SINHGAD TECHNICAL EDUCATION SOCIETY'S
SINHGAD INSTITUTE OF TECHNOLOGY
(Affiliated to SPPU Pune and Approved by, AICTE, New Delhi.)
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Department of Mechanical Engineering

Course Outcomes (COs) 2019 Pattern

SE [Mech]2019 Pattern			
SN	**Course Code**	**Course Name**	**Course Outcomes (COs)**
01	**202041**	**Solid Mechanics**	CO1: DEFINE various types of stresses and strain developed on determinate and indeterminate members.
			CO2: DRAW Shear force and bending moment diagram for various types of transverse loading and support.
			CO3: COMPUTE the slope & deflection, bending stresses and shear stresses on a beam.
			CO4: CALCULATE torsional shear stress in shaft and buckling on the column.
			CO5: APPLY the concept of principal stresses and theories of failure to determine stresses on a 2-D element.
			CO6: UTILIZE the concepts of SFD & BMD, torsion and principal stresses to solve combined loading application based problems.
02	**202042**	**Solid Modeling and Drafting**	CO1: UNDERSTAND basic concepts of CAD system, need and scope in Product Lifecycle Management.
			CO2: UTILIZE knowledge of curves and surfacing features and methods to create complex solid geometry.
			CO3: CONSTRUCT solid models, assemblies using various modelling techniques & PERFORM mass property analysis, including creating and using a coordinate system.
			CO4: APPLY geometric transformations to simple 2D geometries.
			CO5: USE CAD model data for various CAD based engineering applications viz. production drawings, 3D printing, FEA, CFD, MBD, CAE, CAM, etc.
			CO6: USE PMI & MBD approach for

			communication.
03	**202043**	**Engineering Thermodynamics**	CO1: DESCRIBE the basics of thermodynamics with heat and work interactions.
			CO2: APPLY laws of thermodynamics to steady flow and non-flow processes.
			CO3: APPLY entropy, available and non available energy for an Open and Closed System,
			CO4 DETERMINE the properties of steam and their effect on performance of vapour power cycle.
			CO5: ANALYSE the fuel combustion process and products of combustion.
			CO6: SELECT various instrumentations required for safe and efficient operation of steam generator.
04	**202044**	**Engineering Materials and Metallurgy**	CO1: COMPARE crystal structures and ASSESS different lattice parameters.
			CO2: CORRELATE crystal structures and imperfections in crystals with mechanical behaviour of materials.
			CO3 DIFFERENTIATE and DETERMINE mechanical properties using destructive and non- destructive testing of materials.
			CO4: IDENTIFY & ESTIMATE different parameters of the system viz., phases, variables, component, grains, grain boundary, and degree of freedom. etc.
			CO5: ANALYSE effect of alloying element & heat treatment on properties of ferrous & nonferrous alloy.
			CO6: SELECT appropriate materials for various applications.
05	**203156**	**Electrical and Electronics Engineering**	CO1: APPLY programming concepts to UNDERSTAND role of Microprocessor and Microcontroller in embedded systems.
			CO2: DEVELOP interfacing of different types of sensors and other hardware devices with Atmega328 based Arduino Board.
			CO3: UNDERSTAND the operation of DC motor, its speed control methods and braking.
			CO4: DISTINGUISH between types of three

			phase induction motor and its characteristic features
			CO5: EXPLAIN about emerging technology of Electric Vehicle (EV) and its modular subsystems.
			CO6: CHOOSE energy storage devices and electrical drives for EVs.
06	**202045**	**Geometric Dimensioning and Tolerancing Lab**	CO1: SELECT appropriate IS and ASME standards for drawing
			CO2: READ & ANALYSE variety of industrial drawings
			CO3: APPLY geometric and dimensional tolerance, surface finish symbols in drawing
			CO4: EVALUATE dimensional tolerance based on type of fit, etc.
			CO5: SELECT an appropriate manufacturing process using DFM, DFA, etc.
07	**207002**	**Engineering Mathematics - III**	CO1: SOLVE higher order linear differential equations and its applications to model and analyze mass spring systems.
			CO2: APPLY Integral transform techniques such as Laplace transform and Fourier transform to solve differential equations involved in vibration theory, heat transfer and related mechanical engineering applications.
			CO3: APPLY Statistical methods like correlation, regression in analysing and interpreting experimental data applicable to reliability engineering and probability theory in testing and quality control.
			CO4: PERFORM Vector differentiation & integration, analyze the vector fields and APPLY to fluid flow problems.
			CO5: SOLVE Partial differential equations such as wave equation, one and two dimensional heat flow equations.
08	**202047**	**Kinematics of Machinery**	CO1: APPLY kinematic analysis to simple mechanisms.
			CO2: ANALYZE velocity and acceleration in mechanisms by vector and graphical method.
			CO3: SYNTHESIZE a four bar mechanism with analytical and graphical methods.
			CO4: APPLY fundamentals of gear theory as a prerequisite for gear design.
			CO5: Construct cam profile for given follower motion.

09	**202048**	**Applied Thermodynamics**	CO1: Determine COP of refrigeration system and Analuze psychrometric processes.
			CO2: DISCUSS basics of engine terminology, air standard, fuel air and actual cycles.
			CO3: IDENTIFY factors affecting the combustion performance of SI and CI engines.
			CO4: DETERMINE performance parameters of IC Engines and emission control.
			CO5: EXPLAIN working of various IC Engine systems and use of alternative fuels.
			CO6: Calculate performance of single and multi stage reciprocating compressors and DISCUSS rotary positive displacement compressors.
10	**202049**	**Fluid Mechanics**	CO1: DETERMINE various properties of fluid.
			CO2: APPLY the laws of fluid statics and concepts of buoyancy.
			CO3: IDENTIFY types of fluid flow and terms associated in fluid kinematics.
			CO4: APPLY principles of fluid dynamics to laminar flow.
			CO5: Estimate friction and minor losses in internal flows and DETERMINE boundary layer formation over an external surface.
			CO6: Construct mathematical correlation considering dimensionless parameters, also ABLE to predict the performance of prototype using model laws.
11	**202050**	**Manufacturing Processes**	CO1:Select appropriate moulding, core making and melting practice and estimate pouring time, solidification rate and DESIGN riser size and location for sand casting process.
			CO2: Understand mechanism of metal forming techniques and Calculate load required for flat rolling.
			CO3: Demonstrate press working operations and apply the basic principles to design dies and tools for forming and shearing operations.
			CO4: Classify and explain different welding processes and evaluate welding characteristics.
			CO5: Differentiate thermoplastics and thermosetting and explain polymer processing techniques.
			CO6: UNDERSTAND the principle of manufacturing of fibre-reinforce composites

			and metal matrix composites.
12	202051	Machine Shop	CO1: PERFORM welding using TIG/ MIG/ Resistance/Gas welding technique.
			CO2: MAKE Fibre-reinforced Composites by hand lay-up process or spray lay-up techniques.
			CO3: PERFORM cylindrical/surface grinding operation and CALCULATE its machining time.
			CO4: DETERMINE number of indexing movements required and acquire skills to PRODUCE a spur gear on a horizontal milling machine.
			CO5: PREPARE industry visit report.
			CO6: UNDERSTAND procedure of plastic processing.
13	202052	Project Based Learning - II	CO1: IDENTIFY the real-world problem (possibly of interdisciplinary nature) through a rigorous literature survey and formulate / set relevant aims and objectives.
			CO2: ANALYZE the results and arrive at valid conclusions.
			CO3: PROPOSE a suitable solution based on the fundamentals of mechanical engineering by possibly integration of previously acquired knowledge.
			CO4: CONTRIBUTE to society through proposed solutions by strictly following professional ethics and safety measures.
			CO5: USE of technology in proposed work and demonstrate learning in oral and written form.
			CO6: DEVELOP ability to work as an individual and as a team member.

Course Outcomes (COs) 2019 Pattern

SE [Mech]2015 Pattern			
SN	**Course Code**	**Course Name**	**Course Outcomes (COs)**
01	**207002**	**Engineering Mathematics-III**	CO1:Solve higher order linear differential equations and apply to modeling and analyzing

			mass spring systems
			CO2: Apply Laplace transform and Fourier transform techniques to solve differential equations involved in Vibration theory, Heat transfer and related engineering applications.
			CO3: Apply statistical methods like correlation, regression analysis in analyzing, interpreting experimental data and probability theory in testing and quality control.
			CO4: Perform vector differentiation and integration, analyze the vector fields and apply to fluid flow problems.
			CO5: Solve various partial differential equations such as wave equation, one and two dimensional heat flow equations.
02	**202041**	**Manufacturing Process - I**	CO1: To make acquaintance of foundry processes pattern making and casting
			CO2: To study metal forming processes such forging, rolling, extrusion and wire drawing
			CO3: To make study of different plastic molding processes
			CO4: To study metal joining processes
			CO5: To design and development of product with Sheet metal working process
			CO6: Introduction to center lathe
03	**202042**	**(Computer Aided Machine Drawing)**	CO1: Understand the importance of CAD in the light of allied technologies such as CAM, CAE, FEA, CFD, PLM.
			CO2: Understand the significance of parametric technology and its application in 2D sketching.
			CO3: Understand the significance of parametric feature-based modelling and its application in 3D machine components modelling.
			CO4: Ability to create 3D assemblies that represent static or dynamic Mechanical Systems.
			CO5: Ability to ensure manufacturability and proper assembly of components and assemblies.
			CO6: Ability to communicate between Design and Manufacturing using 2D drawings
04	**202043**	**Thermodynamics)**	CO1: Apply various laws of thermodynamics to various processes and real systems.
			CO2: Apply the concept of Entropy, Calculate heat, work and other important thermodynamic properties for various ideal gas processes.
			CO3: Estimate performance of various Thermodynamic gas power cycles and gas refrigeration cycle and availability in each case.

			CO4: Estimate the condition of steam and performance of vapour power cycle and vapour compression cycle
			CO5: Estimate Stoichiometric air required for combustion, performance of steam generators and natural draught requirements in boiler plants.
05	**202044**	**Material Science**	CO1: Understand the basic concepts and properties of Material.
			CO2: Understand about material fundamental and processing.
			CO3: Select proper metal, alloys, nonmetal and powder metallurgical component for specific requirement
			CO4: Detect the defects in crystal and its effect on crystal properties.
			CO5: Evaluate the different properties of material by studying different test
			CO6: Recognize how metals can be strengthened by cold-working and hot working
06	**202051**	**Strength of Materials)**	CO1: Apply knowledge of mathematics, science for engineering applications
			CO2: Design and conduct experiments, as well as to analyze and interpret data
			CO3: Design a component to meet desired needs within realistic constraints of health and safety
			CO4: Identify, formulate, and solve engineering problems
			CO5: Practice professional and ethical responsibility
			CO6: Use the techniques, skills, and modern engineering tools necessary for engineering practice
07	**202045**	**Fluid Mechanics)**	CO1: Use of various properties in solving the problems in fluids
			CO2: Use of various types of flows and use of continuity equation in pipe flows
			CO3: Use of Bernoulli's equation for solutions in fluids and its application in measuring devices
			CO4: Use of velocity, shear stress distribution equation for laminar and turbulent flow
			CO5: Use of Darcy Weisbach equation for solving head loss problems and use of dimensional analysis
			CO6: Determination of forces drag and lift on immersed bodies and boundary layer theory
08	**202048**	**Theory of Machines-I)**	CO1: To make the student conversant with commonly used mechanism for industrial application.
			CO2: To develop competency in drawing velocity and acceleration diagram for simple and complex mechanism.

			CO3: To develop analytical competency in solving kinematic problems using complex algebra method.
			CO4: To develop competency in graphical and analytical method for solving problems in static and dynamic force analysis.
			CO5: To develop competency in conducting laboratory experiments for finding moment of inertia of rigid bodies,
			CO6: To Analyze velocity and acceleration of mechanisms by vector and graphical methods.
09	**202049**	**(Engineering Metallurgy)**	CO1: Describe how metals and alloys formed and how the properties change due to microstructure
			CO2: Apply core concepts in Engineering Metallurgy to solve engineering problems.
			CO3: Conduct experiments, as well as to analyze and interpret data
			CO4: Select materials for design and construction.
			CO5: Possess the skills and techniques necessary for modern materials engineering practice
			CO6: Recognize how metals can be strengthened by alloying, cold-working, and heat treatment
10	**202050**	**Applied Thermodynamics)**	CO1: Classify various types of Engines, Compare Air standard, Fuel Air and Actual cycles and make out various losses in real cycles.
			CO2: Understand Theory of Carburetion, Modern Carburettor, Stages of Combustion in S. I. Engines and Theory of Detonation, Pre-ignition and factors affecting detonation.
			CO3: Understand Fuel Supply system, Types of Injectors and Injection Pumps, Stages of Combustion in CI Engines, Theory of Detonation in CI Engines and Comparison of SI and CI Combustion and Knocking and Factors affecting, Criteria for good combustion chamber and types.
			CO4: Carry out Testing of I. C. Engines and analyze its performance
			CO5: Describe construction and working of various I. C. Engine systems (Cooling, Lubrication, Ignition, Governing, and Starting) also various harmful gases emitted from exhaust and different devices to control pollution and emission norms for pollution control.
			CO6: Describe construction, working of various types of reciprocating and rotary compressors with performance calculations of positive displacement compressors.
11	**203152**	**Electrical and Electronics Engineering)**	CO1: To Develop the capability to identify and select suitable DC motor / and its speed control method for given industrial application.
			CO2: To Develop the capability to identify and

			select suitable induction and its speed control method for given industrial application.
			CO3: To Develop the capability to identify and select suitable special purpose motor and its speed control method for given industrial application.
			CO4: To Develop the capability to identify and select suitable microcontroller and its application in industry.
			CO5: To understand Embedded systems terminologies and sensors
			CO6: To understand Data acquisition system for mechanical applications
TE [Mech]2015 Pattern			
01	**302041**	**Design of Machine Elements-I)**	CO1: Ability to identify and understand failure modes for mechanical elements and design of machine elements based on strength.
			CO2: Ability to design Shafts, Keys and Coupling for industrial applications.
			CO3: Ability to design machine elements subjected to fluctuating loads.
			CO4: Ability to design Power Screws for various applications.
			CO5: Ability to design fasteners and welded joints subjected to different loading conditions.
			CO6: Ability to design various Springs for strength and stiffness.
02	**302042**	**Heat Transfer)**	CO1: Analyse the various modes of heat transfer and implement the basic heat conduction equation for steady state 1-D thermal system.
			CO2: Implement the general heat conduction equation to thermal systems with and without internal heat generation and transient heat conduction.
			CO3: Apply knowledge of lumped parameter analysis for unsteady state heat conduction and transient heat analysis using charts.
			CO4: Analyse the heat transfer rate in natural and forced convection and evaluate through experimental investigation.
			CO5: Interpret Radiation heat transfer between objects with simple geometries.
			CO6: Analyse the heat transfer equipment and investigate the performance.
03	**30204**	**Theory of Machines-II) 3**	CO1: To develop competency in understanding of theory of all types of gears.
			CO2: To understand the analysis of different types of gear train.
			CO3: To understand step-less regulations.
			CO4: To make the student conversant with synthesis of the mechanism.

			CO5: To understand step-less regulations.
			CO6: To understand mechanisms for system control – Gyroscope.
04	**302044**	**(Turbo Machines)**	CO1: Apply thermodynamics and kinematics principles to turbo machines.
			CO2: Analyze the performance of turbo machines.
			CO3: Ability to select turbo machine for given application.
			CO4: Predict performance of turbo machine using model analysis.
			CO5: Perform the preliminary design of turbo machines (pumps, rotary compressors and turbines)
			CO6: Interpret the language and some of the current efforts of turbo machinery manufacturers.
05	**302045**	**Metrology and Quality Control)**	CO1: Explain tolerance, limits of size, fits, geometric and position tolerances, and gauge design
			CO2: Understand the methods of measurement, selection of measuring instruments / standards of measurement, carryout data collection and its analysis.
			CO3: Understand the advanced methods of measurement, and relevant concepts from interdisciplinary areas.
			CO4: Develop an ability of problem solving and decision making by identifying and analysing the cause for variation and recommend suitable corrective actions for quality Improvement.
			CO5: Understand and use/apply Quality Control Techniques/ Statistical Tools appropriately
			CO6: Understand and use/apply TQM tools and Quality management systems
06	**302046**	**(Skill Development) 302046**	CO1: To Develop the skill required for shop floor working
			CO2: To have a Knowledge of Different tools and tackles used in machine assembly shop
			CO3: To apply Theoretical Knowledge in Practice
			CO4: To study Practical Aspect of each component in the assembly of machine shop
			CO5: To understand Function of Parts and its uses.
			CO6: To Understand part Drawing with GD & T sequencing.
07	**302047**	**Numerical Methods and Optimization)**	CO1: Recognize the difference between analytical and Numerical Methods.
			CO2: Identify the appropriate Numerical Methods

			to solve complex mechanical engineering problems.
			CO3: Formulate algorithms for Numerical methods and implement same to evaluate the solution using programming language.
			CO4: Analyze and formulate Solutions for real life problem using optimization techniques.
			CO5: Develop logical sequencing for solution procedure and skills in soft computing.
			CO6: Implement Numerical methods in research problem
08	**302048**	**Design of Machine Elements-II)**	CO1: To understand and apply principles of gear design to spur gears and industrial spur gear boxes.
			CO2: To become proficient in Design of Helical and Bevel Gear.
			CO3: To develop capability to analyse Rolling contact bearing manufacturing's Catalogue.
			CO4: To learn a skill to design worm gear box for various industrial applications.
			CO5: To inculcate an ability to design belt drives and selection of belt, rope and chain drives.
			CO6: To achieve an expertise in design of sliding contact bearing in industrial applications.
09	**302049**	**Refrigeration and Air Conditioning)**	CO6: Compare different refrigerants with respect to properties, applications and environmental issues, Know applications of refrigeration and air-conditioning
			CO1: Study the various refrigeration cycles and evaluate performance using refrigeration property tables.
			CO2: Explain the need for multiple pressure refrigeration systems and Evaluate their performance by applying mass and energy balance equations.
			CO3Understand the basic air conditioning processes on psychrometric charts, calculate cooling load for its applications.
			CO4: Study of various equipment- operating principles, operating and safety controls employed in refrigeration and air conditioning systems.
			CO5: Understand the air distribution systems with air handling unit.
10	**302050**	**(Mechatronics)**	CO1: Identification of key elements of mechatronics system and its representation in terms of block diagram.
			CO2: Ability to explain working principle, characteristics and applications of basic sensors and actuators.
			CO3: Ability to estimate transfer function of given system represented in block diagram format.

			CO4: Ability to explain analog to digital conversion principle and procedure.
			CO5: Ability to draw ladder diagram for given simple control situation.
			CO6: Ability to explain significance of P, I and D control actions..
11	**302051**	**Manufacturing Processes-II)**	CO1: Student should be able to apply the knowledge of various manufacturing Process.
			CO2: Student should be able to identify various process
			CO3: Student should be able to understand various parameters effect on Processes.
			CO4: Student should able to figure out application of modern machining.
			CO5: Student should get the Knowledge of Jigs and Fixtures
			CO6: Student should get the Knowledge for variety of operations.
12	**302053**	**(Seminar)**	CO1: Identify and compare technical and practical issues related to the area of course specialization
			CO2: Outline annotated bibliography of research demonstrating scholarly skills
			CO3: Prepare a well-organized report employing elements of technical writing and critical thinking
			CO4: Demonstrate the ability to describe, interpret and analyze technical issues and develop competence in presenting
			CO5: Recognize and relate practical and applied elements of technical writing and critical thinking
			CO6: Determine the capability to express the area of course specialization
BE [Mech]2015 pattern			
01	**402041**	**Hydraulics and Pneumatics)**	CO1: Able to apply various laws of fluid mechanics to the hydraulic and Pneumatic systems
			CO2: Able to define various principles and functions of various components of Hydraulic & pneumatic systems.
			CO3: Able to select appropriate components required for hydraulic and pneumatic systems
			CO4: Design hydraulic and pneumatic system for industrial applications and tried the same on the training kit
			CO5: Able to understand industrial applications of hydraulic and pneumatic system.
			CO6: Implement knowledge to design hydraulics and pneumatics applications.
02	**402042**	**CAD/CAM Automation)**	CO1: Apply homogeneous transformation matrix for geometrical transformations of 2D CAD entities for basic geometric transformations
			CO2: Use analytical and synthetic curves and

			surfaces in part modeling.
			CO3: Do real times analysis of simple mechanical elements like beams, trusses, etc. and comment on safety of engineering components using analysis software
			CO4: Generate CNC program for Turning / Milling and generate tool path using CAM software.
			CO5: Demonstrate understanding of various rapid manufacturing techniques and develop competency in designing and developing products using rapid manufacturing technology.
			CO6: Understand the robot systems and their applications in manufacturing industries.
03	**402043**	**Dynamics of Machinery**	CO1: Apply balancing technique for static and dynamic balancing of multi cylinder inline and radial engines.
			CO2: Estimate natural frequency for single DOF undamped & damped free vibratory systems
			CO3: Determine response to forced vibrations due to harmonic excitation, base excitation and excitation due to unbalance forces.
			CO4: Estimate natural frequencies, mode shapes for 2 DOF undamped free longitudinal and torsional vibratory systems
			CO5: Describe vibration measuring instruments for industrial / real life applications along with suitable method for vibration control.
			CO6: Explain noise, its measurement & noise reduction techniques for industry and day today life Problems.
04	**402044A**	**Finite Element Analysis)**	CO1: Understand the different techniques used to solve mechanical engineering problems.
			CO2: Derive and use 1-D and 2-D element stiffness matrices and load vectors from various methods to solve for displacements and stresses.
			CO3: Apply mechanics of materials and machine design topics to provide preliminary results used for testing the reasonableness of finite element results.
			CO4: Explain the inner workings of a finite element code for linear stress, displacement, temperature and modal analysis.
			CO5: Use commercial finite element analysis software to solve complex problems in solid mechanics and heat transfer.
			CO6: Interpret the results of finite element analyses and make an assessment of the results in terms of modeling (physics assumptions) errors, discretization (mesh density and refinement toward

			convergence) errors, and numerical (round-off) errors
05	**402045A**	**(Automobile Engineering)**	CO1: To compare and select the proper automotive system for the vehicle
			CO2: To analyse the performance of the vehicle.
			CO3: To diagnose the faults of automobile vehicles.
			CO4: To apply the knowledge of EVs, HEVs and solar vehicles
06	**402045C**	**Energy Audit and Management)**	CO1: Compare energy scenario of India and World.
			CO2: Carry out Energy Audit of the Residence / Institute/ Organization.
			CO3: Evaluate the project using financial techniques
			CO4:Identify and evaluate energy conservation opportunities in Thermal Utilities.
			CO5: Identify and evaluate energy conservation opportunities in Electrical Utilities.
			CO6: Identify the feasibility of Cogeneration and WHRUse a CFD tool effectively for practical problems and research.
07	**402046**	**(Project-I)**	CO1: Find out the gap between existing mechanical systems and develop new creative new mechanical system.
			CO2: Learn about the literature review
			Get the experience to handle various tools, tackles and machines.
			CO3: Strategise different Mechanisms for problem solving
			CO4: Defining various Methodologies for different Problem statement
			CO5: Fill the Gap between Industry and Academics for particular areas and generating numerous profit sources.
08	**402047**	**(Energy Engineering)**	CO1: To study the power generation scenario, the components of thermal power plant, improved Rankin cycle, Cogeneration cycle
			CO2: To understand details of steam condensing plant, analysis of condenser, an environmental impacts of thermal power plant, method to reduce various pollution from thermal power plant
			CO3: To study layout, component details of hydroelectric power plant, hydrology and elements, types of nuclear power plant
			CO4: To understand components; layout of diesel power plant, components; different cycles methods to improve thermal efficiency of gas power plant
			CO5: To understand components; layout of diesel

			power plant, components; different cycles methods to improve thermal efficiency of gas power plant
			CO6: To learn the different instrumentation in power plant and basics of economics of power generation.
09	**402048**	**Mechanical System Design**	CO1: Design machine tool gear boxes using standard procedure and modify them for enhanced efficiency
			CO2: Assess the data by using statistical concepts and provide correct interpretation
			CO3: Identify different conveyors, categorize them for respective material handling systems and design them using related concepts
			CO4: Recognize thick & thin cylinders, categorize different pressure vessels and design them using Indian (IS-2825) & International (ASME Code for pressure vessel design) Standards
			CO5: Identify materials for I C engine components and apply design procedure to design them
			CO6: Outline objectives of optimum design and develop ability to apply optimum design principles of design for manufacturing, assembly & safety
10	**402049B**	**Industrial Engineering)**	CO1: Describe different aspect of industrial engineering and productivity improvement techniques.
			CO2: Apply different concepts of method study to improve the work content
			CO3: describe and analyze techniques of work measurement and time study
			CO4: Illustrate different aspect of work system design and production planning control
			CO5: Identify various cost accounting and financial management practices applicable in different industries
			CO6: Apply concept of engineering economy, ergonomics and industrial safety practices.
11	**402050A**	**(Advance Manufacturing Processes)**	CO1: Classify and Analyze special forming process
			CO2: Analyze and identify applicability of advanced joining process
			CO3: Understand and analyze basic mechanisms of hybrid non-conventional machining techniques
			CO4: Select appropriate micro and nano fabrication techniques for engineering applications
			CO5: Understand and apply various additive

			manufacturing techniques for engineering applications
			CO6: Understand Material Characterization techniques to analyze effects of chemical composition, composition variation, crystal structure etc.
12	**402051**	**(Project-II)**	CO1: Find out the gap between existing mechanical systems and develop new creative new mechanical system.
			CO2: Learn about the literature review
			CO3: Get the experience to handle various tools, tackles and machines.
			CO4: Strategise different Mechanisms for problem solving
			CO5: Defining various Methodologies for different Problem statement
			CO6: Fill the Gap between Industry and Academics for particular areas and generating numerous profit sources.