

Course Code	Course Name	Course Outcomes
14211001	Mathematics-1	CO-1. Modeling of certain physical phenomena into appropriate matrices and their transformations.
		CO- 2. Transforming line integrals, double and triple integrals into one another in solving mathematical models of some engineering applications.
		CO- 3. Students shall apply Laplace transform techniques in Transient and steady state analysis of electrical circuits, analysis of Structural engineering problems such as deflection of beams, columns etc.
		CO-4. Students are able to understand and apply Green's, Stoke's and Gauss-divergence theorems in solid mechanics, fluid mechanics, electrical engineering and various other fields.
14211002	Mathematics-2	CO-1. Students are able to understand and apply differential equations in solving Hydrodynamics, Electromagnetic fields and Fluid mechanics problems.
		CO- 2. Students are able to understand and apply Numerical Methods in solving Simultaneous equations and Transcendental equations.
		CO-3. Solving engineering problems that can be modeled as ordinary differential equations without finding general solutions.
		CO-4. Students are able to apply Fourier transform techniques to solve the Differential and Partial Differential equations that may arise in electrical circuits, analysis of Structural engineering problems such as deflection of beams, columns etc.
		<ul style="list-style-type: none"> CO-1. The different realms of physics and their applications in both scientific and technological systems are achieved through the study of physical optics, lasers and fiber optics.

14221003	Engineering Physics	<ul style="list-style-type: none"> • CO-2. The important properties of crystals like the presence of long-range order and periodicity, structure determination using X-ray diffraction are focused along with ultrasonic non-destructive technique. • CO-3. The properties and device applications of semiconducting and magnetic materials are illustrated. • CO-4. The importance of super conducting materials and Nano-Materials along with their engineering applications is well elucidated
14231004	Engineering Chemistry	<p>CO-1. Graduate will be able to apply the knowledge of chemistry to identifying and addressing the problems of boilers in industry.</p> <p>CO-2. Graduate will be able to appreciate the use of high polymers in engineering uses.</p> <p>CO-3. Graduate will demonstrate the knowledge of Fuels and lubricating oils in Engines.</p> <p>CO-4. Graduate will be able to appreciate the appropriate analytical methods in chemical analysis using instrumentation.</p>
14241005	English	<p>CO-1. Have improved communication in listening, speaking, reading and writing skills in general.</p> <p>CO-2. Have developed their oral communication and fluency in group discussions and interviews.</p> <p>CO-3. Have improved awareness of English in science and technology context.</p> <p>CO-4. Have achieved familiarity with a variety of technical reports.</p>
14031006	Engineering Drawing	<p>CO-1. Apply principles of drawing in representing dimensions of an object.</p> <p>CO-2. Construct polygons and curves.</p> <p>CO-3. Draw projections of points, lines, planes and solids in different positions.</p> <p>CO-4. Convert the orthographic views into isometric views and vice versa.</p>

14051007	Problem Solving & Programming in C	<p>CO-1. Able to understand the basic building blocks of C.</p> <p>CO-2. Able to use logical structure and control structures of a computer program.</p> <p>CO-3. Able to describe the use of arrays and modular programming</p> <p>CO-4. Able to illustrate the use of memory allocation and file handling functions.</p>
14991008	Engineering Workshop	<p>CO-1. Use marking tools, measuring tools, cutting tools (chisels, saws) used in carpentry and fitting trades to prepare basic carpentry and fitting joints.</p> <p>CO-2. Prepare Foundry jobs like single piece pattern and double piece pattern.</p> <p>CO-3. Make basic house wire connections.</p> <p>CO-4. Fabricate tin smithy jobs using snips, stakes and wooden mallet.</p> <p>(IT-Workshop)</p> <p>CO-5. Able to assemble and disassemble the PC.</p> <p>CO-6. Able to install Windows OS.</p> <p>CO-7. Able to work with MS-Office.</p> <p>CO-8. Able to Browse the Internet.</p>
14051009	Programming in C Lab	<p>CO-1. Able to write, compile and debug programs in C language and use different data types in a computer program.</p> <p>CO-2. Able to implement programs involving decision structures, loops, arrays and functions on different applications.</p> <p>CO-3. Able to implement the modular programming concepts, pointers, structures and unions.</p> <p>CO-4. Able to develop the concepts of file I/O operations and random access to files</p>
		<p>CO-1. Graduate will be able to apply the knowledge of physics laboratory in measuring the standard values.</p> <p>CO-2. Graduate will correlate the theory and experimental results.</p>

14991010	Engineering Sciences Lab	<p>CO-3. Graduate will be able to apply the knowledge of chemistry laboratory in identifying and addressing the problems in hardness of water.</p> <p>CO-4. Able to appreciate the appropriate analytical methods in chemical analysis using instrumentation.</p>
14241011	English Language and Communication Skills Lab	<p>CO-1. Have improved communication in listening, speaking, reading and writing skills in general.</p> <p>CO-2. Have developed their oral communication and fluency in group discussions and interviews.</p> <p>CO-3. Have improved awareness of English in science and technology context.</p> <p>CO-4. Have achieved familiarity with a variety of technical reports.</p>
14112101	ENGINEERING MECHANICS	<p>CO1. In order to assess the student's progress towards achieving the learning outcomes, a number of home work problems may be assigned, graded and handed back to the student. Introduction on Law of mechanics,</p> <p>CO2. At the end of the course the student have clear concept about centroid, Moment of Inertia, polar moment of inertia, parallel & perpendicular axis theorems.</p> <p>CO3. Also student learn about Law & types of friction, power transmission systems. Newton's law of motion, D'Alembert's principles & projectiles. simple stresses-strains and strain energy</p> <p>CO5. Ability to explain the differential principles applies to solve engineering problems dealing with force, displacement, velocity and acceleration.</p> <p>CO6. Ability to analyse the forces in any structures.</p>
		<p>learning outcomes, a number of homework problems may be assigned, graded and handed back to the students.</p> <p>find out strength and breaking point of given body. In deflection of beams, students can find out the bending moment and what load beam takes.</p> <p>CO3. Use references that provide tabulated physical data that are by</p>

14112102	MECHANICS OF SOLIDS	using Macaulay's method problems are solved easily.
		CO4.The students can able to apply mathematical knowledge to calculate the deformation behavior of simple structures.
		mechanical elements and analyse the deformation behavior for different types of loads.
		CO6: Acquire the knowledge of calculating complex stress in columns and shafts.
14992103	ELECTRICAL ENGINEERING AND ELECTRONICS ENGINEERING	CO 1: Analyze simple DC circuits and AC circuits.
		CO 2: Utilize the significance of Electrical machines and Transformers
		CO 3: Apply knowledge on semi-conductor diodes and its applications.
		CO 4: Appreciate the importance of SMPS and UPS for computers
		outcomes, Every engineer should know the basic knowledge of electronic components in our real life, like a simple diode is used in rectifier that is convert AC to DC and mainly used in adapters.
		component in electronics usage of like amplifier, TV's, Radio's. Most important measuring instrument that is CRO .Now a days most used microprocessor application like Calculator, CPU, and Robotics
		CO7.Ability to identify the electrical components explain the characteristics of electrical machines
14032104	MATERIAL SCIENCE AND ENGINEERING	CO 1: Students understands the relationship between the structure, properties of metallic,non metallic ,ceramic and composite materials.
		CO2: Students understands materials and heat treatment methods for various industrial applications.
		the different materials, their processing, heat treatments in suitable application in mechanical engineering fields.
14032105	BASIC THERMODYNAMICS	learning outcomes, a number of homework problems are assigned, graded and handed back to the students.
		the Thermodynamic Principles to Mechanical Engineering Application.

		CO3: Apply mathematical fundamentals to study the properties of steam, gas and gas mixtures
14032106	MACHINE DRAWING	engineers. Since machines are made by assembling different parts, Students know how to join.
		CO2.Many solved examples on assembly drawing are practiced to give a comprehensive idea to the students
		CO3.Theory questions at the end of each topic help students in the application during their career.
		evaluating students quickly for short quizzes and to answer well in interviews. A large number of unsolved problems for practice are given to create a thorough grasp on the concepts of the drawing
14992107	MATERIAL SCIENCE LAB & MECHANICS OF SOLIDS LAB	properties of metallic, non metallic, ceramic and composite materials.
		CO2. Ability to characteristic materials.
		CO3. Ability to perform different destructive testing.
14992108	ELECTRICAL & ELECTRONICS ENGINEERING LAB	CO1. Ability to perform speed characteristic of different electrical machine.
		CO2. To get diode, BJT and JFET VI characteristics
		CO3. To verify zener diode as regulator and full wave rectifier and filters
		CO4. To test single stage BJT amplifier and single stage JFET amplifier
		CO5. To check RC phase shift oscillator's performance
14252109	HUMAN VALUES AND PROFESSIONAL ETHICS	CO1. Students understand Professional ethics which includes moral issues and virtues, social responsibilities of an engineer
14212201	PROBABILITY AND STATISTICS	CO1. Acquire knowledge of introductory probability and statistics.
		CO2. Develop an appreciation of the fact that lack of complete, deterministic knowledge about the state of a system does not mean lack of knowledge altogether.
		CO3. Learn how to build probabilistic models that describe imperfect state information. And learn how to update these models as additional information is obtained.

		<p>CO4. Develop problem-solving approaches to learning and acquiring information through sampling</p> <p>CO5. Understand how redundancy of functional components of a system and the general system architecture affect system reliability.</p> <p>engineering & industry using the techniques of testing of hypothesis, ANOVA, Statistical Quality Control and Queuing theory and draw</p>
14012202	ENVIRONMENTAL STUDIES	<p>learning outcomes, a number of home work problems may be assigned, graded and handed back to the student.</p> <p>knowledge about the environment in which we live in land resources and its importance, forest, water and energy resources and how it rectifies transportations, Industrialization on the quality of environment and do the various projects on case the environmental problems in drinking water ,sanitation and public health, Effects of mere laws. Public participation is an important aspect which serves the environmental Protection. One will obtain knowledge on the following after completing the course.</p> <p>CO4.Public awareness of environmental is at infant stage.</p> <p>CO5.Development and improvement in std. of living has lead to serious environmental disasters</p>
14112203	MECHANICALS OF FLUIDS	<p>properties and their engineering significance. The student is able to differentiate between different pressures and study the methods of fluid pressure measurement. Calculation of forces on different surfaces is also known to the student.</p> <p>fundamentals of fluid flow and its description. The student is exposed to the fundamental equations, used in the analysis of fluid flow problems like continuity, energy and momentum equations.</p> <p>flow and the conditions governing them. Equations related to different flows are derived and the student gets to understand the working of the different devices used for measurement of fluid flow</p> <p>CO4. At the end the student shall have understanding of the boundary layer and its significance along with the various concepts of boundary layer like its growth, thickness and separation.</p> <p>importance of the forces exerted by the fluid on the body and vice</p>

		<p>versa. These concepts will be helpful to the student in understanding the effect of these forces on flatplate, sphere, cylinder and airfoil. The student is also exposed to engineering applications of the</p>
1402204	KINEMATICS OF MACHINERY	<p>CO1. After completion students are in a position to identify different mechanisms, inversions of different kinematic chains and</p>
		<p>CO2. After completion students are able to understand the mechanism of Hooke's joint, steering mechanisms and belt friction.</p>
		<p>acceleration diagrams of simple plane mechanisms by using relative velocity method and instantaneous center method.</p>
		<p>diagram and cam profile for different types of motions of the follower. And also to find the displacement, velocity and acceleration of the follower at different positions of cam with</p>
		<p>terminology, types of gears, length of path of contact, contact ratio and interference in gears. Further students are also able to design the</p>
14032205	THERMAL ENGINEERING – I	<p>help of indicator diagrams. Student can differentiate the working of 2-S and 4-S engines and also can draw valve and port timing diagrams. Student can know applications of IC engine in the</p>
		<p>lubrication and ignition systems. Student can understand how auxiliary systems play key role in increasing the performance of an</p>
		<p>cylinder, stages of combustion in S.I and C.I engines. Student can understand the knocking phenomenon. Student can know about Octane number and Cetane number of fuels and properties of fuel.</p>
		<p>and friction power and their methods of measurement. Student can understand the methods to increase the engine performance. Also, student can know calculating specific fuel consumption, A/F ratio and mean effective pressure and estimating heat losses etc.</p>
		<p>rotary air compressors. Student can calculate work done by single and multistage reciprocating air compressors. Student can understand how intercooling reduces the work done / kg of air.</p>
		<p>of patterns and gating systems, moulds, methods of moulding, moulding machines and solidification of castings of various metals.</p>
		<p>methods and their applications, design of risers and feeding systems, crucible melting, cupola operation and steel making process. The students may also be able to design a casting process on his own.</p>

14032206	MANUFACTURING TECHNOLOGY	processes, welds and weld joints, their characteristics, cutting of ferrous and non-ferrous metals by various methods.
		CO4. Students can understand about advanced welding process, heataffected zone(HAZ), Defects and Identification Methods.
		CO5. Students can understand the various surface treatment processes.
14112207	FLUID MECHANICS AND HYDRAULIC MACHINES LAB	CO1: Apply knowledge of compression and tension test procedure on materials.
		CO2: conduct performance tests on pumps and turbines and draw the performance curves.
14032208	MANUFACTURING TECHNOLOGY LAB	CO1: Operate lathe and make parts by performing plain turning, taper turning, eccentric turning and thread cutting operations.
		CO2: Students can understand different welding processes.
		CO3. Students can understand the pattern making, sand compression strength test etc...
14033101	INDUSTRIAL MANAGEMENT	organizations, Management Principles, Concepts and various Schools of Thought on Management, and also the various types of Organizational Structure need to be followed based on size, type of quantitative parameters for locating a plant and decide on plant layouts and optimization.
		study, work simplification, standardization and improving the method of doing work and also setting time standards for doing work and procedures to arrive at the standard time.
		functions of HRM, methods of Performance Evaluation, Wage and Incentive Calculation. They will also know the Difference between Inspection & Quality Control, Statistical Quality Control Techniques, TQM, BIS & ISO and also functions of HRM.
		CO1. Student can be able to illustrate the power generation through Rankine cycle. Student can able understand efficiency enhancement methods of Reheating and regeneration. Student can able to understand the key role of quality of steam after evaporation.
		pressure and low pressure boilers. Student can distinguish mountings and accessories. The student can calculate the chimney height for maximum discharge. Student can know the draughts and its

14033102	THERMAL ENGINEERING II	application in the steam generator.
		CO3. Student can be able to distinguish the ideal flow and actual flow through nozzle. Student can know the importance of maximum discharge through nozzle. Student can able to entail the concept of Critical pressure ratio in calculations. Student can able to understand the effect of meta stable flow/ Super saturation flow through nozzle.
14033103	DYNAMICS OF MACHINERY- I	reaction turbines. Student can able to construct the velocity triangle and combined velocity triangle and can learn its importance in determining the power produced by the turbine. Student can know why to reduce the rotor speed and methods to reduce.
		CO1. Student can able to understand different types of gear trains.
		CO2. Student can able to understand types of transmission units like belt, rope, chain etc...
		CO3. Student can able to understand brakes and dynamometers.
		CO4. Student can able to understand the concept of turning moment diagrams, flywheels and punching press.
14033104	MACHINE TOOLS	CO5. Student can able to understand working of different Governors.
		philosophy of metal cutting and the mechanism of chip formation. Student will understand the interface in the machining zone between the tool and the work piece and how the physical and mechanical parameters dictate the cutting performance.
		shaping and planning operation, parts of the drilling, shaping and planning machines and tool holding devices, operations performed on drilling, shaping and planning and machining calculations.
14033105	DESIGN OF MACHINE ELEMENTS-I	grinding, Lapping, Honing and Broaching \ operation, parts of the milling machine and types of milling and grinding machines.
		CO1. Students are capable to apply design procedures using theories of failure for different elements.
		CO2. Students are able to design simple components under cyclic loading using Goodman's and Soderberg's criterions.
		configuration, boiler shell joint design and eccentric loading design of riveted joints. Further students are able to design bolted joints

		with direct loading and eccentric loading.
		CO4. Students are able to design cotter joint, knuckle joint and shafts.
		CO5. After completion of this unit students are able to design various rigid and flexible shaft couplings.
14033106	HEAT TRANSFER	CO1. Student can able to grasp the concept of steady state conduction. Student can learn representing conduction equation in various forms.
		CO2. Student is expected understand the concept of extended surfaces and its applications. Also, student can aware transient heat conduction and how it vary w.r.t time.
		natural convection heat transfer problems by transforming the physical system into a mathematical model, selecting an appropriate solution technique and evaluating the significance of results. Students will also demonstrate an ability to analyze the
		calculate heat transfer in condensation and boiling systems, turbulent and laminar film condensation. Student can understand the concepts of critical heat flux and different models of critical heat flux. Student can able to grasp the fundamentals of heat exchangers and its
14243107	ADVANCED ENGLISH COMMUNICATION SKILLS LAB	CO1. Students improving the proficiency in English at all levels.
		group discussions, to help them face interviews, and sharpen public speaking skills and enhance the confidence of the student by exposing him/her to various situations and contexts which he/she
14033108	THERMAL ENGINEERING LAB	CO1. Ability to conduct experiment on IC engine to study the characteristic and performance of IC engine.
		CO2. Students are able to understand the value timing-V diagram and performance of IC Engines
		CO3. Students are able to understand the characteristics of fuels/Lubricates used in IC Engines
		CO1. Students are able to understand concepts and tools of economic analysis.
	MANAGERIAL ECONOMICS &	CO2. Students are able to understand managerial economics through differential economics concepts, accounting concepts are

14253201	MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS	<p>necessary to analyze and solve complex problems relating</p> <p>CO3.Students are able to understand professional and ethical responsibility and ability to communicate effectively.</p> <p>CO4.Sudents Recognized the need for, and an ability to engage in life-long learning and to meet contemporary issues.</p>
14033202	OPERATIONS RESEARCH	<p>real life situations and capable of obtaining best solution using Graphical Method and Simplex Method.</p> <p>simplifying the solution procedure for certain LPPs, and solve the special cases of LPP such as Transportation and Assignment problems. A large number of problems are to be solved by the student in order to gain much required capability of handling the</p> <p>CO3.The student will have knowledge of choosing the best strategy out of the available strategies which is an essential skill for any business manager to successfully face the competition.</p> <p>technique to solve the complex problems by breaking them into a series of sub-problems.</p>
14033203	DYNAMICS OF MACHINERY - II	<p>CO1:- Students can apply gyroscopic principles on Aeroplane, ship, four wheel and two wheel vehicles..</p> <p>rotating masses and reciprocating masses in V-engine and multi cylinder engines.</p> <p>degree offreedom systems with free and forced vibrations, evaluate the critical speed of the shaft and simple vibration calculations of rotor systems.</p> <p>CO4.Students undergo for more number of problems on single degree of freedom system, transverse and torsional vibrations.</p>
14033204	REFRIGERATION AND AIR	<p>with refrigeration and also understand the basic principles of Refrigeration and applications. Student can also know the aspects of various natural refrigeration methods; understand the components of Air refrigeration system and the necessity of air craft refrigeration.</p> <p>thecomponents in the domestic refrigerator, analyzing the concepts of sub-cooling and super heating to improve the COP and also necessity of replacements for CFCs and HCFCs with new</p> <p>components of the absorption refrigeration system. Student can have knowledge on latest developments of Electrolux, thermo</p>

14033204	CONDITIONING	<p>electric vortex tube methods.</p> <p>in Air conditioning. Student can learn the use of psychrometric chart to know psychrometric properties of air. Student can able to understand the terms sensible heat load and latent heat load. This technical information is fundamental to all types of domestic, commercial and industrial systems for the calculations of heat loads.</p> <p>describe the cooling equipment combinations. Student can describe the concept of human comfort chart and the processes by which the body produces and rejects heat.</p>
14033205	DESIGN OF MACHINE ELEMENTS– II	<p>roller bearings and to know the advantages of rolling contact bearings against sliding contact bearings.</p> <p>CO2. students are able to know various forces acting on I C engine parts and failure criteria to be adopted for various parts.</p> <p>CO3. students are able to design crane hooks, C-clamps and various belt, rope and chain drives.</p> <p>and laminated springs for trucks. Also students can apply design concepts in designing power screws.</p> <p>CO5. students are able to design spur and helical gears for different input conditions.</p>
14033206	AUTOMOBILE ENGINEERING	<p>component of an automobile. Student can understand the use of turbo charging and super charging.</p> <p>standards, emission control techniques and electrical systems. Student can identify thrust areas for carrying their dissertation in</p> <p>CO3. student can have broad knowledge on each and every component of transmission system of a automobile.</p> <p>CO4. student can able to understand purpose and methods of steering systems and their applications.</p> <p>CO5. Student can have ample knowledge on suspension system and braking system of an automobile.</p>
		<p>CO1. students can understand the fundamental principle, operation, performance of IC Engines, auxiliary systems, combustion of SI & CI engines, various fuels used and engine emissions.</p>

14033207	INTERNAL COMBUSTION ENGINES	CO2.students acquired the knowledge of engine components and fuel air cycles.
		CO3. students can understand the working of engine auxiliary systems.
		CO4. Students can understand the combustion aspects of SI Engines
		CO5. Students can understand the combustion aspects of CI Engines.
		CO6. Know the various alternate fuels, engine emissions, measuring and control techniques
14033208	ENTREPRENEURSHIP	opportunities and importance of woman to become an entrepreneur. It also gives the clear view of how a venture needs to be established with the available resources.
		CO2. Students can understand the financing & managing the capital & venture expansion strategies,
		Entrepreneurship. It also gives the information on location of plants & various public issues, material handling & production
14033209	METROLOGY AND MACHINE TOOLS LAB	CO1.Ability to handle different measurement tools and perform measurements in quality impulsion.
		CO2. Student can operate slotting, shaping and drilling machines;
		CO3: Students can understand different operations on slotting, shaping and drilling machines.
14033210	HEAT TRANSFER AND DYNAMICS LAB	CO1. Ability to demonstrate the principles of kinematics and dynamics of machinery.
		CO2. Ability to use the measuring devices for dynamic testing.
		coefficient used in that transfer application and also design refrigeration cycle.
		components of CAD/CAM, input and output components of CAD, Steps involved in computer aided design.
		component in CAD technology of computer graphics. The techniques of raster technology, scan conversion, clipping,removal of hidden lines and hidden surfaces, color, shading and texture.

14034101	CAD/CAM	<p>complex part in most of CDA software packages. Hence the students should focus on various requirements of information that are generated during geometric modeling stage, various types and its applications. Mathematical representations of curves used in</p> <p>benefits of mass production to relatively smaller production. Understanding the need of computers in process planning and QC. Understanding the definition and concept of FMS, and its</p>
14034102	METROLOGY	<p>CO1. students are able to understand the Limits, Fits and Tolerance. Indian standard system – International Standard organization system.</p> <p>commonly used instruments for measuring linear and angular distances.</p> <p>optical measuring instruments, flatness measurement methods and measuring methods of surface roughness.</p> <p>measuring methods, Gear tooth profile measurement, CMM, Alignment tests on lathe, milling and drilling machinetools.</p>
14034103	FINITE ELEMENT METHODS	<p>CO1. students are able to know introductory basic principles and approaches for solving FEM problems in different fields.</p> <p>CO2. students are able to formulate FEM model for simple problems.</p> <p>CO3. students are able to write interpolation functions to higher order isoparametric elements.</p> <p>principles to find stresses in beams and trusses and temperature distribution in composite walls and fins.</p> <p>problems using FEM and also to apply boundary conditions in realistic problems.</p>
14034104	INSTRUMENTATION AND CONTROL SYSTEMS	<p>CO1. student can select appropriate device for the measurement of parameters like temperature, pressure, speed, stress, humidity, flow velocity etc., and justify its use through</p> <p>CO2. students are able to understand fundamentals of various types of Transducers.</p> <p>CO3. students are able to understand principle & working of Transducers</p> <p>CO4. students are able to understand the methods to analyze the stability of systems from transfer function forms.</p>

14034105	PRODUCTION AND OPERATIONS MANAGEMENT	<p>controls operations and its functions, productivity and productivity measurements, design of goods and services and aggregate planning.</p> <p>long term and short term forecasting and application of qualitative and quantitative methods for finding the future demands.</p> <p>located based on facilities available and what are the important factors affecting the facilities location of a plant, and plant layout. And also able to understand plant layout design to facilitate material flow and processing of a product in the most efficient manner through the shortest possible time. Can compare the rural & urban management applied to develop lean enterprise and basic concepts JIT, Six sigma control etc.,</p> <p>flow shop and job shop scheduling techniques and concepts of Inventory, Classification, Functions, it's associated costs etc., and also able to recognize the importance of Inventory control to ensure their availability with minimum capital lock up.</p>
14034106	COMPUTATIONAL FLUID DYNAMICS	<p>of numerical methods adopted. Students also discusses about various solutions for the numerical methods adopted in CFD.</p> <p>equations, including the governing flow equations which is the foundation for the finite difference method. Explicit and implicit approaches represent the fundamental distinction between various and how the numerical calculations become unstable and also entails the conservations of mass, momentum and energy equations to the fluid flow along with Navier stokes equation.</p> <p>mechanics, its governing differential equations and boundary conditions.</p> <p>solutions for flow problems. These equations are applicable to time and space marching solutions especially parabolic hyperbolic and elliptic equations.</p>
		<p>and controlling the various machines, robots etc. Students may observe CNC machines in CAD/CAM lab to understand the mechatronics concepts.</p> <p>useful required form. These signal condition systems may be observed in electronics and communication engineering department about some precisions mechanical component which are useful in</p>

14034107	MECHATRONICS	<p>the field of automation. This automation system can be observed in many processing industries and manufacturing industries to handle the materials and control the machines (or) process.</p> <p>used in automation. Some of the systems may be observed electrical and electronics labs for better understanding.</p> <p>of programmable logic controls. Students may visit pharmaceutical industries, thermal power plants etc. To observe the PLC based control systems. to know about the interface between processing</p>
14034108	MODERN MANUFACTURING METHODS	<p>machining processes, features, classifications and applications of non-traditional methods.</p> <p>CO2. students are able to understand the processes of USM and AJM, process parameters, application and limitations.</p> <p>and applicable in manufacturing environment in terms of accuracy, surface finish and MRR and their relative advantages and disadvantages. He has to understand the chemical machining</p> <p>metal removal processes, principle of working, accuracy in machining, surface finish, tool selection and other machining</p> <p>electron beam and laser beam in manufacturing environment, accuracy, machining speed and etc, with respect to all non-traditional machining processes.</p>
14034109	TOOL DESIGN	<p>tooling materials, processing of plastics for tooling materials, heat treatment of materials, ferrous, nonferrous, non-metallic, tooling materials.</p> <p>CO2. students are able to understand single point cutting tool geometry and its design theory of chip formation.</p> <p>CO3. students are able to understand the drilling tool geometry and its design. Tool life, machinability and tool wear.</p> <p>and advantages and disadvantages of Jigs and fixtures, types of Jigs & Fixtures – Principles of location and clamping. Some examples of jigs and fixtures.</p> <p>like punching, blanking, bending, drawing and forming, types of power presses, design of die, strip layout.</p>
		<p>suited to the demand. Student can have an idea of various power plants. Student can understand economics of power distribution,</p>

14034110	POWER PLANT ENGINEERING	Power Tariff, Load Factor and other related terms.
		concept of fluidized bed combustion and importance of handling and storage. Student can able to learn the waste heat recovery methods.
		In addition, student can know various cooling towers and its turbine plants. Student can distinguish Open cycle and closed cycle gas turbine cycles.
		to understand the methods of storing water and can have an idea over constructions of dams and spill ways. Student can enable to draw the layout of hydel power plant.
		secondary energy sources. Student can able to understand the power generation through solar energy, wind energy, MHD and Nuclear energy.
14034111	INSTRUMENTATION AND CONTROL SYSTEMS LAB	CO 1. students will be able to calibrate instrument and conduct the experiments with minimum error in measurements.
		CO 2. Students will be able to assess the properties of oils for suitability to various applications.
14034112	CAD / CAM LAB	CO1: students will be able to develop and model mechanical system using CAD packages.
		CO2: students will be able to simulate and execute part program in CNC machine.
14034201	AUTOMATION & ROBOTICS	types of automation, components of automation, strategies and levels of automation.
		quantitative analysis of flow lines, how the assembly is carried out on automated flow line without interruption and how to balance the line and flexible assembly lines.
		CO3. Student should come to know the various components in the anatomy of robot. By knowing this the student may apply in the design of new robotic structure.
		which may adopt in different applications of robot. Student also knows the control motion mechanism in all devices of robot and
		CO 1: students will be able to develop skills for designing and installing the energy conversion and justify storage systems

14034202	RENEWABLE ENERGY SOURCES	<p>CO 2: students will be able to explore the resources of bio energy</p> <p>CO3.students can able to identify the new methodologies /technologies for effective utilization of renewable energy sources.</p>
14034203	GAS TURBINES AND JET PROPULSION	<p>CO1.student can analyze the simple gas turbine cycle in determining the specific work and fthermal efficiency. Also, student can able to know the methods in improving them is using combinations of reheating as well as regeneration.</p> <p>CO2.student can able to understand the basic principle of jet propulsion. Also, student can able to know the working of various Pilotless and piloted propulsion devices.Student can under stand thrust equations , calculating propulsive power, and propulsion efficiency.</p> <p>CO3.student can analyze the working of ramjet engine thermodynamically. Student can aware the calculations related to efficiency. Student can distinguish the working of Ramjet from Pulsejet and Serquijet engines.</p> <p>CO4.student can able to understand the working of rocket engine. Student can have knowledge on propellants of rocket engines. Student can aware of parameters affecting the parameters of performance. Student can get difference between various domains of application.</p> <p>Student can know advanced topics of rocket transfer, ablative cooling. Student can understand the importance of cryogenic engine</p>
14034204	GEOMETRIC MODELLING	<p>CO1.student can able to understand to produce engineering drawings.</p> <p>CO2.student can able to understand applications of geometric modeling techniques</p> <p>CO3.student can able to understand modeling complex curves and surfaces.</p>
		<p>CO1.student can able to understand the need of composite materials and know the properties, types and applications of various types of composites.</p>

14034205	COMPOSITE MATERIALS	<p>CO2.student can able to understand the Types of polymers Thermosetting and thermoplastic resins etc, types of fibers and manufacturing methods of polymers.</p> <p>CO3.student can able to understand the various types of metal composites and difference between alloy and metal composites,and manufacturing methods of metal composites.</p> <p>CO4.student can able to understand the properties advantages, limitations of ceramics, types of ceramics and manufacturing methods of ceramic composites.</p> <p>limitations of carbon composites and manufacturing methods of carbon composites.</p>
14034206	PROFESSIONAL ETHICS AND INTELLECTUAL PROPERTY RIGHTS	<p>CO1. 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</p> <p>CO 2: students will be able to develop an ethical behavior under all situations.</p> <p>CO 3: students will be able to estimate the impact of self and organization's actions on the stakeholders and society.</p>