MAHENDRA COLLEGE OF ENGINEERING
(Approved by AICTE, Affiliated to Anna University, Chennai-25)
Chennai Main Road, Minnampalli
Salem – 636106

B.E.MECHANICAL ENGINEERING

Program Outcomes (POs)

Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs)

The students will demonstrate the abilities to

PSO 1: Identify, formulate and solve engineering problems in three core streams of Mechanical Engineering, i.e., design engineering, thermal and fluids engineering and manufacturing engineering.
PSO 2: Design, develop and test an energy efficient system for required engineering applications.
PSO 3: Use CAD/CAM/CAE/ Computational tools to solve engineering problems

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RSE OUTCOME STATEMENTS FOR B.E.MECHANICAL ENGINEERING (2013 REGULAT		
SEMESTER 01		
1.Course Code and Name : HS6151 - TECHNICAL ENGLISH I		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Classify the types of listening and writing skills with acquired knowledge	K2
2	Demonstrate speaking skills in various occasions	K2

3	Compare the formal and informal writing skills by using the mail and blocks	K2
4	Apply the speaking etiquitte to build up communication proficiency	K3
5	Develop presentations with the use of LSRW skills	K3
2.Course Code and Name : MA6151 - MATHEMATICS I		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Solve the Eigen values and Eigen vectors to diagonalise and reduce a matrix to quadratic form	K3
2	Identify the convergences, divergences of infinite series	K3
3	Solve evolutes and envelopes of a given curve by using radius of curvature and center of curvature	K3
4	Identify the maxima and minima value functions of two variables	K3
5	Solve area of plain curves and volume of solid using double and triple integrals	K3
3.Course Code and Name : PH6151 - ENGINEERING PHYSICS I		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Explain the basics of properties of matter and its applications	K2
2	Summarize the concepts of waves and optical devices and their applications in fiber optics	K2
3	Demonstrate the concepts of thermal properties of materials and their applications in expansion joints and heat	K2
4	Outline the concepts of advanced physics quantum theory and its applications in tunneling microscopes	K2
5	Explain the basics of crystals, their structures and different crystal growth techniques	K2
4.Course Code and Name : CY6151 - ENGINEERING CHEMISTRY I		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Classify the polymers and their utility in the industries and explain the techniques of polymerization and	K2
2	Relate various thermodynamic functions such as enthalpy, entropy, free energy and their importance	K2
3	Explain the photo physical processes such as fluorescence and phosphorescence and various components of	K2
4	Illustrate the phase transitions of one component and two component systems and the types of alloys and their	K2
5	Outline the synthesis, characteristics and the applications of nano materials	K2

5.Course Code and Name : GE6151- COMPUTER PROGRAMMING		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Describe the function of a Computer and problem solving techniques.	K2
2	Write simple C programs using basic constructs	K3
3	Implement applications to manage data using arrays and strings	K3
4	Apply functions and pointers for solving problems	K3
5	Develop simple applications using structure and union	K3
6.Course Code and Name : GE6152- ENGINEERING GRAPHICS		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Demonstrate freehand sketching of basic geometrical constructions and multiple views of objects	K2
2	Develop orthographic projections of points, lines and plane surfaces	K3
3	Construct projections of simple solids and truncated solids	K3
4	Develop projection of sectioned solids and utilize development of surfaces	K3
5	Construct isometric and perspective projections of simple solids	K3
7.Course Code and Name : GE6161- COMPUTER PRACTICES LABORATORY		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Apply the usage of office automation tools.	K2
2	Apply good programming design methods for program development.	K3
3	Design and implement C programs for simple applications.	K3
4	Develop recursive programs.	K3
8.Course Code and Name : GE6162 - ENGINEERING PRACTICES LABORATORY		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Construct carpentry components and pipe connections including plumbing works	K2
2	Make use of welding equipments to join the structures	K3
3	Develop models using sheet metal work	K3

4	Illustrate the working of centrifugal pump and air conditioner	K3
5	Demonstrate basic home electrical works, measurement of the electrical quantities and soldering practices	K3
9.Course Code and Name : GE6163 - PHYSICS AND CHEMISTRY LABORATORY - I		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Make use of spectrometer to find the wavelength of spectral lines, and laser	K3
2	Make use of ultrasonic interferometer and Lee's disc apparatus to find the velocity of sound, compressibility	K3
3	Demonstrate the estimation of DO content in water sample by Winkler's method and molecular weight of	K2
4	Experiment with the strength of an acid using pH meter and conductometer	K3
5	Demonstrate the estimation of weak and strong acids in a mixture by conductometer	K2
SEMESTER 02		
1.Course Code and Name : HS6251 - TECHNICAL ENGLISH II		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Develop the communication skills with proper grammar usage	K2
2	Summarize the various advanced technical and non-technical english tools	K2
3	Classify the speaking skills and expression through professional english	K2
4	Apply the interview techniques for career development	K3
5	Outline the use of writing skills to express innovatiove ideas	K3
2.Course Code and Name : MA6251 - MATHEMATICS II		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Apply solenoidal, irrotational vectors and make use of the concepts of Green's, Gauss divergence , Stokes	K3
2	Solve simultaneous linear equations and P.I. of Cauchy and Legendre Equation	K3
3	Solve Laplace Transforms of periodic functions and ODE using Inverse Laplace Transform	K3
4	Make use of the properties of analytic functions for verifying C-R equations for determination of Bilinear	K3
5	Develop the functions of two variables as Taylor's and Laurent's series and Contour integrals by using	K3

3.Course Code and Name : PH6251 - ENGINEERING PHYSICS II		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Explain the basics, properties and applications of conducting materials	K2
2	Summarize the properties of semiconducting materials and semiconductor devices.	K2
3	Explain the basics, properties and applications of the magnetic materials and super conducting material	K2
4	Illustrate the concepts, mechanisms and applications of dielectric materials	K2
5	Outline the method of synthesis and explain the properties of Nano materials, SMA, Metallic glasses and	K2
4.Course Code and Name : CY6251 - ENGINEERING CHEMISTRY I		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Explain the problems of using hard water in boilers and methods of treatment of water for boiler use	K2
2	Apply the design principles to electro chemical cell. Identify the types of corrosion and the methods of	K3
3	Illustrate the methods of harnessing energy from non-conventional energy sources	K2
4	Classify various engineering materials and explain their importance	K2
5	Relate the significance of solid, liquid and gaseous fuels. Explain the calorific values of fuels and air	K2
5.Course Code and Name : GE6252- BASIC ELECTRICAL AND ELECTRONICS ENGINEERING		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Apply the basic theorems to solve problems in Electrical circuits	K3
2	Classify the different components and function of electrical machines	K2
3	Summarize the characteristics of electronic components	K2
4	Outline the basic concepts of communication engineering	K2
5	Solve design problems in digital electronic circuits	K3
6.Course Code and Name : GE6253- ENGINEERING MECHANICS		
	CO Statements	**Knowledge Level**
The students should be able to		

1	Develop the vectorial and scalar representation of forces and moments	K3
2	Solve problems pertaining to rigid bodies in equilibrium	K3
3	Identify the properties of surfaces and solids like centriod and moment of inertia etc.	K3
4	Solve problems pertaining to rigid bodies under the effect of dynamic forces	K3
5	Apply the laws of friction for the solution of simple rigid bodies	K3
7.Course Code and Name : GE6261 - COMPUTER AIDED DRAFTING AND MODELING LABORATORY		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Develop front view and top view of simple solids and objects	K3
2	Construct isometric projection and sectional views of objects and simple solids	K3
3	Construct plan of a residential building	K3
4	Demonstrate the drawing of truss and curves	K2
5	Model simple objects and construct 2-D multi-view drawings from 3-D using drafting software	K3
8.Course Code and Name :GE6262- PHYSICS AND CHEMISTRY LABORATORY - II		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Illustrate the determination of Young's modulus of the beam and moment of inertia and rigidity modules of	K2
2	Make use of Poiseuille's method to determine the coefficient of viscosity of the liquid	K3
3	Illustrate the determination of dispersive power of a prism and the thickness of a thin wire through	K2
4	Experiment with the type, amount of alkalinity, hardness in a given water sample and evaluate the Amount of	K3
5	Demonstrate titration by potentiometric redox and conductometric precipitation methods	K2
SEMESTER 03		
1.Course Code and Name : MA6351 - Transforms and Partial Differential Equations		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.	K1
2	Understand the mathematical principles on transforms and partial differential equations would provide them the	K2
3	classify the given standard partial differential equations	K2
4	Explain the physical significance of Fourier series techniques in solving one and two dimensional heat flow prob	K2

5	Develop the effective mathematical tools for the solutions of partial differential equations by using Z transform t	K2
2.Course Code and Name : CE6306 - Strength of Materials		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Summarize the concepts of stress and strain in simple and compound bars, the importance of principal stresses a	K2
2	Construct the load transferring mechanism in beams and stress distribution due to shearing force and bending m	K3
3	Apply basic equation of simple torsion in designing of shafts and helical spring.	K3
4	Identify the slope and deflection in beams using different methods.	K3
5	Analyze and design thin and thick shells for the applied internal and external pressures.	K4
3.Course Code and Name : ME6301 - Engineering Thermodynamics		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Apply the first law of thermodynamics for simple open and closed systems.	K3
2	Construct the second law of thermodynamics and apply to open and closed systems	K3
3	Make use of Rankine cycle to steam power plant and compare few cycle improvement methods	K3
4	Classify the simple thermodynamic relations of ideal and real gases	K2
5	Solve the properties of gas mixtures and moist air and its use in psychometric processes	K2
4.Course Code and Name : CE6451 - Fluid Mechanics and Machinery		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Explain the effect of fluid properties on a flow system and Identify type of fluid flow patterns and describe conti	K2
2	Develop the experiments and analyse data on different types of loses in pipes of varying cross section.	K3
3	Plan the use dimensional analysis concept in flow problem.	K3
4	Identify a performance parameters of a given Centrifugal pump.	K3
5	Show the characteristic curves of hydraulic machines.	K2
5.Course Code and Name : ME6302 - Manufacturing Technology - I		
	CO Statements	**Knowledge Level**

	The students should be able to	
1	Explain different metal casting processes, associated defects, merits and demerits	K2
2	Compare different metal joining processes.	K2
3	Summarize various hot working and cold working methods of metals.	K2
4	Explain various sheet metal making processes.	K2
5	Distinguish various methods of manufacturing plastic components.	K4
6.Course Code and Name : EE6351 - Electrical Drives and Controls		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Explain the elements of electrical drives	K2
2	Outline drive motor characteristics	K2
3	Summarize the starting method of DC and AC motors	K2
4	Illustate the conventional speed control of DC and AC drives	K2
5	Infer the concepts of Solid State speed Control of DC and AC drives	K2
7.Course Code and Name : ME6311 - Manufacturing Technology Laboratory - I		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Explain different metal casting processes, associated defects, merits and demerits	K2
2	Compare different metal joining processes.	K2
3	Summarize various hot working and cold working methods of metals.	K2
4	Identify the Work on various sheet metal making processes.	K3
5	Distinguish various methods of manufacturing plastic components.	K2
8.Course Code and Name : CE6461 - Fluid Mechanics and Machinery Laboratory		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Identify the flow in pipes	K3
2	Examine the frictional losses in pipes	K4

3	Develop characteristics of pumps	K3
4	Develop characteristics of turbines	K3
5	Analyze the metacentric height of floating bodies	K4
9.Course Code and Name : EE6365 - Electrical Engineering Laboratory		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Demonstrate the speed control of DC motor using different methods	K2
2	Demonstrate the load test on DC machines to determine its efficiency	K2
3	Build the equivalent circiut of transformer under different loading	K3
4	Demonstrate the suitable test on synchronous motor to draw V and Inverted V curves	K2
5	Determine the regulation of three phase alternator by Pessimistic and Optimistic methods	K4
SEMESTER 05		
1.Course Code and Name : MA6452 Statistics and Numerical Methods		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Apply the concept of testing of hypothesis for small and large samples in real life problems.	K3
2	Utilize the basic concepts of classifications of design of experiments in the field of agriculture.	K3
3	Develop the numerical techniques of interpolation in various intervals and apply the numerical techniques of diff	K3
4	Understand the knowledge of various techniques and methods for solving first and second order ordinary differe	K2
5	Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniq	K3
2.Course Code and Name : ME6401 - Kinematics of Machinery		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Explain the basics of mechanism	K2
2	Analyse the assembly with respect to the displacement, velocity and acceleration	K4

3	Construct the CAM profiles	K3
4	Analyse problems on gears and gear trains	K4
5	Identify the friction in machine elements	K3
3.Course Code and Name : ME6402 - Manufacturing Technology– II		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Explain the mechanism of material removal processes.	K2
2	Illustarte the constructional and operational features of centre lathe and other special purpose lathes.	K2
3	Describe the constructional and operational features of shaper, planner, milling, drilling,sawing and broaching m	K2
4	Classify the types of grinding and other super finishing processes apart from gear manufacturing processes.	K2
5	Summarize numerical control of machine tools and write part program.	K2
4.Course Code and Name : ME6403 - Engineering Materials and Metallurgy		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Analyze the phase diagrams of metals/alloys.	K4
2	Select appropriate heat-treatment techniques to impart desired properties in materials /alloys.	K3
3	Utilize acquire knowledge in the classification, properties, processing methods and applications for various ferr	K3
4	Choose the materials and develop novel materials for design and construction.	K3
5	Identify the acquire knowledge on how the material properties can be calculated experimentally and recognize th	K3
5.Course Code and Name : GE6351 - Environmental Science and Engineering		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Illustrate the concepts of an ecosystem , energy flow and conservation of biodiversity.	K2
2	Explain the causes, effects and control of various types of pollution.	K2
3	Outline the conservation of natural resources.	K2
4	Summarize the social issues of environment and legislative guidelines for disaster management.	K2
5	Relate population growth and its impact on environment and human health.	K4
6.Course Code and Name : ME6404 Thermal Engineering		

	CO Statements	Knowledge Level
	The students should be able to	
1	Apply thermodynamic concepts to different air standard cycles and solve problems	K3
2	Explain the functioning,features	K2
3	Make use of the thermodynamic concepts to steam power cycles	K3
4	Solve problems in single stage and multistage air compressors	K3
5	Summerise the thermodynamic effects on refrigeration and air conditioning	K2
7.Course Code and Name : ME6411 - Manufacturing Technology Laboratory - II		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Utilize different machine tools to manufacturing gears	K3
2	Plan different machine tools for finishing operations	K3
3	Select the Manufacture tools using cutter grinder	K3
4	Develop CNC part programming	K3
8.Course Code and Name : ME6412 Thermal Engineering Laboratory - I		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Solve problems in Steam Nozzle	K3
2	Explain the functioning and features of different types of Boilers and auxiliaries and calculate performance parar	K3
3	Explain the flow in steam turbines, draw velocity diagrams for steam turbines and solve problems.	K3
4	Summarize the concept of Cogeneration, Working features of Heat pumps and Heat exchangers	K3
5	Identify problems using refrigerant table / charts and psychrometric charts	K3
9.Course Code and Name : CE6315 Strength of Materials Laboratory		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Analyze the various stresses on mild steel rod by conducting tension and torsion tests	K4
2	Identify deflection test of metals and carriage springs	K3
3	Test for compression strength of wood and helical springs	K4

4	Compare hardness and impact strength of different metals	K4
5	Examine the shear strength of mild steel rod and properties of cement	K4
SEMESTER 05		
1.Course Code and Name : ME6501 - Computer Aided Design		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Explain the fundamentals of Computer Graphics	K2
2	Classify the different type of geometric modelling techniques	K2
3	Illustrate the various algorithms for visual realism	K2
4	Describe the assembly modeling approaches	K2
5	Infer the different CAD/CAM data exchange standards	K2
2.Course Code and Name : ME6502 - Heat and Mass Transfer		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Apply heat conduction equations to different surface configurations under steady state and transient conditions t	K3
2	Apply convective heat transfer correlations to internal and external flows through various surface configurations	K3
3	Explain the phenomena of boiling and condensation and thermal analysis of different types of heat exchanger co	K2
4	Explain basic laws for Radiation and apply principles to different types of surfaces to solve problems	K2
5	Apply diffusive and convective mass transfer equations and correlations to solve problems for different applicati	K3
3.Course Code and Name : ME6503 Design of Machine Elements		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Explain the influence of steady and variable stresses in machine component design.	K2
2	Apply the concepts of design to shafts, keys and couplings.	K3
3	Apply the concepts of design to temporary and permanent joints.	K3
4	Apply the concepts of design to energy absorbing members, connecting rod and crank shaft.	K3

5	Apply the concepts of design to bearings.	K3
4.Course Code and Name : ME6504 Metrology and Measurements		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Explain the basics of standards of measurement, limits, fits &tolerances industrial applications.	K2
2	Identify the uses of gauges and comparators.	K3
3	Understand the significance of measurement system, errors, transducers, intermediate modifying and terminating	K2
4	Comprehend the fundamentals of thermocouple and strain measurement.	K2
5	Illustrate the measurement of field variables like force, torque and pressure.	K2
5.Course Code and Name : ME6505 Dynamics of Machines		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Solve static and dynamic forces of mechanisms	K3
2	Summarize the balancing masses and their locations of reciprocating and rotating masses	K2
3	Determine the frequency of free vibration and damping	K2
4	Explain the frequency of forced vibration and damping coefficient	K2
5	Illustrate governor variables and estimate the gyroscopic effect on automobiles, ships and airplanes	K2
6.Course Code and Name : GE6075 Professional Ethics in Engineering		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Illustrate the principles of human values	K2
2	Demonstrate the techniques and theories of Engineering Ethics	K2
3	Explain the procedure for Engineering As Social Experimentation	K2
4	Summarize the concept of Safety, Responsibilities And Rights	K2
5	Explain the different Global Issues	K2
7.Course Code and Name : ME6511 Dynamics Laboratory		
	CO Statements	**Knowledge Level**
	The students should be able to	

1	Demonstrate the principles of kinematics and dynamics of machinery	K2
2	Explain the measuring devices for dynamic testing	K2
3	Solve the mass moment of inertia of mechanical element, governor effort and range sensitivity, natural fr	K3
4		
8.Course Code and Name : ME6512 Thermal Engineering Laboratory-II		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Explain heat conduction apparatus and evaluate thermal conductivity of materials	K2
2	Summarize the natural and forced convective heat transfer apparatus and evaluate heat transfer coefficient	K2
3	Compare radiative heat transfer apparatus and evaluate Stefan Boltzmann constant and emissivity	K2
4	Conduct tests to evaluate the performance of parallel/counter flow heat exchanger apparatus and reciprocating a	K2
5	Simplify the performance of refrigeration and airconditioning test rigs	K4
9.Course Code and Name : ME6513 Metrology and Measurements Laboratory		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Explain about the gear tooth dimensions, angle using sine bar, straightness and flatness,temperature using therm	K2
2	Make use of the vernier, micrometer and slip gauges and setting up the comparator for the inspection	K3
3	Show the testing and measurement with the aid of CMM, Autocollimator & Profile Projector.	K2
4		
5		
SEMESTER 06		
1.Course Code and Name : ME6601 Design of Transmission Systems		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Apply the design concepts to belts, chains and rope drives	K3

2	Design spur, helical gears	K4
3	Design worm and bevel gears	K4
4	Design gear boxes	K4
5	Apply the concepts of design to cams, clutches and brakes	K3
2.Course Code and Name : MG6851 Principles of Management		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Summarize the evolution of management concepts.	K2
2	Classify the functions and principles of management	K2
3	Plan the use of POM tools for domain specific applications in an organization	K2
4	Demonstrate the application of various motivational theories to enrich the proper leadership qualities in an	K2
5	Summarize the various budgetary Techniques.	K2
3.Course Code and Name : ME6602 Automobile Engineering		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Understand the vehicle structure and engines	K2
2	Explain the concepts of engine auxiliary systems	K2
3	Knowing the concepts of transmission systems	K2
4	Demonstrate the steering, brakes and suspension systems	K2
5	Utilize alternative energy sources	K3
4.Course Code and Name : ME6603 Finite Element Analysis		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Express the various approximation and elimination methods to find the solution.	K2
2	Solve various numerical engineering problems in 1D bar & Truss element.	K3
3	Make use of the fem analysis in structural and thermal problem.	K3
4	Compile the elements in CST & Axisymmetric.	K4
5	Compare iso, super and sub parametric elements.	K2

5.Course Code and Name : ME6604 Gas Dynamics and Jet Propulsion		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Apply the concept of compressible fluid flow in variable area ducts, nozzles and diffusers	K3
2	Apply the concept of compressible fluid flow in constant area ducts	K3
3	Examine the effect shock waves in compressible flow	K4
4	Demonstrate the concept of gas dynamics in Jet Propulsion	K2
5	Apply the concepts of gas dynamics in Space Propulsion	K3
6.Course Code and Name : ME6004 Unconventional Machining Processes		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Explain the classification of unconventional machining processes and its	K2
2	Demonstrate the mechanical energy base unconventional machining processes	K2
3	Discuss the electrical energy based unconventional machining processes	K4
4	Summarize various chemical and electrochemical energy based process	K2
5	Illustrate various thermal energy based unconventional machining processes	K2
7.Course Code and Name : ME6611 C.A.D. / C.A.M. Laboratory		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Develop 2D and 3D models using modeling softwares.	K3
2	Understand the CNC control in modern manufacturing system.	K2
3	Construct the CNC part programming and perform manufacturing.	K3
8.Course Code and Name : ME6612 Design and Fabrication Project		
	CO Statements	**Knowledge Level**
	The students should be able to	

1	Design and Fabricate the machine element or the mechanical product.	K4
2	Demonstrate the working model of the machine element or the mechanical product.	K2
3	Conclude using proper evidence to support them	K4
4		
5		
9.Course Code and Name : GE6674- Communication and Soft Skills - Laboratory Based		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Demonstrate reading and writing skills	K2
2	Develop listening and speaking skills	K3
3	Make use of acquired knowledge to take up international examination such as IELTS and TOEFL	K3
4	Apply the interview techniques for career development	K3
5	Illustrate the various aspects of soft skills	K2
SEMESTER 07		
1.Course Code and Name : ME6701 Power Plant Engineering		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Describe the layout, construction and working of the components of a thermal power plant	K2
2	Outline the layout, construction and working of the components of a Diesel, Gas and Combined cycle power	K2
3	Illustrate the layout, construction and working of the components of nuclear power plant	K2
4	Ouline the layout, construction and working of the components of a Renewable energy power plants	K2
5	Explain about energy,economic and environmental issues of power plant	K2
2.Course Code and Name : ME6702 Mechatronics		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Explain about various sensors and its working principles	K2

2	Design the microprocessor of 8085 and 8051	K4
3	Identify the program and the microcontroller	K3
4	Know about the functions, working and selection of PLC	K2
5	Design the mechatronic system with electrical and electronic circuits	K4
3.Course Code and Name : ME6703 Computer Integrated Manufacturing Systems		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Make use of CAD/CAM system and will acquire concepts of CAD Packages	K3
2	Understand the data transmission methods in CIM.	K2
3	Relationshipof the basic knowledge in grouping of manufacturing processes and machines.	K4
4	Explain the concepts of flexible manufacturing system (FMS) and automated guided vehicle (AGV) system	K2
5	Classification of robots used in industrial applications	K2
4.Course Code and Name : GE6757 Total Quality Management		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Develop an understanding of quality management philosophies and Framework.	K3
2	Discuss the need of customer expectations, employee involvement and Supplier partnership.	K4
3	Analyze the TQM tools and Techniques to improve the product and process Quality.	K4
4	Apply modern tools to improve quality of the product.	K3
5	Explain about ISO 9001, Environmental Management Standards and ISO 14001 Certification process.	K2
5.Course Code and Name : ME6005 Process Planning and Cost Estimation		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Choose the process, equipment and tools for various industrial products	K2
2	Construct the process planning activity Chart	K2
3	Explain the concept of cost estimation	K2
4	Illustrate the job order for different type of shop floor	K2
5	Solve the machining time for various machining operations	K2

6.Course Code and Name : ME6012 Maintenance Engineering		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Understand the principles and practices of maintenance planning	K2
2	Explain the maintenance policies,preventive maintenance	K2
3	Summarize condition monitoring	K2
4	Discover the repair methods for basic machine elements	K4
5	Understand the repair methods for material handling equipment	K2
7.Course Code and Name : ME6711 Simulation and Analysis Laboratory		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Ebplain about the Model making	K2
2	Construct the working principle of air conditioning system, hydraulic and pneumatic cylinder	K3
3	Analyse and simulate experiments to meet real world system and evaluate the performance	K4
4		
5		
8.Course Code and Name : ME6712 Mechatronics Laboratory		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Demonstrate the functioning of mechatronics system	K2
2	Illustrate the various pneumatic, hydraulic and electrical systems	K2
3	Summarize the functioning of control systems with the help of PLC and microcontrollers	K2
4		
5		
9.Course Code and Name : ME6713 Comprehension		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Understand and comprehend any given problem related to mechanical engineering field.	K2
2	Solve any given problems related to mechanical engineering field using theoretical concepts	K2

3	Develop the ideas to solve the field problems of mechanical engineering.	K4
4		
5		
SEMESTER 08		
1.Course Code and Name : MG6863 Engineering Economics		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Explain the skills to apply the basics of economics.	K2
2	Show the cost analysis to engineering and take economically sound decisions.	K2
3	Illustrate the knowledge about the industrial cost analysis and they will know the importance of costing.	K2
4	Make use of decision to keep the equipment or not for the desired operation	K3
5	Solve the worth of the machinery	K3
2.Course Code and Name : IE6605 Production Planning and Control		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Explain the systems concept for the design of production and service systems.	K2
2	Make use of forecasts in the manufacturing and service sectors using selected quantitative and qualitative techni	K3
3	Apply the principles and techniques for planning and control of the production and service systems to optimize/r	K3
4	Outline the application and evaluation of scheduling and sequencing methodologies	K2
5	Understand the importance and function of inventry and to be to apply selected techniques for its control and ma	K2
3.Course Code and Name : ME6016 Advanced I.C. Engines		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Understand the principle of spark ignition engine components	K2
2	Explain the principle of compression ignition engine components	K2
3	Choose the pollutant formation and control	K3

4	Summarize various alternative fuels for automobile engines	K2
5	Discuss the recent trends I automobile engines	K4
4.Course Code and Name : ME6811 Project Work		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Analyze problems in various domains and formulate methodology	K4
2	Develop different solutions and select the optimum solution.	K3
3	Conclude using proper evidence to support them	K4