PROGRAM OUTCOMES (POs):

(Engineering Course)

Engineering Graduates will be able to

PO01 Engineering Knowledge: Apply the knowledge of basic sciences and engineering fundamentals and engineering fundamentals to the solve the complex engineering problems

PO02 Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO03 Design/ development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO04 Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions for complex problems:

- that cannot be solved by straight forward application of knowledge, theories and techniques applicable to the engineering discipline as against problems given at the end of chapters in a typical text-book that can be solved using simple engineering theories and techniques;
- that may not have a unique but possible multiple solutions, also require consideration of appropriate constraints / requirements not explicitly given in the problem statement such as cost, power requirement, durability, product life, etc.; and
- which need to be defined (modeled) within appropriate mathematical framework.

PO05 Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations

PO06 Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO07 Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development

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PO08 Ethics: Understand their professional and ethical responsibility and enhance their commitment towards best engineering practices.

PO09 Individual and team work: Function effectively as a member or a leader in diverse teams, and be competent to carry out multidisciplinary tasks.

PO10 Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11 Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12 Life-long learning: Recognize the need of self-education, ability to engage in independent and life-long learning process in order to keep abreast with the ongoing technological changes & developments in the field of engineering.

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❖ B.E [Mechanical Engineering]

PROGRAM EDUCATIONAL OBJECTIVES (PEOs):

The graduates of Mechanical Engineering should be able to:

PEO01: Apply the overall knowledge of Mechanical Engineering along with concepts of Mathematics, Science, Communication and Computing skills to understand specific problem areas and finding the optimal solutions for the same.

PEO 2: Implement ideas of Mechanical Engineering for the challenging tasks in the interdisciplinary areas like Electrical, Electronics, Computer Science, Civil, Bio-Technology and allied branches.

PEO 3: Widely talented in the fields of manufacturing, service and design industries, which will not only improve their employability but also aid in establishing the above said industries.

PEO 4: Develop lifelong learning attitudes, ethics and values that will help their career employability and growth in engineering, academia, defence, state and central government sectors.

PROGRAM SPECIFIC OUTCOMES (PSOs):

The students of Mechanical engineering will be able to:

PSO1: Specify, fabricate, test and operate various machines along with essential documentations.

PSO2: Analyse, design, develop and implement the concepts of mechanical systems and processes towards product development.

PSO3: Design components for automotive applications.

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❖ B.E [Electrical Engineering]

PROGRAM EDUCATIONAL OBJECTIVES (PEOs):

The graduates of Electrical Engineering should be able to:

PEO01: develop seamless knowledge for providing solution to any industrial problem.

PEO02: equip the theoretical, practical knowledge of designing of core areas of EE in order to develop & maintain modern electrical equipment's and to actively take part in application based research and development.

PEO03: test and verify the characteristics of common electrical equipment / machines / control system and to develop the skill to analyze, appreciate and interpret the data for engineering applications

PEO04: inculcate professional and ethical attitude, communication and team work skills and the ability to relate engineering issues from broader social perspective for truly contributing to the needs of the nation.

PROGRAM SPECIFIC OUTCOMES (PSOs)

The students of Electrical engineering will be able to:

PSO01: Develop models, analyse and assess the performance of different types of generation, transmission, distribution and protection mechanisms in power systems.

PSO02: Design, develop, analyse and test electrical and electronic systems; deploy control strategies for power electronics related applications.

PSO03: Measure, analyse, model and control the behavior of electrical quantities associated with constituents of energy or allied systems.

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❖ B.E [Computer Engineering]

PROGRAM EDUCATIONAL OBJECTIVES (PEOs):

The graduates of Computer Engineering should be able to:

PEO1: Pursue successful professional career in IT and IT-enabled industries/public sector/research organizations or work as an entrepreneur.

PEO2: Pursue lifelong learning in generating innovative engineering solutions using research and complex problem-solving skills.

PEO3: provide solutions to challenging problems in their profession by applying computer engineering theory and practices.

PEO4: Demonstrate professionalism, ethics, inter-personal skills and continuous learning to develop leadership qualities to work effectively in multidisciplinary environment.

PROGRAM SPECIFIC OUTCOMES (PSOs)

The students of Computer engineering students will be able to:

PSO01: Design and develop the web applications using various technologies such as HTML, JSP, PHP, ASP and ASP.NET to cater the needs of the society.

PSO02: Offer solutions which impact geo-socio-economic and Environmental scenario by using Machine Learning, Artificial Intelligence and IoT.

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❖ B.E. E&TC Engineering

PROGRAM EDUCATIONAL OBJECTIVES (PEOs):

The graduates of E&TC Engineering should be able to:

PEO01: Solve real-life engineering problems, design and development of innovative and cost-effective products exhibiting a solid foundation in Electronics and Communication Engineering fundamentals to cater needs of society.

PEO02: Excel in Industry/technical profession, higher studies, and entrepreneurship exhibiting global competitiveness.

PEO03: Exhibit professional ethics and values, effective communication, teamwork, multidisciplinary approach, and ability to relate engineering issues to broader social context.

PROGRAM SPECIFIC OUTCOMES (PSOS):

PSO 1: Development of Hardware/Software Co-designs: An ability to apply electronic design principles in the development of hardware/software prototypes and systems with progressive depth of complexity.

PSO 2: Development of Electronics Communication Systems: An ability to deploy conventional & next-gen. techniques/tools for analysis & design of Information and Communication systems.

PSO 3: Development of Signal Processing Applications: An ability to apply algorithmic knowledge of signal processing towards analysis, Recognition, and synthesis of multi-dimensional data.

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DEPARTMENT OF FIRST YEAR ENGINEERING
COURSE OUTCOMES

Year	Course Name	Course Outcome NO.	Course Outcome
	107001 – Engineering Mathematics – I	CO1	Mean value theorems and its generalizations leading to Taylors and Maclaurin's series useful in the analysis of engineering problems.
		CO2	the Fourier series representation and harmonic analysis for design and analysis of periodic continuous and discrete systems.
		CO3	to deal withderivative of functions of several variables that are essential in various branches of Engineering.
		CO4	to apply the concept of Jacobian to find partial derivative of implicit function and functional dependence. Use of partial derivatives in estimating error and approximation and finding extreme values of the function.
		CO5	the essential tool of matrices and linear algebra in a comprehensive manner for analysis of system of linear equations, finding linear and orthogonal transformations, Eigen values and Eigen vectors applicable to engineering problems
	107002: Engineering Physics	CO1	Develop understanding of interference, diffraction and polarization; connect it to few engineering applications.
		CO2	Learn basics of lasers and optical fibers and their use in some applications.
		CO3	Understand concepts and principles in quantum mechanics. Relate them to some applications.
		CO4	Understand theory of semiconductors and their applications in some semiconductor devices.
		CO5	Summarize basics of magnetism and superconductivity. Explore few of their technological applications.
		CO6	Comprehend use of concepts of physics for Non Destructive Testing. Learn some properties of nanomaterials and their application.
	102003 - Systems in Mechanical Engineering	CO1	Describe and compare the conversion of energy from renewable and non-renewable energy sources
		CO2	Explain basic laws of thermodynamics, heat transfer and their applications
		CO3	List down the types of road vehicles and their specifications
		CO4	Illustrate various basic parts and transmission system of a road vehicle
		CO5	Discuss several manufacturing processes and identify the suitable process
		CO6	Explain various types of mechanism and its application

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First Year Engineering	104010:Basic Electronics Engineering	CO1	Explain the working of P-N junction diode and its circuits.
		CO2	Identify types of diodes and plot their characteristics and also can compare BJT with MOSFET.
		CO3	Build and test analog circuits using OPAMP and digital circuits using universal/basic gates and flip flops.
		CO4	Use different electronics measuring instruments to measure various electrical parameters.
		CO5	Select sensors for specific applications.
		CO6	Describe basic principles of communication systems.
	110005: Programming and Problem Solving	CO1	Inculcate and apply various skills in problem solving.
		CO2	Choose most appropriate programming constructs and features to solve the problems in diversified domains.
		CO3	Exhibit the programming skills for the problems those require the writing of well-documented programs including use of the logical constructs of language, Python.
		CO4	Demonstrate significant experience with the Python program development environment.
	111006 -Workshop Practice	CO1	Familiar with safety norms to prevent any mishap in workshop.
		CO2	Able to handle appropriate hand tool, cutting tool and machine tools to manufacture a job.
		CO3	Able to understand the construction, working and functions of machine tools and their parts.
		CO4	Able to know simple operations (Turning and Facing) on a centre lathe.
	101007: Environmental Studies-I	CO1	Demonstrate an integrative approach to environmental issues with a focus on sustainability.
		CO2	Explain and identify the role of the organism in energy transfers in different ecosystems.
		CO3	Distinguish between and provide examples of renewable and nonrenewable resources & analyze personal consumption of resources.
		CO4	Identify key threats to biodiversity and develop appropriate policy options for conserving biodiversity in different settings.
		CO1	the effective mathematical tools for solutions of first order differential equations that model physical processes such as Newton's law of cooling, electrical circuit, rectilinear motion, mass spring systems, heat transfer etc.
		CO2	advanced integration techniques such as Reduction formulae, Beta functions, Gamma functions, Differentiation under integral sign and Error functions needed in evaluating multiple integrals and their applications.

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107008 – Engineering Mathematics – II	CO3	to trace the curve for a given equation and measure arc length of various curves.
	CO4	the concepts of solid geometry using equations of sphere, cone and cylinder in a comprehensive manner.
	CO5	evaluation of multiple integrals and its application to find area bounded by curves, volume bounded by surfaces, Centre of gravity and Moment of inertia.
107009: Engineering Chemistry	CO1	Apply the different methodologies for analysis of water and techniques involved in softening of water as commodity.
	CO2	Select appropriate electro-technique and method of material analysis.
	CO3	Demonstrate the knowledge of advanced engineering materials for various engineering applications.
	CO4	Analyze fuel and suggest use of alternative fuels.
	CO5	Identify chemical compounds based on their structure.
		Explain causes of corrosion and methods for minimizing corrosion.
103004: Basic Electrical Engineering	CO1	Differentiate between electrical and magnetic circuits and derive mathematical relation for self and mutual inductance along with coupling effect.
	CO2	Calculate series, parallel and composite capacitor as well as characteristics parameters of alternating quantity and phasor arithmetic
	CO3	Derive expression for impedance, current, power in series and parallel RLC circuit with AC supply along with phasor diagram.
	CO4	Relate phase and line electrical quantities in polyphase networks, demonstrate the operation of single phase transformer and calculate efficiency and regulation at different loading conditions
	CO5	Apply and analyze the resistive circuits using star-delta conversion KVL, KCL and different network theorems under DC supply.
	CO6	Evaluate work, power, energy relations and suggest various batteries for different applications, concept of charging and discharging and depth of charge.
101011: Engineering Mechanics	CO1	Determine resultant of various force systems
	CO2	Determine centroid, moment of inertia and solve problems related to friction
	CO3	Determine reactions of beams, calculate forces in cables using principles of equilibrium
	CO4	Solve trusses, frames for finding member forces and apply principles of equilibrium to forces in space
	CO5	Calculate position, velocity and acceleration of particle using principles of kinematics

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		CO6	Calculate position, velocity and acceleration of particle using principles of kinetics and Work, Power, Energy
	102012: Engineering Graphics	CO1	Draw the fundamental engineering objects using basic rules and able to construct the simple geometries.
		CO2	Construct the various engineering curves using the drawing instruments.
		CO3	Apply the concept of orthographic projection of an object to draw several 2D views and its sectional views for visualizing the physical state of the object.
		CO4	Apply the visualization skill to draw a simple isometric projection from given orthographic views precisely using drawing equipment.
		CO5	Draw the development of lateral surfaces for cut section of geometrical solids.
		CO6	Draw fully-dimensioned 2D, 3D drawings using computer aided drafting tools.
	110013: Project Based Learning	CO1	Project based learning will increase their capacity and learning through shared cognition.
		CO2	Students able to draw on lessons from several disciplines and apply them in practical way.
		CO3	Learning by doing approach in PBL will promote long-term retention of material and replicable skill, as well as improve teachers' and students' attitudes towards learning.
	101014: Environmental Studies-II	CO1	Have an understanding of environmental pollution and the science behind those problems and potential solutions.
		CO2	Have knowledge of various acts and laws and will be able to identify the industries that are violating these rules.
		CO3	Assess the impact of ever increasing human population on the biosphere: social, economic issues and role of humans in conservation of natural resources.
		CO4	Learn skills required to research and analyze environmental issues scientifically and learn how to use those skills in applied situations such as careers that may involve environmental problems and/or issues.

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Year	Course Name	Course Outcome NO.	Course Outcome
SE			
SEM IV	202041-Solid Mechanics	CO 1	CO1.DEFINE various types of stresses and strain developed on determinate and indeterminate members.
		CO2	CO2. DRAW Shear force and bending moment diagram for various types of transverse loading and support.
		CO 3	CO3. COMPUTE the slope & deflection, bending stresses and shear stresses on a beam.
		CO 4	CO4. CALCULATE torsional shear stress in shaft and buckling on the column.
		CO 5	CO5. APPLY the concept of principal stresses and theories of failure to determine stresses on a 2-D element.
		CO 6	CO6. UTILIZE the concepts of SFD & BMD, torsion and principal stresses to solve combined loading application based problems.
	202042 - Solid Modeling and Drafting	CO 1	CO1. UNDERSTAND basic concepts of CAD system, need and scope in Product Lifecycle Management
		CO2	CO2. UTILIZE knowledge of curves and surfacing features and methods to create complex solid geometry
		CO 3	CO3. CONSTRUCT solid models, assemblies using various modeling techniques & PERFORM mass property analysis, including creating and using a coordinate system
		CO 4	CO4. APPLY geometric transformations to simple 2D geometries
		CO 5	CO5. USE CAD model data for various CAD based engineering applications viz. production drawings, 3D printing, FEA, CFD, MBD, CAE, CAM, etc.
		CO 6	CO6. USE PMI & MBD approach for communication
	202043 - Engineering Thermodynamics	CO 1	CO1. DESCRIBE the basics of thermodynamics with heat and work interactions.
		CO2	CO2. APPLY laws of thermodynamics to steady flow and non-flow processes.
		CO 3	CO3. APPLY entropy, available and non available energy for an Open and Closed System,
		CO 4	CO4. DETERMINE the properties of steam and their effect on performance of vapour power cycle.
		CO 5	CO5. ANALYSE the fuel combustion process and products of combustion.
		CO 6	CO6. SELECT various instrumentations required for safe and efficient operation of steam generator.
	202044 - Engineering Materials and Metallurgy	CO 1	CO1. COMPARE crystal structures and ASSESS different lattice parameters.
		CO2	CO2. CORRELATE crystal structures and imperfections in crystals with mechanical behaviour of materials.
		CO 3	CO3. DIFFERENTIATE and DETERMINE mechanical properties using destructive and non-destructive testing of materials.
		CO 4	CO4. IDENTIFY & ESTIMATE different parameters of the system viz., phases, variables, component, grains, grain boundary, and degree of freedom. etc.
		CO 5	CO5. ANALYSE effect of alloying element & heat treatment on properties of ferrous & nonferrous alloy.
		CO 6	CO6. SELECT appropriate materials for various applications.
	203156 - Electrical and Electronics Engineering	CO 1	CO1. APPLY programming concepts to UNDERSTAND role of Microprocessor and Microcontroller in embedded systems
		CO2	CO2. DEVELOP interfacing of different types of sensors and other hardware devices with Atmega328 based Arduino Board
		CO 3	CO3. UNDERSTAND the operation of DC motor, its speed control methods and braking
		CO 4	CO4. DISTINGUISH between types of three phase induction motor and its characteristic features
		CO 5	CO5. EXPLAIN about emerging technology of Electric Vehicle (EV) and its modular subsystems
		CO 6	CO6. CHOOSE energy storage devices and electrical drives for EVs
	202045 - Geometric Dimensioning and Tolerancing Lab	CO 1	CO1. SELECT appropriate IS and ASME standards for drawing
		CO2	CO2. READ & ANALYSE variety of industrial drawings
		CO 3	CO3. APPLY geometric and dimensional tolerance, surface finish symbols in drawing
		CO 4	CO4. EVALUATE dimensional tolerance based on type of fit, etc.
		CO 5	CO5. SELECT an appropriate manufacturing process using DFM, DFA, etc.

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SEM V	207002 - Engineering Mathematics - III	CO 1	CO1. SOLVE higher order linear differential equations and its applications to model and analyze mass spring systems.
		CO2	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.
		CO 3	CO3. APPLY Statistical methods like correlation, regression in analyzing and interpreting experimental data applicable to reliability engineering and probability theory in testing and quality control.
		CO 4	CO4. PERFORM Vector differentiation & integration, analyze the vector fields and APPLY to fluid flow problems.
		CO 5	CO5. SOLVE Partial differential equations such as wave equation, one and two dimensional heat flow equations.
	202047 - Kinematics of Machinery	CO 1	CO1. APPLY kinematic analysis to simple mechanisms
		CO2	CO2. ANALYZE velocity and acceleration in mechanisms by vector and graphical method
		CO 3	CO3. SYNTHESIZE a four bar mechanism with analytical and graphical methods
		CO 4	CO4. APPLY fundamentals of gear theory as a prerequisite for gear design
		CO 5	CO5. CONSTRUCT cam profile for given follower motion
	202048 - Applied Thermodynamics	CO 1	CO1. DETERMINE COP of refrigeration system and ANALYZE psychrometric processes.
		CO2	CO2. DISCUSS basics of engine terminology,air standard, fuel air and actual cycles.
		CO 3	CO3. IDENTIFY factors affecting the combustion performance of SI and CI engines.
		CO 4	CO4. DETERMINE performance parameters of IC Engines and emission control.
		CO 5	CO5. EXPLAIN working of various IC Engine systems and use of alternative fuels.
		CO 6	CO6. CALCULATE performance of single and multi stage reciprocating compressors and DISCUSS rotary positive displacement compressors
	202049 - Fluid Mechanics	CO 1	CO1. DETERMINE various properties of fluid
		CO2	CO2. APPLY the laws of fluid statics and concepts of buoyancy
		CO 3	CO3. IDENTIFY types of fluid flow and terms associated in fluid kinematics
		CO 4	CO4. APPLY principles of fluid dynamics to laminar flow
		CO 5	CO5. ESTIMATE friction and minor losses in internal flows and DETERMINE boundary layer formation over an external surface
		CO 6	CO6. CONSTRUCT mathematical correlation considering dimensionless parameters, also ABLE to predict the performance of prototype using model laws
	202050 - Manufacturing Processes	CO 1	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	CO2. UNDERSTAND mechanism of metal forming techniques and CALCULATE load required for flat rolling
		CO 3	CO3. DEMONSTRATE press working operations and APPLY the basic principles to DESIGN dies and tools for forming and shearing operations
		CO 4	CO4. CLASSIFY and EXPLAIN different welding processes and EVALUATE welding characteristics
		CO 5	CO5. DIFFERENTIATE thermoplastics and thermosetting and EXPLAIN polymer processing techniques
		CO 6	CO6. UNDERSTAND the principle of manufacturing of fibre-reinforce composites and metal matrix composites
	202051 - Machine Shop	CO 1	CO1. PERFORM welding using TIG/ MIG/ Resistance/Gas welding technique
		CO2	CO2. MAKE Fibre-reinforced Composites by hand lay-up process or spray lay-up techniques
		CO 3	CO3. PERFORM cylindrical/surface grinding operation and CALCULATE its machining time
		CO 4	CO4. DETERMINE number of indexing movements required and acquire skills to PRODUCE a spur gear on a horizontal milling machine
		CO 5	CO5. PREPARE industry visit report
		CO 6	CO6. UNDERSTAND procedure of plastic processing
	202052 - Project Based Learning - II	CO 1	CO1. IDENTIFY the real-world problem (possibly of interdisciplinary nature) through a rigorous literature survey and formulate / set relevant aims and objectives.
		CO2	CO2. ANALYZE the results and arrive at valid conclusions.
		CO 3	CO3. PROPOSE a suitable solution based on the fundamentals of mechanical engineering by possibly integration of previously acquired knowledge.
		CO 4	CO4. CONTRIBUTE to society through proposed solutions by strictly following professional ethics and safety measures.
		CO 5	CO5. USE of technology in proposed work and demonstrate learning in oral and written form.
		CO 6	CO6. DEVELOP ability to work as an individual and as a team member.

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Year	Course Name	Course Outcome NO.	Course Outcome
TE			
SEM V	302041: Numerical and Statistical Methods	CO 1	SOLVE system of equations using direct and iterative numerical methods
		CO2	ESTIMATE solutions for differential equations using numerical techniques
		CO 3	DEVELOP solution for engineering applications with numerical integration.
		CO 4	DESIGN and CREATE a model using a curve fitting and regression analysis.
		CO 5	APPLY statistical Technique for quantitative data analysis.
		CO 6	DEMONSTRATE the data, using the concepts of probability and linear algebra.
	302042: Heat and Mass Transfer	CO 1	CO1. ANALYZE & APPLY the modes of heat transfer equations for one dimensional thermal system.
		CO2	CO2. DESIGN a thermal system considering fins, thermal insulation and & Transient heat conduction.
		CO 3	CO3. EVALUATE the heat transfer rate in natural and forced convection & validate with experimentation results.
		CO 4	CO4. INTERPRET heat transfer by radiation between objects with simple geometries, for black and grey surfaces.
		CO 5	CO5. ABILITY to analyze the rate of mass transfer using Fick's Law of Diffusion and understands mass diffusion in different coordinate systems.
		CO 6	CO6. DESIGN & ANALYSIS of heat transfer equipments and investigation of its performance
	302043: Design of Machine Elements	CO 1	CO1. DESIGN AND ANALYZE the cotter and knuckle Joints, levers and components subjected to eccentric loading.
		CO2	CO2. DESIGN shafts, keys and couplings under static loading conditions.
		CO 3	CO3. ANALYZE different stresses in power screws and APPLY those in the procedure to design screw jack.
		CO 4	CO4. EVALUATE dimensions of machine components under fluctuating loads.
		CO 5	CO5. EVALUATE & INTERPRET the stress developed on the different type of welded and threaded joints.
		CO 6	CO6. APPLY the design and development procedure for different types of springs.
	302044: Mechatronics	CO 1	CO1. DEFINE key elements of mechatronics, principle of sensor and its characteristics.
		CO2	CO2. UTILIZE concept of signal processing and MAKE use of interfacing systems such as ADC, DAC, Digital I/O.
		CO 3	CO3. DETERMINE the transfer function by using block diagram reduction technique.
		CO 4	CO4. EVALUATE Poles and Zero, frequency domain parameter for mathematical modeling for mechanical system. CO5. APPLY the concept of different controller modes to an industrial application. CO6. DEVELOP the ladder programming for industrial application.
		CO 5	CO5. APPLY the concept of different controller modes to an industrial application.
		CO 6	CO6. DEVELOP the ladder programming for industrial application.
	302045-A: Advanced Forming & Joining Processes	CO 1	CO1. ANALYSE the effect of friction in metal forming deep drawing and IDENTIFICATION of surface defects and their remedies in deep drawing operations
		CO2	CO2. ASSESS the parameters for special forming operation and SELECT appropriate special forming operation for particular applications
		CO 3	CO3. ANALYSE the effect of HAZ on microstructure and mechanical properties of materials
		CO 4	CO4. CLASSIFY various solid state welding process and SELECT suitable welding processes for particular applications
		CO 5	CO5. CLASSIFY various advanced welding process and SELECT suitable welding processes for particular applications.
		CO 6	CO6. INTERPRET the principles of sustainable manufacturing and its role in manufacturing industry.
	302045-B:Machining Science &Technology	CO 1	CO1. DEFINE metal cutting principles and mechanics of metal cutting and tool life.
		CO2	CO2. DESCRIBE features of gear and thread manufacturing processes.
		CO 3	CO3. SELECT appropriate grinding wheel and demonstrate the various surface finishing processes.
		CO 4	CO4. SELECT appropriate jigs/fixtures and to draw the process plan for a given component.
		CO 5	CO5. SELECT & EVALUATE various parameters of process planning. CO6. GENERATE CNC program for Turning / Milling processes and generate tool path using CAM software.
		CO 6	CO6. GENERATE CNC program for Turning / Milling processes and generate tool path using CAM software.

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Year	Course Name	Course Outcome NO.	Course Outcome
TE			
SEM V	304181: Digital Communication	CO 1	CO1: Apply the statistical theory for describing various signals in a communication system.
		CO 2	CO2: Understand and explain various digital modulation techniques used in digital communication systems and analyze their performance in presence of AWGN noise.
		CO 3	CO3: Describe and analyze the digital communication system with spread spectrum modulation.
		CO 4	CO4: Analyze a communication system using information theoretic approach.
		CO 5	CO5: Use error control coding techniques to improve performance of a digital communication system.
SEM V	304182: Electromagnetic Field Theory	CO 1	CO1: Apply the basic electromagnetic principles and determine the fields (E & H) due to the given source.
		CO2	CO2: Apply boundary conditions to the boundaries between various media to interpret behavior of the fields on either sides.
		CO 3	CO3: State, Identify and Apply Maxwell's equations (integral and differential forms) in both the forms (Static, time-varying or Time-harmonic field) for various sources, Calculate the time average power density using Poynting Theorem, Retarded magnetic vector potential.
		CO 4	CO4: Formulate, Interpret and solve simple uniform plane wave (Helmholtz Equations) equations, and analyze the incident/reflected/transmitted waves at normal incidence.
		CO 5	CO5: Interpret and Apply the transmission line equation to transmission line problems with load impedance todetermine input and output voltage/current at any point on the Transmission line, Find input/load impedance, input/load admittance, reflection coefficient, SWR, Vmax/Vmin, length of transmission l ine using Smith Chart.
		CO 6	CO6: Carry out a detailed study, interpret the relevance and applications of Electromagnetics.
SEM V	304183: Database Management	CO 1	CO1: Ability to implement the underlying concepts of a database system.
		CO2	CO2: Design and implement a database schema for a given problem-domain using data model.
		CO 3	CO3: Formulate, using SQL/DML/DDL commands, solutions to a wide range of query and update problems.
		CO 4	CO4: Implement transactions, concurrency control, and be able to do Database recovery.
		CO 5	CO5: Able to understand various Parallel Database Architectures and its applications.
		CO 6	CO6: Able to understand various Distributed Databases and its applications.
SEM V	304184: Microcontroller	CO 1	CO1: Understand the fundamentals of microcontroller and programming.
		CO 2	CO2: Interface various electronic components with microcontrollers.
		CO 3	CO3: Analyze the features of PIC 18F XXXX.
		CO 4	CO4: Describe the programming details in peripheral support.
		CO 5	CO5: Develop interfacing models according to applications.
		CO 6	CO6: Evaluate the serial communication details and interfaces.
SEM V	304185 (D): Computer Networks (Elective - I)	CO 1	CO1: Design LAN using appropriate networking architecture, topologies, transmission media, and networking devices.
		CO 2	CO2: Understand the working of controlling techniques for flawless data communication using data link layer protocols.
		CO 3	CO3: Learn the functions of network layer, various switching techniques and internet protocol addressing.
		CO 4	CO4: Explore various interior and exterior, unicasting and multicasting protocols.
		CO 5	CO5: Analyze data flow using TCP/UDP Protocols, congestion control techniques for QoS.
		CO 6	CO6: Illustrate the use of protocols at application layer.
SEM V	304190: Skill Development	CO 1	CO1: Student should recognize the need to engage in independent and life-long learning in required skill sets
		CO 2	CO2: Student needs to experience the impact of industries on society by visiting different industries and understand the importance of industrial products for analog and digital circuits and systems.
		CO 3	CO3: Student has to make use of the modern electronic and IT Engineering Tools and Technologies for solving electronic engineering problems.
		CO 4	CO4: Student would be able to communicate effectively at different technical and administrative levels.
		CO 5	CO5: Student will exhibit leadership skills both as an individual and as a member in a team in multidisciplinary environment.

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SEM VI	304192: Cellular Networks	CO 1	CO1: Understand fundamentals of wireless communications.
		CO2	CO2: Discuss and study OFDM and MIMO concepts. CO3: Elaborate fundamentals mobile communication.
		CO 3	CO4: Describes aspects of wireless system planning.
		CO 4	CO5: Understand of modern and futuristic wireless networks architecture.
		CO 5	CO6: Summarize different issues in performance analysis.
SEM VI	304193: Project Management	CO 1	CO1: Apply the fundamental knowledge of project management for effectively handling the projects.
		CO2	CO2: Identify and select the appropriate project based on feasibility study and undertake its effective planning.
		CO 3	CO3: Assimilate effectively within the organizational structure of project and handle project management related issues in an efficient manner.
		CO 4	CO4: Apply the project scheduling techniques to create a Project Schedule Plan and accordingly utilize the resources to meet the project deadline.
		CO 5	CO5: Identify and assess the project risks and manage finances in line with Project Financial Management Process.
		CO 6	CO6: Develop new products assessing their commercial viability and develop skillsets for becoming successful entrepreneurs while being fully aware of the legal issues related to Product development and Entrepreneurship.
SEM VI	304194: Power Devices & Circuits	CO 1	CO1: To differentiate based on the characteristic parameters among SCR, GTO, MOSFET & IGBT and identify suitability of the power device for certain applications and understand the significance of device ratings.
		CO2	CO2: To design triggering / driver circuits for various power devices.
		CO 3	CO3: To evaluate and analyze various performance parameters of the different converters and its topologies.
		CO 4	CO4: To understand significance and design of various protections circuits for power devices.
		CO 5	CO5: To evaluate the performance of uninterruptible power supplies, switch mode power supplies and battery.
		CO 6	CO6: To understand case studies of power electronics in applications like electric vehicles, solar systems etc.
SEM VI	304195 (E): Network Security (Elective-II)	CO 1	CO1: Analyze attacks on computers and computer security.
		CO2	CO2: Demonstrate knowledge of cryptography techniques.
		CO 3	CO3: Illustrate various Symmetric and Asymmetric keys for Ciphers
		CO 4	CO4: Evaluate different Message Authentication Algorithms and Hash Functions
		CO 5	CO5: Get acquainted with various aspects of E-Mail Security
		CO 6	CO6: Assimilate various aspects of Web Security
SEM VI	304196: Cellular Networks Lab	CO 1	CO1: To develop professional competence through internship.
		CO2	304195 (E): Network Security (Elective-II)
		CO 3	CO3: To build the professional network and expose students to future employees.
		CO 4	CO4: Apply professional and societal ethics in their day to day life.
		CO 5	CO5: To become a responsible professional having social, economic and administrative considerations.
		CO 6	CO6: To make own career goals and personal aspirations.
SEM VI	304199: Internship	CO 1	CO1: To develop professional competence through internship.
		CO2	CO2: To apply academic knowledge in a personal and professional environment.
		CO 3	CO3: To build the professional network and expose students to future employees.
		CO 4	CO4: Apply professional and societal ethics in their day to day life.
		CO 5	CO5: To become a responsible professional having social, economic and administrative considerations.
		CO 6	CO6: To make own career goals and personal aspirations.
SEM VI	304200: Mini Project	CO 1	CO1: Understand, plan and execute a Mini Project with team.
		CO2	CO2: Implement electronic hardware by learning PCB artwork design, soldering techniques, testing and troubleshooting etc.
		CO 3	CO3: Prepare a technical report based on the Mini project.
		CO 4	CO 4: Deliver technical seminar based on the Mini Project work carried out.

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Year	Course Name	Course Outcome NO.	Course Outcome
BE			
SEM VII	404181: Radiation and Microwave Theory	CO 1	CO1: Apply the fundamentals of electromagnetic to derive free space propagation equation and distinguish various performance parameters of antenna.
		CO2:	CO2: Identify various modes in the waveguide. Compare: coaxial line, rectangular waveguides & striplines and identify applications of the same.
		CO3:	CO3: Explore construction and working of principles passive microwave devices/components.
		CO4:	CO4: Explore construction and working of principles active microwave devices/components.
		CO5:	CO5: Analyze the structure, characteristics, operation, equivalent circuits and applications of various microwave solid state active devices.
		CO6:	CO6: Know the various microwave systems, device set ups of microwave measurement devices and Identify the effect of radiations on environmental sustainability.
SEM VII	404182: VLSI Design and Technology	CO 1	CO1: Develop effective HDL codes for digital design.
		CO2:	CO2: Apply knowledge of real time issues in digital design.
		CO3:	CO3: Model digital circuit with HDL, simulate, synthesis and prototype in PLDs.
		CO4:	CO4: Design CMOS circuits for specified applications.
		CO5:	CO5: Analyze various issues and constraints in design of an ASIC.
		CO6:	CO6: Apply knowledge of testability in design and Build In Self Test (BIST) circuit.
SEM VII	404183: Cloud Computing	CO 1	CO1: Understand the basic concepts of Cloud Computing.
		CO2:	CO2: Describe the underlying principles of different Cloud Service Models.
		CO3:	CO3: Classify the types of Virtualization.
		CO4:	CO4: Examine the Cloud Architecture and understand the importance of Cloud Security.
		CO5:	CO5: Develop applications on Cloud Platforms.
		CO6:	CO6: Evaluate distributed computing and the Internet of Things.
SEM VII	404184 (D): Embedded System & RTOS (Elective - III)	CO 1	CO1: Apply design metrics of Embedded systems to design real time applications to match recent trends in technology.
		CO2:	CO2: Apply Real time systems concepts.
		CO3:	CO3: Evaluate µCOS operating system and its services.
		CO4:	CO4: Apply Embedded Linux Development Environment and testing tools.
		CO5:	CO5: Analyze Linux operating system and device drivers.
		CO6:	CO6: Analyze the hardware – software co design issues for testing of real time Embedded system.
SEM VII	404185 (B): Electronics	CO 1	CO1: Understand and explain design flow of design of electronics product.
		CO2:	CO2: Associate with various circuit design issues and testing.
		CO3:	CO3: Inferring different software designing aspects and the Importance of product test & test specifications.

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SEM VII	Product Design (Elective - IV)	CO4:	CO4: Summarizing printed circuit boards and different parameters.
		CO5:	CO5: Estimating assorted product design aspects.
		CO6:	CO6: Exemplifying special design considerations and importance of documentation.
SEM VII	404188: Project Phase – I	CO 1	CO1: Demonstrate a sound technical knowledge in field of E&TC in the form of project.
		CO2:	CO2: Undertake real life problem identification, formulation and solution.
		CO3:	CO3: Design engineering solutions to complex problems utilizing a systematic approach.
		CO4:	CO4: Demonstrate the knowledge, effective communication skills and attitudes as professional engineer

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SEM VIII	404190: Fiber Optic Communication	CO 1	CO1: Explain the working of components and measurement equipments in optical fiber networks.
		CO2:	CO2: Calculate the important parameters associated with optical components used in fiber optic telecommunication systems.
		CO3:	CO3: Compare and contrast the performance of major components in optical links.
		CO4:	CO4: Evaluate the performance viability of optical links using the power and rise time budget analysis.
		CO5:	CO5: Design digital optical link by proper selection of components and check its viability using simulation tools.
		CO6:	CO6: Compile technical information related to state of art components, standards, simulation tools and current technological trends by accessing the online resources to update their domain knowledge

SEM VIII	404191 (E): Mobile Computing (Elective - V)	CO 1	CO1: Understand concepts of Mobile Communication.
		CO2:	CO2: Analyse next generation Mobile Communication System.
		CO3:	CO3: Understand network layers of Mobile Communication.
		CO4:	CO4: Understand IP and Transport layers of Mobile Communication.
		CO5:	CO5: Study of different mathematical models.
		CO6:	CO6: Understand different mobile applications

SEM VIII	404192 (D): Digital Marketing (Elective - VI)	CO 1	CO1: Design websites using free tools like Wordpress and explore it for digital marketing.
		CO2:	CO2: Apply various keywords for a website & to perform SEO.
		CO3:	CO3: Understand the various SEM Tools and implement the Digital Marketing Tools.
		CO4:	CO4: Illustrate the use of Facebook, Instagram and Youtube for Digital Marketing in real life.
		CO5:	CO5: Use Linked in platform for various campaigning.
		CO6:	CO6: Understand the importance of recent trends in digital marketing.

SEM VIII	404193: Innovation and Entrepreneurship	CO 1	CO1: Understand Innovation, Entrepreneurship and characteristics of an entrepreneur.
		CO2:	CO2: Develop a strong understanding of the Design Process and its application in variety of business settings.
		CO3:	CO3: Generate sustainable ideas.
		CO4:	CO4: Explore various processes required to be an entrepreneur.
		CO5:	CO5: Understand patents and its process of filing.
		CO6:	CO6: Choose and use appropriate social media for marketing

SEM VIII	404194: Digital Business Management	CO 1	CO1: Identify drivers of digital business.
		CO2:	CO2: Illustrate various approaches and techniques for E-business and management.
		CO5:	CO3: Prepare E-business plan.

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Year	Course Name	Course Outcome NO.	Course Outcome
SE			
SEM III	210241: Discrete Mathematics	CO 1	CO1: Design and analyze real world engineering problems by applying set theory, propositional logic and mathematical induction
		CO2	CO2: Develop skill in expressing mathematical properties of relation and function
		CO 3	CO3: Identify number of logical possibilities of events to design professional engineering Solutions
		CO 4	CO4: Model and solve computing problem using tree and graph Analyze the properties of binary operations and evaluate the algebraic structure
		CO 5	CO5: Apply abstract algebra in combinatorics, coding theory and questions regarding geometric constructio
	210242: Fundamentals of Data Structures	CO 1	CO1: To demonstrate a detailed understanding of behaviour of data structures like array, linked list, stack, and queue by developing programs.
		CO2	CO2: To use appropriate algorithmic strategy for better efficiency
		CO 3	CO3: To summarize data searching and sorting techniques.
		CO 4	CO4: To discriminate the usage of various structures in approaching the problem solution.
		CO 5	CO5: To analyze and use effective and efficient data structures in solving various Computer Engineering domain problems.
		CO 6	CO6: To design the algorithms to solve the programming problems.
	210243: Object Oriented Programming	CO 1	CO1: Analyze the strengths of object oriented programming
		CO2	CO2: Design and apply OOP principles for effective programming
		CO 3	CO3: Develop the application using object oriented programming language(C++)
		CO 4	CO4: Apply object-oriented concepts for advanced programming.
	210244: Computer Graphics	CO 1	CO1: Define basic terminologies of Computer Graphics, interpret the mathematical foundation of the concepts of computer graphics and apply mathematics to develop Computer programs for elementary graphic operations.
		CO2	CO2: Define the concept of windowing and clipping and apply various algorithms to fill and clip polygons.
		CO 3	CO3: Explain the core concepts of computer graphics, including transformation in two and three dimensions, viewing and projection.
		CO 4	CO4: Explain the concepts of color models, lighting, shading models and hidden surface elimination.
		CO 5	CO5: Describe the fundamentals of curves, fractals, animation and gaming.
	210245: Digital Electronics and Logic Design	CO 1	CO1: Simplify Boolean Expressions using K Map.
		CO2	CO2: Design and implement combinational circuits.
		CO 3	CO3: Design and implement sequential circuits.
		CO 4	CO4: Develop simple real-world application using ASM and PLD.
		CO 5	CO5: Choose appropriate logic families IC packages as per the given design specifications.
		CO 6	CO6: Explain organization and architecture of computer system
	210246: Humanity & Social Science	CO 1	CO1: Aware of the various issues concerning humans and society.
		CO2	CO2: Aware about their responsibilities towards society.
		CO 3	CO3: Sensitized about broader issues regarding the social, cultural, economic and human aspects, involved in social changes.
		CO 4	CO4: Able to understand the nature of the individual and the relationship between self and the community.
		CO 5	CO5: Able to understand major ideas, values, beliefs, and experiences that have shaped human history and cultures.

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SEM IV	210253: Data Structures & Algorithms	CO 1	CO1: To identify & articulate the complexity goals and benefits of a good hashing scheme for real-world applications.
		CO2	CO2: To apply non-linear data structures for solving problems of various domain.
		CO 3	CO3: To design and specify the operations of a nonlinear-based abstract data type and implement them in a high-level programming language.
		CO 4	CO4: To analyze the algorithmic solutions for resource requirements and optimization
		CO 5	CO5: To use efficient indexing methods and multiway search techniques to store and maintain data.
		CO 6	CO6: To use appropriate modern tools to understand and analyze the functionalities confined to the secondary storage.
	210254: Software Engineering	CO 1	CO1: Apply software engineering principles to develop software.
		CO2	CO2: Analyze software requirements and formulate design solution for a software.
		CO 3	CO3: Explain concepts of project estimation, planning and scheduling.
		CO 4	CO4: Explain risk management and software configuration management.
		CO 5	CO5: Explain various types of software testing.
	210255: Microprocessor	CO 1	CO1: To apply the assembly language programming to develop small real life embedded application.
		CO2	CO2: To understand the architecture of the advanced processor thoroughly to use the resources for programming
		CO 3	CO3: To understand the higher processor architectures descended from 80386 architecture
	210256: Principles of Programming Languages	CO 1	CO1: Make use of basic principles of programming languages
		CO2	CO2: Able to develop a program with Data representation and Computations
		CO 3	CO3: Able to develop programs using Object Oriented Programming language : Java
		CO 4	CO4: Develop application using inheritance, encapsulation, and polymorphism
		CO 5	CO5: Able to demonstrate Applet and Multithreading for robust application development
		CO 6	CO6: Able to develop a simple program using basic concepts of Functional and Logical programming paradigm
	210259: Code of Conduct	CO 1	CO1: Understand the basic perception of profession, professional ethics, various moral & social issues, industrial standards, code of ethics and role of professional ethics in engineering field.
		CO2	CO2: Aware of professional rights and responsibilities of an engineer, responsibilities of an engineer for safety and risk benefit analysis.
		CO 3	CO3: Understand the impact of the professional Engineering solutions in societal and Environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
		CO 4	CO4: Acquire knowledge about various roles of engineers in variety of global issues and able to apply ethical principles to resolve situations that arise in their professional lives.
	210260: Project Based Learning	CO 1	CO1: Ability to solve real life problems by applying knowledge.
		CO2	CO2: Ability to analyze alternative approaches, apply and use most appropriate one for feasible solution.
		CO 3	CO3: Ability to understand basics of IT Project management
		CO 4	CO4: Students should be able to accept and meet challenges in the real world, mirroring what professionals do every day.
		CO 5	CO5: Able to Classify software applications and identify unique features of various domains
		CO 6	CO6: Learning by doing approach in PBL will promote long-term retention of material and replicable skill, as well as improve teachers' and students' attitudes towards learning.

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Year	Course Name	Course Outcome NO.	Course Outcome
TE			
SEM V	310241: Database Management Systems	CO 1	CO1: Analyze and design Database Management System using ER model
		CO 2	CO2: Implement database queries using database languages
		CO 3	CO3: Normalize the database design using normal forms
		CO 4	CO4: Apply Transaction Management concepts in real-time situations
		CO 5	CO5: Use NoSQL databases for processing unstructured data
		CO 6	CO6: Differentiate between Complex Data Types and analyze the use of appropriate data types
	310242: Theory of Computation	CO 1	CO1: Understand formal language, translation logic, essentials of translation, alphabets, language representation and apply it to design Finite Automata and its variants
		CO2	CO2: Construct regular expression to present regular language and understand pumping lemma forRE
		CO 3	CO3: Design Context Free Grammars and learn to simplify the grammar
		CO 4	CO4: Construct Pushdown Automaton model for the Context Free Language
		CO 5	CO5: Design Turing Machine for the different requirements outlined by theoretical computerscience
		CO 6	CO6: Understand different classes of problems, classify and analyze them and study concepts ofNP completeness
	310243: Systems Programming and Operating System	CO 1	CO1: Analyze and synthesize basic System Software and its functionality.
		CO 2	CO2: Identify suitable data structures and Design & Implement various System Software
		CO 3	CO3: Compare different loading schemes and analyze the performance of linker and loader
		CO 4	CO4: Implement and Analyze the performance of process scheduling algorithms
		CO 5	CO5: Identify the mechanism to deal with deadlock and concurrency issues
		CO 6	CO6: Demonstrate memory organization and memory management policies
	310244: Computer Networks and Security	CO 1	CO1: Summarize fundamental concepts of Computer Networks, architectures, protocols and technologies
		CO 2	CO2: Illustrate the working and functions of data link layer
		CO 3	CO3: Analyze the working of different routing protocols and mechanisms
		CO 4	CO4: Implement client-server applications using sockets
		CO 5	CO5: Illustrate role of application layer with its protocols, client-server architectures
		CO 6	CO6: Comprehend the basics of Network Security
	Elective I 310245(A): Internet of Things and Embedded Systems	CO 1	CO1: Understand the fundamentals and need of Embedded Systems for the Internet of Things
		CO 2	CO2: Apply IoT enabling technologies for developing IoT systems
		CO 3	CO3: Apply design methodology for designing and implementing IoT applications
		CO 4	CO4: Analyze IoT protocols for making IoT devices communication
		CO 5	CO5: Design cloud based IoT systems
		CO 6	CO6: Design and Develop secured IoT applications
	310249: Seminar and Technical Communication	CO 1	CO1: Analyze a latest topic of professional interest
		CO 2	CO2: Enhance technical writing skills
		CO 3	CO3: Identify an engineering problem, analyze it and propose a work plan to solve it
		CO 4	CO4: Communicate with professional technical presentation skills
		CO 5	

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SEM VI	310251: Data Science and Big Data Analytics	CO 1	CO1: Analyze needs and challenges for Data Science Big Data Analytics
		CO 2	CO2: Apply statistics for Big Data Analytics
		CO 3	CO3: Apply the lifecycle of Big Data analytics to real world problems
		CO 4	CO4: Implement Big Data Analytics using Python programming
		CO 5	CO5: Implement data visualization using visualization tools in Python programming
		CO 6	CO6: Design and implement Big Databases using the Hadoop ecosystem
	310252: Web Technology	CO 1	CO1: Implement and analyze behavior of web pages using HTML and CSS
		CO 2	CO2: Apply the client side technologies for web development
		CO 3	CO3: Analyze the concepts of Servlet and JSP
		CO 4	CO4: Analyze the Web services and frameworks
		CO 5	CO5: Apply the server side technologies for web development
		CO 6	CO6: Create the effective web applications for business functionalities using latest web development platforms
	310253: Artificial Intelligence	CO 1	CO1: Identify and apply suitable Intelligent agents for various AI applications
		CO 2	CO2: Build smart system using different informed search / uninformed search or heuristic approaches
		CO 3	CO3: Identify knowledge associated and represent it by ontological engineering to plan a strategy to solve given problem
		CO 4	CO4: Apply the suitable algorithms to solve AI problems
		CO 5	CO5: Implement ideas underlying modern logical inference systems
		CO 6	CO6: Represent complex problems with expressive yet carefully constrained language of representation
	Elective II 310254(A): Information Security	CO 1	CO1: Model the cyber security threats and apply formal procedures to defend the attacks
		CO 2	CO2: Apply appropriate cryptographic techniques by learning symmetric and asymmetric key cryptography
		CO 3	CO3: Design and analyze web security solutions by deploying various cryptographic techniques along with data integrity algorithms
		CO 4	CO4: Identify and Evaluate Information Security threats and vulnerabilities in Information systems and apply security measures to real time scenarios
		CO 5	CO5: Demonstrate the use of standards and cyber laws to enhance Information Security in the development process and infrastructure protection
	310255: Internship**	CO 1	CO1: To demonstrate professional competence through industry internship.
		CO 2	CO2: To apply knowledge gained through internships to complete academic activities in a professional manner.
		CO 3	CO3: To choose appropriate technology and tools to solve given problem.
		CO 4	CO4: To demonstrate abilities of a responsible professional and use ethical practices in day to day life.
		CO 5	CO5: Creating network and social circle, and developing relationships with industry people.
		CO 6	CO6: To analyze various career opportunities and decide carrier goals.

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Year	Course Name	Course Outcome NO.	Course Outcome
BE			
SEM VII	410241: Design and Analysis of Algorithms	CO 1	CO1: Formulate the problem
		CO 2	CO2: Analyze the asymptotic performance of algorithms
		CO 3	CO3: Decide and apply algorithmic strategies to solve given problem
		CO 4	CO4: Find optimal solution by applying various methods
		CO 5	CO5: Analyze and Apply Scheduling and Sorting Algorithms.
		CO 6	CO6: Solve problems for multi-core or distributed or concurrent environments
	410242: Machine Learning	CO 1	CO1: Identify the needs and challenges of machine learning for real time applications.
		CO 2	CO2: Apply various data pre-processing techniques to simplify and speed up machine learning algorithms.
		CO 3	CO3: Select and apply appropriately supervised machine learning algorithms for real time applications.
		CO 4	CO4: Implement variants of multi-class classifier and measure its performance.
		CO 5	CO5 :Compare and contrast different clustering algorithms.
		CO 6	CO6: Design a neural network for solving engineering problems.
	410243: Blockchain Technology	CO 1	CO1: Interpret the fundamentals and basic concepts in Blockchain
		CO 2	CO2: Compare the working of different blockchain platforms
		CO 3	CO3: Use Crypto wallet for cryptocurrency based transactions
		CO 4	CO4: Analyze the importance of blockchain in finding the solution to the real-world problems.
		CO 5	CO5: Illustrate the Ethereum public block chain platform
		CO 6	CO6: Identify relative application where block chain technology can be effectively used and implemented.
	Elective III 410244(D): Object oriented Modeling and Design	CO 1	CO1: Describe the concepts of object-oriented and basic class modelling.
		CO 2	CO2: Draw class diagrams, sequence diagrams and interaction diagrams to solve problems.
		CO 3	CO3: Choose and apply a befitting design pattern for the given problem
		CO 4	CO4: To Analyze applications, architectural Styles & software control strategies
		CO 5	CO5: To develop Class design Models & choose Legacy Systems.
		CO 6	CO6:To Understand Design Patterns
	Elective IV 410245 (D): Software Testing and Quality Assurance	CO 1	CO1: Describe fundamental concepts in software testing such as manual testing, automation testing and software quality assurance.
		CO 2	CO2: Design and Develop project test plan, design test cases, test data, and conduct test operations.
		CO 3	CO3: Apply recent automation tool for various software testing for testing software.
		CO 4	CO4: Apply different approaches of quality management, assurance, and quality standard to software system.
		CO 5	CO5: Apply and analyze effectiveness Software Quality Tools.
		CO 6	CO6: Apply tools necessary for efficient testing framework.
	410248: Project Work Stage I	CO 1	CO1: Solve real life problems by applying knowledge.
		CO 2	CO2: Analyze alternative approaches, apply and use most appropriate one for feasible solution.
		CO 3	CO3: Write precise reports and technical documents in a nutshell.
		CO 4	CO4: Participate effectively in multi-disciplinary and heterogeneous teams exhibiting team work
		CO 5	CO5: Inter-personal relationships, conflict management and leadership quality

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SEM VIII	410250: High Performance Computing	CO 1	CO1: Understand various Parallel Paradigm
		CO 2	CO2: Design and Develop an efficient parallel algorithm to solve given problem
		CO 3	CO3: Illustrate data communication operations on various parallel architecture
		CO 4	CO4: Analyze and measure performance of modern parallel computing systems
		CO 5	CO5: Apply CUDA architecture for parallel programming
		CO 6	CO6: Analyze the performance of HPC applications
	410251: Deep Learning	CO 1	CO1: Understand the basics of Deep Learning and apply the tools to implement deep learning applications
		CO 2	CO2: Evaluate the performance of deep learning models (e.g., with respect to the bias-variance trade- off, overfitting and underfitting, estimation of test error).
		CO 3	CO3: To apply the technique of Convolution (CNN) and Recurrent Neural Network (RNN) for implementing Deep Learning models
		CO 4	CO4: To implement and apply deep generative models.
		CO 5	CO5: Construct and apply on-policy reinforcement learning algorithms
		CO 6	CO6:To Understand Reinforcement Learning Process
	Elective V 410252(C): Software Defined Networks	CO 1	CO1: Interpret the need of Software Defined networking solutions.
		CO 2	CO2: Analyze different methodologies for sustainable Software Defined Networking solutions.
		CO 3	CO3: Select best practices for design, deploy and troubleshoot of next generation networks.
		CO 4	CO4: Develop programmability of network elements.
		CO 5	CO5: Demonstrate virtualization and SDN Controllers using Open Flow protocol
		CO 6	CO6: Design and develop various applications of SDN
	Elective VI 410253(B): Soft Computing	CO 1	CO1: Understand requirement of soft computing and be aware of various soft computing techniques.
		CO 2	CO2: Understand Artificial Neural Network and its characteristics and implement ANN algorithms.
		CO 3	CO3: Understand and Implement Evolutionary Computing Techniques.
		CO 4	CO4: Understand the Fuzzy logic and Implement fuzzy algorithms for solving real life problems.
		CO 5	CO5: Apply knowledge of Genetic algorithms for problem solving.
		CO 6	CO6: Develop hybrid systems for problem solving.
	410256: Project Work Stage II	CO 1	CO1: Show evidence of independent investigation
		CO 2	CO2: Critically analyze the results and their interpretation.
		CO 3	CO3: Report and present the original results in an orderly way and placing the open questions in the right perspective.
		CO 4	CO4: Link techniques and results from literature as well as actual research and future research lines with the research.
		CO 5	CO5: Appreciate practical implications and constraints of the specialist subject

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