




ARJUN COLLEGE OF TECHNOLOGY
Thamaraikulam, Coimbatore – Pollachi Highway, Coimbatore- 642120
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		CO5 Classification of robots used in industrial applications
81	ME8074 VIBRATION AND NOISE CONTROL	Upon the completion of this course the students will be able to CO1 Summarize the Basics of Vibration CO2 Summarize the Basics of Noise CO3 Explain the Sources of Automotive Noise CO4 Discuss the Control techniques for vibration CO5 Describe the sources and control of Noise
82	EE8091 MICRO ELECTRO MECHANICAL SYSTEMS	CO1 Ability to understand and apply basic science, circuit theory, Electro-magnetic field theory control theory and apply them to electrical engineering problems. CO2 Ability to understand and analyse, linear and digital electronic circuits.
83	GE8076 PROFESSIONAL ETHICS IN ENGINEERING	CO1 Upon completion of the course, the student should be able to apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.




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MECHANICAL ENGINEERING

2021 Regulation

Course Outcomes


S.No	Course Code & Title	Course Outcomes
1	HS3152 - PROFESSIONAL ENGLISH – I	At the end of the course, learners will be able CO1 To use appropriate words in a professional context CO2 To gain understanding of basic grammatic structures and use them in right context. CO3 To read and infer the denotative and connotative meanings of technical texts CO4 To read and interpret information presented in tables, charts and other graphic forms CO5 To write definitions, descriptions, narrations and essays on various topics
2	MA3151 MATRICES AND CALCULUS	At the end of the course the students will be able to CO1 Use the matrix algebra methods for solving practical problems. CO2 Apply differential calculus tools in solving various application problems. CO3 Able to use differential calculus ideas on several variable functions. CO4 Apply different methods of integration in solving practical problems. CO5 Apply multiple integral ideas in solving areas, volumes and other practical problems.
3	PH3151 ENGINEERING PHYSICS	After completion of this course, the students should be able to CO1 Understand the importance of mechanics. CO2 Express their knowledge in electromagnetic waves. CO3 Demonstrate a strong foundational knowledge in oscillations, optics and lasers. CO4 Understand the importance of quantum physics. CO5 Comprehend and apply quantum mechanical principles towards the formation of energy bands.
4	CY3151 ENGINEERING CHEMISTRY	At the end of the course, the students will be able: CO1 To infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water.



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		<p>CO2 To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engineering and technology applications.</p> <p>CO3 To apply the knowledge of phase rule and composites for material selection requirements.</p> <p>CO4 To recommend suitable fuels for engineering processes and applications.</p> <p>CO5 To recognize different forms of energy resources and apply them for suitable applications in energy sectors.</p>
5	GE3151 PROBLEM SOLVING AND PYTHON PROGRAMMING	<p>Upon completion of the course, students will be able to</p> <p>CO1: Develop algorithmic solutions to simple computational problems.</p> <p>CO2: Develop and execute simple Python programs.</p> <p>CO3: Write simple Python programs using conditionals and looping for solving problems.</p> <p>CO4: Decompose a Python program into functions.</p> <p>CO5: Represent compound data using Python lists, tuples, dictionaries etc.</p> <p>CO6: Read and write data from/to files in Python programs.</p>
6	GE3171 PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY	<p>On completion of the course, students will be able to:</p> <p>CO1: Develop algorithmic solutions to simple computational problems</p> <p>CO2: Develop and execute simple Python programs.</p> <p>CO3: Implement programs in Python using conditionals and loops for solving problems.</p> <p>CO4: Deploy functions to decompose a Python program.</p> <p>CO5: Process compound data using Python data structures.</p> <p>CO6: Utilize Python packages in developing software applications.</p>
7	BS3171 PHYSICS AND CHEMISTRY LABORATORY	<p align="center">PHYSICS LABORATORY</p> <p>Upon completion of the course, the students should be able to</p> <p>CO1 Understand the functioning of various physics laboratory equipment.</p>




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		<p>CO2 Use graphical models to analyze laboratory data.</p> <p>CO3 Use mathematical models as a medium for quantitative reasoning and describing physical reality.</p> <p>CO4 Access, process and analyze scientific information.</p> <p>CO5 Solve problems individually and collaboratively.</p> <p align="center">CHEMISTRY LABORATORY</p> <p>CO1 To analyse the quality of water samples with respect to their acidity, alkalinity, hardness and DO.</p> <p>CO2 To determine the amount of metal ions through volumetric and spectroscopic techniques</p> <p>CO3 To analyse and determine the composition of alloys.</p> <p>CO4 To learn simple method of synthesis of nanoparticles</p> <p>CO5 To quantitatively analyse the impurities in solution by electroanalytical techniques</p>
8	GE3172 ENGLISH LABORATORY	<p>At the end of the course, learners will be able</p> <p>CO1 To listen and comprehend complex academic texts</p> <p>CO2 To listen to and understand different points of view in a discussion</p> <p>CO3 To speak fluently and accurately in formal and informal communicative contexts</p> <p>CO4 To describe products and processes and explain their uses and purposes clearly and accurately</p> <p>CO5 To express their opinions effectively in both oral and written medium of communication</p>
9	HS3252 PROFESSIONAL ENGLISH – II	<p>At the end of the course, learners will be able</p> <p>CO1 To compare and contrast products and ideas in technical texts.</p> <p>CO2 To identify cause and effects in events, industrial processes through technical texts</p> <p>CO3 To analyse problems in order to arrive at feasible solutions and communicate them orally and in the written format.</p> <p>CO4 To report events and the processes of technical and industrial nature.</p> <p>CO5 To present their opinions in a planned and logical manner, and draft effective resumes in context of job search.</p>




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10	MA3251 STATISTICS AND NUMERICAL METHODS	<p>Upon successful completion of the course, students will be able to:</p> <p>CO1 Apply the concept of testing of hypothesis for small and large samples in real life problems.</p> <p>CO2 Apply the basic concepts of classifications of design of experiments in the field of agriculture.</p> <p>CO3 Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.</p> <p>CO4 Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.</p> <p>CO5 Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications</p>
11	PH3251 MATERIALS SCIENCE	<p>At the end of the course, the students should be able to</p> <p>CO1 know basics of crystallography and its importance for varied materials properties</p> <p>CO2 gain knowledge on the electrical and magnetic properties of materials and their applications</p> <p>CO3 understand clearly of semiconductor physics and functioning of semiconductor devices</p> <p>CO4 understand the optical properties of materials and working principles of various optical devices</p> <p>CO5 appreciate the importance of functional Nano electronic devices.</p>
12	BE3251 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	<p>After completing this course, the students will be able to</p> <p>CO1 Compute the electric circuit parameters for simple problems</p> <p>CO2 Explain the working principle and applications of electrical machines</p> <p>CO3 Analyze the characteristics of analog electronic devices</p> <p>CO4 Explain the basic concepts of digital electronics</p> <p>CO5 Explain the operating principles of measuring instruments</p>
13	GE3251 ENGINEERING GRAPHICS	<p>On successful completion of this course, the student will be able to</p> <p>CO1 Use BIS conventions and specifications for engineering drawing</p>



		<p>CO2 Construct the conic curves, involutes and cycloid.</p> <p>CO3 Solve practical problems involving projection of lines.</p> <p>CO4 Draw the orthographic, isometric and perspective projections of simple solids.</p> <p>CO5 Draw the development of simple solids.</p>
14	GE3271 ENGINEERING PRACTICES LABORATORY	<p>After completing this course, the students will be able to</p> <p>CO1 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.</p> <p>CO2 Wire various electrical joints in common household electrical wire work.</p> <p>CO3 Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common household equipments; Make a tray out of metal sheet using sheet metal work.</p> <p>CO4 Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB.</p>
15	BE3271 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LABORATORY	<p>After completing this course, the students will be able to</p> <p>CO1 Use experimental methods to verify the Ohm's and Kirchhoff's Laws.</p> <p>CO2 Analyze experimentally the load characteristics of electrical machines</p> <p>CO3 Analyze the characteristics of basic electronic devices</p> <p>CO4 Use DSO to measure the various parameters</p>
16	GE3272 COMMUNICATION LABORATORY	<p>At the end of the course, learners will be able to</p> <p>CO1 Speak effectively in group discussions held in a formal/semi formal contexts.</p> <p>CO2 Discuss, analyse and present concepts and problems from various perspectives to arrive at suitable solutions</p> <p>CO3 Write emails, letters and effective job applications.</p> <p>CO4 Write critical reports to convey data and information with clarity and precision</p> <p>CO5 Give appropriate instructions and recommendations for safe execution of tasks emails and effective job applications</p>



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17	MA3351 TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	<p>Upon successful completion of the course, students should be able to:</p> <p>CO1 Understand how to solve the given standard partial differential equations.</p> <p>CO2 Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.</p> <p>CO3 Appreciate the physical significance of Fourier series techniques in solving one- and two-dimensional heat flow problems and one dimensional wave equations.</p> <p>CO4 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.</p> <p>CO5 Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems</p>
18	ME3351 ENGINEERING MECHANICS	<p>At the end of the course the students would be able to</p> <p>CO1 Illustrate the vector and scalar representation of forces and moments</p> <p>CO2 Analyse the rigid body in equilibrium</p> <p>CO3 Evaluate the properties of distributed forces</p> <p>CO4 Determine the friction and the effects by the laws of friction</p> <p>CO5 Calculate dynamic forces exerted in rigid body</p>
19	ME3391 ENGINEERING THERMODYNAMICS	<p>At the end of the course the students would be able to</p> <p>CO1 Apply the zeroth and first law of thermodynamics by formulating temperature scales and calculating the property changes in closed and open engineering systems.</p> <p>CO2 Apply the second law of thermodynamics in analysing the performance of thermal devices through energy and entropy calculations.</p> <p>CO3 Apply the second law of thermodynamics in evaluating the various properties of steam through steam tables and Mollier chart</p> <p>CO4 Apply the properties of pure substance in computing the macroscopic properties of ideal and real gases using gas laws and appropriate thermodynamic relations.</p> <p>CO5 Apply the properties of gas mixtures in calculating the properties of gas mixtures and</p>



		applying various thermodynamic relations to calculate property changes.
20	CE3391 FLUID MECHANICS AND MACHINERY	<p>On completion of the course, the student is expected to be able to</p> <p>CO1 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</p> <p>CO2 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.</p> <p>CO3 Formulate the relationship among the parameters involved in the given fluid phenomenon and to predict the performances of prototype by model studies</p> <p>CO4 Explain the working principles of various turbines and design the various types of turbines.</p> <p>CO5 Explain the working principles of centrifugal, reciprocating and rotary pumps and design the centrifugal and reciprocating pumps</p>
21	ME3392 ENGINEERING MATERIALS AND METALLURGY	<p>At the end of the course the students would be able to</p> <p>CO1 Explain alloys and phase diagram, Iron-Iron carbon diagram and steel classification.</p> <p>CO2 Explain isothermal transformation, continuous cooling diagrams and different heat treatment processes.</p> <p>CO3 Clarify the effect of alloying elements on ferrous and non-ferrous metals.</p> <p>CO4 Summarize the properties and applications of non-metallic materials.</p> <p>CO5 Explain the testing of mechanical properties.</p>




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22	ME3393 MANUFACTURING PROCESSES	<p>At the end of the course the students would be able to</p> <p>CO1 Explain the principle of different metal casting processes.</p> <p>CO2 Describe the various metal joining processes.</p> <p>CO3 Illustrate the different bulk deformation processes.</p> <p>CO4 Apply the various sheet metal forming process.</p> <p>CO5 Apply suitable molding technique for manufacturing of plastics components.</p>
23	ME3381 COMPUTER AIDED MACHINE DRAWING	<p>At the end of the course the students would be able to</p> <p>CO1 Prepare standard drawing layout for modelled assemblies with BoM.</p> <p>CO2 Model orthogonal views of machine components.</p> <p>CO3 Prepare standard drawing layout for modelled parts</p>
24	ME3382 MANUFACTURING TECHNOLOGY LABORATORY	<p>At the end of the course the students would be able to</p> <p>CO1 Demonstrate the safety precautions exercised in the mechanical workshop and join two metals using GMAW.</p> <p>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.</p> <p>CO3 The students become make the gears using gear making machines and analyze the defects in the cast and machined components</p>
25	GE3361 PROFESSIONAL DEVELOPMENT	<p>On successful completion the students will be able to</p> <p>CO1 Use MS Word to create quality documents, by structuring and organizing content for their day today technical and academic requirements</p> <p>CO2 Use MS EXCEL to perform data operations and analytics, record, retrieve data as per requirements and visualize data for ease of understanding</p> <p>CO3 Use MS PowerPoint to create high quality academic presentations by including common tables, charts, graphs, interlinking other elements, and using media objects.</p>



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26	ME3491 THEORY OF MACHINES	<p>At the end of the course the students would be able to</p> <p>CO1 Discuss the basics of mechanism. CO2 Solve problems on gears and gear trains. CO3 Examine friction in machine elements. CO4 Calculate static and dynamic forces of mechanisms. CO5 Calculate the balancing masses and their locations of reciprocating and rotating masses. Computing the frequency of free vibration, forced vibration and damping coefficient.</p>
27	ME3451 THERMAL ENGINEERING	<p>At the end of the course the students would be able to</p> <p>CO1 Apply thermodynamic concepts to different air standard cycles and solve problems. CO2 To solve problems in steam nozzle and calculate critical pressure ratio. CO3 Explain the flow in steam turbines, draw velocity diagrams, flow in Gas turbines and solve problems. CO4 Explain the functioning and features of IC engine, components and auxiliaries. CO5 Calculate the various performance parameters of IC engines</p>
28	ME3492 HYDRAULICS AND PNEUMATICS	<p>At the end of the course the students would be able to</p> <p>CO1 Apply the working principles of fluid power systems and hydraulic pumps. CO2 Apply the working principles of hydraulic actuators and control components. CO3 Design and develop hydraulic circuits and systems. CO4 Apply the working principles of pneumatic circuits and power system and its components. CO5 Identify various troubles shooting methods in fluid power systems.</p>
29	ME3493 MANUFACTURING TECHNOLOGY	<p>At the end of the course the students would be able to</p> <p>CO1 Apply the mechanism of metal removal process and to identify the factors involved in improving machinability. CO2 Describe the constructional and operational features of centre lathe and other special purpose lathes. CO3 Describe the constructional and operational features of reciprocating machine tools.</p>



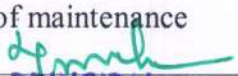
		<p>CO4 Apply the constructional features and working principles of CNC machine tools.</p> <p>CO5 Demonstrate the Program CNC machine tools through planning, writing codes and setting up CNC machine tools to manufacture a given component.</p>
30	CE3491 STRENGTH OF MATERIALS	<p>At the end of the course the students would be able to</p> <p>CO1 Understand the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes.</p> <p>CO2 Understand the load transferring mechanism in beams and stress distribution due to shearing force and bending moment.</p> <p>CO3 Apply basic equation of torsion in designing of shafts and helical springs</p> <p>CO4 Calculate slope and deflection in beams using different methods.</p> <p>CO5 Analyze thin and thick shells for applied pressures</p>
31	GE3451 ENVIRONMENTAL SCIENCES AND SUSTAINABILITY	<p>At the end of the course the students would be able to</p> <p>CO1 To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation.</p> <p>CO2 To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society.</p> <p>CO3 To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations.</p> <p>CO4 To recognize the different goals of sustainable development and apply them for suitable technological advancement and societal development.</p> <p>CO5 To demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization.</p>
32	CE3481 STRENGTH OF MATERIALS AND FLUID MACHINERY LABORATORY	<p>On completion of the course, the student is expected to be able to</p> <p>CO1 Determine the tensile, torsion and hardness properties of metals by testing</p> <p>CO2 Determine the stiffness properties of helical and carriage spring</p> <p>CO3 Apply the conservation laws to determine the</p>



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		<p>coefficient of discharge of a venturimeter and finding the friction factor of given pipe</p> <p>CO4 Apply the fluid static and momentum principles to determine the metacentric height and forces due to impact of jet</p> <p>CO5 Determine the performance characteristics of turbine, rotodynamic pump and positive displacement pump.</p>
33	ME3461 THERMAL ENGINEERING LABORATORY	<p>At the end of the course the students would be able to</p> <p>CO1 Conduct tests to evaluate performance characteristics of IC engines</p> <p>CO2 Conduct tests to evaluate the performance of refrigeration cycle</p> <p>CO3 Conduct tests to evaluate Performance and Energy Balance on a Steam Generator.</p>
34	ME3591 DESIGN OF MACHINE ELEMENTS	<p>At the end of the course the students would be able to</p> <p>CO1 Explain the design machine members subjected to static and variable loads.</p> <p>CO2 Apply the concepts design to shafts, key and couplings.</p> <p>CO3 Apply the concepts of design to bolted, Knuckle, Cotter, riveted and welded joints.</p> <p>CO4 Apply the concept of design helical, leaf springs, flywheels, connecting rods and crank shafts.</p> <p>CO5 Apply the concepts of design and select sliding and rolling contact bearings, seals</p>
35	ME3592 METROLOGY AND MEASUREMENTS	<p>At the end of the course the students would be able to</p> <p>CO1 Discuss the concepts of measurements to apply in various metrological instruments.</p> <p>CO2 Apply the principle and applications of linear and angular measuring instruments, assembly and transmission elements.</p> <p>CO3 Apply the tolerance symbols and tolerance analysis for industrial applications.</p> <p>CO4 Apply the principles and methods of form and surface metrology.</p> <p>CO5 Apply the advances in measurements for quality control in manufacturing Industries.</p>
36	CME388 INDUSTRIAL SAFETY	<p>CO1: Explain the fundamental concept and principles of industrial safety</p> <p>CO 2. Apply the principles of maintenance engineering.</p>




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		<p>CO 3. Analyze the wear and its reduction.</p> <p>CO 4. Evaluate faults in various tools, equipments and machines</p> <p>CO 5. Apply periodic maintenance procedures in preventive maintenance.</p>
37	CME387 NON-TRADITIONAL MACHINING PROCESSES	<p>CO 1:Formulate different types of non-traditional machining processes and evaluate mechanical energy based non-traditional machining processes.</p> <p>CO 2: Illustrate chemical and electro chemical energy based processes.</p> <p>CO 3: Evaluate thermo-electric energy based processes.</p> <p>CO 4: Interpret nano finishing processes.</p> <p>CO 5: Analyse hybrid non-traditional machining processes and differentiate non- traditional machining processes.</p>
38	CME380 AUTOMOBILE ENGINEERING	<p>CO 1: Recognize the various parts of the automobile and their functions and materials.</p> <p>CO 2: Discuss the engine auxiliary systems and engine emission control.</p> <p>CO 3: Distinguish the working of different types of transmission systems.</p> <p>CO 4: Explain the Steering, Brakes and Suspension Systems.</p> <p>CO 5: Predict possible alternate sources of energy for IC Engines.</p>
39	MX3084 DISASTER RISK REDUCTION AND MANAGEMENT	<p>CO1: To impart knowledge on the concepts of Disaster, Vulnerability and Disaster Risk reduction (DRR)</p> <p>CO2: To enhance understanding on Hazards, Vulnerability and Disaster Risk Assessment prevention and risk reduction</p> <p>CO3: To develop disaster response skills by adopting relevant tools and technology</p> <p>CO4: Enhance awareness of institutional processes for Disaster response in the country.</p> <p>CO5: Develop rudimentary ability to respond to their surroundings with potential Disaster response in areas where they live, with due sensitivity</p>




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40	ME3581 METROLOGY AND DYNAMICS LABORATORY	<p>CO1 The students able to measure the gear tooth dimensions, angle using sine bar, straightness.</p> <p>CO2 Determine mass moment of inertia of mechanical element, governor effort and range of sensitivity.</p> <p>CO3 Determine the natural frequency and damping coefficient, critical speeds of shafts,</p>
41	ME3691 HEAT AND MASS TRANSFER	<p>CO1 Apply heat conduction equations to different surface configurations under steady state and transient conditions and solve problems.</p> <p>CO2 Apply free and forced convective heat transfer correlations to internal and external flows through/over various surface configurations and solve problems.</p> <p>CO3 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.</p> <p>CO4 Explain basic laws for Radiation and apply these principles to radiative heat transfer between different types of surfaces to solve problems.</p> <p>CO5 Apply diffusive and convective mass transfer equations and correlations to solve problems for different applications.</p>
42	CME389 DESIGN OF TRANSMISSION SYSTEMS	<p>CO1 Apply the concepts of design to belts, chains and rope drives.</p> <p>CO2 Apply the concepts of design to spur, helical gears.</p> <p>CO3 Apply the concepts of design to worm and bevel gears.</p> <p>CO4 Apply the concepts of design to gear boxes.</p> <p>CO5 Apply the concepts of design to cams, brakes and clutches</p>
43	CME350 ENVIRONMENT SUSTAINABILITY AND IMPACT ASSESSMENT	<p>CO1 Explain the concepts of Environment Sustainability and trained to make decision related to Environment.</p> <p>CO2 Make decision that has an effect on our environment</p> <p>CO3 Evaluate the basics of environmental policy, planning and various legislation Get valuable information for exploring decisions in each life stage of materials, buildings, services and infrastructure.</p>



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		CO4 Explain the Life cycle assessment of Environmental sustainability. CO5 Explain sustainable urban economic development.
44	CME365 RENEWABLE ENERGY TECHNOLOGIES	CO1 Discuss the Indian and global energy scenario. CO2 Describe the various solar energy technologies and its applications. CO3 Explain the various wind energy technologies. CO4 Explore the various bio-energy technologies. CO5 Discuss the ocean and geothermal technologies
45	CME344 PRODUCT LIFECYCLE MANAGEMENT	CO1 Summarize the history, concepts and terminology of PLM CO2 Develop the functions and features of PLM/PDM CO3 Discuss different modules offered in commercial PLM/PDM tools. CO4 Interpret the implement PLM/PDM approaches for industrial applications. CO 5 Integrate PLM/PDM with legacy data bases, CAx& ERP systems
46	ME3681 CAD/CAM LABORATORY	At the end of the course the students would be able to CO1 Design experience in handling 2D drafting and 3D modelling software systems CO2 Design 3-Dimensional geometric model of parts, sub-assemblies, assemblies and export it to drawing CO3 Demonstrate manual part programming and simulate the CNC program and Generate part programming using G and M code through CAM software.
47	ME 3682 HEAT TRANSFER LABORATORY	At the end of the course the students would be able to CO1 Conduct experiment on Predict the thermal conductivity of solids and liquids CO2 Conduct experiment on Estimate the heat transfer coefficient values of various fluids. CO3 Conduct experiment on Test the performance of tubes in tube heat exchangers




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48	ME3791 MECHATRONICS AND IoT	<p>CO1 Explain Select suitable sensors and actuators to develop mechatronics systems.</p> <p>CO2 Discuss Devise proper signal conditioning circuit for mechatronics systems, and also able to implement PLC as a controller for an automated system.</p> <p>CO3 Elucidate the fundamentals of IOT and Embedded Systems</p> <p>CO4 Discuss Control I/O devices through Arduino and Raspberry Pi.</p> <p>CO5 Design and develop an apt mechatronics/IoT based system for the given real-time application.</p>
49	ME3792 COMPUTER INTEGRATED MANUFACTURING	<p>CO1 Discuss the basics of computer aided engineering.</p> <p>CO2 Choose appropriate automotive tools and material handling systems.</p> <p>CO3 Discuss the overview of group technology, FMS and automation identification methods.</p> <p>CO4 Design using computer aided process planning for manufacturing of various components</p> <p>CO5 Acquire knowledge in computer process control techniques.</p>
50	GE3791 HUMAN VALUES AND ETHICS	<p>CO1 Identify the importance of democratic, secular and scientific values in harmonious functioning of social life</p> <p>CO2 Practice democratic and scientific values in both their personal and professional life.</p> <p>CO3 Find rational solutions to social problems.</p> <p>CO4 Behave in an ethical manner in society</p> <p>CO5 Practice critical thinking and the pursuit of truth.</p>
51	GE3792 INDUSTRIAL MANAGEMENT	<p>CO1 Discuss basic concepts of management; approaches to management; contributors to management studies; various forms of business organization and trade unions function in professional organizations.</p> <p>CO2 Discuss the planning; organizing and staffing functions of management in professional organization.</p> <p>CO3 Apply the leading; controlling and decision-making functions of management in professional organization.</p> <p>CO4 Discuss the organizational theory in professional organization.</p>




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		CO5 Apply principles of productivity and modern concepts in management in professional organization.
52	OML351 INTRODUCTION TO NON-DESTRUCTIVE TESTING	CO1 Realize the importance of NDT in various engineering fields. CO2 Have a basic knowledge of surface NDE techniques which enables to carry out various inspection in accordance with the established procedures. CO3 Calibrate the instrument and inspect for in-service damage in the components by means of Eddy current testing as well as Thermography testing. CO4 Differentiate various techniques of UT and AET and select appropriate NDT methods for better evaluation. CO5 Interpret the results of Radiography testing and also have the ability to analyse the influence of various parameters on the testing.
53	OPE353 INDUSTRIAL SAFETY	CO1 Describe, with example, the common work-related diseases and accidents in occupational setting CO2 Name essential members of the Occupational Health team CO3 What roles can a community health practitioners play in an Occupational setting to ensure the protection, promotion and maintenance of the health of the employee
54	ME3781 MECHATRONICS AND IoT LABORATORY	CO1 Demonstrate the functioning of mechatronics systems with various pneumatic, hydraulic and electrical systems. CO2 Demonstrate the microcontroller and PLC as controllers in automation systems by executing proper interfacing of I/O devices and programming CO3 Demonstrate the sensing and actuation of mechatronics elements using IoT.




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55	ME3811 PROJECT WORK	CO1 Take up any challenging practical problems and find solution by formulating proper methodology.
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