



CHRIST

COLLEGE OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE, New Delhi and Affiliated to Pondicherry University)

Pitchaveeranpet, Moolakulam, Pondicherry - 605010.

(A Unit of Sam Paul Educational Trust)

DEPARTMENT OF MECHANICAL ENGINEERING

SUBJECT WISE COURSE OUTCOMES (2018 – 2023)

I – SEMESTER

T101 - Mathematics - I		Yr/Sem: I/I
CO 1	Able to apply knowledge of mathematics to solve functions of several variables.	
CO 2	Identify, formulate and solve engineering problems like multiple integrals and their usage.	
CO 3	To solve differential equations that model physical processes using effective mathematical tools	
CO 4	Able to find equation of straight line of shortest distance, equation of plane, angle between straight lines.	
CO 5	Gain the knowledge to solve first order differential equation arising in engineering.	

T102 - Physics		Yr/Sem: I/I
CO 1	Apply knowledge of science and engineering to understand physics and its significant contribution in the advancement of technology and invention of new products that dramatically transform modern day society.	
CO 2	Identify different areas of physics which have direct relevance and applications to different engineering disciplines	
CO 3	Apply fundamental knowledge to understand applications of ultrasonics, optics and some optical devices, lasers and fiber optics, nuclear energy sources and wave mechanics.	
CO 4	Understand the basic operating principles of laser, its applications, optical fiber, and its types, transmission characteristics, applications of optical fibers.	
CO 5	Understand the basic operating principles of laser, its applications, optical fiber, and its types, transmission characteristics, applications of optical fibers.	

T103 - Chemistry		Yr/Sem: I/I
CO 1	Apply knowledge of science and engineering to understand the importance of chemistry in engineering domain.	
CO 2	Identify different electrochemical cells and their usage for industrial process.	
CO 3	Apply fundamental knowledge of chemistry and build an interface of theoretical concepts with industrial applications/engineering applications.	
CO 4	Guide the students to gain the knowledge about the cooling curves , phase diagrams, alloys and their practical importance.	
CO 5	Strengthen the fundamentals of chemistry and then build an interface of theoretical concepts with their industrial/engineering applications.	

T104 – Basic Electrical and Electronics Engineering		Yr/Sem: I/I
CO 1	Will learn the fundamentals of rotational and stationary machine operation, single-	

	phase and three-phase power measurement, magnetic and electrical circuits, and these topics.
CO 2	Will learn the fundamentals of measuring devices, communication systems, and network models.
CO 3	Knowledge about non-conventional energy systems will be available to students.
CO 4	The varieties of metal joining will be known by the students.
CO 5	Students will learn about numerous engines, energies, and joints as well as construction and building components offered with diverse principles.

T105 – Engineering Thermodynamics		Yr/Sem: I/I
CO 1	Familiar with the fundamental thermodynamic concepts and understand the basic laws	
CO 2	Apply first law of thermodynamics concepts to calculate the system work for closed and open systems	
CO 3	Apply Second Law of Thermodynamics and entropy concepts to evaluate the performance of heat engine, heat pump and refrigerator.	
CO 4	Analyze and design gas power cycles by calculating thermal efficiencies	
CO 5	Understand the basic working principle of refrigeration systems	

T106 – Computer Programming		Yr/Sem: I/II
CO 1	Know concepts in problem solving.	
CO 2	To do programming in C language.	
CO 3	To write diversified solutions using the C language.	
CO 4	To know about structures, pointers and its manipulation.	
CO 5	To know about the evaluation of computers, components and its applications. Basic knowledge on the internet, information technology, word processing and worksheets.	

P101 - Computer Programming Laboratory		Yr/Sem: I/I
CO 1	Students can work with command line interface OS's, like MS-DOS.	
CO 2	Students can solve most of the real time problems with C program.	
CO 3	Students can interact with computer using C program, through various input and output functions.	
CO 4	Students can make a use of various keywords, constants, variables, data types, operators, type conversion in C program.	
CO 5	Students will have knowledge about arrays, functions, structures and pointers in C program.	

P102 – Engineering Graphics		Yr/Sem: I/II
CO 1	Perform freehand sketching of basic geometrical constructions and multiple views of objects.	
CO 2	Project orthographic projections of lines and plane surfaces.	
CO 3	Draw projections and solids and development of surfaces.	
CO 4	Visualize and to project isometric and perspective sections of simple solids.	
CO 5	Students will be able to draw orthographic projections and isometric projections.	

P103 - Basic Electrical and Electronics Laboratory		Yr/Sem: I/I
CO 1	Know about basic electrical tools, applications and precautions	
CO 2	Perform different types of wiring used in domestic and industrial applications.	
CO 3	Measurements of voltage and phase using CRO, basic operation and applications of devices such as PN junction diode and transistors.	
CO 4	Understand the function and applications of basic logic gates and flip flops.	
CO 5	Gain knowledge in domestic wiring and application of electronics device in the field	

	of electrical engineering.
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II- SEMESTER

T 107 – Mathematics - II		Yr/Sem: I/II
CO 1	Apply knowledge of mathematics to solve matrix algebra technique for practical applications and Curl, divergence and integration of vectors in vector calculus.	
CO 2	Identify, formulate and solve engineering problems like Laplace transform and to solve differential and integral equations.	
CO 3	Apply formulae and analyze problems of Fourier transform techniques.	
CO 4	Determine the Fourier transform, Fourier cosine and sine transform of elementary functions, properties of transforms and its application in engineering	
CO 5	Acquire knowledge of matrix algebra technique, vector calculus, Laplace and Fourier Transform.	

T108 – Material Science		Yr/Sem: I/II
CO 1	Apply core concepts in material science to solve engineering problems.	
CO 2	Knowledgeable of contemporary issues relevant to material science and engineering	
CO 3	Understand about the ferrites and its application to magnetic materials.	
CO 4	Select materials for design and construction.	
CO 5	Understand the importance and properties of materials.	

T109 – Environmental Science		Yr/Sem: I/II
CO 1	Apply fundamental knowledge to understand about the environment.	
CO 2	Identify environmental pollution through science.	
CO 3	Apply basic knowledge to solve various environmental issues and problems.	
CO 4	Ability to consider issues of environment and sustainable development in his personal and professional undertakings.	
CO 5	Provides a comprehensive knowledge in environmental science, environmental issues and the management from an interdisciplinary perspective.	

T110 - Basic Civil and Mechanical Engineering		Yr/Sem: I/II
CO 1	Understand the building classification as per National building code.	
CO 2	Get the idea about construction procedure for various components of the building.	
CO 3	Students understand the principles of surveying, construction procedure for roads, bridges and dams.	
CO 4	Student will be able know about the working of Internal and external combustion systems	
CO 5	Student will be able know about Non-Conventional Energy Systems	
CO 6	Student will be able to know about manufacturing process.	

T111- Engineering Mechanics		Yr/Sem: I/II
CO 1	Understand the basic laws of mechanics and resolution of forces using different methods.	
CO 2	Learn and apply the knowledge on analysis of forces acting on the trusses and effect	

	of friction force on bodies.
CO 3	Learn about the centroid and moment of inertia for plane and solid figures.
CO 4	Understand the three laws of motion, principles of dynamics for particles.
CO 5	The student will be able to analyse the laws of motion for rigid bodies.

T112- Communicative English		Yr/Sem: I/II
CO 1	Learnt about the definition of communication, importance, concept. Sender, Ideation, the levels in communication, channels, oral and written way of communication, body language and non verbal communication, Accuracy, Brevity and Clarity, different barriers for Communication, techniques in making effective communication, listening importance and types of listening.	
CO 2	Students learnt about the types of letters, report writing, notices and memo and also developed their skill in writing.	
CO 3	Understands the comprehension, identifies the difference between Skimming and scanning, guess the meaning of the words, Identify to make notes.	
CO 4	Students learnt the writing skills, how to write a paragraph in a proper manner, four modes of writing and how to make bibliographical entries.	
CO 5	Students were able to develop their spoken skills by making them to involve in many activities related to it.	

P 104 – Physics Lab		Yr/Sem: I/II
CO 1	Able to understand how to find the thickness of the specimen and also to find the radius of curvature of glass using the phenomenon of interference of light	
CO 2	Able to understand the specific rotatory power of an optical active solution using the principle of polarization.	
CO 3	To understand about the thermal conductivity of bad conductor and rubber tube.	
CO 4	Ability to understand about the optical properties like dispersive power, Resolving power by applying the knowledge of optics	
CO 5	To acquire knowledge about the magnetometer due to current coil and jolly method of determining the pressure coefficient of air at constant volume.	
CO 6	Ability to understand the basic knowledge of inference ,polarization ,Magnetic materials ,thermal conductivity that correlates the theory and practical	

P 105 – Chemistry Lab		Yr/Sem: I/II
CO 1	Students will become well acquainted to test amount of hardness present in sample of water for their engineering needs.	
CO 2	Students will be efficient in estimating acidity/alkalinity in given samples.	
CO 3	Students will have knowledge about estimating amount of dissolved oxygen in water.	
CO 4	Students will become well acquainted to estimate copper in brass.	
CO 5	Students will have knowledge about determination of viscosity of sucrose using Ostwald's viscometer.	
CO 6	To develop an understanding of basic titration setup and methodologies for determining strength, hardness and alkalinity of various unknown solutions	

P 106 – Workshop Practice		Yr/Sem: I/II
CO 1	Understand and comply with workshop safety regulations.	
CO 2	Student will be able to make various joints in carpentry shop with the wooden material. Students can able to gain skills about various tools used in welding to make simple joints.	
CO 3	Students can able to Identify the hand tools and instruments, Students can able to gain knowledge about various operations carried out in sheetmetal, fitting shop	

P107 – NSS/NCC		Yr/Sem: I/II
CO 1	To create awareness in social and environmental issues.	
CO 2	To participate in relief and rehabilitation work during natural calamities.	
CO 3	To develop some proposals for local slum area development and waste disposal.	
CO 4	To create team works among students and produce efficient results.	

III- SEMESTER

MA T31 – Mathematics – III		Yr/Sem: II/III
CO 1	Ability to know the complex variable techniques and to know the properties of analytic and harmonic functions.	
CO 2	Ability to know the conformal mapping and transforms play a major role in several areas of engineering	
CO 3	To understand analytic function of a complex variable and able to apply Cauchy integral theorem and residue theorem to solve contour integrations	
CO 4	To introduce the basics of analytic functions and the basics in complex integration which is used to evaluate complicated real integrals	
CO 5	Find the Fourier series representation of a function of one variable, find the solution of the wave, diffusion and Laplace equations using the Fourier series.	

MET31 – Mechanics of Solids		Yr/Sem: II/III
CO 1	Understand the fundamentals and concepts of stress and strain at a point as well as the stress-strain relationships for homogenous, isotropic materials and to construct the shear force and bending moment diagrams in beams of various types with various loading condition.	
CO 2	Evaluate the bending stress, shear stress and the combination of the stresses in a beam when subjected to loading.	
CO 3	Understanding the concept of deflection and slope in a beam member subjected to combined loading and apply the theories of failure for static loading.	
CO 4	Evaluate the effect of torsion in shaft and spring.	
CO 5	Calculate the stresses and strains associated with thin-wall spherical and cylindrical pressure vessels and to emphasize on buckling of Columns with various end configurations.	

MET32– Mechanics of Fluids		Yr/Sem: II/III
CO 1	An understanding of fluid mechanics fundamentals, including concepts of mass	

	and momentum conservation.
CO 2	An ability to apply the Bernoulli equation and potential flow theory to solve problems in fluid mechanics.
CO 3	Ability to solve for internal flow in pipes and channels through simple solutions of the Navier-Stokes equations and the head-loss equation.
CO 4	An ability to perform dimensional analysis for problems in fluid mechanics.
CO 5	Knowledge of boundary layer separation, laminar and turbulent boundary layer fundamentals

MET33- Applied Thermodynamics		Yr/Sem: II/III
CO 1	To explain the theoretical concepts of thermodynamics and how it applies to energy conversion in technological application and biological systems. Apply mathematical fundamentals to study the properties of steam, gas and gas mixtures	
CO 2	The students can able to apply the thermodynamic I and II law to Mechanical Engineering application	
CO 3	The students will understand the concept of Energy, the maximum energy that can be converted into useful work, the availability and unavailability in a thermodynamic system.	
CO 4	The students acquire the knowledge about thermodynamic relations regarding entropy change in a system and heat transfer.	
CO 5	Students will be able to analyze the chemical reaction in combustion	

MET34- Manufacturing Processes		Yr/Sem: II/III
CO 1	To understand the concepts in casting process and to know about the types of casting processes suited for the production of different shaped component using specific materials.	
CO 2	Explain the working principle of various welding and joining processes	
CO 3	Understand basic concept and operations in bulk deformation process and to enumerate the principle of sheet metal and various forming processes.	
CO 4	Understand basic concept and operations involved in super finishing process and to study the principle and operations of various grinding process.	
CO 5	To gain a wide knowledge about the types of plastics and the process involved for welding, casting and forming of plastics.	

MET35- Electrical and Electronics Engineering		Yr/Sem: II/III
CO 1	Distinguish the different types of transformers and analysis its performance characteristics under different load conditions	
CO 2	Understand the construction and working of different induction motors employed in various industries	
CO 3	Understand the construction, working and synchronization methods employed in alternator	
CO 4	Develop the required circuit using IC 741 for required applications	
CO 5	Develop and use the IC555 in timer circuit application	

MEP31- Material Testing and Metallurgy Lab		Yr/Sem: II/III
CO 1	Students will be able to understand the procedures for evaluating the mechanical behavior of materials	

CO 2	Students will be able to recognize the process of specimen preparation for testing of materials and microstructures
CO 3	Students will be able to understand the experimental procedures in carrying out heat treatment operations

MEP32– Manufacturing Processes Lab - I		Yr/Sem: II/III
CO 1	Students can perform turning and facing operations using a lathe.	
CO 2	Students will be ready to machine and produce a required component using a lathe, milling and shaping machine	
CO 3	Students can perform thread cutting operation using lathe.	

MEP33– Electrical and Electronics Lab		Yr/Sem: II/III
CO 1	Select the range of apparatus based on the ratings of transformer and induction motor	
CO 2	Evaluate the efficiency of the electrical machines by analyzing test results	
CO 3	Design the techniques of DC power supply suitable to electronic circuits.	

IV– SEMESTER

MAT41 – Mathematics – IV		Yr/Sem: II/IV
CO 1	Able to apply the concept of partial differential equation and the method of their solution and also able to solve the problems related to Engineering fields.	
CO 2	Understand the concept of initial and boundary value problems like wave equations and will also able to find the solutions of wave equations.	
CO 3	Ability to differentiate heat and wave equations and find their different types of solution.	
CO 4	Understand the concept of curve fitting and by using hypothetical testing able to solve the problems related to large samples.	
CO 5	Ability to differentiate large samples and small samples and also find the solution of small samples by using various methods.	

MET41– Engineering Metallurgy		Yr/Sem: II/IV
CO 1	To analyze the Structure of materials at different levels, basic concepts of crystalline materials like unit cell, FCC, BCC, HCP, APF. To understand the principle of Electron microscopes.	
CO 2	Able to gain fundamental knowledge of Ferrous & Non Ferrous Metal Processing	
CO 3	To able to identify the right material when they design some components	
CO 4	The students will able to familiarize with the various kinds of testing done on the metals.	
CO 5	To develop futuristic insight into Metals. Plastic deformation, Slip and twinning – Hot, cold and warm working, understand the fracture mechanics – Types - ductile to brittle transition – Creep and Fatigue failures – Testing	

MET42– Fluid Machinery		Yr/Sem: II/IV
CO 1	To understand the basic fluid property and law with their application. Explain	

	the theoretical concepts of impact of fluid jet and force exerted on stationary and moving vane through impulse momentum equation and velocity diagrams.
CO 2	The students can able to understand the working of hydraulic turbines and types. Calculation of performance parameters of turbines. The performance, efficiency and characteristics of turbine. Draft tubes and specific speed of turbines, Governing of turbine.
CO 3	To understand the working of Hydraulic pumps and types. Calculation of performance parameters of centrifugal and reciprocating
CO 4	To understand the working of air machines compressors and types. Calculation of performance parameters of centrifugal and reciprocating compressor. Performance characteristics of compressor.
CO 5	Acquire knowledge and application of special purpose fluid pumps and machines like submersible pump, gear pump, vane, hydraulic .air lift, jet pumps and power transmitting fluid machines like hydraulic lift, crane, coupling and torque converter.

MET43– Kinematics of Machinery		Yr/Sem: II/IV
CO 1	Students will be able to visualize simple mechanism involved in various machines	
CO 2	Students will be able to visualize students about Kinematic Analysis (Instantaneous center method and relative velocity method) of simple mechanisms involved in various machines	
CO 3	Students will gain knowledge about graphical and analytical two point and three point synthesis of mechanisms	
CO 4	Students will gain knowledge about different types of specified contour and derived contour cams and its kinematic analysis	
CO 5	Students will gain knowledge about kinematics advantages, problems and how these problems are avoided for involute profiled gear and epicyclic gear train	

MET44– Machine Drawing		Yr/Sem: II/IV
CO 1	Recall basic concepts of machine drawing.	
CO 2	Explain various types of fits, tolerances machining symbols and Roughness.	
CO 3	Develop sectional views of fasteners, joints and couplings.	
CO 4	Draw assembly of machine parts..	
CO 5	To learn about dimensioning various components in an assembly	

MET45– Machining Processes		Yr/Sem: II/IV
CO 1	Students will be able to visualize lathe machine and its operations.	
CO 2	Students will gain knowledge about drilling machines and its operations	
CO 3	Students will gain knowledge about shaper, planner and slotter machines and its importance	
CO 4	Students will gain knowledge about different types of specified contour and derived contour producing machines and its applications	
CO 5	Students will gain knowledge about importance of tool geometry, tool material and Mechanism in machining.	

MEP41– Fluid Mechanics and Machinery Lab		Yr/Sem: II/IV
CO 1	To provide the students with a solid foundation in fluid flow principles	
CO 2	Students will be able to measurement of flow through the orifice meter and Venturimeter.	
CO 3	Students will be able to knowledge in calculating performance analysis in turbines and pump.	

MEP42– Manufacturing Processes Lab – II		Yr/Sem: II/IV
CO 1	Classify and understand the principle and constructional features of lathe.	
CO 2	Classify and understand the principle and constructional features of drilling machine, milling machine and grinding machine	
CO 3	students can perform basic metal cutting operations using lathe, shaping machine, milling machine and grinding machine	

MEP43– Computer Aided Machine Drawing Lab		Yr/Sem: II/IV
CO 1	Students will be able to understand production drawings.	
CO 2	Students can interpret the dimensions and the associated tolerances, some annotations of the given drawings.	
CO 3	Students can prepare 2D drafts for the given components and assembly models	

MEP44 – Physical Education		Yr/Sem: II/IV
CO 1	Understanding the opportunities of students’ physical, cognitive, social and emotional development.	
CO 2	Understanding of individual and group motivation and behavior.	
CO 3	To create team work among students and produce efficient results.	
CO 4	The students were taught to operate advanced playing kits.	

V– SEMESTER

MET51– Dynamics of Machinery		Yr/Sem: III/V
CO 1	To make the students familiar with force analysis	
CO 2	Students are able analyze the balancing of rotating and reciprocating masses by using static and dynamic balance.	
CO 3	Students can analyze gyroscopic effect on aero-plane, ship and any other auto motive vehicle	
CO 4	Students are aware of the effect of free and forced vibration on a mechanical system knowledge about types of governors and characteristics. And also study about gyroscopic effect on ship, plane, two wheeler and four wheeler.	
CO 5	Students will be able to perform balancing, vibration and critical speeds with respect to machine dynamics	

MET52– Design of Machine Elements		Yr/Sem: III/V
CO 1	Students will be able to formulate and analyze stresses and strains in machine elements and structures in 3-D subjected to various loads	
CO 2	Students will be able to formulate and analyze stresses and strains variety of mechanical components available and emphasize the need to continue learning.	
CO 3	Students will be able to apply multidimensional static failure criteria in the analysis and design of mechanical components couplings, brakes and clutches	
CO 4	Students will be able to apply multidimensional fatigue failure criteria in the analysis and design of mechanical components like mechanical joints and springs	
CO 5	Students will be acquainted with standards, safety, reliability, importance of dimensional parameters and manufacturing aspects in Mechanical design considering the failure theories able to apply computer based techniques in the analysis, design and/or selection of machine components.	

MET53– Metrology and Quality Control		Yr/Sem: III/V
CO 1	Students shall demonstrate the knowledge associated with various Standards of length, Use of slip gauges, and System of limits, fits and tolerance and Design of Gauges.	
CO 2	Students shall demonstrate the knowledge associated with Comparators (Mech, Optical, and Electrical& Pneumatic), Use of Sine bar, Interferometer, and measurement of Screw threads & Gear tooth parameters.	
CO 3	Students will be able to work in Quality control and quality assurances divisions in industries	
CO 4	Students are well aware of various basic and advanced Measuring Instruments and their appropriate usage, inspection methods and statistical quality control.	
CO 5	Students will be able to maintain quality in engineering products	

MET54– Heat and Mass Transfer		Yr/Sem: III/V
CO 1	Student will be able to distinguish between various heat transfer methods. Ability to solve problems involving steady and unsteady heat conduction in simple geometries, develop solutions for transient heat conduction in simple geometries.	
CO 2	Enables the students to understand the fundamentals of convective heat transfer process, evaluate heat transfer coefficients for natural convection, evaluate heat transfer coefficients for forced convection inside ducts, and evaluate heat transfer coefficients for forced convection over exterior surfaces. Students will be able to apply analytical techniques for optimizing heat transfer rates.	
CO 3	Calculate radiation heat transfer between black body surfaces; calculate radiation heat Exchange between gray body surfaces. Analyze and calculate heat transfer in complex systems involving several heat transfer mechanisms.	
CO 4	Analyze heat exchanger performance by using the method of log mean temperature difference; analyze heat exchanger performance by using the method of heat exchanger, effectiveness. Student will be able to estimate heat transfer rates by all the three modes of heat transfer in heat exchangers.	
CO 5	Apply principles of heat and mass transfer to basic engineering systems and enables them to solve problems involving mass transfer due to diffusion, chemical reaction, and convection	

MET55– Mechanical Measurements		Yr/Sem: III/V
CO 1	To learn about the basic transducer , terminating devices and methods , calibration principles	
CO 2	To learn get knowledge about the strain measurements and force measurement and torque measurement.	
CO 3	To learn get knowledge about pressure measurement , temperature measurement , flow measurement	
CO 4	To learn and get knowledge about the displacement measurement and motion measurement	
CO 5	To learn and get knowledge about the digital techniques in mechanical measurement	

MEE54– Industrial Casting Technology		Yr/Sem: III/V
CO 1	Students will be able to know in detail about casting process and testing methods. ability to understand the importance of casting process in the overall manufacturing activity and will be in a position to select a suitable casting process for a given application.	
CO 2	To make students aware of working of various Melting Furnaces and refractories used in casting process.	
CO 3	To know the concept of types of gates and risers, gate/riser design and methods of achieving good casting.	

CO 4	Students will learn about the various Special moulding Process that are employed to Manufacture metal and non-metal cast products.
CO 5	Student will be able to know about casting defects and foundry mechanization.

MEP51– Manufacturing Process Lab – III		Yr/Sem: III/V
CO 1	Students gain knowledge about casting methodologies in foundry shop	
CO 2	Student gain the knowledge about CNC Machine and CNC programming for machining operation	
CO 3	Students gain knowledge in ability to do the jobs as per the requiring dimensions by using conventional milling machine, Grinding Machine.	

MEP52– Mechanical Measurement and Metrology Lab		Yr/Sem: III/V
CO 1	Students will be able to work in Quality control and quality assurances divisions in industries	
CO 2	Students will be able to design a sensors and transducers used for stress analysis	
CO 3	Students will be able to design any measuring equipments for the measurement of temperature and flow.	

MEP53– Computational Methods Lab		Yr/Sem: III/V
CO 1	Students can apply numerical methods to solve modern scientific problems	
CO 2	Apply numerical methods to obtain approximate solutions to mathematical problems.	
CO 3	Students can create a program to solve any complex design problems using programming language	

MEP54– General Proficiency – I		Yr/Sem: III/V
CO 1	Student can interact with technical and business communities at international forums.	
CO 2	Student shall be able to demonstrate skills of leadership and team building.	
CO 3	Student shall be able to present appropriate etiquettes, style, manners and graceful Personality.	

VI – SEMESTER

MET61 – Operations Research		Yr/Sem: III/VI
CO 1	To provide students the knowledge of formulating mathematical models for quantitative analysis of managerial problems in industry.	
CO 2	To enable the students apply mathematical ,computational and communication skills needed for the practical utility of operations research for transportation and assignment	
CO 3	Students gain knowledge about inventory, decision and replacement models	
CO 4	To provide students the mathematical models for analysis of real problems in operations research using network and probabilities consideration	
CO 5	To introduce students to research methods and current trends in operations research using simulation and queuing models	

MET62 –Design of Transmission Systems		Yr/Sem: III/VI
CO 1	Able to gain knowledge about various mechanical transmissions systems, Student can select suitable bearing like journal and ball bearing for given Applications.	
CO 2	Can select suitable belt, chain drives for given applications using data book.	
CO 3	Can design spur and helical gears for the transmitting required power.	
CO 4	Design bevel and worm gears for power transmission.	
CO 5	Decide the layout and design the gear box and speed reducer.	

MET63 – Thermal Engineering		Yr/Sem: III/VI
CO 1	The students will be able to understand the basic concepts of fuel air combustion in IC engines, working of SI and CI engines	
CO 2	Students will understand the importance of fuels and its properties which are sustainable and emission free in engine	
CO 3	Students will gain knowledge in the basic concepts compressible flow fundamentals.	
CO 4	Students will gain knowledge about the compressible flow with friction and heat transfer and to know the application of normal shock & their governing equations.	
CO 5	Students will gain an understanding of the principles involved in jet propulsion and rocket engine.	

MET64 – Computer Integrated Manufacturing		Yr/Sem: III/VI
CO 1	On completion of the course the students are expected to be knowledgeable in converting design information in to manufacturing planning and manufacturing control.	
CO 2	To gain knowledge on how computers are integrated at various levels of planning and manufacturing and understand the concept of computer networking, CAD/CAM integration, computer process planning and production planning.	
CO 3	To gain knowledge about the fundamental concept of product design, simultaneous/concurrent engineering and reverse engineering.	
CO 4	To understand the database manufacturing system and to handle the product data and various software	
CO 5	Apply modern computational, analytical, simulation tools and techniques to face the challenges in manufacturing	

MET65 – Control System Engineering		Yr/Sem: III/VI
CO 1	Proficient to know the importance of control engineering in day to day life, basic components to construct control system and different tools used for analysis, efficient usage of mathematical modeling to derive transfer function of any typical system.	
CO 2	Ability to arrive mathematical model for any physical system using differential equations, deduction of transfer function from a complex system using block diagram approach, in depth study of standard test signals for output response of the closed loop control system.	
CO 3	Able to acquire adequate or basic knowledge to obtain the output response of first and second order system using standard test signals, static and dynamic error constants. Design of controllers for a closed loop systems.	
CO 4	Able to understand the concept of stability of control system which is applied in case of dc-dc converters during transient and steady state conditions	
CO 5	Able to acquire adequate knowledge in frequency response of closed loop system using graphical plots and in depth knowledge about state variable method which can be used to apply for mechanical rotational systems	

MEE61 – Automobile Engineering		Yr/Sem: III/VI
CO 1	To enable students identify the different parts of the automobile. Classification of vehicles	
CO 2	To learn working of various parts like engine, transmission, clutch, brakes. Power transmission system	
CO 3	To study how the steering and the suspension systems operate.	
CO 4	Students will know the working of various parts like brakes and chassis.	
CO 5	Students will have good knowledge of battery, ignition system and electronics in automobile.	

MEP61 – Thermal Engineering Lab - I		Yr/Sem: III/VI
CO 1	Compute the various properties of fuels and lubricating oils using suitable tests.	
CO 2	Demonstrate conduction, convection and radiation heat transfer through experiments.	
CO 3	Determination of heat transfer coefficient and Interpret heat transfer enhancement mechanisms.	

MEP62 – Dynamics of Machine Lab		Yr/Sem: III/VI
CO 1	Ability to apply the principles of gyroscopic effects and stabilization on various transport vehicles and applications of various governors	
CO 2	Ability to study the various principles of vibrations of different systems	
CO 3	Ability to apply the principles of balancing of masses to various links, mechanisms and engines	

MEP63 – Computational Fluid Dynamics Lab		Yr/Sem: III/VI
CO 1	Student can design, solve and optimize any real world fluid dynamics and heat transfer applications using CAE Linux Package.	
CO 2	Student can optimize and solve any CFD Problem using simulations in CAE Package	
CO 3	Students can work on any other commercial CFD Package with just a little Introduction.	

MEP64 – General Proficiency - II		Yr/Sem: III/VI
CO 1	Students will be able to effectively use the English language, writing and speaking with clarity, coherence, and persuasiveness.	
CO 2	Students can attend and perform well in Group discussions, personal interview while appearing for a job interview.	
CO 3	Students are well equipped to face GRE and TOFEL exams.	

VII– SEMESTER

MET71 – Computer Aided Design		Yr/Sem: IV/VII
CO 1	The student gains knowledge about the architecture of a CAD software and about the various input, output and storage devices and working of display devices used in a Cad system.	
CO 2	The student gains knowledge about the graphic functions of a cad software and various transformation features used in graphics.	
CO 3	The student gains knowledge about different types of geometric modeling, representation of curves and surfaces, features of modeling packages and various solid modeling techniques.	
CO 4	The student gains knowledge about the concept of visual realism and overview of various modeling packages	

CO 5	Student gains knowledge about the various graphics and data exchange standards and a brief knowledge about CAD Database.
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MET72 – Industrial Engineering and Management		Yr/Sem: IV/VII
CO 1	To familiarize the student about plant layout, plant location and material handling systems	
CO 2	Various method study and work measurement techniques are analyzed in detail	
CO 3	Different methods of forecasting techniques and inventory management concepts are known	
CO 4	Scientific Management methods and financial management techniques are studied in detail.	
CO 5	Important basics of marketing management and human resource management are Studied. Effectively adapt to the changing demands in workplace and are able to perform increasingly complex tasks, and tasks outside their field of expertise.	

MET73 – Refrigeration, Air Conditioning and Cryogenic Engineering		Yr/Sem: IV/VII
CO 1	Learning the simple vapour compression refrigeration and Understanding the P-h chart and T-S chart and various refrigerants and its properties and Discuss Alternative Refrigerants for the future.	
CO 2	To study the vapour absorption refrigeration system and compare the performance of VAR system and VCR system and Study the various alternative refrigeration systems and its advantages and disadvantage	
CO 3	Learn the basics of Psychometric and Study air-conditioning Processes with the help of psychometric chart and To understand the basics of human comfort and factors affecting it .	
CO 4	To Study different types of loads on a building and performance of the cooling on summer and winter air-conditioning	
CO 5	Understanding the science of cryogenic, Working of liquefaction of the cryogenic and cryogenic refrigerator.	

MEE74– Metal Forming Processes		Yr/Sem: IV/VII
CO 1	Understand forming processes classification, flow curves, and their significance, considering the impact of temperature, speed, metallurgical structure, and friction; grasp basic yield criteria concepts and types.	
CO 2	Gain knowledge of forging processes classifications, equipment, and die design; identify forging defects, calculate forging load, explore P/M forging, and examine applications.	
CO 3	Learn about rolling mills, estimating rolling load and power, understanding rolling defects, and applications; explore direct extrusion equipment, hydrostatic extrusion, extrusion of tubes, and determination of extrusion stress; study extrusion defects and applications.	
CO 4	Master drawing techniques for rods, wires, and tubes, including determination of drawing loads through conical dies; explore various sheet metal forming processes such as shearing, blanking, bending, punching, piercing, stretch forming, deep drawing, and rubber pad forming, along with their applications.	
CO 5	Understand high rate energy forming processes, their effects on mechanical properties and microstructures; explore explosive forming, electro hydraulic forming, electromagnetic forming, and water hammer forming.	

MEP71 – Thermal Engineering Lab - II		Yr/Sem: IV/VII
CO 1	Demonstrate the performance of internal combustion engines and air compressors.	
CO 2	Students will be familiar with the working of boilers, steam turbine and take readings on these systems.	
CO 3	Calculate the cooling load of air conditioning systems and cooling towers	

MEP72 –Computer Aided Engineering Lab		Yr/Sem: IV/VII
CO 1	Students will be able to design and draft various components using programming language	
CO 2	Students can model 3D components and visualize and present using CATIA a modeling package	
CO 3	Students can analyze and simulate any structural, Thermal and Fluid Problems using ANSYS an analysis Package.	

MEP73 – Comprehensive Viva - Voce		Yr/Sem: IV/VII
CO 1	Students will be ready to face interviews both at the academic and any core industry sector	
CO 2	The student will be able to exhibit his / her understanding of concepts and application studied in various courses in the previous semesters	
CO 3	The student will be able to deliver employability skills required by his / her target enterprise	

MEP74 – Industrial Visit/Training Report		Yr/Sem: IV/VII
CO 1	Students are exposed to the 'real' working environment and get acquainted with the organization structure, business operations and administrative functions.	
CO 2	To have hands-on experience in the students' related field so that they can relate and reinforce what has been taught at the college	
CO 3	An ability to utilize technical resources	

MEPW7 – Project Work(Phase I)		Yr/Sem: IV/VII
CO 1	The student should be able to apply the relevant knowledge and skills, which are acquired within the technical area, to a given problem	
CO 2	Be able to document and present one's own work, for a given target group, with strict requirements on structure, format, and language usage.	
CO 3	Be able to identify one's need for further knowledge and continuously develop one's own competencies	

VIII– SEMESTER

MET81 – Power Plant Engineering		Yr/Sem: IV/VIII
CO 1	To Teach the students about the working of various steam power generation units with steam cycles and boiler working and its mounting	
CO 2	To provide the students fuel, ash and draught system used for steam power plants.	
CO 3	To provide the students about the steam nozzles and steam turbine and its applications.	
CO 4	To enable students understand in detail about nuclear, gas turbine which play an important role in power generation, Emission control through equipment and process modification	
CO 5	To provide the students to knowledge about economics of power generations	

MET 82 – Professional Ethics and Indian Constitution		Yr/Sem: IV/VIII
CO 1	To help the students to know about the current global issues and its consequences	
CO 2	The students will practice the ethical values of the society.	
CO 3	The students will be efficient enough to handle the human resources.	
CO 4	The students will know about the Indian Constitution, fundamental Rights and duties and act accordingly	
CO 5	The students will be able to understand the global issues and can take initiatives to solve them. Engineer's responsibility for safety	

MEE 83 – Composite Materials		Yr/Sem: IV/VIII
CO 1	Able to understand the fundamental knowledge on composites materials and their unique properties.	
CO 2	To be able to fabricate fiber reinforced, polymer composite products using a variety of processes and to know how variables affect the processing and product performance.	
CO 3	Able to understand about Metal Matrix Composites – Matrix selection, Reinforcement and reinforcement Selection To be able to use rework and repair methods common to the fabrication of composite products.	
CO 4	Student become familiarize in Polymer Matrix Production Methods – Bag Moulding, Compression Moulding, Pultrusion, Filament Winding, Metal Matrix Composites - Fabrication methods – Solid State Techniques and Liquid State Techniques	
CO 5	To acquire knowledge on latest green composites, To be able to synthesis a new advanced composite indigenously by individual student.	

MEE 85 - Maintenance And Safety Engineering		Yr/Sem: IV/VIII
CO 1	Able to analyze the issues of maintenance, reliability and safety of technical systems, Fault finding and diagnostics in engineering industry, Knowledge of lubricants and lubrication systems	
CO 2	Predictive Maintenance knowledge, Understand maintenance requirements of plant and equipment with increased sophistication and complexity. Productive Maintenance (TPM)	
CO 3	Gain knowledge about Reliability: Definition, concept of reliability based design, failure rate, MTTF, MTBF, failure pattern, system	
CO 4	Gain knowledge about Safety and productivity - causes of accidents in industries, reliability Hazard identification and risk assessment in operation and maintenance of Industrial plant Familiarization with prevailing regulations for safe environment and health.	
CO 5	Students get familiarize in Safety Codes and Standards – Air Quality – indoor - outdoor – safe drinking water - General Safety considerations in Material Handling equipment's	

MEPW8 – Project Work (Phase II)		Yr/Sem: IV/VIII
CO 1	The student should be able to apply the relevant knowledge and skills, which are acquired within the technical area, to a given problem	
CO 2	Be able to document and present one's own work, for a given target group, with strict requirements on structure, format, and language usage.	
CO 3	Be able to identify one's need for further knowledge and continuously develop one's own competencies	

MEP81 – Seminar		Yr/Sem: IV/VIII
CO 1	To expose students to the real working environment and get acquainted with the organization structure, business operation and administrative functions	
CO 2	To promote and develop presentation skills and import a knowledgeable society	
CO 3	The student are exposed in conducting a detailed study/survey on the assigned topic and prepare a report.	