynamics (ME205)	
Course outcome	
C01	Students will be able to acquire fundamental knowledge in thermodynamic concepts.
C02	Students will be able to understand different laws of thermodynamics and to apply them in practice when called for.
C03	Students will be able to analyze preliminary problems of change in entropy in various thermodynamic processes.
C04	Students will be able to apply thermodynamic relations and problem solving ability with respect to issues related to social interest.
C05	Students will gain knowledge in thermodynamic properties of pure substances and their mixtures to enable continuing education and use of data books.
C06	Students will be encouraged to observe and distinguish the different thermodynamic processes around them and think creatively.

Course code & title: CE230 Material Testing Lab	
Course outcome	
C01	To determine the Modulus of Elasticity of steel and wood using UTM
C02	To verify Clerk- Maxwell's Reciprocal Theorem and hence determine the Modulus of elasticity of steel.
C03	To determine the Modulus of rigidity of steel using torsion test, spring test and torsion pendulum
C04	To analyse the toughness of a specimen using Impact testing machine.
C05	To test the hardness of a material by Rockwell, Brinell and Vicker Hardness test.
C06	To determine the ultimate shear stress of steel using UTM

Semester 5

ME301 MECHANICS OF MACHINERY	
Course outcome	
C01	Are you able to identify different types of mechanisms and their inversions, and to calculate their degrees of freedom.
C02	Are you able to conduct displacement, velocity and acceleration analysis of planar mechanism
C03	Are you able to conduct synthesis of mechanism, and to construct a mechanism for a specified output motion
C04	Are you able to design and develop a cam for a specified follower motion
C05	Are you having knowledge in gear terminologies and to calculate velocity of gears in a gear train.

Course Code & Title: ME303 MACHINE TOOLS AND DIGITAL MANUFACTURING	
Course Outcome	
C01	Are you able to understand the mechanism of metal cutting?
C02	Are you able to select appropriate process parameters in a machine tool while machining a job.
C03	Are you able to understand and apply operational principles of machine tools.
C04	Are you able to select different super finishing operations.
C05	Whether you are able to understand and apply the principles of digital manufacturing.

Course code & title: ME305 COMPUTER PROGRAMMING & NUMERICAL METHODS	
Course outcome	
C01	Are you able to identify fundamental idea about computer programming concept, Keywords, Identifiers, Data types, constants & Variables, Operators and structure of C++ program.
C02	Are you able to write C++ programs to solve simple engineering programs using control statements, arrays and functions.
C03	Write C++ programs to solve simple engineering programs using Class, Object and concepts like member functions, friend declaration and inheritance.
C04	Carry out curve fitting using method of least squares, non-linear relationships, Linear correlation, measures of correlation.
C05	Solve Partial differential equations using Finite difference method
C06	Solve linear system of equations using Gauss elimination, Gauss-Jordan and Gauss–Seidel methods

Course code & title: EE311 ELECTRICAL DRIVES AND CONTROL FOR AUTOMATION	
Course outcome	
C01	Are you able to explain the principle of electrical machines and their applications.
C02	Are you able to apply the principle of electrical drives and understand the dynamics of electrical drive systems.
C03	Are you able to select a drive for a particular application based on power rating & to select a drive based on mechanical characteristics for a particular drive application
C04	Are you able to identify solid state drive for speed control of various special electrical machines.
C05	Are you able to design speed control of induction motor drives in an energy efficient manner using power electronics

Course code & title: ME367 NON-DESTRUCTIVE TESTING	
Course outcome	
C01	Differentiate various defect types and select the appropriate NDT methods for the specimen
C02	Understand the basic theory and principles of NDT methods
C03	Understand the scope, limitations and applications of the NDT methods
C04	Understand the procedure followed in various NDT techniques
C05	Understand the considerations for selection of appropriate NDT technique(s) for various applications

Course code & title: HS 300 PRINCIPLES OF MANAGEMENT	
Course outcome	
C01	Are you able to recall and identify the relevance of management concepts
C02	Are you able to describe, discuss and relate management techniques adopted within an organization
C03	Are you able to apply management techniques for meeting current and future management challenges faced by the organisation.
C04	Are you able to compare the management theories and models critically and to inspect and question its validity in the real world.
C05	Are you able to assess and modify different theories of management so as to relate it to current
CO6	Are you able to apply principles of management in order to execute the role as a manager.

Course code & title: ME341DESIGN PROJECT	
Course outcome	
C01	Are you able to think innovatively on the development of components, products, processes or technologies in the engineering field
C02	Are you able to analyse the problem requirements and arrive at workable design solutions.
C03	Are you able to understand the engineering aspects of design with reference to simple products to assess its impact on the society, health, environment and safety
C04	Are you able to develop design that add value to products and solve technical problems

Course code & title: EE 335 ELECTRICAL AND ELECTRONICS LAB	
Course outcome	
C01	Are you able to Perform load test on DC shunt, series motors, single phase transformers, 3/1 phase induction motors and analyse its performance characteristics.
C02	Are you able to perform the load test on shunt generator and predetermine the performance of DC machine when working as motor/generator
C03	Are you able to determine the efficiency and voltage regulation of a single phase transformer performing OC/SC test
C04	Are you able to determine the open circuit characteristics of self excited generators
C05	Do you have awareness in applying rectifier circuits and CE configuration of BJT

Course code & title: ME331 Manufacturing Technology LAB 1	
Course outcome	
C01	Can you identify various process parameters and their influence on surface properties of various metals?
C02	Are you capable enough to recommend appropriate speed, feed and depth of cut for various processes on lathe machine?
C03	In what capacity you can position, hold and locate work material and cutting tools in various basic machine tools?.
C04	Choose suitable welding process for different metals?
C05	Will be able to choose appropriate heat treatment process for different metals?

Semester 6

Course code & title: ME302 HEAT AND MASS TRANSFER	
Course outcome	
C01	Are you able to understand the definition of heat conduction and solving of related problems.
C02	Understanding and defining of hydrodynamics and thermal boundary layers and convective heat transfer and solving related problems.
C03	Assessment of transient heat conduction, heat transfer through fins, boiling and condensation heat transfer and solving related problems.
C04	Analyzing combined conduction and convective heat transfer and heat exchangers and solving related problems
C05	Definition, understanding and evaluation of heat radiation and solving and analyzing of the related problems
CO6	Formulation, learning and evaluation of mass transfer and convective mass transfer

Course code & title: ME304 Dynamics of Machinery	
Course outcome	
C01	Are you are capable of solving problems related to static and dynamic force analysis of planar mechanism both graphically and analytically.
C02	Can you explain turning moment diagrams of IC engines and can conduct flywheel analysis.
C03	Are you able to explain the theory behind gyroscopic couple and to predict the effect of gyroscopic couple in aircraft, ships and automobiles.
C04	Are you able to explain vibration model of a system, concept of free ,damped ,un damped and forced vibration systems .
C05	Understand the concept of series and parallel resonance.
CO6	knowledge in the critical speed of shafts and are capable of solving problems related to torsional vibrations in shafts

Course code & title: ME306 ADVANCED MANUFACTURING TECHNOLOGY	
Course outcome	
C01	Understand the principle and production methods of metal powders and fundamentals of ladder program in PLC.
C02	Are you able to program on CNC lathe and milling machine.
C03	Understand the principle and operations and types of non-traditional machines and methods of operations along with applications.
C04	Compare the various non-traditional machining processes and recommend the best process that satisfies a design requirement.
C05	Understand the principles and applications and limitations of different types of high energy rate forming processes.
CO6	Learn different additive manufacturing techniques and nano-finishing operations.

Course code & title: ME308 COMPUTER AIDED DESIGN AND ANALYSIS	
Course outcome	
C01	Express the concept of CAD/CAM/CIM and other terminologies used in the development and manufacturing of a product.
C02	Demonstrate different methods for geometric modelling in CAD
C03	Evaluate the types of curves used in creating a geometry
C04	Are you able to Formulate stiffness matrix to analyse structural and thermal problems
C05	Analyze structural finite element problems by getting knowledge about various finite element methods.

ME312 METROLOGY AND INSTRUMENTATION	
Course outcome	
C01	Can you understand the working of linear and angular measuring instruments
C02	Are you familiarize with the working of optical measuring instruments and fundamentals of limits and limit gauges.
C03	Will you understand various methods for measurement of screw thread and surface roughness parameters
C04	Are you exposure to advanced measuring devices and machine tool metrology.
C05	Could you acquire an overview of mechanical measurement systems.
CO6	Accumulate basic idea about working principle and applications of devices for measurement of force and torque, strain , stress and temperature.

Course code & title: ME376 MAINTENANCE ENGINEERING	
Course outcome	
C01	Understand the principles, functions and practices of maintenance activities.
C02	Do you have the ability in formulating suitable maintenance strategies to achieve reliable manufacturing system.
C03	Are you able to introduce the different maintenance categories and failure analysis tools in your daily life.
C04	Are you able to illustrate the techniques used for maintenance management.
C05	Are you empowered with the skills to manage a manufacturing system.
CO6	Will you be able to synthesize ideas into a marketing plan.

Course code & title: ME368 MARKETING MANAGEMENT	
Course outcome	
C01	Are you able to gain a solid understanding of key marketing concepts and skills..
C02	Can you Identify and demonstrate the dynamic nature of the environment in which marketing decisions are taken.
C03	Are you able to develop the skills in applying the analytic perspectives, decision tools, and concepts of marketing to decisions involving segmentation, targeting and positioning.
C04	Understanding of the underlying concepts, strategies and the issues involved in the exchange of products and services and control the marketing mix variables in order to achieve organizational goals.
C05	Are you able to develop strong marketing plans and persuasively communicate your recommendations and rationale.
CO6	Will you be able to understand new trends in the marketing.

Course code & title: ME332 COMPUTER AIDED DESIGN AND ANALYSIS LAB	
Course outcome	
C01	Are you capable of developing3D models of machine components, complex geometries etc. using Solid Edge ST 9
C02	Can you to assembly the parts created to develop the whole mechanism.
C03	Are you capable to generate 2D sketches of the assembled parts and provide dimensions and symbols to generate 2D drawing.
C04	Are you able to modify and mesh using different meshing methods and local meshing controls.
C05	apply their knowledge in importing CAD geometries and to modify and mesh using different meshing methods and local meshing controls

Course code & title: ME334 MANUFACTURING TECHNOLOGY LAB 2	
Course outcome	
C01	Able to select and use different linear and angle measuring devices like vernier calipers, micrometers, bevel protractors, slip gauges etc.
C02	Able to use equipments like Surface Roughness tester, Profile projector, and Tool makers Microscope to find out parameters of gear, thread, tool and surface roughness..
C03	Able to do the process of calibration by carrying out experiments on devices like strain gauge, LVDT, and Roughness tester.
C04	Able to understand about CNC machine tool and also to write NC part programming statements to carry out the machining processes using CNC machine tool.
C05	Able to make inferences during different measurement processes.
CO6	Will you be able to perform, analyse and infer the experiments as a team. .

S7- B.TECH MECHANICAL ENGG.

Course code & title: ME 409 Compressible fluid flow	
Course outcome	
C01	Determine the effect of Mach number on compressibile flow.
C02	Formulate and solve problems in one-dimensional steady compressible flow
C03	Derive the conditions for the change in pressure, density and temperature for normal shock.
C04	Formulate and solve problems in constant area flow with friction (Fanno flow)
C05	Formulate and solve problems in constant area flow with heat transfer
C06	Know the various measuring instruments used in compressible fluid flow.
Course code & title: ME401 DESIGN OF MACHINE ELEMENTS I	
Course outcome	
C01	Students will able to understand and identify the different procedures to be followed during different phases of design process and understand the basic material properties.
C02	Students will understand different failure theories and basic concepts of deign factors like stress, factor of safety, etc.
C03	Students will understand the basics of threaded and bolted joints.
C04	Students will understand the basics and applications of riveted, cotter, kuckle, gib and welded joints. They will be able to calculate and analyze the load on the system.
C05	Students will be able to classify different type of springs. They will be able to predict different effects on the spring under different loading conditions.
C06	Students will be able to explain the different design consideration while designing shaft and couplings. They will be able to calculate the forces acting on the system.

Course code & title: ME403:ADVANCED ENERGY ENGINEERING	
Course outcome	
C01	Listing of conventional energy sources and survey of the global and Indian energy scenario
C02	Illustrate different power plants like thermal, steam, hydro, gas turbine and nuclearpower plants and its components with the restating of its working principle withtheketching of components by symbols
C03	To explain the basic working of solar photovoltaic systems, aerodynamics of windturbines and chemical conversion of biomass
C04	Application of solar, wind and biomass energy
C05	Analyzing the importance and basic working principle and types of solar, wind andbiomass energy renewable power systems and other renewable energy sources
C06	Evaluating the environmental impact of energy conversions
Course code & title: ME405Refrigeration & Air Conditioning	
Course outcome	
C01	Understand the principles refrigeration of air-conditioning and basic design considerations
C02	Carry out analysis of refrigeration cycles
C03	Apply the concepts of indoor environmental comfort
C04	Perform psychometric calculations, humidity control and analysis of air-conditioning processes
C05	Know the various applications of Refrigeration and air conditioning
C06	Evaluate cooling and heating load and design of HVAC system.

Course code & title: ME 407 MECHATRONICS	
Course outcome	
C01	Students will understand the basic structure of Mechatronics system, sensors and encoders.
C02	Students will gain knowledge on the various types of hydraulic and pneumatic actuators used.
C03	Students will develop and idea about Micro Electro Mechanical System, Deep Reactive Ion Etching (DRIE) and LIGA Process..
C04	Students will be able to select various mechatronics elements in the Design of modern CNC machines
C05	Students will gain fundamental knowledge in system modelling and Mechatronics in Robotics.
C06	Students will be able to assess case studies of mechatronic systems.
Course code & title: ME 467 CRYOGENIC ENGINEERING	
Course outcome	
C01	To gain knowledge and to understand the scope and history of cryogenics. To understand the properties of materials at low temperature applying fundamental knowledge.
C02	To apply the knowledge of low temperature production methods to understand and analyse different liquefaction systems. To gain knowledge about the critical components involved in liquefaction.
C03	To apply the knowledge of ideal refrigeration techniques, to understand and analyse common cryogenic refrigeration systems. To understand some of the novel cryogenic refrigeration methods.
C04	Students will understand the basics and applications of riveted, cotter, kuckle, gib and welded joints. They will be able to calculate and analyze the load on the system.
C05	To gain knowledge about different cryogenic instrumentation and to understand cryo pumping.

Course code & title: ME 463 AUTOMOBILE ENGINEERING	
Course outcome	
C01	Students will be able to practically identify and explain different automotive systems and subsystems.
C02	Students will be able to understand the principles of transmission, suspension, steering and braking systems of an automobile.
C03	Students will be able to investigate the future developments in the automobile industry
C04	Students will be able to interpret the various terminologies.
C05	Students will be able to analyse the effectiveness of energy storing and dissipating systems in a vehicle.
C06	Students will be able to evaluate the aerodynamic design parameters of the vehicle and can validate the same.
Course code & title: ME 431 MECHANICAL ENGINEERING LAB	
Course outcome	
C01	Ability to apply the principle of heat transfer for quantitative measurement and to compare the results with theoretical values.
C02	Ability to compute natural frequency of simple vibrating systems
C03	Understand the working of different governors, and can predict the stability of mechanical governors.
C04	Understand the theory behind gyroscopic effect and to predict the effect of gyroscopic couple in different mechanisms.
C05	To practice calibration of thermometer and pressure gauges

Course code & title: ME 451 SEMINAR & PROJECT PRELIMINARY	
Course outcome	
C01	The students will be able to explore the recent technological advancements correlating the fundamentals of mechanical engineering.
C02	The students will be able to identify, define and formulate engineering problems through detailed literature survey.
C03	The students will develop presentation skills with the ability to communicate to audience and also ethical writing skills as a part of report submission.
C04	The students will be in a position to hypothesize future advancements in their present work.

S8- B.TECH MECHANICAL ENGG.

Course code & title: ME402 DESIGN OF MACHINE ELEMENTS II	
Course outcome	
C01	Are you able to analyse the design considerations for different types of clutches and brakes.
C02	Are you able to design different types of bearings for static and dynamic load and selection of appropriate rolling contact bearing.
C03	whether you are able to Study gear nomenclature, tooth profile and design of spur gear.
C04	whether you are able design helical, bevel and worm gears for power transmission.
C05	Whether you are able design suitable belt, chain drives for given applications.
C06	Whether you are able to design pressure vessels, cylinders and parts of internal combustion engine.
Course code & title: MT482 INDUSTRIAL SAFETY	
Course outcome	
C01	identify the various possible hazards in different fields of engineering.
C02	classify various hazards based on their nature and severity
C03	use the knowledge gained for maintaining safety, occupational health and hygiene in an industry.
C04	examine the factors that lead to an accident
C05	select the safety equipment to be used for prevention of various hazards
C06	use the general rules for an industrial safety practitioner.

Course code & title: ME 476MATERIAL HANDLING AND FACILITIES PLANNING	
Course outcome	
C01	Develop a systematic plant layout
C02	Assess the value of facility planning on the strategy of a firm.
C03	Study the importance of safety measures in a plant layout
C04	Know in detail about the different services required..
C05	Know the environmental and economical aspects in facilities planning.
C06	Understand various material handling systems
Course code & title: ME492 Project	
Course outcome	
C01	Ability to effectively gather and interpret information from literature survey. And use this knowledge to identify, formulate, analyze and solve complex problems and to evaluate and interpret various solutions.
C02	Gain the ability to communicate effectively with written, oral, and visual means in a technical setting.
C03	Ability to use modern design and analysis tools to analyse and evaluate complex problems.
C04	Students will be able to carry out calculations involved in design, consider and evaluate alternate assumptions, approaches, a n d procedures .
C05	Ability to serve as effective team member to plan and complete the project/task within a specified budget and time

Course code & title: ME404:INDUSTRIAL ENGINEERING	
Course outcome	
C01	Definition of industrial engineering and recalling the evolution of industrialengineering and reviewing the field of application of industrial engineering and designfunction
C02	Understanding and assessing of plant layout and material handling and itsapplication
C03	Explaining the methods of engineering, work measurement and job evaluation
C04	Learning and discussion on Industrial relations, psychological attitudes to work and working conditions, industrial safety and trade union
C05	Evaluation and understanding of production planning and control and lecturing on scheduling, dispatching and inventory.
C06	Application and understanding on quality control and inspection and reliability