ROHINI COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

B.E Mechanical Engineering
Anna University Regulation 2013

List of Course Names

Subject No.	SEM	Course code	Course	Course Title
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4	I	13C104	CY6151	Engineering Chemistry – I
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6	I	13C106	GE6152	Engineering Graphics
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55	VII	13C402	ME6702	Mechatronics
56	VII	13C403	ME6703	Computer Integrated Manufacturing Systems
57	VII	13C404	GE6757	Total Quality Management
58	VII	13C405	ME6005	Process Planning and Cost Estimation
59	VII	13C406	ME6012	Maintenance Engineering
60	VII	13C407	ME6711	Simulation and Analysis Laboratory
61	VII	13C408	ME6712	Mechatronics Laboratory
62	VII	13C409	ME6713	Comprehension
63	VIII	13C410	MG6863	Engineering Economics
64	VIII	13C411	MG6071	Entrepreneurship Development
65	VIII	13C412	ME6019	Non Destructive Testing and Materials
66	VIII	13C413	ME6811	Project Work

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Course Outcomes (CO)

13C101	**HS6151 / Technical English – I**
13C101.1	Develop the learners' basic communication skills in English by listening audios and long text
13C101.2	Explain technical things and develop instructions and recommendations.
13C101.3	Summarize cohesively and coherently without grammatical errors ,organize the ideas logically on a topic
13C101.4	Interpret charts and graphs and illustrate different types of essays.
13C101.5	Apply the technical strategies in E-Learning and develop E- Communication Skills

13C102	**MA6151 / Mathematics – I**
13C102.1	Apply the concept of orthogonal transformation to diagonalise the given matrix..
13C102.2	Apply the comparison test , Integral test, D' Alembert's ratio test and Leibnitz' s test to verify the convergence.
13C102.3	Find the radius of curvature, circle of curvature and Centre of curvature of a given curve.
13C102.4	Identify maxima and minima in two variables using partial differentiation.
13C102.5	Apply multiple integral techniques in evaluating Area and Volume of Solids

13C103	**PH6151 / Engineering Physics – I**
13C103.1	Outline the various crystal structure and its growth techniques

13C103.2	Illustrate basic concepts of stress and strain in solids and one dimensional Heat transfer
13C103.3	Illustrate the quantum theory and its applications
13C103.4	Apply the knowledge of acoustics in designing buildings
13C103.5	Classify the type of optical fiber and Laser

13C104	**CY6151 / Engineering Chemistry – I**
13C104.1	List the various methods involved in the polymerization techniques.
13C104.2	Apply the concepts of Thermodynamic laws in engineering applications.
13C104.3	Outline the molecular structure by using spectroscopic techniques.
13C104.4	Illustrate the basic concepts of phase rule for the purpose and significance of alloying.
13C104.5	Apply the basics of Nano materials and their properties in various applications.

13C105	**GE6151 / Computer Programming**
13C105.1	Explain the Organization of a Computer and number systems.
13C105.2	Explain the attributes of algorithm and programming basics
13C105.3	Apply arrays and string functions in simple C programs
13C105.4	Explain functions and pointers for solving problems
13C105.5	Apply structure and union in simple C applications

13C106	GE6152 / Engineering Graphics
13C106.1	Discuss the orthographic views of Engineering components.
13C106.2	Relate to basic principles of orthographic projection for drawing projection of points, lines and planes.
13C106.3	Apply basic principles of orthographic projection for drawing projection of solids like prisms, pyramids, cone and cylinder.
13C106.4	Show the sectioned view of solids and the development of solid surfaces
13C106.5	Show the isometric projection and perspective views for simple solids.

13C107	GE6161 / Computer Practices Laboratory
13C107.1	Apply word processor and it's basic features
13C107.2	Explain various formatting tools, types of tables, drawing tools and mail merging for effective documentation
13C107.3	Apply Spread sheet and it's salient features for Problem solving
13C107.4	Apply basic programs in C language for problem solving
13C107.5	Apply suitable data structures and functions in C programs
13C107.6	Exhibit ethical principles in engineering practices
13C107.7	Perform task as individual and /or team member to manage the task in time
13C107.8	Express the engineering activities with effective presentation and report
13C107.9	Interpret the finding with appropriate technological /research citation

13C108	GE6162 / Engineering Practices Laboratory
13C108.1	Explain the various manufacturing process in smithy, foundry, fitting, assembling and disassembling and will be able to provide effective presentation.
13C108.2	Summarize the operations of various machine tools lathe , drilling
13C108.3	Develop models by using skills achieved from workshop sections like welding, carpentry, sheet metal and plumbing
13C108.4	Apply the skills of basic electrical engineering for domestic wiring practices
13C108.5	Apply the measuring instruments like energy meter and perform measurements in electrical circuits.
13C108.6	Explain the working of electronic components.
13C108.7	Apply the electronic principle for develop engineering circuits.
13C108.8	Exhibit ethical principles in engineering practices
13C108.9	Perform task as individual and /or team member to manage the task in time
13C108.10	Express the engineering activities with effective presentation and report
13C108.11	Interpret the finding with appropriate technological /research citation

13C109	GE6163 / Physics and Chemistry Laboratory - I
13C109.1	Find the wavelength and particle size using laser and thermal conductivity of bad conductors using Lee's Disc
13C109.2	Compare the Young's modulus of the material by non uniform bending and the wavelength of mercury spectrum using Spectrometer grating both individually and by team work
13C109.3	List the velocity of ultrasonic waves in different liquids like water and kerosene

13C109.4	Estimate strength of acids quantitatively based on the conductance and PH level of the solution both individually and in teams
13C109.5	Estimate water quality parameters such as dissolved oxygen content, chloride content and iron content of the water samples both individually and in teams .
13C109.6	Exhibit ethical principles in engineering practices
13C109.7	Perform task as individual and /or team member to manage the task in time
13C109.8	Express the engineering activities with effective presentation and report
13C109.9	Interpret the finding with appropriate technological /research citation

13C110	**HS6251 / Technical English – II**
13C110.1	Explain convincingly their opinions and also initiate, negotiate and argue using appropriate communicative strategies.
13C110.2	Apply the basic grammar techniques to enhance the language
13C110.3	Make use of the importance of writing skills and its techniques
13C110.4	Develop various types and formats of reports, emails, resumes, letters, to meet particular needs or purposes
13C110.5	Apply skills pertaining to presentation, group discussion, creative and critical thinking in everyday life

13C111	**MA6251 / Mathematics – II**
13C111.1	Solve the line integral, surface integral and volume integral in Engineering applications
13C111.2	Solve simultaneous first order linear equations with constant coefficients.

13C111.3	Solve the second order ODE by Laplace transformation.
13C111.4	Find the analytic functions by Milne Thomson method
13C111.5	Solve real definite integrals , contour integrals around unit circle and semi-circle

13C112	**PH6251 / Engineering Physics – II**
13C112.1	Infer the electrical properties of material and quantum theory.
13C112.2	Classify the type of semiconductor and its uses.
13C112.3	Outline the magnetic properties of different materials and superconductivity.
13C112.4	Apply the knowledge of polarization in polaroids
13C112.5	Interpret the metallic glasses, Nano Materials and Biomaterials

13C113	**CY6251/ Engineering Chemistry – II**
13C113.1	Explain the concepts of various water treatment process.
13C113.2	Apply the principles of electrochemical reactions in prevention of materials from corrosion.
13C113.3	Explain the working of power plants using conventional and non conventional sources of energy such as nuclear, solar and wind
13C113.4	Illustrate knowledge of metals for Engineering Applications
13C113.5	Explain various types of fuels, their manufacturing processes and calculation of calorific theoretically

13C114	**GE6252 / Basic Electrical and Electronics Engineering**

13C114.1	Analyze the D.C electric circuits.
13C114.2	Explain the working principle & Performance Characteristics of DC machines.
13C114.3	Relate the characteristics of semiconducting devices
13C114.4	Show the performance of various logic gates and flip flops.
13C114.5	Explain the type of signals and communication systems.

13C115	**GE6253 / Engineering Mechanics**
13C115.1	Illustrate the vector and scalar representation of forces of bodies in two dimension and three dimensions.
13C115.2	Show the resultant force, moment for a system of forces.
13C115.3	Relate the centroid, center of gravity, moment of inertia for different geometry.
13C115.4	Apply the principle of dynamic equilibrium for rigid bodies
13C115.5	Demonstrate the value of frictional force under equilibrium condition.

13C116	**GE6261 / Computer Aided Drafting and Modeling Laboratory**
13C116.1	Interpret drawings of machine components, Indian Standards on drawing practices and standard components.
13C116.2	Design and draft of Mechanical components using standard 2D drafting CAD packages
13C116.3	Design 3D models of engine parts using3D modeling software systems.
13C116.4	Develop 3D models of couplings and joints.
13C116.5	Design 3D models of miscellaneous parts using3D modeling software systems.

13C116.6	Exhibit ethical principles in engineering practices
13C116.7	Perform task as individual and /or team member to manage the task in time
13C116.8	Express the engineering activities with effective presentation and report
13C116.9	Interpret the finding with appropriate technological /research citation

13C117	**GE6262 / Physics and Chemistry Laboratory - II**
13C117.1	Find the particle size by diode laser.
13C117.2	List out the thermal conductivity of bad conductors .
13C117.3	Show the velocity of ultrasonic waves in different liquids like water and kerosene
13C117.4	Show the iron content of the given solution using potentiometer
13C117.5	Relate water quality parameters such as alkalinity, hardness, Sodium of the water samples both individually and in teams.
13C117.6	Exhibit ethical principles in engineering practices
13C117.7	Perform task as individual and /or team member to manage the task in time
13C117.8	Express the engineering activities with effective presentation and report
13C117.9	Interpret the finding with appropriate technological /research citation

13C201	MA6351 / Transforms and Partial Differential Equations
13C201.1	Formulate simple Engineering problems as Partial Differential Equations
13C201.2	Apply the concept of Fourier series in solving boundary value problems
13C201.3	Solve the standard Partial Differential Equations in engineering problems like Wave equation, Heat flow equation by Fourier series.
13C201.4	Solve Fourier, Fourier Sine and Cosine transforms and properties
13C201.5	Understand the discrete transform applied to engineering problems.

13C202	CE6306 / Strength of Materials
13C202.1	Apply the various stresses and strain relations induced in different materials due to tension and compression.
13C202.2	Develop the shear force and bending moment diagrams of various type of beams under different loading conditions
13C202.3	Illustrate the stresses and deformation of circular structures and helical structures subjected to torsion
13C202.4	Apply the stress distribution of shear and bending in various sections of beams.
13C202.5	Apply the principal plane and stresses in two dimensional bodies and thick cylinders

13C203	ME6301 / Engineering Thermodynamics
13C203.1	Explain the basic concepts and Solve the laws of thermodynamics applied to various applications.
13C203.2	Explain the concept of Second law, Availability, Entropy in thermal systems and apply entropy for second law applications.
13C203.3	Interpret the properties of pure substance and explain the working of steam cycles

13C203.4	Differentiate the properties of ideal, real gases and deduce its relations in thermodynamic aspects
13C203.5	Apply the properties of moist air in Psychrometric processes and calculate the properties of gas mixtures.

13C204	**CE6451 / Fluid Mechanics and Machinery**
13C204.1	Illustrate the basic properties of fluid and fluid statics.
13C204.2	Analysis the flow through the pipes and interpret the conept of development of boundary layer.
13C204.3	Apply the dimensional analysis to identify the fundamental variables that
13C204.4	Ilustrate the working principles of pumps and its performance.
13C204.5	Illustrate the working principles of turbines and its performance.

13C205	**ME6302 / Manufacturing Technology - I**
13C205.1	Explain different metal casting processes, associated defects, merits and demerits
13C205.2	Explain different metal joining processes.
13C205.3	Summarize various hot working and cold working methods of metals.
13C205.4	Explain various sheet metal making processes
13C205.5	Compare various methods of manufacturing of plastic components.

13C206	EE6351/ Electrical Drives and Controls
13C206.1	Understand the basic concept of electric drives.
13C206.2	Understand the characteristics of different types of machines and their performance
13C206.3	Analyze the different methods of starting of D.C motors and induction motors
13C206.4	Describe the conventional and solid0state drives of DC motors
13C206.5	Explain the conventional and solidstate drives of AC motors

13C207	ME6311 / Manufacturing Technology Laboratory - I
13C207.1	Demonstrate the working principles of lathe machine.
13C207.2	Make use of lathe to perform various operations.
13C207.3	Identify suitable manufacturing techniques to manufacture different products
13C207.4	Make use of shaping machine to perform various operations.
13C207.5	Utilize CNC Program for various machining process
13C207.6	Exhibit ethical principles in engineering practices
13C207.7	Perform task as individual and /or team member to manage the task in time
13C207.8	Express the engineering activities with effective presentation and report
13C207.9	Interpret the finding with appropriate technological /research citation

13C208	CE6461 / Fluid Mechanics and Machinery Laboratory
13C208.1	Demonstrate the various flow merers to find coefficient of discharge
13C208.2	Experiment with Rota meter to find the rate of flow.
13C208.3	Demonstrate the practice of understanding the frictional and internal loses in internal flow.
13C208.4	Demonstrate the theoritical and experimental analysis of hydraulic pumps.
13C208.5	Demonstrate the theoritical and experimental analysis of hydraulic turbines.
13C208.6	Exhibit ethical principles in engineering practices
13C208.7	Perform task as individual and /or team member to manage the task in time
13C208.8	Express the engineering activities with effective presentation and report
13C208.9	Interpret the finding with appropriate technological /research citation

13C209	EE6365 / Electrical Engineering Laboratory
13C209.1	Explain the working of DC and AC Starters.
13C209.2	Compare the various characteristics of single phase DC and AC motors.
13C209.3	Calculate the regulation of single and three phase alternators and transformers.
13C209.4	Design speed controllers for single and three phase electrical machines.
13C209.5	Develop speed and load characteristics of electrical machines.

13C209.6	Exhibit ethical principles in engineering practices
13C209.7	Perform task as individual and /or team member to manage the task in time
13C209.8	Express the engineering activities with effective presentation and report
13C209.9	Interpret the finding with appropriate technological /research citation

13C210	**MA6452 / Statistics and Numerical Methods**
13C210.1	Relate the basic hypothesis testing
13C210.2	Design and conduct of engineering experiments involving a single factor ,two and three factors.
13C210.3	Solve the system of linear algebraic equations in Mechanical Engineering
13C210.4	Apply the interpolation technique for solving real time engineering problems
13C210.5	Solve ordinary and partial differential equations using numerical methods .

13C211	**ME6401 / Kinematics of Machinery**
13C211.1	Apply knowledge of fundamentals of kinematics to common mechanism and determine kinematics parameters of various linkages
13C211.2	Analysis graphically, velocity and acceleration in various linkage mechanism
13C211.3	Categorize the type of cam follower and its profile based on the required application

13C211.4	Analysis the performance characteristics of gear trains for power transmission
13C211.5	Identify the effect of frictional forces influencing the various power transmission systems

13C212	**ME6402 / Manufacturing Technology– II**
13C212.1	Illustrate the nomenclature of single and multipoint cutting tools used in manufacturing process
13C212.2	Interpret the constructional and working principles of turning machine
13C212.3	Explain the working principles and application of shaping, drilling, boring, milling and gear machines.
13C212.4	Explain the requirement and application of abrasive process and broaching machines
13C212.5	Expalin the contructional features of CNC machines and develop the programming skills for real world applications.

13C213	**ME6403 / Engineering Materials and Metallurgy**
13C213.1	Explain various binary alloy systems with respective invariant reaction.
13C213.2	Apply the concepts of isothermal transformation using heat treatment processes.
13C213.3	Explain various Ferrous and non-ferrous metals with its application
13C213.4	Explain various non-metallic materials with its applications
13C213.5	Demonstrate the working of various material testing equipments and find material properties

13C214	**GE6351 / Environmental Science and Engineering**

13C214.1	Illustrate the features of Ecosystem & biodiversity
13C214.2	Choose pollution control methods and waste management.
13C214.3	Apply the environmental concepts for conservation and protection of natural resources.
13C214.4	Demonstrate the impact of social issues on environment
13C214.5	Demonstrate the impact of human on environment.

13C215	**ME6404 / Thermal Engineering**
13C215.1	Apply the concept of thermodynamics cycles to solve problems
13C215.2	Analyse the performance characteristics of reciprocating air compressor
13C215.3	Analysis the functions of internal combustion engine and illustrate the combustion in internal combustion engine.
13C215.4	Analysis the performance parameters of internal combustion engines and concept of auxiliary systems.
13C215.5	Analyse the performance of gas turbine cycles.

13C216	**ME6411 / Manufacturing Technology Laboratory–II**
13C216.1	Make use of milling machine and carryout various milling operations
13C216.2	Utilize gear generation methods to form gears
13C216.3	Make use of different machine tools for finishing operations

13C216.4	Develop cutting edges using tool and cutter grinder
13C216.5	Make use of CNC machines to perform various operations.
13C216.6	Exhibit ethical principles in engineering practices
13C216.7	Perform task as individual and /or team member to manage the task in time
13C216.8	Express the engineering activities with effective presentation and report
13C216.9	Interpret the finding with appropriate technological /research citation

13C217	**ME6412 / Thermal Engineering Laboratory - I**
13C217.1	Compare Ideal and Actual Valve Timing and Port Timing diagrams of IC engines.
13C217.2	Examine the performance of IC engines under different loading conditions.
13C217.3	Determine the characteristics of fuels /Lubricates used in IC engines
13C217.4	Analyze the performance of steam generator
13C217.5	Compute the performance of steam turbines.
13C217.6	Exhibit ethical principles in engineering practices
13C217.7	Perform task as individual and /or team member to manage the task in time
13C217.8	Express the engineering activities with effective presentation and report
13C217.9	Interpret the finding with appropriate technological /research citation

13C218	CE6315 / Strength of Materials Laboratory
13C218.1	Demonstrate experiments for tensile and shear on material specimen.
13C218.2	Make use of various equipments for to test the torsion and impact strength
13C218.3	Apply specific testing methods for material characterization
13C218.4	Compute the response of the beam by deflection method
13C218.5	Calculate the deflection of springs using tensile and compression tests
13C218.6	Exhibit ethical principles in engineering practices
13C218.7	Perform task as individual and /or team member to manage the task in time
13C218.8	Express the engineering activities with effective presentation and report
13C218.9	Interpret the finding with appropriate technological /research citation

13C301	ME6501 / Computer Aided Design
13C301.1	Explain the basic concept of product design, 2D and 3D CAD graphical manipulations.
13C301.2	Examine the representation of curves, surface and solid modeling techniques for various real time applications
13C301.3	Outline the Various techniques to communicate the CAD drawing realistically
13C301.4	Demonstrate the concept of parametric design for mechanical assembly.
13C301.5	Summarize the usage of various CAD Standards for Graphic design of components

13C302	ME6502 / Heat and Mass Transfer
13C302.1	Apply the concept of heat conduction equations with different surface configuration under steady and transient heat conduction.
13C302.2	Apply the concepts of free and forced convection correlations with the different fluid flow elements.
13C302.3	Apply the applications of phase change heat transfer and LMTD and NTU methods of heat exchangers.
13C302.4	Analyse the concept of radiation and application in heat transfer systems.
13C302.5	Analyse the concept of diffusion& convective mass transfer correlations.

13C303	ME6503 / Design of Machine Elements
13C303.1	Determine the stress acting on various machine elements
13C303.2	Design a shaft and couplings based on various load conditions
13C303.3	Analyze the temporary, permanent joints and design joints based on applications
13C303.4	Design energy storing devices for the specific applications
13C303.5	Select appropriate bearing, from the standard catalog for varied applications

13C304	ME6504 / Metrology and Measurements
13C304.1	Explain the errors during calibration of Measuring system
13C304.2	Interpret the use of Linear and Angular Measurement instruments
13C304.3	Compare the various advanced measurement techniques and devices in engineering applications

13C304.4	Interpret measurement of field variables like Flatness, Straightness, and Roundness.
13C304.5	Explain the measuring instruments to measure power, flow and temperature.

13C305	**ME6505 / Dynamics of Machines**
13C305.1	Expalin the forces required by various machine components to overcome inertia
13C305.2	Interpret the concept of balancing of rotating and Reciprocating mass
13C305.3	Analyze free longitudinal, damped and transversal vibration of a system
13C305.4	Analyse the forced vibration of a system.
13C305.5	Explain the control mechanisms of governor and gyroscope with their applications.

13C306	**GE6075 / Professional Ethics in Engineering**
13C306.1	Understand the basic perception of profession, professional ethics, various moral issues & uses of ethical theories
13C306.2	Understand the core values that shape the ethical behavior of an engineer and Exposed awareness on professional ethics and human values.
13C306.3	Understand various issues, industrial standards, code of ethics and role of professional ethics in engineering field.
13C306.4	Relate the suitable safety measures towards risk benefit analysis.
13C306.5	Analyze knowledge about various roles of engineers in variety of global issues and able to apply ethical principles to resolve situations that arise in their professional lives.

13C307	ME6511 Dynamics Laboratory
13C307.1	Demonstrate the various types of gears, gear trains, kinematic mechanisms, and universal joints.
13C307.2	Experiment with the Turn table apparatus, bi-filar suspension, single and double rotor systems, equivalent spring mass system.
13C307.3	Inspect the critical speed of shaft under the given load conditions and the gyroscopic effect and couple on motorized gyroscope
13C307.4	Develop the characteristic curves of Watt, Porter, Proell and Hartnell governors and motion curves for the given cam follower setup.
13C307.5	Examine the balancing of rotating masses in dynamic balancing machine.
13C307.6	Exhibit ethical principles in engineering practices
13C307.7	Perform task as individual and /or team member to manage the task in time
13C307.8	Express the engineering activities with effective presentation and report
13C307.9	Interpret the finding with appropriate technological /research citation

13C308	ME6512 Thermal Engineering Laboratory-II
13C308.1	Experiment with thermal conductivity mesuringequipments to measure thermal conductivity of various engineering materials.
13C308.2	Analyze the heat transfer rate in free and forced convection environment.
13C308.3	Demonstrate the emissivity of grey surface.
13C308.4	Make use of parallel and counter flow heat exchanger to find the overall heat transfer coefficient and effectiveness.
13C308.5	Identify the COP of refrigeration and air conditioning system and performance of air compressor.

13C308.6	Exhibit ethical principles in engineering practices
13C308.7	Perform task as an individual and/ or team member to manage the task in time
13C308.8	Express the engineering activities with effective presentation and report
13C308.9	Interpret the findings with appropriate technological/ research citation

13C309	**ME6513 Metrology and Measurements Laboratory**
13C309.1	Calibrate the various measureing devices used in engineering applications.
13C309.2	Inspect the dimensions, angularity and parallelism of a given component.
13C309.3	Develop the torque characteristic curves to various loads at various distances.
13C309.4	Measure the straightness of surfaces and determine size of irregularities on a machined surface.
13C309.5	Measure the vertical distances or height of objects, taper angle of slope for a given component, various parameters of threads and gear wheel.
13C309.6	Exhibit ethical principles in engineering practices
13C309.7	Perform task as individual and /or team member to manage the task in time
13C309.8	Express the engineering activities with effective presentation and report
13C309.9	Interpret the finding with appropriate technological /research citation

13C310	ME6601 / Design of Transmission Systems
13C310.1	Analyse the concept of design in the flexible drive elements like belt, chain and rope drives.
13C310.2	Develop a method of various types of gears with parallel axis
13C310.3	Develop a method for various types of gears with inclination with axis.
13C310.4	Explain the techniques used in industrial design multispeed gear box application
13C310.5	Categorize a suitable design for cam, clutches and brakes for automotive applications.

13C311	MG6851 / Principles of Management
13C311.1	Understand the Evolution of Management, culture and types of Organization
13C311.2	Examine various Strategic planning tools and Techniques also can take part in decision making process.
13C311.3	Explain the need and importance of decision making for managers in the organization
13C311.4	Build the leadership style, Barriers to effective Communication, its impact and methods to overcome them
13C311.5	Explain various Controlling techniques to maintain standards in Organizations

13C312	ME6602 / Automobile Engineering
13C312.1	Demonstrate the various parts of the automobile and their functions and materials.
13C312.2	Explain the engine auxiliary systems and engine emission control.
13C312.3	Distinguish the working of different types of transmission systems.

13C312.4	Explain the Steering, Brakes and Suspension Systems.
13C312.5	Select possible alternate sources of energy for IC Engines.

13C313	**ME6603 / Finite Element Analysis**
13C313.1	Apply the basics of finite element equations.
13C313.2	Apply the use of one-dimensional finite element equations
13C313.3	Analyse the finite element equations to solve two dimensional scalar variable problems.
13C313.4	Analyse the use of Finite element equations for solving axisymmetric elements.
13C313.5	Explain the concept of using finite element methods to solve iso parametric elements

13C314	**ME6604 / Gas Dynamics and Jet Propulsion**
13C314.1	Apply the concepts of compressible flows in variable area ducts
13C314.2	Apply the concepts of compressible flows in constant area ducts.
13C314.3	Analyze the effects of compression and expansion waves in compressible flow.
13C314.4	Analyze the performance of different types of Jet engines.
13C314.5	Apply the concepts of gas dynamics in Space Propulsion.

13C315	ME6004 / Unconventional Machining Processes
13C315.1	Summarize the needs and classification of unconventional machining process.
13C315.2	Explain the working principle of energy based machining process.
13C315.3	Explain the working principle of electrical energy based machining process.
13C315.4	Compare chemical and electro-chemical energy based processes
13C315.5	Discuss the working principle of thermal energy based machining process.

	ME6611 / C.A.D. / C.A.M. Laboratory
13C316.1	Make use of standard software tools to create 2D and 3D product models.
13C316.2	Develop the part drawing and the sectional views which are utilized in real time application
13C316.3	Apply the knowledge of dimensioning sets and tolerance of mechanical components
13C316.4	Understand the part drawings and components and combine into assembly view
13C316.5	Utilize CNC part programming and perform manufacturing using G and M Codes
13C316.6	Exhibit ethical principles in engineering practices
13C316.7	Perform task as individual and /or team member to manage the task in time
13C316.8	Express the engineering activities with effective presentation and report
13C316.9	Interpret the finding with appropriate technological /research citation

13C317	ME6612 / Design and Fabrication Project
13C317.1	Utilize the design principles and develop concept for the project
13C317.2	Estimate the time frame and cost for the project execution and completion
13C317.3	Analyze the project progress with remedial measures individual in a team
13C317.4	Examine the environmental impact of the project
13C317.5	Demonstrate the project functionality along with report and presentation
13C317.6	Assess health, safety and legal relevant to professional engineering practices.
13C317.7	Apply the Engineering knowledge in design and economically manufacturing of components to support the society need.
13C317.8	Justify ethical principles in engineering practices
13C317.9	Perform multi-disciplinary task as an individual and / or team member to manage the project/task.
13C317.10	Comprehend the Engineering activities with effective presentation and report.
13C317.11	Interpret the findings with appropriate technological / research citation

13C318	GE6674 / Communication Skills Lab
13C318.1	Make use of GD Strategies and participating in Group Discussion
13C318.2	Develop various types and formats of reports, emails, resumes, letters, to meet particular needs or purposes
13C318.3	Develop their knowledge to take part in international examination such as IELTS and TOEFL for enhancing verbal ability.

13C318.4	Relate the stress management & career management strategies in one's career development
13C318.5	Develop their creative and critical thinking adapting learning styles and strategies
13C318.6	Exhibit ethical principles in engineering practices
13C318.7	Perform task as individual and /or team member to manage the task in time
13C318.8	Express the engineering activities with effective presentation and report
13C318.9	Interpret the finding with appropriate technological /research citation

13C401	**ME6701 / Power Plant Engineering**
13C401.1	Illustrate various types of power plants and working principle of boilers.
13C401.2	Explain the layout, construction and working of the components inside a thermal power plant
13C401.3	Explain the layout, construction and working of the components inside nuclear and hydro power plants.
13C401.4	Analyze the principles of various renewable power plants.
13C401.5	Interpret the Economics of power plants.

13C402	**ME6702 / Mechatronics**
13C402.1	Demonstrate a fundamental knowledge of sensors, actuators and associated control systems.
13C402.2	Select appropriate sensors and actuators in automating systems.
13C402.3	Explain and use various controllers to control the various mechatronics systems.

13C402.4	Simplify a system with Programmable Logic Controller.
13C402.5	Apply the fundamental principles of integral design to the solution of practical problems related to automation systems.

13C403	**ME6703 / Computer Integrated Manufacturing Systems**
13C403.1	Understand the application of computers in various aspects of Design and Manufacturing
13C403.2	Apply Proper production planning and control
13C403.3	Analysis the basic knowledge in grouping of manufacturing processes and machines.
13C403.4	Apply the integration of manufacturing activities to ease factory floor management
13C403.5	Understand the concept of robotics

13C404	**GE6757 / Total Quality Management**
13C404.1	Explain the importance of quality and deeming philosophy of quality.
13C404.2	Justify the method of continuous process improvement.
13C404.3	Apply traditional & modern quality management tools and techniques to manufacturing and service processes.
13C404.4	Apply statistical tools & techniques to different processes.
13C404.5	Assess the implementation of ISO 9000/9001-2008/14000 for given manufacturing, service sector.

13C405	ME6005 / Process Planning and Cost Estimation
13C405.1	Apply the knowledge of engineering fundamentals for process planning
13C405.2	Classify various method of production system
13C405.3	Analyze the cost estimation for various products after process planning
13C405.4	Demonstrate the cost of production for various jobs manufactured by different manufacturing process
13C405.5	Identify the Machining time for various operations carried out in different machines

13C406	ME6012 / Maintenance Engineering
13C406.1	Apply the concept and principle of maintenance processes based on the industrial Configuration
13C406.2	Analyze the maintenance categories, preventive maintenance, methods of lubrication and TPM
13C406.3	Illustrate appropriate condition monitoring (CM) techniques including vibration, thermal and lubricant analysis.
13C406.4	Analyze the various repair methods for basic machine elements
13C406.5	Analyze the various repair methods for material handling equipment.

13C407	ME6711 / Simulation and Analysis Laboratory
13C407.1	Understand the basic concepts ANSYS Software
13C407.2	Understand the basic concepts of different types Load conditions in structure
13C407.3	Apply the different methods analysis required for the structural members

13C407.4	Analyse theVibration of spring-mass systems.
13C407.5	Analyse the Harmonic, transient and spectrum motion of simple systems
13C407.6	Exhibit ethical principles in engineering practices
13C407.7	Perform task as individual and /or team member to manage the task in time
13C407.8	Express the engineering activities with effective presentation and report
13C407.9	Interpret the finding with appropriate technological /research citation

13C408	**ME6712 / Mechatronics Laboratory**
13C408.1	Make use of assembly language programming of 8085 , stepper motor interface
13C408.2	Analyze the basic hydraulic and pneumatic circuits using software
13C408.3	Compare the Basic hydraulic and Pneumatic Trainer Kit with manual and electrical Controls and PLC Control
13C408.4	Understand the Image processing system with hardware & software
13C408.5	Understand thetrsffic light control system
13C408.6	Exhibit ethical principles in engineering practices
13C408.7	Perform task as individual and /or team member to manage the task in time
13C408.8	Express the engineering activities with effective presentation and report
13C408.9	Interpret the finding with appropriate technological /research citation

13C409	ME6713 / Comprehension
13C409.1	Summarize the various thermodynamics laws to engineering application
13C409.2	Discuss various mechanism for design of mechanical system
13C409.3	Compute the properties and strength of engineering material
13C409.4	Point out various manufacturing process suitable for making products
13C409.5	Compute the fluid properties and flow characteristics
13C409.6	Exhibit ethical principles in engineering practices
13C409.7	Perform task as individual and /or team member to manage the task in time
13C409.8	Express the engineering activities with effective presentation and report
13C409.9	Interpret the finding with appropriate technological /research citation

13C410	MG6863 / Engineering Economics
13C410.1	Interpret basics of Engineering Economics and optimum costing.
13C410.2	Analyze Value Engineering and Time Value of Money.
13C410.3	Differentate Cash Dominated and Revenue Dominated Cash flow.
13C410.4	Apply suitable cash flow methods for different Situations.
13C410.5	Apply Depreciation methods for Individual/Industrial/Public Alternatives.

13C411	MG6071 / Entrepreneurship Development
13C411.1	Show the concept of entrepreneurship and need for becoming an entrepreneur.
13C411.2	Develop competencies and motivation to become an entrepreneur.
13C411.3	Demonstrate their plan to start a small enterprise.
13C411.4	Analyze the financial and accounting details needed for starting and running a small enterprise.
13C411.5	Summarize the various supports available to start a small enterprise.

13C412	ME6019 / Non Destructive Testing and Materials
13C412.1	Summarize the fundamentals of various NDT methods.
13C412.2	Explain the principles and testing knowledge for surface NDE methods like Liquid Penetrant Testing and Magnetic Particle Testing.
13C412.3	Explain the materials and testing procedure by Thermography and Eddy Current Testing.
13C412.4	Interpret Ultrasonic Testing (UT) And Acoustic Emission test of various products.
13C412.5	Understand the principles and procedure steps in Radiography.

13C413	ME6811 / Project Work
13C413.1	Discuss a topic in advanced area, methods and materials to carry out experiments.
13C413.2	Identify gaps to define objective and scope of work with the concern for society environment and ethics.
13C413.3	Build innovative ideas and discuss the results to draw valid conclusions.

13C413.4	Develop a prototype model, experimental setup and prepare the report as per recommended format
13C413.5	Possibilities of compiling the result into technical articles for publishing in peer reviewed journals /conferences
13C413.6	Assess health, safety and legal relevant to professional engineering practices.
13C413.7	Comply the environmental needs and sustainable development.
13C413.8	Justify ethical principles in engineering practices
13C413.9	Perform multi-disciplinary task as an individual and / or team member to manage the project/task.
13C413.10	Comprehend the Engineering activities with effective presentation and report.
13C413.11	Interpret the findings with appropriate technological / research citation

HOD **PRINCIPAL**