



**MACET**  
**MARTHANDAM COLLEGE OF**  
**ENGINEERING AND TECHNOLOGY**

**DEPARTMENT OF MECHANICAL ENGINEERING**

# **COURSE OUTCOMES**



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### DEPARTMENT OF MECHANICAL ENGINEERING

#### ANNA UNIVERSITY REGULATION 2021(MECH) LIST OF COURSE NAMES

S.No	Sem	Course Code	Course Name
1.	I	HS3152	Professional English I
2	I	MA3151	Matrices and Calculus
3	I	PH3151	Engineering Physics
4	I	CY3151	Engineering Chemistry
5	I	GE3151	Problem Solving and Python Programming
6	I	GE3171	Problem Solving and Python Programming Laboratory
7	I	BS3171	Physics and Chemistry Laboratory (Physics)
8	I	BS3171	Physics and Chemistry Laboratory (Chemistry)
9	I	GE3172	English Laboratory
10	II	HS3252	Professional English II
11	II	MA3251	Statistics and Numerical Methods
12	II	PH3251	Physics for Material Science
13	II	BE3251	Basic Electrical and Electronics Engineering
14	II	GE3251	Engineering Graphics
15	II	GE3271	Engineering Practices Laboratory
16	II	BE3271	Basic Electrical and Electronics Engineering Labo
17	II	GE3272	Communication Laboratory
18	III	MA3351	Transforms and Partial Differential Equations
19	III	ME3351	Engineering Mechanics
20	III	ME3391	Engineering Thermodynamics
21	III	CE3391	Fluid Mechanics and Machinery
22	III	ME3392	Engineering Materials and Metallurgy
23	III	ME3393	Manufacturing Processes
24	III	ME3381	Computer Aided Machine Drawing
25	III	ME3382	Manufacturing Technology Laboratory



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26	IV	ME3491	Theory of Machines
27	IV	ME3451	Thermal Engineering
28	IV	ME3492	Hydraulics and Pneumatics
29	IV	ME3493	Manufacturing Technology
30	IV	CE3491	Strength of Materials
31	IV	GE3451	Environmental sciences and Sustainability
32	IV	CE3481	Strength of Materials and Fluid Machinery Laboratory
33	IV	ME3461	Thermal Engineering Laboratory
34	V	ME3591	Design Of Machine Elements
35	V	ME3592	Metrology and Measurements
36	V	CME350	Environment Sustainability and Impact Assessment
37	V	CME360	Bioenergy Conversion Technologies
38	V	CME365	Renewable Energy Technologies
39	V	MX3084	Disaster Risk Reduction and Management
40	V	ME3581	Metrology and Dynamics Laboratory
41	VI	ME 3691	Heat and Mass Transfer
42	VI	CME 359	Design Codes and Standards
43	VI	CME 387	Non-traditional Machining Processes
44	VI	CME 395	Casting and Welding Processes
45	VI	CME 396	Process Planning and Cost Estimation
46	VI	MX 3089	Industrial Safety
47	VI	ME 3681	CAD/CAM Laboratory
48	VI	ME3682	Heat Transfer Laboratory



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**I SEMESTER**



**Course Code & Course Name: HS3152 – Professional English I**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	To use appropriate words in a professional context
<b>CO2</b>	To gain understanding of basic grammatic structures and use them in right context.
<b>CO3</b>	To read and infer the denotative and connotative meanings of technical texts
<b>CO4</b>	To write definitions, descriptions, narrations and essays on various topics
<b>CO5</b>	To interpret non verbal texts

**Course Code & Course Name: MA3151- Matrices and Calculus**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Use the matrix algebra methods for solving practical problems.
<b>CO2</b>	Apply differential calculus tools in solving various application problems.
<b>CO3</b>	Able to use differential calculus ideas on several variable functions.
<b>CO4</b>	Apply different methods of integration in solving practical problems.
<b>CO5</b>	Apply multiple integral ideas in solving areas, volumes and other practical problems.

**Course Code & Course Name: PH3151-ENGINEERING PHYSICS**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Understand the importance of mechanics.
<b>CO2</b>	Express their knowledge in electromagnetic waves.
<b>CO3</b>	Demonstrate a strong foundational knowledge in oscillations, optics and lasers.
<b>CO4</b>	Understand the importance of quantum physics.
<b>CO5</b>	Comprehend and apply quantum mechanical principles towards the formation of energy bands.



**Course Code & Course Name: CY3151 Engineering Chemistry**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	To infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water.
<b>CO2</b>	To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engineering and technology applications.
<b>CO3</b>	To apply the knowledge of phase rule and composites for material selection requirements.
<b>CO4</b>	To recommend suitable fuels for engineering processes and applications.
<b>CO5</b>	To recognize different forms of energy resources and apply them for suitable applications in energy sectors.

**Course Code & Course Name: GE3151 Problem Solving and Python Programming**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	CO1: Develop algorithmic solutions to simple computational problems.
<b>CO2</b>	CO2: Develop and execute simple Python programs.
<b>CO3</b>	CO3: Write simple Python programs using conditionals and loops for solving problems.
<b>CO4</b>	CO4: Decompose a Python program into functions.
<b>CO5</b>	CO5: Represent compound data using Python lists, tuples, dictionaries etc.

**Course Code & Course Name: GE3171 Problem Solving and Python Programming Laboratory**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Develop algorithmic solutions to simple computational problems
<b>CO2</b>	Develop and execute simple Python programs.
<b>CO3</b>	Implement programs in Python using conditionals and loops for solving problems.



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<b>CO4</b>	Deploy functions to decompose a Python program.
<b>CO5</b>	Process compound data using Python data structures.

**Course Code & Course Name: BS3171&Physics and Chemistry Laboratory (Physics)**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Understand the functioning of various physics laboratory equipment.
<b>CO2</b>	Use graphical models to analyze laboratory data.
<b>CO3</b>	Use mathematical models as a medium for quantitative reasoning and describing physical reality.
<b>CO4</b>	Access, process and analyze scientific information.
<b>CO5</b>	Solve problems individually and collaboratively.

**Course Code & Course Name: BS3171&Physics and Chemistry Laboratory (Chemistry)**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	To analyse the quality of water samples with respect to their acidity, alkalinity, hardness and DO
<b>CO2</b>	To determine the amount of metal ions through volumetric and spectroscopic techniques
<b>CO3</b>	To analyse and determine the composition of alloys.
<b>CO4</b>	To learn simple method of synthesis of nanoparticles
<b>CO5</b>	To quantitatively analyse the impurities in solution by electroanalytical techniques

**Course Code & Course Name: GE3172- English Laboratory**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	To listen to and comprehend general as well as complex academic information
<b>CO2</b>	To listen to and understand different points of view in a discussion
<b>CO3</b>	To speak fluently and accurately in formal and informal communicative contexts



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CO4	To describe products and processes and explain their uses and purposes clearly and accurately.
CO5	To express their opinions effectively in both formal and informal discussions





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# **II SEMESTER**



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**Course Code & Course Name: HS3252 – Professional English II**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	To compare and contrast products and ideas in technical texts.
<b>CO2</b>	To identify and report cause and effects in events, industrial processes through technical texts
<b>CO3</b>	To analyse problems in order to arrive at feasible solutions and communicate them in the written format.
<b>CO4</b>	To present their ideas and opinions in a planned and logical manner
<b>CO5</b>	To draft effective resumes in the context of job search.

**Course Code & Course Name: MA3251-Statistics and Numerical Methods**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Apply the concept of testing of hypothesis for small and large samples in real life problems.
<b>CO2</b>	Apply the basic concepts of classifications of design of experiments in the field of agriculture.
<b>CO3</b>	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.
<b>CO4</b>	Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.
<b>CO5</b>	Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.

**Course Code & Course Name: PH3251 – Material Science**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	know basics of crystallography and its importance for varied materials properties
<b>CO2</b>	gain knowledge on the electrical and magnetic properties of materials and their applications
<b>CO3</b>	understand clearly of semiconductor physics and functioning of semiconductor devices
<b>CO4</b>	understand the optical properties of materials and working principles of various optical devices



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<b>CO5</b>	appreciate the importance of functional nanoelectronic devices.
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**Course Code & Course Name: BE3251 – Basic Electrical and Electronics Engineering**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Compute the electric circuit parameters for simple problems
<b>CO2</b>	Explain the working principle and applications of electrical machines
<b>CO3</b>	Analyze the characteristics of analog electronic devices
<b>CO4</b>	Explain the basic concepts of digital electronics
<b>CO5</b>	Explain the operating principles of measuring instruments

**Course Code & Course Name: GE3251 Engineering Graphics**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Use BIS conventions and specifications for engineering drawing.
<b>CO2</b>	Construct the conic curves, involutes and cycloid.
<b>CO3</b>	Solve practical problems involving projection of lines.
<b>CO4</b>	Draw the orthographic, isometric and perspective projections of simple solids.
<b>CO5</b>	Draw the development of simple solids.

**Course Code & Course Name: GE3271 Engineering Practices Laboratory**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household wood work.
<b>CO2</b>	Wire various electrical joints in common household electrical wire work.
<b>CO3</b>	Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts;



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<b>CO4</b>	Assemble simple mechanical assembly of common household equipment, Make a tray out of metal sheet using sheet metal work.
<b>CO5</b>	Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB.

**Course Code & Course Name: BE3271 Basic Electrical and Electronics Engineering Laboratory**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Use experimental methods to verify the Ohm's Laws.
<b>CO2</b>	Use experimental methods to verify the Kirchhoff's Laws.
<b>CO3</b>	Analyze experimentally the load characteristics of electrical machines
<b>CO4</b>	Analyze the characteristics of basic electronic devices
<b>CO5</b>	Use DSO to measure the various parameters

**Course Code & Course Name: GE3272- Communication Laboratory**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Speak effectively in group discussions held in a formal/semi formal contexts.
<b>CO2</b>	Discuss, analyse and present concepts and problems from various perspectives to arrive at suitable solutions
<b>CO3</b>	Write emails, letters and effective job applications.
<b>CO4</b>	Write critical reports to convey data and information with clarity and precision
<b>CO5</b>	Give appropriate instructions and recommendations for safe execution of tasks



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# **III SEMESTER**



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**Course Code & Course Name: MA3351 Transforms and Partial Differential Equations**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Understand how to solve the given standard partial differential equations. Solve
<b>CO2</b>	Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.
<b>CO3</b>	Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations.
<b>CO4</b>	Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering.
<b>CO5</b>	Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.

**Course Code & Course Name: ME3351 Engineering Mechanics**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Illustrate the vector and scalar representation of forces and moments.
<b>CO2</b>	Analyse the rigid body in equilibrium.
<b>CO3</b>	Evaluate the properties of distributed forces.
<b>CO4</b>	Determine the friction and the effects by the laws of friction.
<b>CO5</b>	Calculate dynamic forces exerted in rigid body.

**Course Code & Course Name: ME3391 Engineering Thermodynamics**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Apply the zeroth and first law of thermodynamics by formulating temperature scales and calculating the property changes in closed and open engineering systems.
<b>CO2</b>	Apply the second law of thermodynamics in analysing the performance of thermal devices through energy and entropy calculations.
<b>CO3</b>	Apply the second law of thermodynamics in evaluating the various properties of steam through steam tables and Mollier chart.



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<b>CO4</b>	Apply the properties of pure substance in computing the macroscopic properties of ideal and real gases using gas laws and appropriate thermodynamic relations.
<b>CO5</b>	Apply the properties of gas mixtures in calculating the properties of gas mixtures and applying various thermodynamic relations to calculate property changes.

**Course Code & Course Name:CE3391 Fluid Mechanics and Machinery**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Understand the properties and behaviour in static conditions. Also, to understand the conservation laws applicable to fluids and its application through fluid kinematics and dynamics.
<b>CO2</b>	Estimate losses in pipelines for both laminar and turbulent conditions and analysis of pipes connected in series and parallel. Also, to understand the concept of boundary layer and its thickness on the flat solid surface.
<b>CO3</b>	Formulate the relationship among the parameters involved in the given fluid phenomenon and to predict the performances of prototype by model studies.
<b>CO4</b>	Explain the working principles of various turbines and design the various types of turbines.
<b>CO5</b>	Explain the working principles of centrifugal, reciprocating and rotary pumps and design the centrifugal and reciprocating pumps.

**Course Code & Course Name:ME3392 Engineering Materials and Metallurgy**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Explain alloys and phase diagram, Iron-Iron carbon diagram and steel classification.
<b>CO2</b>	Explain isothermal transformation, continuous cooling diagrams and different heat treatment processes.
<b>CO3</b>	Clarify the effect of alloying elements on ferrous and non-ferrous metals.
<b>CO4</b>	Summarize the properties and applications of non-metallic materials.
<b>CO5</b>	Explain the testing of mechanical properties.

**Course Code & Course Name:ME3393 Manufacturing Processes**

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Explain the principle of different metal casting processes.
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CO2	Describe the various metal joining processes.
CO3	Illustrate the different bulk deformation processes.
CO4	Apply the various sheet metal forming process.
CO5	Apply suitable moulding technique for manufacturing of plastics components.

**Course Code & Course Name:ME3381 Computer Aided Machine Drawing**

#### COURSE OUTCOMES (COs)

##### List of Course Outcomes

CO1	Prepare standard drawing layout for modelled assemblies with BoM.
CO2	Model orthogonal views of machine components.
CO3	Prepare standard drawing layout for modelled parts.
CO4	Prepare standard drawing layout for modelled parts.
CO5	Prepare standard drawing layout for modelled parts.

**Course Code & Course Name:ME3382 Manufacturing Technology Laboratory**

#### COURSE OUTCOMES (COs)

##### List of Course Outcomes

CO1	Demonstrate the safety precautions exercised in the mechanical workshop and join two metals using GMAW.
CO2	The students able to make the work piece as per given shape and size using machining process such as rolling, drawing, turning, shaping, drilling and milling.
CO3	The students become make the gears using gear making machines and analyze the defects in the cast and machined components
CO4	The students able to make the work piece as per given shape
CO5	The students able to make the work piece as per given shape





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**IV SEMESTER**



Course Code & Course Name :ME3491 Theory of Machines

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Discuss the basics of mechanism
<b>CO2</b>	Solve problems on gears and gear trains.
<b>CO3</b>	Examine friction in machine elements.
<b>CO4</b>	Calculate static and dynamic forces of mechanisms.
<b>CO5</b>	Calculate the balancing masses and their locations of reciprocating and rotating masses. Computing the frequency of free vibration, forced vibration and damping coefficient.

Course Code & Course Name :ME3451 Thermal Engineering

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Apply thermodynamic concepts to different air standard cycles and solve problems.
<b>CO2</b>	To solve problems in steam nozzle and calculate critical pressure ratio.
<b>CO3</b>	Explain the flow in steam turbines, draw velocity diagrams, flow in Gas turbines and solve problems.
<b>CO4</b>	Explain the functioning and features of IC engine, components and auxiliaries.
<b>CO5</b>	Calculate the various performance parameters of IC engines

Course Code & Course Name :ME3492 Hydraulics and Pneumatics

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Apply the working principles of fluid power systems and hydraulic pumps.
<b>CO2</b>	To understand the concepts of Lines and Insulators.
<b>CO3</b>	Design and develop hydraulic circuits and systems.
<b>CO4</b>	Apply the working principles of pneumatic circuits and power system and its components.



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<b>CO5</b>	Identify Various trouble shooting methods in fluid power system.
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Course Code & Course Name :ME3493 Manufacturing technology

#### COURSE OUTCOMES (COs)

##### List of Course Outcomes

<b>CO1</b>	Apply the mechanism of metal removal process and to identify the factors involved in improving machinability.
<b>CO2</b>	Describe the constructional and operational features of centre lathe and other special purpose lathes.
<b>CO3</b>	Describe the constructional and operational features of reciprocating machine tools.
<b>CO4</b>	Apply the constructional features and working principles of CNC machine tools.
<b>CO5</b>	Demonstrate the Program CNC machine tools through planning, writing codes and setting up CNC machine tools to manufacture a given component.

Course Code & Course Name :CE3491 Strength of Materials

#### COURSE OUTCOMES (COs)

##### List of Course Outcomes

<b>CO1</b>	Understand the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes.
<b>CO2</b>	Understand the load transferring mechanism in beams and stress distribution due to shearing force and bending moment.
<b>CO3</b>	Apply basic equation of torsion in designing of shafts and helical springs
<b>CO4</b>	Calculate slope and deflection in beams using different methods.
<b>CO5</b>	Analyze thin and thick shells for applied pressures.

Course Code & Course Name :GE3451 Environmental sciences and Sustainability

#### COURSE OUTCOMES (COs)

##### List of Course Outcomes

<b>CO1</b>	To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation.
<b>CO2</b>	To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society.



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<b>CO3</b>	To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations.
<b>CO4</b>	To recognize the different goals of sustainable development and apply them for suitable technological advancement and societal development.
<b>CO5</b>	To demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization.

Course Code & Course Name :CE3481 Strength of Materials and Fluid Machinery Laboratory

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Determine the tensile, torsion and hardness properties of metals by testing.
<b>CO2</b>	Determine the stiffness properties of helical and carriage spring.
<b>CO3</b>	Apply the conservation laws to determine the coefficient of discharge of a venturimeter and finding the friction factor of given pipe.
<b>CO4</b>	Apply the fluid static and momentum principles to determine the metacentric height and forces due to impact of jet.
<b>CO5</b>	Determine the performance characteristics of turbine, rotodynamic pump and positive displacement pump.

Course Code & Course Name :ME3461 Thermal Engineering Laboratory

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Conduct tests to evaluate performance characteristics of IC engines
<b>CO2</b>	Conduct tests to evaluate the performance of refrigeration cycle
<b>CO3</b>	Conduct tests to evaluate Performance and Energy Balance on a Steam Generator.
<b>CO4</b>	Conduct tests to evaluate Performance and Energy Balance on a Single Petrol Engine
<b>CO5</b>	Conduct tests to evaluate Performance and Energy Balance on a Multi Cylinder Petrol Engine



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**V SEMESTER**



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Course Code & Course Name : ME3591 DesignOfMachine Elements

#### COURSE OUTCOMES (COs)

##### List of Course Outcomes

CO1	Explain the design machine members subjected to static and variable loads.
CO2	Apply the concepts design to shafts, key and couplings.
CO3	Apply the concepts of design to bolted, Knuckle, Cotter, riveted and welded joints.
CO4	Apply the concept of design helical, leaf springs, flywheels, connecting rods and crank shafts.
CO5	Apply the concepts of design and select sliding and rolling contact bearings, seals and gaskets.

Course Code & Course Name : ME3592 Metrology andMeasurements

#### COURSE OUTCOMES (COs)

##### List of Course Outcomes

CO1	Discuss the concepts of measurements to apply in various metrological instruments.
CO2	Apply the principle and applications of linear and angular measuring instruments, assembly and transmission elements.
CO3	Apply the tolerance symbols and tolerance analysis for industrial applications.
CO4	Apply the principles and methods of form and surface metrology.
CO5	Apply the advances in measurements for quality control in manufacturing Industries.

Course Code & Course Name :CME350 Environment Sustainability and Impact Assessment

#### COURSE OUTCOMES (COs)

##### List of Course Outcomes

CO1	To make the students to understand the concepts of Environmental Sustainability & Impact Assessment.
CO2	To familiarize the students in environmental decision making procedure.
CO3	Make the students to identify, predict and evaluate the economic, environmental, and social impact of development activities.
CO4	To provide information on the environmental consequences for decision makin.g



<b>CO5</b>	To promote environmentally sound and sustainable development through the identification of appropriate alternatives and mitigation measures.
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Course Code & Course Name : CME360 Bioenergy Conversion Technologies

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Estimate the surplus biomass availability of any given area.
<b>CO2</b>	Design a biogas plant for a variety of biofuels.
<b>CO3</b>	Determine and compare the cost of steam generation from biofuels with that of coal and petroleum fuels.
<b>CO4</b>	Analyse the influence of process governing parameters in thermochemical conversion of biomass.
<b>CO5</b>	Synthesize liquid biofuels for power generation from biomass.

Course Code & Course Name : CME365 Renewable Energy Technologies

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Discuss the Indian and global energy scenario.
<b>CO2</b>	Discuss Various solar energy technologies
<b>CO3</b>	Explain the various wind energy technologies.
<b>CO4</b>	Explore the various bio-energy technologies.
<b>CO5</b>	Discuss the ocean and geothermal technologies.

Course Code & Course Name : MX3084 Disaster Risk Reduction and Management

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	To impart knowledge on the concepts of Disaster, Vulnerability and Disaster Risk reduction (DRR)
<b>CO2</b>	To enhance understanding on Hazards, Vulnerability and Disaster Risk Assessment prevention and risk reduction



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<b>CO3</b>	To develop disaster response skills by adopting relevant tools and technology
<b>CO4</b>	Enhance awareness of institutional processes for Disaster response in the country and
<b>CO5</b>	Develop rudimentary ability to respond to their surroundings with potential Disaster response in areas where they live, with due sensitivity

**Course Code & Course Name : ME3581 Metrology and Dynamics Laboratory**

#### COURSE OUTCOMES (COs)

##### **List of Course Outcomes**

<b>CO1</b>	The students able to measure the gear tooth dimensions, angle using sine bar, straightness
<b>CO2</b>	Determine mass moment of inertia of mechanical element, governor effort and range of sensitivity.
<b>CO3</b>	Determine the natural frequency and damping coefficient, critical speeds of shafts,
<b>CO4</b>	The students able to measure the gear tooth dimensions, angle using sine bar, straightness
<b>CO5</b>	Determine mass moment of inertia of mechanical element, governor effort and range of sensitivity.





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**VI SEMESTER**



Course Code & Course Name :ME 3691 Heat and Mass Transfer

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Apply heat conduction equations to different surface configurations under steady state and transient conditions and solve problems.
<b>CO2</b>	Apply free and forced convective heat transfer correlations to internal and external flows through/over various surface configurations and solve problems.
<b>CO3</b>	Explain the phenomena of boiling and condensation, apply LMTD and NTU methods of thermal analysis to different types of heat exchanger configurations and solve problems.
<b>CO4</b>	Explain basic laws for Radiation and apply these principles to radiative heat transfer between different types of surfaces to solve problems.
<b>CO5</b>	Apply diffusive and convective mass transfer equations and correlations to solve problems for different applications.

Course Code & Course Name :CME 359 Design Codes and Standards

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Explain the need for codes and standards in industry.
<b>CO2</b>	Discuss the different codes and standards used in different industries.
<b>CO3</b>	Discuss the sources of different codes and standards and the societies that publish them and how these are evolved.
<b>CO4</b>	Explain the need for Government regulations and Certification authorities and familiar with common regulations in India and International.
<b>CO5</b>	Discuss knowledge of codes and standards used in Process equipment design for Oil and Gas Industry.

Course Code & Course Name : CME 387 Non-traditional Machining Processes

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Formulate different types of non-traditional machining processes and evaluate mechanical energy based non-traditional machining processes.
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<b>CO2</b>	Illustrate chemical and electro chemical energy based processes.
<b>CO3</b>	Evaluate thermo-electric energy based processes.
<b>CO4</b>	Interpret nano finishing processes.
<b>CO5</b>	Analyse hybrid non-traditional machining processes and differentiate non- traditional machining processes.

Course Code & Course Name : CME 395 Casting and Welding Processes

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Explain the ferrous casting metallurgy and its applications.
<b>CO2</b>	Explain the non ferrous casting metallurgy and its applications.
<b>CO3</b>	Explain the ferrous welding metallurgy and its applications.
<b>CO4</b>	Explain the welding metallurgy of alloy steels and non ferrous metals and its applications.
<b>CO5</b>	Identify the causes and remedies of various welding defects; apply welding standards and codes.

Course Code & Course Name : CME 396 Process Planning and Cost Estimation

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Discuss select the process, equipment and tools for various industrial products.
<b>CO2</b>	Explain the prepare process planning activity chart.
<b>CO3</b>	Explain the concept of cost estimation.
<b>CO4</b>	Compute the job order cost for different type of shop floor.
<b>CO5</b>	Calculate the machining time for various machining operations.

Course Code & Course Name :MX 3089 Industrial Safety

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Understand the basic concept of safety.
<b>CO2</b>	Obtain knowledge of Statutory Regulations and standards.



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<b>CO3</b>	Know about the safety Activities of the Working Place.
<b>CO4</b>	Analyze on the impact of Occupational Exposures and their Remedies
<b>CO5</b>	Obtain knowledge of Risk Assessment Techniques.

Course Code & Course Name : ME 3681 CAD/CAM Laboratory

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Design experience in handling 2D drafting and 3D modelling software systems.
<b>CO2</b>	Design 3 Dimensional geometric model of parts, sub-assemblies, assemblies and export it to drawing
<b>CO3</b>	Demonstrate manual part programming and simulate the CNC program and Generate part programming using G and M code through CAM software.
<b>CO4</b>	Design experience in handling 2D drafting and 3D modelling software systems.
<b>CO5</b>	Design 3 Dimensional geometric model of parts, sub-assemblies, assemblies and export it to drawing

Course Code & Course Name :ME3682 Heat Transfer Laboratory

**COURSE OUTCOMES (COs)**

**List of Course Outcomes**

<b>CO1</b>	Conduct experiment on Predict the thermal conductivity of solids and liquids
<b>CO2</b>	Conduct experiment on Estimate the heat transfer coefficient values of various fluids.
<b>CO3</b>	Conduct experiment on Test the performance of tubes in tube heat exchangers
<b>CO4</b>	Conduct experiment on Predict the thermal conductivity of solids and liquids
<b>CO5</b>	Conduct experiment on Estimate the heat transfer coefficient values of various fluids.