Class	Semester	Name of Subject	Subject Code	CO No.	CO
FY	1	BASIC MATHEMATICS	311302	CO1	Apply the concepts of algebra to solve engineering (discipline) related problems.
				CO2	Utilize trigonometry to solve branch specific engineering problems.
				CO3	Solve area specific engineering problems under given conditions of straight lines.
				CO4	Apply differential calculus to solve discipline specific problems.
				CO5	Use techniques and methods of statistics to crack discipline specific problems.
FY	1	COMMUNICATION SKILLS (ENGLISH)	311303	CO1	Construct grammatically correct sentences in English
				CO2	Compose paragraphs and dialogues on given situations
				CO3	Comprehend passages correctly.
				CO4	Use contextual words in English appropriately
				CO5	Deliver effective presentations in English using appropriate body language
FY	1	BASIC SCIENCE	311305	CO1	Use basic instruments to measure the physical quantities in various engineering situations.
				CO2	Apply the basic principles of electromagnetics to solve given engineering problems.
				CO3	Apply basic principles of thermometry and fibre optics to solve engineering problems.
				CO4	Predict the structure, properties and behaviour of molecules and compounds based on the types of chemical bond.
				CO5	Apply the concepts of electrochemistry and corrosion preventive measures in industry.
				CO6	Use the appropriate engineering material and catalyst appropriately.
FY	1	FUNDAMENTALS OF ICT	311001	CO1	Use computer system and its peripherals for given purpose
				CO2	Prepare Business document using Word Processing Tool
				CO3	Analyze Data and represent it graphically using Spreadsheet
				CO4	Prepare professional Slide Show presentations
				CO5	Use different types of Web Browsers and Apps
				CO6	Explain concept and applications of Emerging Technologies
FY	1	ENGINEERING WORKSHOP PRACTICE	311005	CO1	Use firefighting tools and equipment.
				CO2	Prepare job using different tools in fitting shop.
				CO3	Perform various operations using plumbing and carpentry tools.
				CO4	Prepare various welding joints.
				CO5	Produce simple job using different sheet metal operations.
FY	1	YOGA AND MEDITATION	311003	CO1	Practice basic Yoga and Pranayama in daily life to maintain physical and mental fitness.
				CO2	Practice meditation regularly for improving concentration and better handling of stress and anxiety.
				CO3	Follow healthy diet and hygienic practices for maintaining good health.
FY	1	ENGINEERING GRAPHICS	311006	CO1	Draw geometrical figures and engineering curves.
				CO2	Apply principles of orthographic projections for drawing given pictorial views
				CO3	Draw isometric views of given component or from orthographic projections.
				CO4	Use various drawing codes, conventions and symbols as per IS SP-46 in engineering drawing.
				CO5	Draw free hand sketches of given engineering elements.
FY	2	APPLIED MATHEMATICS	312301	CO1	Solve the broad-based engineering problems of integration using suitable methods
				CO2	Use definite integration to solve given engineering related problems.
				CO3	Apply the concept of differential equation to find the solutions of given engineering problems
				CO4	Employ numerical methods to solve programme specific problems.
				CO5	Use probability distributions to solve elementary engineering problems.
FY	2	APPLIED SCIENCE	312308	CO1	Select relevant material in industries by analyzing its physical properties .
				CO2	Apply the concept of simple harmonic motion , resonance and ultrasonic sound for various engineering applications.
				CO3	Apply the concept of modern Physics (X-rays, LASER, Photosensors and Nanotechnology) for various engineering applications.
				CO4	Use the relevant metallurgical processes in different engineering applications
				CO5	Use relevant water treatment processes to solve industrial problems.
				CO6	Use appropriate fuel and electrolyte for engineering applications.
FY	2	ENGINEERING DRAWING	312311	CO1	Apply principles of sectional orthographic projections for drawing given pictorial views.
				CO2	Draw projection of lines and planes.
				CO3	Draw projections of given solids for various orientations.
				CO4	Interpret curves of intersection for given solids.
				CO5	Draw development of lateral surfaces of various solids.
FY	2	ENGINEERING MECHANICS	312312	CO1	Select the suitable machine under given loading condition.
				CO2	Analyze the given force system to calculate resultant force.
				CO3	Determine unknown force(s) of given load combinations in the given situation.
				CO4	Apply the laws of friction in the given situation.
				CO5	Determine the centroid/centre of gravity of the given lamina.
FY	2	PROFESSIONAL COMMUNICATION	312002	CO1	Communicate effectively (oral / spoken and Written) in various formal and informal situations minimizing the barriers.
				CO2	Develop listening skills through active listening and note taking.
				CO3	Write circulars, notices and minutes of the meeting.
				CO4	Draft inquiry letter, complaint letter , Job application with resume / CV, Compose effective E - mails
				CO5	Write Industrial reports
FY	2	SOCIAL AND LIFE SKILLS	312003	CO1	Enhance the ability to be fully self-aware and take challenges by overcoming all fears and insecurities and grow fully.
				CO2	Increase self-knowledge and awareness of emotional skills and emotional intelligence at the place of study/work.
				CO3	Provide the opportunity to realizing self-potential through practical experience while working individually or in group.
				CO4	Develop interpersonal skills and adopt good leadership behaviour for self-empowerment and empowerment of others.
				CO5	Set appropriate life goals with managing stress and time effectively.
FY	2	MANUFACTURING TECHNOLOGY	312313	CO1	Produce a part using a lathe and drilling machine as per given drawing.
				CO2	Produce a part using a milling machine as per given drawing.
				CO3	Produce a part using casting processes as per given drawing.
				CO4	Produce a part using forming processes as per given drawing.
				CO5	Produce a part using joining processes as per given drawing..
SY	3	STRENGTH OF MATERIALS	313308	CO1	Calculate the M.I. of the given object using relevant formulae & methods
				CO2	Analyze the structural behavior of the given structural components under various loading conditions
				CO3	Draw SFD and BMD for the given structural element under given loading conditions.
				CO4	Determine the bending and shear stresses in beams under different loading conditions

				CO5	Analyze the direct & bending stresses in the structural members under eccentric loading conditions.
SY	3	FLUID MECHANICS AND MACHINERY	313309	CO1	Determine different properties of fluid and pressure measurements
				CO2	Apply Bernoulli's theorem to various flow measuring devices.
				CO3	Calculate the various losses in flow through pipes
				CO4	Select suitable hydraulic turbine and pump for the given application
				CO5	Evaluate the performance of hydraulic turbines and pumps
SY	3	THERMAL ENGINEERING	313310	CO1	Apply fundamental concepts of thermodynamics to various thermodynamic systems.
				CO2	Determine various properties of steam using steam table.
				CO3	Use suitable strategies to maintain steam boiler,steam turbine, steam condenser & cooling towers efficiently.
				CO4	Select proper heat exchanger for given application.
				CO5	Identify different components of an I.C. Engine.
SY	3	PRODUCTION DRAWING	313311	CO1	Construct an auxiliary view of given object.
				CO2	Use convention for representation of material and mechanical components.
				CO3	Interpret and draw production drawing
				CO4	Prepare assembly drawing using given details.
				CO5	Prepare detail drawing based on the given assembly drawing/data.
SY	3	BASIC ELECTRICAL AND ELECTRONICS	312020	CO1	Use Principles of electrical and magnetic circuits to solve mechanical engineering broadly defined problems.
				CO2	Use of Transformer and Electric motors for given applications
				CO3	Suggest suitable electronic component for given mechanical engineering application.
				CO4	Use of diodes and transistors as a relevant component in given electric circuits of . mechanical engineering application
SY	3	ESSENCE OF INDIAN CONSTITUTION	313002	CO1	List salient features and characteristics of the constitution of India.
				CO2	Follow fundamental rights and duties as responsible citizen of the country.
				CO3	Analyze major constitutional amendments in the constitution.
				CO4	Follow procedure to cast vote using voter-id.
SY	3	COMPUTER AIDED DRAFTING	313006	CO1	Use basic commands in CADD software.
				CO2	Draw complex 2D drawings in CADD software using draw and modify tools.
				CO3	Draw isometric drawings using CADD software.
				CO4	Use software to dimension and write text on 2D geometric entities.
				CO5	Plot given 2D entities using proper plotting parameters in CADD.
SY	3	FUNDAMENTALS OF PYTHON PROGRAMMING	313007	CO1	Use program designing tools and IDE for python.
				CO2	Employ python building blocks and data types in the programming.
				CO3	Implement conditional and looping statements in the python programming.
				CO4	Implement built in functions and modules in the python programming.
				CO5	Use NumPy for performing operations on list and array.
SY	4	ENVIRONMENTAL EDUCATION AND SUSTAINABILITY	314301	CO1	Identify the relevant Environmental issues in specified locality.
				CO2	Provide the green solution to the relevant environmental problems.
				CO3	Conduct SWOT analysis of biodiversity hotspot
				CO4	Apply the relevant measures to mitigate the environmental pollution.
				CO5	Implement the environmental policies under the relevant legal framework.
SY	4	THEORY OF MACHINES	313313	CO1	Apply knowledge and skill related to different mechanisms and its motion in given situation.
				CO2	Determine velocity and acceleration for given mechanism
				CO3	Develop a Cam profile for given type of Follower and its motions in given situation
				CO4	Select the suitable power transmission devices for the given field/industrial application.
				CO5	Use knowledge and skills related to balancing of masses and vibration for various applications.
SY	4	METROLOGY AND MEASUREMENT	313316	CO1	Select relevant linear measuring instrument for measurement.
				CO2	Select different gauges and comparators for measurement of given components.
				CO3	Use relevant instrument for measurement of different parameters of engineering components.
				CO4	Select relevant instrument for measuring the physical parameters of given system.
				CO5	Use relevant instrument for measurement of operating parameters of system.
SY	4	MECHANICAL ENGINEERING MATERIALS	313317	CO1	Select suitable material(s) based on desired properties according to application.
				CO2	Choose relevant alloy steel & Cast iron for mechanical components.
				CO3	Select relevant non ferrous & powder material components for the engineering application.
				CO4	Select relevant non metallic & Advanced material for the engineering application.
				CO5	Use relevant heat treatment processes in given situations.
SY	4	PRODUCTION PROCESSES	314340	CO1	Use appropriate CNC machine as per given application.
				CO2	Prepare the component using grinding and various finishing operation.
				CO3	Produce gears using various gear manufacturing methods.
				CO4	Select the press and its components for various applications.
				CO5	Select suitable Non-Traditional machining process for given component.
SY	4	ENTREPRENEURSHIP DEVELOPMENT AND STARTUPS	314014	CO1	Identify one's entrepreneurial traits.
				CO2	Use information collected from stakeholder for establishing/setting up/founding starts up
				CO3	Use support systems available for Starts up
				CO4	Prepare project plans to manage the enterprise effectively
SY	4	BASICS OF MECHATRONICS	314017	CO1	Identify basic elements of mechatronics system such as sensors, actuators, controllers etc.
				CO2	Use sensors for different mechatronics systems
				CO3	Use actuators for different mechatronics systems
				CO4	Develop PLC program for various mechatronics systems
				CO5	Use microcontroller for different mechatronics systems
SY	4	CNC PROGRAMMING	314018	CO1	Develop manual part program for CNC lathe and milling machine.
				CO2	Simulate the part program using simulation software
				CO3	Produce job on CNC lathe and milling machine.