DEPARTMENT OF M ENGINEERING
2021 REGULATION-COURSE OUTCOMES

SEMESTER	COURSE CODE	COURSE NAME	COURSE ID	COURSE OUTCOME
III	MA8353	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	CO 1	Understand how to solve the given standard partial differential equations
			CO 2	Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.
			CO 3	Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations
			CO 4	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
			CO 5	Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.
III	ME8391	ENGINEERING THERMODYNAMICS	CO 1	Apply the first law of thermodynamics for simple open and closed systems under steady and unsteady conditions.
			CO 2	Apply second law of thermodynamics to open and closed systems and calculate entropy and availability.
			CO 3	Apply Rankine cycle to steam power plant and compare few cycle improvement methods
			CO 4	Derive simple thermodynamic relations of ideal and real gases
			CO 5	Calculate the properties of gas mixtures and moist air and its use in psychometric processes
III	CE8394	FLUID MECHANICS AND MACHINERY	CO 1	Apply mathematical knowledge to predict the properties and characteristics of a fluid.
			CO 2	Can analyse and calculate major and minor losses associated with pipe flow in piping networks.
			CO 3	Can mathematically predict the nature of physical quantities
			CO 4	Can critically analyse the performance of pumps
			CO 5	Can critically analyse the performance of turbines.

MRK Institute of Technology
Nattarmangalam Village,
Kattumannarkoil – 608 301.
Cuddalore Dt, Tamilnadu.
Ph: 04144 – 260270, 262728
Fax : 04144 – 262728
: +91 - 9487691969

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III	ME8351	MANUFACTURING TECHNOLOGY - I	CO 1	Explain different metal casting processes, associated defects, merits and demerits
			CO 2	Compare different metal joining processes.
			CO 3	Summarize various hot working and cold working methods of metals
			CO 4	Explain various sheet metal making processes.
			CO 5	Distinguish various methods of manufacturing plastic components
III	EE8353	ELECTRICAL DRIVES AND CONTROLS	CO 1	Upon Completion of this subject, the students can able to explain different types of electrical machines and their performance
III	ME8361	MANUFACTURING TECHNOLOGY LABORATORY - I	CO 1	Demonstrate the safety precautions exercised in the mechanical workshop.
			CO 2	Make the workpiece as per given shape and size using Lathe.
			CO 3	Join two metals using arc welding.
			CO 4	Use sheet metal fabrication tools and make simple tray and funnel.
			CO 5	Use different moulding tools, patterns and prepare sand moulds.
III	ME8381	COMPUTER AIDED MACHINE DRAWING	CO 1	Follow the drawing standards, Fits and Tolerances
			CO 2	Re-create part drawings, sectional views and assembly drawings as per standards
III	EE8361	ELECTRICAL ENGINEERING LABORATORY	CO 1	Ability to perform speed characteristic of different electrical machine
III	HS8381	INTERPERSONAL SKILLS / LISTENING & SPEAKING	CO 1	Listen and respond appropriately
			CO 2	Participate in group discussions
			CO 3	Make effective presentations
			CO 4	Participate confidently and appropriately in conversations both formal and informal
IV	MA8452	STATISTICS AND NUMERICAL METHODS	CO 1	Apply the concept of testing of hypothesis for small and large samples in real life problems

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			CO 2	Apply the basic concepts of classifications of design of experiments in the field of agriculture.
			CO 3	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.
			CO 4	Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.
			CO 5	Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications
IV	ME8492	KINEMATICS OF MACHINERY	CO 1	Discuss the basics of mechanism
			CO 2	Calculate velocity and acceleration in simple mechanisms
			CO 3	Develop CAM profiles
			CO 4	Solve problems on gears and gear trains
			CO 5	Examine friction in machine elements
IV	ME8451	MANUFACTURING TECHNOLOGY – II	CO 1	Explain the mechanism of material removal processes
			CO 2	Describe the constructional and operational features of centre lathe and other special purpose lathes.
			CO 3	Describe the constructional and operational features of shaper, planner, milling, drilling, sawing and broaching machines
			CO 4	Explain the types of grinding and other super finishing processes apart from gear manufacturing processes
			CO 5	Summarize numerical control of machine tools and write a part program
IV	ME8491	ENGINEERING METALLURGY	CO 1	Explain alloys and phase diagram, Iron-Iron carbon diagram and steel classification.
			CO 2	Explain isothermal transformation, continuous cooling diagrams and different heat treatment processes

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			CO 3	Clarify the effect of alloying elements on ferrous and non-ferrous metals
			CO 4	Summarize the properties and applications of non-metallic materials
			CO 5	Explain the testing of mechanical properties.
IV	CE8395	STRENGTH OF MATERIALS FOR MECHANICAL ENGINEERS	CO 1	Understand the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes.
			CO 2	Understand the load transferring mechanism in beams and stress distribution due to shearing force and bending moment.
			CO 3	Apply basic equation of simple torsion in designing of shafts and helical spring
			CO 4	Calculate the slope and deflection in beams using different methods.
			CO 5	Analyse and design thin and thick shells for the applied internal and external pressures.
IV	ME8493	THERMAL ENGINEERING - I	CO 1	Apply thermodynamic concepts to different air standard cycles and solve problems.
			CO 2	Solve problems in single stage and multistage air compressors
			CO 3	Explain the functioning and features of IC engines, components and auxiliaries
			CO 4	Calculate performance parameters of IC Engines.
			CO 5	Explain the flow in Gas turbines and solve problems.
IV	ME8462	MANUFACTURING TECHNOLOGY LABORATORY – II	CO 1	Use different machine tools to manufacturing gears
			CO 2	Ability to use different machine tools to manufacturing gears.
			CO 3	Ability to use different machine tools for finishing operations
			CO 4	Ability to manufacture tools using cutter grinder
			CO 5	Develop CNC part programming
IV	CE8381		CO 1	Perform Tension, Torsion, Hardness, Compression, and Deformation test on Solid materials.

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		STRENGTH OF MATERIALS AND FLUID MECHANICS AND MACHINERY LABORATORY	CO 2	Use the measurement equipment's for flow measurement
			CO 3	Perform test on different fluid machinery.
IV	HS8461	ADVANCED READING AND WRITING	CO 1	Write different types of essays.
			CO 2	Write winning job applications.
			CO 3	Read and evaluate texts critically.
			CO 4	Display critical thinking in various professional contexts.
V	ME8595	THERMAL ENGINEERING – II	CO 1	Solve problems in Steam Nozzle
			CO 2	Explain the functioning and features of different types of Boilers and auxiliaries and calculate performance parameters.
			CO 3	Explain the flow in steam turbines, draw velocity diagrams for steam turbines and solve problems.
			CO 4	Summarize the concept of Cogeneration, Working features of Heat pumps and Heat exchangers
			CO 5	Solve problems using refrigerant table / charts and psychrometric charts
V	ME8593	DESIGN OF MACHINE ELEMENTS	CO 1	Explain the influence of steady and variable stresses in machine component design.
			CO 2	Apply the concepts of design to shafts, keys and couplings.
			CO 3	Apply the concepts of design to temporary and permanent joints.
			CO 4	Apply the concepts of design to energy absorbing members, connecting rod and crank shaft.
			CO 5	Apply the concepts of design to bearings.

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V	ME8501	METROLOGY AND MEASUREMENTS	CO 1	Describe the concepts of measurements to apply in various metrological instruments
			CO 2	Outline the principles of linear and angular measurement tools used for industrial applications
			CO 3	Explain the procedure for conducting computer aided inspection
			CO 4	Demonstrate the techniques of form measurement used for industrial components
			CO 5	Discuss various measuring techniques of mechanical properties in industrial applications
V	ME8594	DYNAMICS OF MACHINES	CO 1	Calculate static and dynamic forces of mechanisms.
			CO 2	Calculate the balancing masses and their locations of reciprocating and rotating masses.
			CO 3	Compute the frequency of free vibration.
			CO 4	Compute the frequency of forced vibration and damping coefficient.
			CO 5	Calculate the speed and lift of the governor and estimate the gyroscopic effect on automobiles, ships and airplanes.
V	ORO551	RENEWABLE ENERGY SOURCES	CO 1	Understanding the physics of solar radiation.
			CO 2	Ability to classify the solar energy collectors and methodologies of storing solar energy
			CO 3	Knowledge in applying solar energy in a useful way.
			CO 4	Knowledge in wind energy and biomass with its economic aspects
			CO 5	Knowledge in capturing and applying other forms of energy sources like wind, biogas and geothermal energies.
V	ME8511	KINEMATICS AND DYNAMICS LABORATORY	CO 1	Explain gear parameters, kinematics of mechanisms, gyroscopic effect and working of lab equipment's
			CO 2	Determine mass moment of inertia of mechanical element, governor effort and range sensitivity, natural frequency and damping coefficient, torsional frequency, critical speeds of shafts, balancing mass of rotating and reciprocating masses, and transmissibility ratio.

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V	ME8512	THERMAL ENGINEERING LABORATORY	CO 1	Conduct tests on heat conduction apparatus and evaluate thermal conductivity of materials
			CO 2	Conduct tests on natural and forced convective heat transfer apparatus and evaluate heat transfer coefficient.
			CO 3	Conduct tests on radiative heat transfer apparatus and evaluate Stefan Boltzmann constant and emissivity.
			CO 4	Conduct tests to evaluate the performance of parallel/counter flow heat exchanger apparatus and reciprocating air compressor
			CO 5	Conduct tests to evaluate the performance of refrigeration and airconditioning test rigs.
V	ME8513	METROLOGY AND MEASUREMENTS LABORATORY	CO 1	Measure the gear tooth dimensions, angle using sine bar, straightness and flatness, thread parameters, temperature using thermocouple, force, displacement, torque and vibration
			CO 2	Calibrate the vernier, micrometer and slip gauges and setting up the comparator for the inspection.
VI	ME8651	DESIGN OF TRANSMISSION SYSTEMS	CO 1	Apply the concepts of design to belts, chains and rope drives.
			CO 2	Apply the concepts of design to spur, helical gears.
			CO 3	Apply the concepts of design to worm and bevel gears
			CO 4	Apply the concepts of design to gear boxes
			CO 5	Apply the concepts of design to cams, brakes and clutches
VI	ME8691	COMPUTER AIDED DESIGN AND MANUFACTURING	CO 1	Explain the 2D and 3D transformations, clipping algorithm, Manufacturing models and Metrics
			CO 2	Explain the fundamentals of parametric curves, surfaces and Solids
			CO 3	Summarize the different types of Standard systems used in CAD
			CO 4	Apply NC & CNC programming concepts to develop part programme for Lathe & Milling Machines
			CO 5	Summarize the different types of techniques used in Cellular Manufacturing and FMS

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VI	ME8693	HEAT AND MASS TRANSFER	CO 1	Apply heat conduction equations to different surface configurations under steady state and transient conditions and solve problems
			CO 2	Apply free and forced convective heat transfer correlations to internal and external flows through/over various surface configurations and solve problems
			CO 3	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
			CO 4	Explain basic laws for Radiation and apply these principles to radiative heat transfer between different types of surfaces to solve problems
			CO 5	Apply diffusive and convective mass transfer equations and correlations to solve problems for different applications
VI	ME8692	FINITE ELEMENT ANALYSIS	CO 1	Summarize the basics of finite element formulation
			CO 2	Apply finite element formulations to solve one dimensional Problems
			CO 3	Apply finite element formulations to solve two dimensional scalar Problems.
			CO 4	Apply finite element method to solve two dimensional Vector problems.
			CO 5	Apply finite element method to solve problems on iso parametric element and dynamic Problems
VI	ME8694	HYDRAULICS AND PNEUMATICS	CO 1	Explain the Fluid power and operation of different types of pumps
			CO 2	Summarize the features and functions of Hydraulic motors, actuators and Flow control valves
			CO 3	Explain the different types of Hydraulic circuits and systems
			CO 4	Explain the working of different pneumatic circuits and systems
			CO 5	Summarize the various trouble shooting methods and applications of hydraulic and pneumatic systems.
VI	ME8091	AUTOMOBILE ENGINEERING	CO 1	Recognize the various parts of the automobile and their functions and materials.
			CO 2	Discuss the engine auxiliary systems and engine emission control.

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			CO 3	Distinguish the working of different types of transmission systems.
			CO 4	Explain the Steering, Brakes and Suspension Systems.
			CO 5	Predict possible alternate sources of energy for IC Engines.
VI	ME8681	CAD / CAM LABORATORY	CO 1	Draw 3D and Assembly drawing using CAD software
			CO 2	Demonstrate manual part programming with G and M codes using CAM
VI	ME8682	DESIGN AND FABRICATION PROJECT	CO 1	Design and Fabricate the machine element or the mechanical product
			CO 2	Demonstrate the working model of the machine element or the mechanical product.
VI	HS8581	PROFESSIONAL COMMUNICATION	CO 1	Make effective presentations.
			CO 2	Participate confidently in Group Discussions.
			CO 3	Attend job interviews and be successful in them.
			CO 4	Develop adequate Soft Skills required for the workplace.
VII	ME8792	POWER PLANT ENGINEERING	CO 1	Explain the layout, construction and working of the components inside a thermal power plant.
			CO 2	Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants.
			CO 3	Explain the layout, construction and working of the components inside nuclear power plants.
			CO 4	Explain the layout, construction and working of the components inside Renewable energy power plants.
			CO 5	Explain the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy production.
VII	ME8793	PROCESS PLANNING AND COST ESTIMATION	CO 1	Select the process, equipment and tools for various industrial products
			CO 2	Prepare process planning activity chart.

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			CO 3	Explain the concept of cost estimation
			CO 4	Compute the job order cost for different type of shop floor
			CO 5	Calculate the machining time for various machining operations
VII	ME8791	MECHATRONICS	CO 1	Discuss the interdisciplinary applications of Electronics, Electrical, Mechanical and Computer Systems for the Control of Mechanical, Electronic Systems and sensor technology
			CO 2	Discuss the architecture of Microprocessor and Microcontroller, Pin Diagram, Addressing Modes of Microprocessor and Microcontroller
			CO 3	Discuss Programmable Peripheral Interface, Architecture of 8255 PPI, and various device interfacing
			CO 4	Explain the architecture, programming and application of programmable logic controllers to problems and challenges in the areas of Mechatronic engineering
			CO 5	Discuss various Actuators and Mechatronics system using the knowledge and skills acquired through the course and also from the given case studies
VII	OIE751	ROBOTICS	CO 1	Upon completion of this course, the students can able to apply the basic engineering knowledge for the design of robotics
VII	ME8073	UNCONVENTIONAL MACHINING PROCESSES	CO 1	Explain the need for unconventional machining processes and its classification
			CO 2	Compare various thermal energy and electrical energy based unconventional machining processes
			CO 3	Summarize various chemical and electro-chemical energy based unconventional machining processes.
			CO 4	Explain various nano abrasives based unconventional machining processes.
			CO 5	Distinguish various recent trends based unconventional machining processes.
VII	ME8097	NON DESTRUCTIVE TESTING AND EVALUATION	CO 1	Explain the fundamental concepts of NDT
			CO 2	Discuss the different methods of NDE
			CO 3	Explain the concept of Thermography and Eddy current testing
			CO 4	Explain the concept of Ultrasonic Testing and Acoustic Emission

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			CO 5	Explain the concept of Radiography
VII	ME8711	SIMULATION AND ANALYSIS LABORATORY	CO 1	Simulate the working principle of air conditioning system, hydraulic and pneumatic cylinder and cam follower mechanisms using MATLAB.
			CO 2	Analyze the stresses and strains induced in plates, brackets and beams and heat transfer problems.
			CO 3	Calculate the natural frequency and mode shape analysis of 2D components and beams.
VII	ME8781	MECHATRONICS LABORATORY	CO 1	Demonstrate the functioning of mechatronics system with various pneumatic, hydraulic and electrical systems
			CO 2	Demonstrate the functioning of control systems with the help of PLC and microcontrollers.
VIII	MG8591	PRINCIPLES OF MANAGEMENT	CO 1	Upon completion of the course, students will be able to have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management
VIII	IE8693	PRODUCTION PLANNING AND CONTROL	CO 1	Upon completion of this course, the students can able to prepare production planning and control activities such as work study, product planning, production scheduling, Inventory Control.
			CO 2	They can plan manufacturing requirements manufacturing requirement Planning (MRP II) and Enterprise Resource Planning (ERP)
VIII	ME8811	PROJECT WORK	CO 1	On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology