Nutan Maharashtra Vidya Prasarak Mandal's

NUTAN MAHARASHTRA INSTITUTE OF ENGINEERING AND TECHNOLOGY

Under Administrative Support - PimpriChinchwad Education Trust

ESTD 1996

Approved by AICTE | Accredited by NAAC | Affiliated to SPPU

"Samarth Vidya Sankul", Vishnupuri, Telegaon Dabhade, Taluka Maval, District Pune - 410507

Tel. No. 02114 – 231666, E-mail :nmiettalegaon@gmail.com Web : www.nmiet.edu.in

Mechanical Engineering

Course Outcomes (COs) 2019 Pattern

SE Mechanical Engineering(2019 Pattern) SEM-III				
SN	**Course Code**	**Course Name**	**Course Outcomes (COs)**	
1	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.
2	210242	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 modeling 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
3	210243	Engineering Thermodynamics	CO1	Describe the basics of thermodynamics with heat and work interactions
			CO2	Apply laws of thermodynamics to steady flow and non flow process.

Scanned with OKEN Scanner

			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
4	210244	**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 system viz, phase, variables, components, grains, grain boundary & degree of freedom etc.
			CO5	ANALYSE effect of alloying elements & heat treatment on properties of ferrous and nonferrous alloy.
			CO6	SELECT appropriate materials for various applications.
5	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
6	202045	**Geometric Dimensioning and Tolerance Lab**	CO1	SELECT appropriate IS and ASME standards for drawing
			CO2	READ and ANALYSE 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.
			CO6	EVALUATE the industrial drawing and IDENTIFY suitable manufacturing process for it.
SE Mechanical Engineering (2019 Pattern) SEM-IV				
1	207002	**Engineering Mathematics III**	CO1	SOLVE higher order linear differential equations and its applications to model and analyse mass spring systems

Scanned with OKEN Scanner

			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 analyzing 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.
			CO6	Understand and apply complex analysis to solve engineering problems involving potential theory and aerodynamics.
2	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
			CO6	Solve problems related to kinematics in real-world applications.
3	202048	**Applied Thermodynamics**	CO1	To determine COP of refrigeration cycle and study Psychrometric properties and processes.
			CO2	To study working of engine, Actual, Fuel-Air and Air standard cycle and its Performance.
			CO3	To understand Combustion in SI and CI engines and factors affecting performance parameters
			CO4	To study emission from IC Engines and its controlling method, various emission norms.
			CO5	To estimate performance parameters by conducting a test on I. C. Engines.
			CO6	To determine performance parameters of Positive displacement compressor.
4	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

Talegaon Dabhade 410507

Scanned with OKEN Scanner

5	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
6	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

Maharashtra Instt. of Engg. & Technology
Talegaon Dabhade

Scanned with OKEN Scanner

TE Mechanical Engineering(2019 Pattern) SEM-V				
SN	**Course Code**	**Course Name**	**Course Outcomes (COs)**	
1	302041	**Numerical & Statistical Methods**	CO1	Solve system of equations using direct & iterative numerical methods.
			CO2	Estimate solutions of differential equations using numerical techniques.
			CO3	Develop solution for engineering applications with numerical integration.
			CO4	Design & create model using a curve fitting & regression analysis.
			CO5	Apply statistical techniques for quantitative data analysis.
			CO6	Demonstrate the data using concepts of probability & linear algebra.
2	302042	**Heat & Mass Transfer**	CO1	Analyze & apply the modes of heat transfer equations for one dimensional thermal system.
			CO2	Design a thermal system considering fins, thermal insulation and & transient heat conduction.
			CO3	Evaluate the heat transfer rate in natural and forced convection & validate with experimentation results.
			CO4	Interpret heat transfer by radiation between objects with simple geometries, for black and grey surfaces.
			CO5	Ability to analyze the rate of mass transfer using fick's law of diffusion and understands mass diffusion in different coordinate systems.
			CO6	Design & analysis of heat transfer equipments and investigation of its performance.
3	302043	**Design of Machine Elements**	CO1	Design and analyze the cotter and knuckle joints, levers and components subjected to eccentric loading.
			CO2	Design shafts, keys and couplings under static loading conditions.
			CO3	Analyze different stresses in power screws and apply those in the procedure to design screw jack.
			CO4	Evaluate dimensions of machine components under fluctuating loads.
			CO5	Evaluate & interpret the stress developed on the different type of welded and threaded joints.

Scanned with OKEN Scanner

			CO6	Apply the design and development procedure for different types of springs.
4	302044	Mechatronics	CO1	Understand the key elements of mechatronics, principle of sensor and itscharacteristics.
			CO2	Understand the concept of signal processing and use of interfacing systems such asadc, dac, digital i/o.
			CO3	Understand the block diagram representation and concept of transfer function.
			CO4	Understand the system modeling and analysis in frequency domain.
			CO5	Understand the system modeling and analysis in time domain, controller modes and itsindustrial applications.
			CO6	Utilize the concepts of plc system and its ladder programming and significance of plcsystem in industrial application.
5	302045	Elective I (Machining science & Technology)	CO1	Define metal cutting principles and mechanics of metal cutting and tool life.
			CO2	Describe features of gear and thread manufacturing processes.
			CO3	Select appropriate grinding wheel and demonstrate the various surface finishing processes.
			CO4	Select appropriate jigs/fixtures and to draw the process plan for a given component.
			CO5	Select & evaluate various parameters of process planning.
			CO6	Generate cnc program for turning / milling processes and generate tool path using cam software.
6	302046	Digital Manufacturing Laboratory	CO1	Develop a component using conventional machines, cnc machines and additive manufacturing techniques.
			CO2	Analyze cutting tool parameters for machining given job.
			CO3	Demonstrate simulation of manufacturing process using digital manufacturing tools.
			CO4	Select and design jigs and fixtures for a given component.
			CO5	Demonestrate different parameters for cnc retrofitting and reconditioning.
			CO6	Develop teamwork and communication skills while working on group projects related to digital manufacturing systems.
7	302047	Skill Development	CO1	Apply& demonstrate procedure of assembly & disassembly of various machines.
			CO2	Design & develop a working/model of machine parts or any new product.
			CO3	Evaluate fault with diagnosis on the machines, machine tools and home appliances.
			CO4	Identify & demonstrate the various activities performed in an industry such as maintenance, design of components, material selection.
			CO5	Apply practical knowledge for hands-on projects and skill-based learning in mechanical engineering domains.

Scanned with OKEN Scanner

			CO6	Communicate technical ideas clearly and effectively through reports, presentations, and project documentation.
TE COMPUTER ENGINEERING(2019PATTERN) SEM-VI				
1	302049	**Artificial Intelligence &Machine Learning**	CO1	Demonstrate fundamentals of artificial intelligence and machine learning.
			CO2	Apply feature extraction and selection techniques.
			CO3	Apply machine learning algorithms for classification and regression problems.
			CO4	Devise and develop a machine learning model using various steps.
			CO5	Explain concepts of reinforced and deep learning.
			CO6	Simulate machine learning model in mechanical engineering problems.
2	302050	**Computer Aided Engineering**	CO1	Define the use of cae tools and describe the significance of shape functions in finite element formulations
			CO2	Apply the various meshing techniques for better evaluation of approximate results
			CO3	Apply material properties and boundary condition to solve 1-d and 2-d element stiffness matrices to obtain nodal or elemental solution
			CO4	Analyze and apply various numerical methods for different types of analysis.
			CO5	Evaluate and solve non-linear and dynamic analysis problems by analyzing the results obtained from analytical and computational method
			CO6	Generate the results in the form of contour plot by the use of cae tools
3	302051	**Design of Transmission Systems**	CO1	Apply the principle of spur & helical gear design for industrial application and prepare a manufacturing drawing with the concepts of gd&t.
			CO2	Explain and design bevel & worm gear considering design parameters as per design standards.
			CO3	Select and design rolling and sliding contact bearings from manufacturer's catalogue for a typical application considering suitable design parameters.
			CO4	Define and design various types of clutches, brakes, used in automobile.
			CO5	Apply various concept to design machine tool gear box, for different applications.
			CO6	Elaborate various modes of operation, degree of hybridization and allied terms associated with hybrid electric vehicles.
4	302052	**Elective II (Surface Engineering)**	CO1	Define the basic's principle & mechanism of surface degradation.
			CO2	Analyse & select correct corrosion prevention techniques for a different service condition.
			CO3	Demonstrate the role of surface engineering of materials to modify/improve the surface properties.

Scanned with OKEN Scanner

			CO3	Classify and analyze the mechanism, process parameters of the chemical and electrochemical machining.
			CO4	Relate and analyze the mechanism and select process parameters electrical discharge machining for an application.
			CO5	Illustrate the application of micromachining processes.
			CO6	Suggest appropriate nanomachining process for the specific application.
5	402045	Elective – IV (Product Design and Development)	CO1	Understand product design and product development processes
			CO2	Understand processes, tools and techniques for market survey & product specification finalization
			CO3	Understand processes, tools and techniques for concept inception, verification and selection
			CO4	Understand processes, tools and techniques for concept exploration & development
			CO5	Understand processes, tools and techniques for design verification and validation
			CO6	Understand processes, tools and techniques for robust design and development
6	402046	Data Analytics Laboratory	CO1	Show the results of a descriptive analytics in the form of charts and graphs and withdraw useful conclusions from acquired data set.
			CO2	Apply various inferential statistical analysis techniques to describe data sets and withdraw useful conclusions from acquired data set.
			CO3	Explore the data analytics techniques using various tools
			CO4	Apply data science concept and methods to solve problems in real world context
			CO5	Select advanced techniques to conduct thorough and insightful analysis and interpret the results.
			CO6	Survey of methods used for data analysis in different data domains.
7	402047	Project (Stage - I)	CO1	Implement systems approach
			CO2	To conceptualize a novel idea / technique into a product
			CO3	To think in terms of a multi-disciplinary environment.
			CO4	To take on the challenges of teamwork, and document all aspects of design work
			CO5	To understand the management techniques of implementing a project.
			CO6	Comprehend the engineering activities with effective presentation and report and interpret the findings with appropriate technological / research citation.

BE MECHANICAL ENGINEERING (2019PATTERN)
SEM-VIII

Scanned with OKEN Scanner

SN	Course Code	Course Name	Course outcomes (cos)	
1	402041	Heating Ventilation Air-Conditioning and Refrigeration	CO1	Analyse different air-craft refrigeration systems and explain the properties, applications and environmental issues of different refrigerants.
			CO2	Analyse multi pressure refrigeration system used for refrigeration applications.
			CO3	Discuss types of compressors, condensers, evaporators and expansion valves along with regulatory and safety controls and describes transcritical and ejector refrigeration systems.
			CO4	Estimate cooling load for air conditioning systems used with concern of design conditions and indoor quality of air.
			CO5	Design air distribution system along with consideration of ventilation and infiltration.
			CO6	Explain the working type of desiccants, evaporator, thermal storage, radiant cooling, clean room and heat pump system.
2	402042	Dynamics of Machinery	CO1	Apply balancing technique for static and dynamic balancing of multi cylinder inline and radial engines.
			CO2	Analyze the gyroscopic couple or effect for stabilization of ship, airplane and four wheeler vehicles.
			CO3	Estimate natural frequency for single dof un-damped & damped free vibratory systems.
			CO4	Determine response to forced vibrations due to harmonic excitation, base excitation and excitation due to unbalance forces.
			CO5	Estimate natural frequencies, mode shapes for 2 dof un-damped free longitudinal and torsional vibratory systems.
			CO6	Describe noise and vibration measuring instruments for industrial / real life applications along with suitable method for noise and vibration control.
3	402043	Turbomachinery	CO1	Validate impulse moment principle using flat, inclined and curved surfaces and investigate performance characteristics of hydraulic turbines.
			CO2	Determine performance parameters of impulse and reaction steam turbine along with discussion of nozzles, governing mechanism & losses.
			CO3	Measure performance parameters of single & multistage centrifugal pumps along with discussion of cavitation and selection.
			CO4	Explain performance parameters of centrifugal compressor along with discussion of theoretical aspects of axial compressor.
4	402044	Elective – III (Modern Machining Process)	CO1	Understand and analyze the mechanism, process parameters of mechanical assisted modern machining processes.
			CO2	Understand the mechanism, construction and working of laser, plasma and electron beam assisted machining.

Scanned with OKEN Scanner

			CO4	Select the suitable surface heat treatments to improve the surface properties.
			CO5	Apply the surface modification technique to modify surface properties.
			CO6	Analyse & evalute various surface coating defects using various testing/characterization method.
5	302053	Measurement Laboratory	CO1	Evaluate causes of errors in vernier calipers, micrometers by performing experiments in standard metrological conditions, noting deviations at actual and by plotting cause and effect diagram, to reduce uncertainty in measurement
			CO2	Analyze strain measurement parameters by taking modulus of elasticity in consideration to acknowledge its usage in failure detection and force variations
			CO3	Examine surface textures, surface finish using equipment's like talysurf and analyze surface finish requirements of metrological equipment's like gauges, jaws of verniercalipers, micrometers, magnifying glasses of height gauge and more, to optimize surface finish accuracy requirements and cost of measurement.
			CO4	Measure the dimensional accuracy using comparator and limit gauges and appraise their usage in actual measurement or comparison with standards set to reduce measurement lead time.
			CO5	Perform testing of flow rate, speed and temperature measurements and their effect on performance in machines and mechanisms like hydraulic or pneumatic trainers, lathe machine etc. To increase repeatability and reproducibility.
			CO6	Compile the information of opportunities of entrepreneurships/business in various sectors of metrology like calibrations, testing, coordinate and laser metrology etc in an industry visit report.
6	302054	Fluid Power &Control Laboratory	CO1	Define working principle of components used in hydraulic and pneumatic systems.
			CO2	Identify & explain various applications of hydraulic and pneumatic systems.
			CO3	Select an appropriate component required for hydraulic and pneumatic systems using manufactures' catalogues.
			CO4	Select an appropriate component required for hydraulic and pneumatic systems using manufactures' catalogues.
			CO5	Design a hydraulic and pneumatic system for the industrial applications.
			CO6	Design & demonestrate various iot, plc based controlling system using hydraulics and pneumatics.

BE MECHANICAL ENGINEERING(2019 PATTERN)
SEM-VII

Scanned with OKEN Scanner

1	402048	Computer Integrated Manufacturing	CO1	Explain cim and factory automation.
			CO2	Understand the integration of hardware and software elements for cim
			CO3	Apply cnc program for appropriate manufacturing techniques.
			CO4	Analyze processes planning, quality and mrp integrated with computers.
			CO5	Interpret flexible, cellular manufacturing and group technology.
			CO6	Analyze the effect of iot, industry-4.0 and cloud base manufacturing.
2	402049	Energy Engineering	CO1	Explain the power generation scenario, the layout components of thermal power plant and analyze the improved rankine cycle
			CO2	Analyze the performance of steam condensers, cooling tower system; recognize an environmental impact of energy systems and methods to control the same.
			CO3	:Explain the layout, component details of diesel engine plant, hydel and nuclear energy systems
			CO4	Analyze gas and improved power cycles
			CO5	:Explain the fundamentals of renewable energy systems
			CO6	Explain basic principles of energy management, storage and economics of power generation
3	402050 (A)	Elective – V (Quality and Reliability Engineering)	CO1	Understand basic concepts of quality and relate various quality tools
			CO2	Develop analytical competencies to solve problems on control charts and process capability.
			CO3	Understand fundamental concepts of reliability.
			CO4	Evaluate system reliability.
			CO5	Identify various failure modes and create fault tree diagram.
			CO6	Understand the concept of reliability centered maintenance and apply reliability tests methods.
4	402051 (E)	Elective-VI (Electrical and Hybrid Vehicle)	CO1	Understand the basics related to e-vehicle
			CO2	Classify the different hybrid vehicles
			CO3	Identify and evaluate the prime movers, energy storage and controllers
			CO4	Discover and catagorize the electric vehicle configuration with respect to propulsion, power distribution and drive-train topologies
			CO5	Develop body frame with appropriate suspension system and testing of for e-vehicles
			CO6	Classify and evaluate battery charging techniques and management

Scanned with OKEN Scanner

5	402052	Mechanical Systems Analysis Laboratory	CO1	Develop an understanding of the systems engineering process and the range of factors that influence the product need, problem-specific information collection, problem definition, task specification, solution concept inception, concept development, system's mathematical modelling, synthesis, analysis, final solution selection, simulation, detailed design, construction, prototyping, testing, fault-finding, diagnosis, performance analysis, and evaluation, maintenance, modification, validation, planning, production, evaluation and use of a system using manual calculation, computational tools 105 | p a g e to automate product development process, redesign from customer feedback and control of technological systems.
			CO2	Illustrate the concepts and use the developed skill-set of use of computational tools (fea, cfd, mbd, fsi, cae) to automate the complete product development process.
			CO3	Evaluate the knowledge of new developments and innovations in technological systems to carry forward to next stage of employment after passing your undergraduate degree examination
			CO4	Appraise how technologies have transformed people's lives and can be used to solve challenges associated with climate change, efficient energy use, security, health, education and transport, which will be coming your ways in the coming future.
			CO5	Prioritize the concept of quality and standards, including systems reliability, safety and fitness for the intended purpose
			CO6	Invent yourself to face the challenges of future technologies and their associated problems.
6	402053	Project (Stage - II)	CO1	Implement systems approach
			CO2	To conceptualize a novel idea / technique into a product
			CO3	To think in terms of a multi-disciplinary environment.
			CO4	To take on the challenges of teamwork, and document all aspects of design work
			CO5	To understand the management techniques of implementing a project.
			CO6	Present and publish the project work.

Scanned with OKEN Scanner

Nutan Maharashtra Vidya Prasarak Mandal's
NUTAN MAHARASHTRA INSTITUTE OF ENGINEERING AND TECHNOLOGY
Under Administrative Support - Pimpri Chinchwad Education Trust
ESTD 1996
Approved by AICTE | Accredited by NAAC | Affiliated to SPPU
"Samarth Vidya Sankul", Vishnupuri, Telegaon Dabhade, Taluka Maval, District Pune - 410507
Tel. No. 02114 – 231666, E-mail :nmiettalegaon@gmail.com Web : www.nmiet.edu.in

Information Technology

Course Outcomes (COs) 2019 Pattern

SE [IT] 2019 Pattern				
SN	Course Code	Course Name	Course Outcomes (COs)	
1	214441	Discrete Mathematics	CO1	Formulate, apply formal proof techniques and solve the problems with logical reasoning.
			CO2	Analyze and evaluate the combinatorial problems by using probability theory
			CO3	Apply the concepts of graph theory to devise mathematical models.
			CO4	Analyze types of relations and functions to provide solution to computational problems.
			CO5	Identify techniques of number theory and its application.
			CO6	Identify fundamental algebraic structures..
2	214442	Computer Organization & Logic Design	CO1	Perform basic binary arithmetic & simplify logic expressions..
			CO2	Grasp the operations of logic ICs and Implement combinational logic functions using ICs.
			CO3	Comprehend the operations of basic memory cell types and Implement sequential logic Functions using ICs.
			CO4	Elucidate the functions & organization of various blocks of CPU..
			CO5	Understand CPU instruction characteristics, enhancement features of CPU.
			CO6	Describe an assortment of memory types (with their characteristics) used in computer systems and basic principle of interfacing input, output devices.
3	214443	Data Structure & Algorithms	CO1	Analyze algorithms and to determine algorithm correctness and time efficiency class.
			CO2	Understand different advanced abstract data type (ADT) and data structures and their implementations
			CO3	Understand different algorithm design techniques (brute -force, divide and conquer, greedy, etc.) and their implementation.
			CO4	Apply and implement learned algorithm design techniques and data structures to solve problems.
			CO5	Perform basic analysis of algorithms with respect to time and space complexity.
			CO6	Use algorithmic foundations for solving problems and programming.
4	214444	Object Oriented	CO1	Differentiate various programming paradigms and apply basic concepts of OOP

Scanned with OKEN Scanner

		Programming	CO2	Identify classes, objects, methods, and handle object creation, initialization, and destruction to model real-world problems..
			CO3	Identify relationship among objects using inheritance and polymorphism.
			CO4	Handle different types of exceptions and perform generic programming.
			CO5	Use file handling for real world application.
			CO6	Apply appropriate design patterns to provide object-oriented solutions.
5	214445	Basics of Computer Network	CO1	Understand and explain the concepts of communication theory and compare functions of OSI and TCP/IP model.
			CO2	Analyze data link layer services, error detection and correction, linear block codes, cyclic codes, framing and flow control protocols
			CO3	Compare different access techniques, channelization and Ethernet standards.
			CO4	Apply the skills of subnetting, supernetting and routing mechanisms.
			CO5	Compare IPv4 and IPv6
			CO6	Understand services and protocols used at transport layer.
7	214446	Computer Organization & Logic Design Lab	CO1	Use logic function representation for simplification with K-Maps and design Combinational logic circuits using SSI & MSI chips.
			CO2	Design Sequential Logic circuits: MOD counters using synchronous counters.
			CO3	Apply the basics of system management to access the resources of computer system
			CO4	Apply the basics of simulator tool & to simulate simple ALU / CPU
8	214447	Data Structure & Algorithms Lab	CO1	Analyze algorithms and to determine algorithm correctness and time efficiency class.
			CO2	Understand different advanced abstract data type (ADT) and data structures and their implementations.
			CO3	Understand different algorithm design techniques (brute -force, divide and conquer, greedy, etc.) and their implementation..
			CO4	Apply and implement learned algorithm design techniques and data structures to solve problems.
			CO5	Perform basic analysis of algorithms with respect to time and space complexity.
			CO6	Use algorithmic foundations for solving problems and programming
9	214448	Object Oriented Programming Lab	CO1	Differentiate various programming paradigms and apply basic concepts of OOP.
			CO2	Identify classes, objects, methods, and handle object creation, initialization, and destruction to model real-world problems.
			CO3	Identify relationship among objects using inheritance and polymorphism.
			CO4	Handle different types of exceptions and perform generic programming.
			CO5	Use file handling for real world application.
			CO6	Apply appropriate design patterns to provide object-oriented solutions.
10	210250	Soft Skills Lab	CO1	Introspect about individual's goals, aspirations by evaluating one's SWOC and think creatively.
			CO2	Develop effective communication skills including Listening, Reading, Writing and Speaking.
			CO3	Constructively participate in group discussion, meetings and prepare and deliver presentations
			CO4	Write precise briefs or reports and technical documents

Scanned with OKEN Scanner

			CO5	Understand professional etiquette, present oneself confidently and successfully handle personal interviews
			CO6	Function effectively in multi-disciplinary and heterogeneous teams through the knowledge of teamwork, Inter-personal relationships, conflict management and leadership quality.
11	214450	214450 (A): Mandatory Audit Course 3: Ethics and Values in Information Technology	CO1	Students will be able to get knowledge about global ethical principles and modern ethical issues.
			CO2	Students will be able to understand the importance of ethics in the business relationships and ethical practices of IT users..
			CO3	Students will be able to apply knowledge gained in implementing trustworthy computing to manage risk and security vulnerabilities.
			CO4	The students will be able to analyze concerns of privacy, privacy rights in information-gathering practices in IT.
		214450 (B)- Mandatory Audit Course 3: Quantitative Aptitude & Logical Reasoning	CO1	Understand the basic concepts of quantitative abilities
			CO2	Understand the basic concepts of logical reasoning
			CO3	Solve the problems related to quantitative abilities, logical and verbal reasoning
			CO4	Compete in examinations like civil services, postgraduate admissions, industry placements etc.
		214450 (C) - Mandatory Audit Course 3: Language Study Japanese - Module I	CO1	Converse with simple sentences in Japanese
			CO2	Recognize and read simple sentences in Japanese
			CO3	Write simple sentences in Japanese
			CO4	Be aware about Japanese society and people
SE Information Technology 4th Sem (2019 Pattern)				
1	207003	Engineering Mathematics III	CO1	Solve Linear differential equations, essential in modelling and design of computer-based systems.
			CO2	Apply concept of Fourier transform and Z-transform and its applications to continuous and discrete systems and image processing.
			CO3	Apply Statistical methods like correlation and regression analysis and probability theory for data analysis and predictions in machine learning
			CO4	Solve Algebraic and Transcendental equations and System of linear equations using numerical techniques
			CO5	Obtain Numerical Solution of Algebraic and Transcendental equations and System of linear equations used in modern scientific computing.
			CO6	Obtain Interpolating polynomials, numerical differentiation and integration, numerical solutions of ordinary differential equations used in modern scientific computing.
2	214451	Processor Architecture	CO1	Understand architecture and memory organization of PIC 18 microcontrolle
			CO2	Learn and apply Embedded C programming for PIC 18.
			CO3	Explain timers and interrupts of PIC 18.
			CO4	Demonstrate real life applications using PIC 18.
			CO5	Demonstrate the PIC 18 Interfacing
			CO6	Understand architectural details of ARM processor.
3	214452	Database Management System	CO1	Define fundamental elements of database management systems
			CO2	Describe the fundamental elements of relational database management systems and Design ERmodels to represent simple database application scenarios.

Scanned with OKEN Scanner

			CO3	Populate relational database and formulate SQL queries on data.
			CO4	Improve the database design by normalization & to incorporate query processing
			CO5	Illustrate ACID properties for transaction management & to describe concurrency control protocols.
			CO6	Understand recent trends in database technology.
4	214453	Computer Graphics	CO1	Specify mathematical and logical aspects for developing elementary graphics operations like scan conversion of points, lines and circle and apply it for problem solving.
			CO2	Explain and employ techniques of geometrical transforms to produce, position and manipulate objects in 2 dimensional and 3-dimensional space respectively
			CO3	Describe mapping from a world coordinates to device coordinates, clipping, and projections in order to produce 3D images on 2D output device
			CO4	Apply the concepts of rendering, shading, animation using computer graphics tools in design, development and testing of 2D, 3D modeling applications
			CO5	Apply the concepts of rendering, shading, animation, curves and fractals using computer graphics tools in design, development and testing of 2D, 3D modeling applications
			CO6	Develop the competency to understand the concepts related to Virtual reality
5	214455	Software Engineering	CO1	Identify various software application domains and classify software applications.
			CO2	Analyze software requirements by applying various modeling techniques.
			CO3	Translate the requirement models into design models
			CO4	Apply planning and estimation to any project.
			CO5	Apply quality attributes and testing principles in software development life cycle.
			CO6	Discuss recent trends in Software engineering by using CASE and agile tools.
6	214455	Programming Skill Development Lab	CO1	After completion of this course student will be able to
			CO2	Students will learn concepts related to embedded C programming.
			CO3	Students will be able to write and execute embedded C program to perform array addition, block transfer, sorting operations.
			CO4	Students will be able to learn interfacing of real world input and output devices to PIC18FXXX microcontroller..
			CO5	Students will learn open source prototype platform like Raspberry-Pi/Beagle board/Arduino.
7	214456	Database Management System LAB	CO1	To install and configure database systems.
			CO2	To analyze database models & entity relationship models
			CO3	To design and implement a database schema for a given problem-domain
			CO4	To understand the relational database systems
			CO5	To populate and query a database using SQL DDL / DML / DCL commands.
			CO6	To design a backend database of any one organization: CASE STUDY
8	214457	Computer Graphics Lab	CO1	Apply and implement line drawing and circle drawing algorithms to draw the objects.

Scanned with OKEN Scanner

			CO2	Apply and implement polygon filling methods for the object
			CO3	Apply and implement polygon clipping algorithms for the object
			CO4	Apply and implement the 2D transformations on the object
			CO5	Implement the curve generation algorithms
			CO6	Demonstrate the animation of any object using animation principles
9	214458	Project Based Learning	CO1	Students will gain knowledge of how to provide solution to real life problems and analyze its concerns through shared cognition..
			CO2	Students will be able to understand concepts of various disciplines and apply them in practical way
			CO3	Learning by doing approach in PBL will promote long-term retention of material and replicable skill.
			CO4	Becoming well prepared for the labor market.
			CO5	Student will motivate to collaborate with external partners and engage in interdisciplinary learning environments
10	214459	Mandatory Audit Course - 4B: Language Study Japanese: Module-II	CO1	Have Japanese Communicative competence for primitive Social conversation in Japanese
			CO2	Comprehend Grammar of Japanese Script
			CO3	Translate simple sentences from Japanese to English and vice a versa
			CO4	Be aware about Japanese society and people

TE [IT] 2019 Pattern				
SN	**Course Code**	**Course Name**	**Course Outcomes (COs)**	
1	314441	Theory of Computation	COs1	Construct finite automata and its variants to solve computing problems
			COs2	Write regular expressionsfor the regular languages and finite automata.
			COs3	Identify types of grammar, design and simplify Context Free Grammar.
			COs4	Construct Pushdown Automata machine for the Context Free Language.
			COs5	Design and analyze Turing machines for formal languages.
			COs6	Understand decidable and undecidable problems, analyze complexity classes
2	314442	Operating Systems	COs1	Explain the role of Modern Operating Systems.
			COs2	Apply the concepts of process and thread scheduling.
			COs3	Illustrate the concept of process synchronization, mutual exclusion and the deadlock
			COs4	Implement the concepts of various memory management techniques.
			COs5	Make use of concept of I/O management and File system.
			COs6	Understand Importance of System software.
3	314443	Machine Learning	COs1	Apply basic concepts of machine learning and different types of machine learning algorithms.
			COs2	Differentiate various regression techniques and evaluate their performance

Talegaon Dabhade 410507

Scanned with OKEN Scanner

			COs3	Compare different types of classification models and their relevant application.
			COs4	Illustrate the tree-based and probabilistic machine learning algorithms.
			COs5	Identify different unsupervised learning algorithms for the related real-worldproblems
			COs6	Apply fundamental concepts of ANN.
4	314444	Human Computer Interaction	COs1	Explain importance of HCIstudy and principles of user-centered design (UCD) approach.
			COs2	Develop understanding of human factors in HCI design.
			COs3	Develop understanding of models, paradigms, and context of interactions.
			COs4	Design effective user-interfacesfollowing a structured and organized UCD process
			COs5	Evaluate usability of a user-interface design.
			COs6	Apply cognitive modelsfor predicting human-computer-interactions.
5	314445(D)	Elective -I : Internet of Things	COs1	Discuss fundamentals, architecture and framework of IoT.
			COs2	Select suitable sensors and actuators for real time scenarios.
			COs3	Justify the significance of protocol for wireless communication and IoT challenges
			COs4	Understand the Python programming for development of IoT applications.
			COs5	Understand the cloud interfacing technologies.
			COs6	Design and Implement realtime IoT applications.
6	314446	Operating Systems Lab	COs1	Apply the basics of Linux commands.
			COs2	Build shellscripts for various applications.
			COs3	Implement basic building blocks like processes, threads under the Linux
			COs4	Develop various system programs for the functioning of OS concepts in user space like concurrency control, CPU Scheduling, Memory Management and Disk Scheduling in Linux.
			COs5	Develop system programs for Inter Process Communication in Linux.
7	314447	Human Computer Interaction Laboratory	COs1	Differentiate between good design and bad design.
			COs2	Analyze creative design in the surrounding.
			COs3	Assess design based on feedback and constraint.
			COs4	Design paper-based prototypes and use wire frame.
			COs5	Implement user-interface design using web technology.
			COs6	Evaluate user-interface design using HCI evaluation techniques.
8	314448	Laboratory Practice-I (Machine Learning)	COs1	Implement different supervised and unsupervised learning algorithms.
			COs2	Evaluate performance of machine learning algorithmsfor real-world applications.
9	314448	Laboratory Practice I		**Laboratory Practice-I (Internet of Things)**
			COs1	Design and implement realtime applications with sensors and actuators.
			COs2	Design and develop real time IoT based application by cloud interfacing.

Maharashtra Instt. of Engg. & Technology Talegaon Dabhade 410507

Scanned with OKEN Scanner

10	314449	Seminar	COs1	Understand, interpret and summarize technical literature.
			COs2	Demonstrate the techniques used in the paper
			COs3	Distinguish the varioustechniquesrequired to accomplish the task. CO4: Identify intended future work based on the technical review.
			COs3	Prepare and present the content through various presentation tools and techniques in effective manner.
			COs4	Keep audience engaged through improved interpersonalskills
11	314450	AC5-I: Banking and Insurance	COs1	Differentiate between types of banks and their working.
			COs2	Carry out banking transactions on their own.
			COs3	Decide which insurance policy they should buy.
			COs4	Handle investing in annuities and claim settlements.
		AC5- Startup Ecosystems	COs1	Identify Startup opportunities
			COs2	Explain legal and other requirementsfor new ventures
			COs3	Analyze financial Issues ofstartups
		AC5-III: Foreign Language-(Japanese Language-III)	COs1	Do basic communication.
			COs2	Demonstrate knowledge of Japanese script (reading, writing and listening skills)
			COs3	Demonstrate knowledge about Japanese culture, life style, manners and etiquettes.
			COs4	Pursue professional Japanese Language course.
				TE [IT]6th Sem 2019Pattern
1	314451	Computer Network and Security	COs1	Explain Responsibilities,services offered and protocol used at application layer of network
			COs2	Apply concepts of wireless network and different wirelessstandards.
			COs3	Recognize the Adhoc Network's MAC layer, routing protocol and Sensor network architecture.
			COs4	Implement the principal concepts of network security and Understand network security threats, security services, and countermeasures
			COs5	Apply basic cryptographic techniques in application development
			COs6	Gain a good comprehension of the landscape of cyber security Vulnerabilities & describe typical threats to modern digitalsystems.
2	314452	Data Science and Big Data Analytics	COs1	Understand Big Data primitives.
			COs2	Learn and apply different mathematical models for Big Data
			COs3	Demonstrate Big Data learning skills by developing industry or research applications
			COs4	Analyze and apply each learning model comes from a different algorithmic approach and it will perform differently under different datasets.
			COs5	Understand, apply and analyze needs, challenges and techniques for big data visualization.
			COs6	Learn different programming platformsfor big data analytics.
3	314453	Web Application Developmen t	COs1	Develop Static and Dynamic website using technologies like HTML, CSS, Bootstrap.
			COs2	Demonstrate the use of web scripting languages
			COs3	Develop web application with Front End

Scanned with OKEN Scanner

			COs4	Develop web application with Back End
			COs5	Develop mobile website using JQuery Mobile.
			COs6	Deploy web application on cloud using AWS
4	314454 (C))	Elective-II- (Cloud Computing)	COs1	Articulate the main concepts, key technologies and fundamentals of cloud computing.
			COs2	Understand cloud enabling technologies and virtualization
			COs3	Analyze various cloud programming models and apply them to solve problems on the cloud.
			COs4	Explain data storage and major security issues in the cloud.
			COs5	Understand trends in ubiquitous cloud and internet ofthings
			Cos6	Explore future trends of cloud computing.
5	314455	Internship	COs1	Develop professional competence through industry internship
			COs2	Apply academic knowledge in a personal and professional environment
			COs3	Build the professional network and expose students to future employees.
			COs4	Apply professional and societal ethics in their day-to-day life..
			COs5	Become a responsible professional having social, economic and administrative considerations.
			COs6	Make own career goals and personal aspirations.
6	314456	Computer Network Security Lab	COs1	Design and configure small size network and associated networking commands.
			COs2	Understand various client/server environments to use application layer protocols.
			COs3	Use basic cryptographic techniques in software and system design.
			COs4	Apply methods for authentication, access control, intrusion detection.
7	314457	DS & BDA Lab	COs1	Apply Big data primitives and fundamentals for application development.
			COs2	Explore different Big data processing techniques with use cases.
			COs3	Apply the Analytical concept of Big data using Python.
			COs4	Visualize the Big Data using Tableau.
			COs5	Design algorithms and techniques for Big data analytics.
			COs6	Design and develop Big data analytic application for emerging trends.
				· Web Application Development
8	310258	Laboratory Practice II	COs1	Develop Static and Dynamic responsive website using technologies HTML, CSS, Bootstrapand AJAX.
			COs2	Create Version Control Environment.
			COs3	Develop an application using front end and backend technologies.
			COs4	Develop an application using front end .
			Cos5	Develop mobile website using JQuery Mobile
			Cos6	Deploy web application on cloud using AWS.
				(Cloud Computing)
			COs1	Use tools and techniques in the area of Information Security
			COs2	Use the knowledge of security for problem solving

Scanned with OKEN Scanner

			COs3	Apply the concepts of Information Security to design and develop applications
		Audit Course 6		
9	314459	AC6-I Green and Unconventional Energy	COs1	List and explain the main sources of energy and their primary applications in the India, and theworld.
			COs2	Describe the challenges and problems associated with the use of various energy sources and itsconservation.
			COs3	List and describe the primary renewable energy resources and technologies
			Cos4	Collect and organize information on renewable energy technologies as a basis for further analysis and evaluation.
		AC6-II Leadership and Personality Development	COs1	Practice responsible decision-making and personal accountability
			COs2	Demonstrate an understanding of group dynamics and effective teamwork
			COs3	Develop a range of leadership skills and abilities such as effectively leading change, resolving conflict, and motivating others.
			COs4	Develop multi-dimensional personality.
		AC6-III Foreign Language-(Japanese Language-IV)	COs1	Do Better Communication in Japanese language
			COs2	Demonstrate knowledge of Japanese Language Scripts (Reading, Writing, etc).
			COs3	Demonstrate knowledge of Japanese culture, lifestyle, etc.
			COs4	Pursue advanced Professional Japanese Language course..

BE[IT[2019 Pattern]				
SN	**Course Code**	**Course Name**	**Course Outcomes (COs)**	
1	414441	Information Storage and Retrieval	COs1	Understand the concept of Information retrieval and to apply clustering in information retrieval
			COs2	Use an indexing approach for retrieval of text and multimedia data
			COs3	Evaluate performance of information retrieval systems
			COs4	Apply the concepts of multimedia and distributed information retrieval.
			COs5	Use appropriate tools in analyzing the web information
			COs6	Simulate the working of a search engine and recommender system.
2	414442	Software Project Management	COs1	Apply the practices and methods for successful Software Project Management
			COs2	Create Design and Evaluate Project
			COs3	Analyze Project Schedule and calculate Risk Management with help of tools
			COs4	Demonstrate different tools used for Project Tracking, Monitoring & Control.
			COs5	Identify Staff Selection Process and the issues related to Staff Management
			COs6	Discuss and use modern tools for Software Project Management.
3	414443	Deep	COs1	Understand the theoretical foundations, algorithms, and methodologies

Scanned with OKEN Scanner

		Learning		of Deep Learning.
			COs2	Apply the concepts of Convolution Neural Networks and use of popular CNN architectures.
			COs3	Compare Feed Forward Neural Network and Recurrent Neural Network and learn modeling the time dimension using RNN and LSTM.
			COs4	Elaborate unsupervised deep learning algorithms like Autoencoders
			COs5	Explore Representation Learning and Transfer Learning techniques using variants of CNN architecture
			COs6	Evaluate the performance of deep learning algorithms and to provide solution for various real-world applications..
4	414444	Elective – III (Mobile Computing)	COs1	understand the basic concepts of mobile computing, MAC and different multiplexing technics.
			COs2	understand Protocols, Connection Establishment, Frequency Allocation, Routing of mobile telecommunication system like GSM, GPRS, UMTS.
			COs3	understand the Generations of Mobile Communication Technologies.
			COs4	learn mobile IP , Adhoc – Network, Reactive Routing protocols, Multicast Routing..
			COs5	obtaining knowledge of transport layer protocol TCP, File System, and different application layer protocols.
			COs6	gain knowledge about different mobile platforms, operating Systems, Software Development Kit, Security Issues.
5	410245 (B)	Elective – IV (Wireless Communication)	COs1	Articulate the fundamental concept of cellular system.
			COs2	Analyse the fundamentals of cellular systems.
			COs3	Illustrate multiple access technique for effective utilization of spectrum.
			COs4	Design and analyse the WAP Programming Model in networking environment.
			COs5	Learn and understand security issues, challenges and tools in wireless communication.
			COs6	Explore the emerging trends and applications in wireless communication
6	414446	Lab Practice III	COs1	Apply preprocessing techniques on datasets.
			COs2	Use appropriate indexing approach for retrieval of text and multimedia data. Evaluate performance of information retrieval systems.
			COs3	Apply appropriate tools in analyzing the web information.
			COs4	Map the concepts of the subject on recent developments in the Information retrieval field.
7	410247	Lab Practice IV	COs1	Learn and Use various Deep Learning tools and packages
			COs2	Build and train a deep Neural Network models for use in various applications.
			COs3	Apply Deep Learning techniques like CNN, RNN Auto encoders to solve real word Problems.
			COs4	Evaluate the performance of the model build using Deep Learning
8	414448	Project Stage I	COs1	To apply knowledge of mathematics, science, and engineering to formulate the Problem statement.
			COs2	To design and conduct experiments, as well as to analyze and interpret data..
			COs3	Understand the professional and ethical responsibility
			COs4	To communicate effectively.

Talegaon Dabhade 410507

Scanned with OKEN Scanner

			Cos5	Get broad education which is necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
			Cos6	Recognition of the need for, and an ability to engage in life-long learning.
			Cos7	To use the techniques, skills, and modern engineering tools necessary for engineering practices.
			Cos8	To design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
9	414449 A	**Audit Course 7** Copyrights and Patents	COs1	Understand the concepts of Intellectual Property Rights
			COs2	Understand the knowledge about Copyrights and Trademark.
			COs3	Understand the knowledge how to protect trade secrets.
BE [Information Technology] 8th Sem 2019Pattern				
1	414450	Distributed Systems	COs1	Demonstrate the core concepts of distributed systems.
			COs2	Understand the concept of middleware of distributed systems
			COs3	Understand Inter-process communication methods and analyze different coordination algorithms.
			COs4	Comprehend the importance of replication to achieve fault tolerance in distributed systems.
			COs5	Analyze the design and functioning of existing distributed file systems, distributed multimedia, and distributed web-based systems.
			COs6	Understand various Recent Trends in distributed systems.
2	414451	Elective-V (Software Defined Network)	COs1	Acquire fundamental knowledge of SDN exploring the need, characteristics, and architecture of SDN and methods of API's in SDN.
			COs2	Recognize Open Flow protocols and its forwarding, pipeline model and use cases of SDN controller
			COs3	Demonstrate virtualization and Cloud computing services of SDN
			COs4	Comprehend IT Infrastructure and understand the data center in SDN.
			COs5	Analyse various security issues and challenges in SDN
			COs6	Comprehend SDN application areas and future
3	414451	Elective- V (Social Computing)	COs1	Understand basics of Social Media Analytics
			COs2	Correlate Network Measures for Social Media Data
			COs3	Visualize mining in social media data
			COs4	Discuss the Social Similarities
			COs5	Interpret social media behavior
			COs6	Apply Social Media Computations for Google+
		Elective V (Natural Language Processing)	COs1	Understand and analyze the natural language text and model.
			COs2	Analyze the natural language syntactically.
			COs3	Analyze and study natural language logically.
			COs4	Process the natural language text based on relations and knowledge.
			COs5	Evaluate the natural language text using models and apply modeling techniques for automatic document separation and text mining.
			COs6	Apply information retrieval techniques.
		Elective-V	COs1	Learn soft computing techniques and their roles in problem solving

Scanned with OKEN Scanner

		(Soft Computing)	COs2	Understand and Analyze various Artificial neural network techniques
			COs3	Understand and define the fuzzy systems for problem solving.
			COs4	Understand and apply the concepts of genetic algorithms for problem solving.
			COs5	Identify and select a suitable Soft Computing method to solve the problem
			COs6	Identify and understand the role of soft computing models in various applications
4	414452	Elective VI (Ethical Hacking and Security)	COs1	Identify Ethical hacking processes and become acquainted with Penetration testing.
			COs2	Recognize Foot printing techniques and apply in real time applications
			COs3	Build knowledge about Meta sploit tool with Kali Linux
			COs4	Differentiate Privilege Escalation in Windows and Linux
			COs5	Construct Secure Web Applications to understand Hacking Techniques.
			COs6	Recognize Wifi Hacking and Security techniques.
	410253 (B)	Elective-VI Augmented and Virtual Reality	COs1	Analyze how Virtual Reality systems work.
			COs2	Understand the representation of Virtual world
			COs3	Describe the importance of motion and tracking in VR systems.
			COs4	Analyze how AR systems work and list the applications of AR..
			COs5	Identify the working of various AR components and AR devices.
			COs6	Make use of computer vision concepts for AR.
	410253 (C)	Elective-VI Business Analytics and Intelligence	COs1	Apply conceptual knowledge on how Business Intelligence is used in decision making process
			COs2	Use modelling concepts in Business Intelligence
			COs3	Understand and apply the concepts of business reports and analytics with the help of visualization for business performance management
			COs4	Comprehend the model-based decision making using prescriptive analytics
			COs5	Analyze the role of analytics and intelligence in Business
			COs6	Comprehend different Business Intelligence trends and its future impacts
	410253 (D)	Elective-VI Blockchain Technology	COs1	Understand the concept of cryptography and decentralization
			COs2	Acquire fundamental knowledge of blockchain with issues associated with it.
			COs3	Acquire knowledge of Ethereum blockchain platform.
			COs4	Understand hyper ledger fabric platform.
			COs5	Acquire the knowledge regarding working of tokenization.
			COs6	Describe the applications and risk involved
5	414453	Startup and Entrepreneurship	COs1	able to understand key concepts and framework of innovation and start-up ecosystem.
			COs2	gain knowledge of how to develop start up ecosystem, its key components and how to influence and manage dynamics between them and increase the productivity of ecosystem
			COs3	understand the role of different stakeholders in ecosystem in building and supporting growth of start-ups.

Scanned with OKEN Scanner

			COs4	have insight into global trend in start-up ecosystem and product development.
			COs5	mapping different start-up ecosystems and developing performance indicators.
6	414454	Lab Practice - V	COs1	Demonstrate knowledge of the core concepts and techniques in distributed systems.
			COs2	Learn how to apply principles of state-of-the-Art Distributed systems in practical application
			COs3	Design, build and test application programs on distributed systems.
7	414455	Laboratory Practice VI(Ethical Hacking and Security	COs1	Perform internal and external vulnerability analysis on web application and network.
			COs2	Comprehend the hacker's mindset while conducting reconnaissance and system hacking.
			COs3	Implement industry standard security protocols to prevent cyber-attacks.
			COs4	Carry-out the same tactics, techniques, and procedures as actual hackers.
		Laboratory Practice VI (Business Analytics and Intelligence))	COs1	Show evidence of independent investigation
			COs2	Critically analyze the results and their interpretation.
			COs3	Report and present the original results in an orderly way and placing the open questions in the rightperspective
			COs4	Link techniques and results from literature as well as actual research and future research lines withthe research.
			COs5	Appreciate practical implications and constraints of the specialist subject
		Lab Practice VI (Blockchain Technology)	COs1	To implement small blockchain experimentations
			COs2	Identify Consensus mechanism for Blockchain Application.
8	414456	Project-II	COs1	To apply engineering and mathematical knowledge to investigate / select proper technology / Algorithm suitable to solve the problem in hand
			COs2	To apply knowledge of statistics for analysis of results and express conclusion and justification for the same.
			COs3	To design and conduct experiments, as well as to analyze and interpret data or develop prototype model of the application
			COs4	To communicate effectively
			COs5	Get broad education which is necessary to understand the impact of engineering solutions in a global, economic, environmental, ethically and societal context
			COs6	Recognition of the need for, and an ability to engage in life-long learning.

Navalmamarathi Inst. of Engg. & Technology * Talegaon Dabhade 410507

Scanned with OKEN Scanner

Nutan Maharashtra Vidya Prasarak Mandal's

NUTAN MAHARASHTRA INSTITUTE OF ENGINEERING AND TECHNOLOGY

Under Administrative Support - Pimpri Chinchwad Education Trust

ESTD : 1906

Approved by AICTE | Accredited by NAAC | Affiliated to SPPU

"Samarth Vidya Sankul", Vishnupuri, Telegaon Dabhade, Taluka Maval, District Pune - 410507

Tel. No. 02114 – 231666, E-mail :nmiettalegaon@gmail.com Web : www.nmiet.edu.in

Computer Engineering

Course Outcomes (COs) 2019 Pattern

SE Computer Engineering(2019 Pattern) SEM-III				
SN	**Course Code**	**Course Name**	**Course Outcomes (COs)**	
1	210241	Discrete Mathematics	CO1	Formulate problems precisely, solve the problems, apply formal proof techniques, and explain the reasoning clearly.
			CO2	Apply appropriate mathematical concepts and skills to solve problems in both familiar and unfamiliar situations including those in real-life contexts.
			CO3	Design and analyze real world engineering problems by applying set theory, propositional logic and to construct proofs using mathematical induction.
			CO4	Specify, manipulate and apply equivalence relations; construct and use functions and apply these concepts to solve new problems.
			CO5	Calculate numbers of possible outcomes using permutations and combinations; to model and analyse computational processes using combinatorics.
			CO6	Model and solve computing problem using tree and graph and solve problems using appropriate algorithms.
			CO7	Analyze the properties of binary operations, apply abstract algebra in coding theory and evaluate the algebraic structures.
2	210242	Fundamentals of Data Structures	CO1	Design the algorithms to solve the programming problems, identify appropriate algorithmic strategy for specific application, and analyze the time and space complexity.
			CO2	Discriminate the usage of various structures, Design/Program/Implement the appropriate data structures; use them in implementations of abstract data types and Identity the appropriate data structure in approaching the problem solution

Scanned with OKEN Scanner

			CO3	Demonstrate use of sequential data structures- Array and Linked lists to store and process data
			CO4	Understand the computational efficiency of the principal algorithms for searching and sorting and choose the most efficient one for the application.
			CO5	Compare and contrast different implementations of data structures (dynamic and static).
			CO6	Understand, Implement and apply principles of data structures- stack and queue to solve computational problems.
3	210243	Object Oriented Programming (OOP)	CO1	Apply constructs- sequence, selection and iteration; classes and objects, inheritance, use of predefined classes from libraries while developing software.
			CO2	CO2: Design object-oriented solutions for small systems involving multiple objects.
			CO3	CO3: Use virtual and pure virtual function and complex programming situations.
			CO4	CO4: Apply object-oriented software principles in problem solving.
			CO5	CO5: Analyze the strengths of object-oriented programming.
			CO6	CO6: Develop the application using object oriented programming language(C++).
4	210244	Computer Graphics	CO1	Identify the basic terminologies of Computer Graphics and interpret the mathematical foundation of the concepts of computer graphics.
			CO2	Apply mathematics to develop Computer programs for elementary graphic operations.
			CO3	Illustrate the concepts of windowing and clipping and apply various algorithms to fill and clip polygons.
			CO4	Understand and apply the core concepts of computer graphics, including transformation in two and three dimensions, viewing and projection.
			CO5	Understand the concepts of color models, lighting, shading models and hidden surface elimination
			CO6	Create effective programs using concepts of curves, fractals, animation and gaming.
5	210245	Digital Electronics and Logic Design	CO1	Simplify Boolean Expressions using K Map.
			CO2	Design and implement combinational circuits.
			CO3	Design and implement sequential circuits.
			CO4	Develop simple real-world application using ASM and PLD.

Scanned with OKEN Scanner

			CO5	Differentiate and Choose appropriate logic families IC packages as per the given design specifications
			CO6	CO6: Explain organization and architecture of computer system
6	210250	Humanity and Social Science	CO1	Aware of the various issues concerning humans and society.
			CO2	Aware about their responsibilities towards society.
			CO3	Sensitized about broader issues regarding the social, cultural, economic and human aspects, involved in social changes.
			CO4	Able to understand the nature of the individual and the relationship between self and the community
			CO5	Able to understand major ideas, values, beliefs, and experiences that have shaped human history and cultures
			CO6	Aware of various issues concerning humans and society, including social, cultural, economic, and human aspects involved in social changes.
7	210251	AC3-IV: Smart Cities	CO1	Understand the dynamic behaviour of the urban system by going beyond the physical appearance and by focusing on representations, properties and impact factors
			CO2	Explore the city as the most complex human-made organism with a metabolism that can be modeled in terms of stocks and flows
			CO3	Knowledge about data-informed approaches for the development of the future city, based on crowd sourcing and sensing
			CO4	Knowledge about the latest research results in for the development and management of future cities
			CO5	Understand how citizens can benefit from data-informed design to develop smart and responsive cities
			CO6	Analyze the role of various technologies in enhancing urban infrastructure, including sensors, communication networks, and data analytics platforms.
SE Computer Engineering (2019 Pattern) SEM-IV				
1	207003	Engineering Mathematics III	CO1	Solve Linear differential equations, essential in modelling and design of computer-based systems.
			CO2	Apply concept of Fourier transform and Z-transform and its applications to continuous and discrete systems and image processing.

Scanned with OKEN Scanner

			CO3	Apply Statistical methods like correlation and regression analysis and probability theory for data analysis and predictions in machine learning
			CO4	Solve Algebraic and Transcendental equations and System of linear equations using numerical techniques
			CO5	Obtain Interpolating polynomials, numerical differentiation and integration, numerical solutions of ordinary differential equations used in modern scientific computing.
			CO6	Apply mathematical methods to analyze and solve complex engineering problems, including optimization, numerical methods, and statistical analysis.
2	210252	Data Structures and Algorithms	CO1	Identify and articulate the complexity goals and benefits of a good hashing scheme for real- world applications
			CO2	Apply non-linear data structures for solving problems of various domain.
			CO3	Design and specify the operations of a nonlinear-based abstract data type and implement them in a high-level programming language.
			CO4	Analyze the algorithmic solutions for resource requirements and optimization
			CO5	Use efficient indexing methods and multiway search techniques to store and maintain data.
			CO6	Use appropriate modern tools to understand and analyze the functionalities confined to the secondary storage.
3	210253	Software Engineering	CO1	Analyze software requirements and formulate design solution for a software.
			CO2	Design applicable solutions in one or more application domains using software engineering approaches that integrate ethical, social, legal and economic concerns.
			CO3	Apply new software models, techniques and technologies to bring out innovative and novelistic solutions for the growth of the society in all aspects and evolving into their continuous professional development.
			CO4	Model and design User interface and component-level.
			CO5	Identify and handle risk management and software configuration management.
			CO6	Utilize knowledge of software testing approaches, approaches to verification and validation.

Scanned with OKEN Scanner

			CO7	Construct software of high quality – software that is reliable, and that is reasonably easy to understand, modify and maintain efficient, reliable, robust and cost-effective software solutions.
4	210254	Microprocessor	CO1	Exhibit skill of assembly language programming for the application.
			CO2	Classify Processor architectures.
			CO3	Illustrate advanced features of 80386 Microprocessor.
			CO4	Compare and contrast different processor modes.
			CO5	Use interrupts mechanism in applications
			CO6	Differentiate between Microprocessors and Microcontrollers.
			CO7	Identify and analyze the tools and techniques used to design, implement, and debug microprocessor-based systems.
5	210255	Principles of Programming Languages	CO1	Make use of basic principles of programming languages.
			CO2	Develop a program with Data representation and Computations.
			CO3	Develop programs using Object Oriented Programming language : Java.
			CO4	Develop application using inheritance, encapsulation, and polymorphism.
			CO5	Demonstrate Multithreading for robust application development.
			CO6	Develop a simple program using basic concepts of Functional and Logical programming paradigm
6	210260	AC4-I: Water Management	CO1	Understand the global water cycle and its various processes
			CO2	Understand climate change and their effects on water systems
			CO3	Understand Drinking treatment and quality of groundwater and surface water
			CO4	Understand the Physical, chemical, and biological processes involved in water treatment and distribution.
			CO5	Develop and implement strategies for water conservation and efficiency in residential, agricultural, and industrial settings.
			CO6	Evaluate the performance and sustainability of existing water infrastructure.

Scanned with OKEN Scanner

TE Computer Engineering(2019 Pattern) SEM-V				
SN	**Course Code**	**Course Name**	**Course Outcomes (COs)**	
1	310241	Database Management Systems	CO1	Analyze and design Database Management System using ER model
			CO2	Implement database queries using database languages
			CO3	Normalize the database design using normal forms
			CO4	Apply Transaction Management concepts in real-time situations
			CO5	Use NoSQL databases for processing unstructured data
			CO6	Differentiate between Complex Data Types and analyze the use of appropriate data types
2	310242	Theory of Computation	CO1	Understand formal language, translation logic, essentials of translation, alphabets, language representation and apply it to design Finite Automata and its variants
			CO2	Construct regular expression to present regular language and understand pumping lemma for RE
			CO3	Design Context Free Grammars and learn to simplify the grammar
			CO4	Construct Pushdown Automaton model for the Context Free Language
			CO5	Design Turing Machine for the different requirements outlined by theoretical computer science
			CO6	Understand different classes of problems, classify and analyze them and study concepts of NP completeness
3	310243	Systems Programming and Operating System	CO1	Analyze and synthesize basic System Software and its functionality.
			CO2	Identify suitable data structures and Design & Implement various System Software
			CO3	Compare different loading schemes and analyze the performance of linker and loader

Talegaon Dabhade

Scanned with OKEN Scanner

			CO4	Implement and Analyze the performance of process scheduling algorithms
			CO5	Identify the mechanism to deal with deadlock and concurrency issues
			CO6	Demonstrate memory organization and memory management policies
4	310244	Computer Networks and Security	CO1	Summarize fundamental concepts of Computer Networks, architectures, protocols and technologies
			CO2	Illustrate the working and functions of data link layer
			CO3	Analyze the working of different routing protocols and mechanisms
			CO4	Implement client-server applications using sockets
			CO5	Illustrate role of application layer with its protocols, client-server architectures
			CO6	Comprehend the basics of Network Security
5	310245 (D)	Software Project Management	CO1	Comprehend Project Management Concepts
			CO2	Use various tools of Software Project Management
			CO3	Schedule various activities in software projects
			CO4	Track a project and manage changes
			CO5	Apply Agile Project Management
			CO6	Analyse staffing process for team building and decision making in Software Projects and Management
6	310249	Seminar and Technical Communication	CO1	Analyze a latest topic of professional interest
			CO2	Enhance technical writing skills
			CO3	Identify an engineering problem, analyze it and propose a work plan to solve it
			CO4	Communicate with professional technical presentation skills
			CO5	Present technical information confidently and clearly in both formal and informal settings, using effective speaking techniques and engaging delivery methods.
			CO6	Analyze and understand the needs, background, and expectations of different audiences to tailor communication strategies effectively.
7	310250	AC5-I: Cyber Security	CO1	Understand and classify various cybercrimes
			CO2	Understand how criminals plan for the cybercrimes
			CO3	Apply tools and methods used in cybercrime
			CO4	Analyze the examples of few case studies of cybercrimes

Scanned with OKEN Scanner

			CO5	Create and implement incident response plans for detecting, responding to, and recovering from cybersecurity incidents.
			CO6	Apply best practices for secure software development, including coding standards, vulnerability testing, and code review.
TE Computer Engineering(2019Pattern)				
SEM-VI				
1	310251	Data Science and Big Data Analytics	CO1	Analyze needs and challenges for Data Science Big Data Analytics
			CO2	Apply statistics for Big Data Analytics
			CO3	Apply the lifecycle of Big Data analytics to real world problems
			CO4	Implement Big Data Analytics using Python programming
			CO5	Implement data visualization using visualization tools in Python programming
			CO6	Design and implement Big Databases using the Hadoop ecosystem
2	310252	Web Technology	CO1	Implement and analyze behavior of web pages using HTML and CSS
			CO2	Apply the client side technologies for web development
			CO3	Analyze the concepts of Servlet and JSP
			CO4	Analyze the Web services and frameworks
			CO5	Apply the server side technologies for web development
			CO6	Create the effective web applications for business functionalities using latest web development platforms
3	310253	Artificial Intelligence	CO1	Identify and apply suitable Intelligent agents for various AI applications
			CO2	Build smart system using different informed search / uninformed search or heuristic approaches
			CO3	Identify knowledge associated and represent it by ontological engineering to plan a strategy to solve given problem
			CO4	Apply the suitable algorithms to solve AI problems
			CO5	Implement ideas underlying modern logical inference systems
			CO6	Represent complex problems with expressive yet carefully constrained language of representation

Scanned with OKEN Scanner

4	310254(C)	Cloud Computing	CO1	Understand the different Cloud Computing environment
			CO2	Use appropriate data storage technique on Cloud, based on Cloud application
			CO3	Analyze virtualization technology and install virtualization software
			CO4	Develop and deploy applications on Cloud
			CO5	Apply security in cloud applications
			CO6	Use advance techniques in Cloud Computing
5	310255	Internship	CO1	To demonstrate professional competence through industry internship.
			CO2	To apply knowledge gained through internships to complete academic activities in a professional manner.
			CO3	To choose appropriate technology and tools to solve given problem.
			CO4	To demonstrate abilities of a responsible professional and use ethical practices in day to day life.
			CO5	Creating network and social circle, and developing relationships with industry people.
			CO6	To analyze various career opportunities and decide carrier goals
6	410249	AC6-II Sustainable Energy Systems	CO1	Comprehend the importance of Sustainable Energy Systems
			CO2	Correlate the human population growth and its trend to the natural resource degradation and develop the awareness about his/her role towards Sustainable Energy Systems protection
			CO3	Identify different types of natural resource pollution and control measures
			CO4	Correlate the exploitation and utilization of conventional and non-conventional resources
			CO5	Compare different energy sources, including fossil fuels, renewables (solar, wind, hydro, geothermal, bioenergy), and nuclear power, in terms of their sustainability, efficiency, and impact on the environment.
			CO6	Evaluate the feasibility and benefits of renewable energy technologies, including solar photovoltaics, wind turbines, and hydropower.

Scanned with OKEN Scanner

SN	Course Code	Course Name	Course Outcomes (COs)	
1	410241	Design and Analysis of Algorithms	CO1	Formulate the problem
			CO2	Analyze the asymptotic performance of algorithms
			CO3	Decide and apply algorithmic strategies to solve given problem
			CO4	Find optimal solution by applying various methods
			CO5	Analyze and Apply Scheduling and Sorting Algorithms.
			CO6	Solve problems for multi-core or distributed or concurrent environments
2	410242	Machine Learning	CO1	Identify the needs and challenges of machine learning for real time applications.
			CO2	Apply various data pre-processing techniques to simplify and speed up machine learning algorithms.
			CO3	Select and apply appropriately supervised machine learning algorithms for real time applications.
			CO4	Implement variants of multi-class classifier and measure its performance.
			CO5	Compare and contrast different clustering algorithms.
			CO6	Design a neural network for solving engineering problems.
3	410243	Blockchain Technology	CO1	Interpret the fundamentals and basic concepts in Blockchain
			CO2	Compare the working of different blockchain platforms
			CO3	Use Crypto wallet for cryptocurrency based transactions
			CO4	Analyze the importance of blockchain in finding the solution to the real-world problems
			CO5	Illustrate the Ethereum public block chain platform
			CO6	Identify relative application where block chain technology can be effectively used and implemented.
4	410244 (C)		CO1	Analyze threats in order to protect or defend it in cyberspace from cyber-attacks.

Scanned with OKEN Scanner

		Cyber Security and Digital Forensics	CO2	Build appropriate security solutions against cyber-attacks.
			CO3	Underline the need of digital forensic and role of digital evidences.
			CO4	Explain rules and types of evidence collection
			CO5	Analyze, validate and process crime scenes
			CO6	Identify the methods to generate legal evidence and supporting investigation reports.
5	410245 (D)	Software Testing and Quality Assurance	CO1	Describe fundamental concepts in software testing such as manual testing, automation testing and software quality assurance.
			CO2	Design and Develop project test plan, design test cases, test data, and conduct test operations.
			CO3	Apply recent automation tool for various software testing for testing software.
			CO4	Apply different approaches of quality management, assurance, and quality standard to software system
			CO5	Apply and analyze effectiveness Software Quality Tools.
			CO6	Apply tools necessary for efficient testing framework.
6	410248	Project Work Stage I	CO1	Solve real life problems by applying knowledge.
			CO2	Analyze alternative approaches, apply and use most appropriate one for feasible solution.
			CO3	Write precise reports and technical documents in a nutshell.
			CO4	Participate effectively in multi-disciplinary and heterogeneous teams exhibiting team work
			CO5	Inter-personal relationships, conflict management and leadership quality.
			CO6	Evaluate the thoroughness and accuracy of project documentation, including requirements, plans, and feasibility analyses.
7		AC7 – II: Entrepreneurship Development	CO1	Understand the legalities in product development
			CO2	Undertake the process of IPR, Trademarks, Copyright and patenting

Scanned with OKEN Scanner

			CO3	Understand and apply functional plans
			CO4	Manage Entrepreneurial Finance
			CO5	Inculcate managerial skill as an entrepreneur
			CO6	Analyze and solve real-world business problems through case studies and simulations.
BE Computer Engineering (2019Pattern) SEM-VIII				
1	410250	High Performance Computing	CO1	Understand various Parallel Paradigm
			CO2	Design and Develop an efficient parallel algorithm to solve given problem
			CO3	Illustrate data communication operations on various parallel architecture
			CO4	Analyze and measure performance of modern parallel computing systems
			CO5	Apply CUDA architecture for parallel programming
			CO6	Analyze the performance of HPC applications
2	410251	Deep Learning	CO1	Understand the basics of Deep Learning and apply the tools to implement deep learning applications
			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).
			CO3	To apply the technique of Convolution (CNN) and Recurrent Neural Network (RNN) for implementing Deep Learning models
			CO4	To implement and apply deep generative models.
			CO5	Construct and apply on-policy reinforcement learning algorithms
			CO6	To Understand Reinforcement Learning Process
3	410252 (B)	: Image Processing	CO1	Apply Relevant Mathematics Required for Digital Image Processing.
			CO2	Apply Special and Frequency Domain Method for Image Enhancement.
			CO3	Apply algorithmic approaches for Image segmentation.
			CO4	Summarize the Concept of Image Compression and Object Recognition.

Scanned with OKEN Scanner

			CO5	Explore the Image Restoration Techniques.
			CO6	Explore the Medical and Satellite Image Processing Applications.
4	410253 (C)	: Elective-VI Business Intelligence	CO1	Differentiate the concepts of Decision Support System & Business Intelligence
			CO2	Use Data Warehouse & Business Architecture to design a BI system.
			CO3	Build graphical reports
			CO4	Apply different data preprocessing techniques on dataset
			CO5	mplement machine learning algorithms as per business needs
			CO6	Identify role of BI in marketing, logistics, and finance and telecommunication sector
5	410256	Project Work Stage II	CO1	Show evidence of independent investigation
			CO2	Critically analyze the results and their interpretation.
			CO3	Report and present the original results in an orderly way and placing the open questions in the rightperspective
			CO4	Link techniques and results from literature as well as actual research and future research lines withthe research.
			CO5	Appreciate practical implications and constraints of the specialist subject
			CO6	Analyze test results and identify any issues or areas for improvement.
6	410257 :	AC8–III: Social Media And Analytics	CO1	Describe the human centered design process and usability engineering process and their roles in system design and development.
			CO2	Develop a far deeper understanding of the changing digital land scape.
			CO3	Identify some of the latest digital marketing trends and skill sets needed for today's marketer.
			CO4	Successful planning, prediction, and management of digital marketing campaigns
			CO%	Assess User Interfaces Using Different Usability

Scanned with OKEN Scanner

	Engineering techniques
CO6	Implement smart management of different digital assets for marketing needs.

Scanned with OKEN Scanner

Nutan Maharashtra Vidya Prasarak Mandal's

NUTAN MAHARASHTRA INSTITUTE OF ENGINEERING AND TECHNOLOGY

Under Administrative Support - Pimpri Chinchwad Education Trust

ESTD 1998

Approved by AICTE | Accredited by NAAC | Affiliated to SPPU

"Samarth Vidya Sankul", Vishnupuri, Telegaon Dabhade, Taluka Maval, District Pune - 410507

Tel. No. 02114 – 231666, E-mail :nmiettalegaon@gmail.com Web : www.nmiet.edu.in

Electronics & Telecommunication Engineering

Course Outcomes (COs) 2019 Pattern

SE Electronics & Telecommunication Engineering SEM-III (2019 Pattern)				
SN	**Course Code**	**Course Name**	**Course Outcomes (COs)**	
1	207005	Engineering Mathematics III	CO1	Solve higher order linear differential equation using appropriate techniques for modelling and analyzing of electrical circuits and control systems.
			CO2	Apply concept of Fourier transform & Z-transform and its applications to continuous & discrete systems, signal & image processing and communication systems.
			CO3	Determine Interpolating polynomials, numerically differentiate and integrate functions, numerical solutions of differential equations using single step and multi-step iterative methods used in modern scientific computing.
			CO4	Perform vector differentiation , analyze the vector fields and apply to electro-magnetic fields & wave theory.
			CO5	Perform vector integration, analyze the vector fields and apply to electro- magnetic fields & wave theory.
			CO6	Analyze Complex functions, Conformal mappings, Contour integration applicable to electrostatics, digital filters, signal and image processing.
2	204181	**Electronic Circuits**	CO1	Assimilate the physics, characteristics and parameters of MOSFET towards its application as an amplifier.
			CO2	Design MOSFET amplifiers, with and without feedback, & MOSFET oscillators, for given Specifications.
			CO3	Analyze and assess the performance of linear and switching regulators, with their variants, towards applications in regulated power supplies.

Scanned with OKEN Scanner

			CO4	Describe internal schematic of Op-Amp and define its performance parameters.
			CO5	Design, Build and test Op-amp based analog signal processing and conditioning circuits towards various real time applications.
			CO6	Describe and compare the principles of various data conversion techniques and PLL with their applications.
3	204182	**Digital Circuits**	CO1	Identify and prevent various hazards and timing problems in a digital design.
			CO2	Use the basic logic gates and various reduction techniques of digital logic circuit.
			CO3	Analyze, design and implement combinational logic circuits.
			CO4	Analyze, design and implement sequential circuits.
			CO5	Differentiate between Mealy and Moore machines.
			CO6	Analyze digital system design using PLD.
4	204183	**Electrical Circuits**	CO1	Analyze the simple DC and AC circuit with circuit simplification techniques.
			CO2	Formulate and analyze driven and source free RL and RC circuits.
			CO3	Formulate & determine network parameters for given network and analyze the given network using Laplace Transform to find the network transfer function.
			CO4	Explain construction, working and applications of DC Machines / Single Phase & Three Phase AC Motors.
			CO5	Explain construction, working and applications of special purpose motors & understand motors used in electrical vehicles
			CO6	Analyze and select a suitable motor for different applications.
5	204184	**Data Structures**	CO1	Solve mathematical problems using C programming language.
			CO2	Implement sorting and searching algorithms and calculate their complexity.
			CO3	Develop applications of stack and queue using array.

Scanned with OKEN Scanner

			CO4	Demonstrate applicability of Linked List.
			CO5	Demonstrate applicability of nonlinear data structures - Binary Tree with respect to its time complexity.
			CO6	Apply the knowledge of graph for solving the problems of spanning tree and shortest path algorithm
6	204185	**Electronic Circuit Lab**	CO1	Assimilate the physics, characteristics and parameters of MOSFET towards its application as an amplifier.
			CO2	Design MOSFET amplifiers, with and without feedback, & MOSFET oscillators, for given Specifications.
			CO3	Analyze and assess the performance of linear and switching regulators, with their variants, towards applications in regulated power supplies.
			CO4	Describe internal schematic of Op-Amp and define its performance parameters.
			CO5	Design, Build and test Op-amp based analog signal processing and conditioning circuits towards various real time applications.
			CO6	Describe and compare the principles of various data conversion techniques and PLL with their applications.
7	204186	**Digital Circuits Lab**	CO1	Design and implement various combinational logic circuits.
			CO2	Design and implement code converters.
			CO3	Design and implement sequential ciruits like counters.
			CO4	Analyze the parameters of TTL and CMOS Ics.
			CO5	Design and implement sequential circuits like shift registers.
			CO6	Analyze the various flip flop circuits.
8	204187	**Electrical Circuit Lab**	CO1	Analysis of simple DC circuits using KVL and KCL, node, loop analysis and circuit simplification techniques
			CO2	Analysis of simple DC circuits using Network theorems
			CO3	Formulate differential equation for RL and RC circuits
			CO4	Determine the Z, Y, h, ABCD parameters for a given network.

Scanned with OKEN Scanner

			CO5	Analysis of Torque- speed characteristic of 3 phase induction motor
			CO6	To study speed control of DC shunt motor
9	204188	**Data Structures Lab**	CO1	Solve mathematical problems using C programming language
			CO2	Implement sorting and searching algorithms and calculate their complexity.
			CO3	Develop applications of stack and queue using array.
			CO4	Demonstrate applicability of Linked List.
			CO5	Demonstrate applicability of nonlinear data structures - Binary Tree with respect to its time complexity.
			CO6	Apply the knowledge of graph for solving the problems of spanning tree and shortest path algorithm.

SE Electronics & Telecommunication Engineering SEM-IV (2019 Pattern)

SN	Course Code	Course Name	Course Outcomes (COs)	
1	204191	**Signals & Systems**	CO1	Identify, classify basic signals and perform operations on signals.
			CO2	Identify, Classify the systems based on their properties in terms of input output relation and in terms of impulse response and will be able to determine the convolution between to signals.
			CO3	Analyze and resolve the signals in frequency domain using Fourier series.
			CO4	Analyze and resolve the signals in frequency domain using Fourier Transform.
			CO5	Resolve the signals in complex frequency domain using Laplace Transform, and will be able to apply and analyze the LTI systems using Laplace Transforms.
			CO6	Define and Describe the probability, random variables, random signals and compute the CDF and PDF.
2	204192	**Control Systems**	CO1	Determine and use models of physical systems in forms suitable for use in the analysis and design of control systems

Scanned with OKEN Scanner

			CO2	Perform time domain analysis of control systems required for stability analysis.
			CO3	Perform frequency domain analysis of control systems required for stability analysis.
			CO4	Apply root-locus, Frequency Plots technique to analyse control systems.
			CO5	Express and solve system equations in state variable form.
			CO6	Differentiate between various digital controllers and understand the role of the controllers in Industrial automation.
3	204193	**Principles of Communication Systems**	CO1	Compute & compare the bandwidth and transmission power requirements by analyzing time and frequency domain spectra of signal required for modulation schemes under study.
			CO2	Describe and analyze the techniques of generation, transmission and reception of Amplitude Modulation Systems
			CO3	Explain generation and detection of FM systems and compare with AM systems
			CO4	Exhibit the importance of Sampling Theorem and correlate with Pulse Modulation technique (PAM,PWM, and PPM).
			CO5	Characterize the quantization process and elaborate digital representation techniques (PCM, DPCM, DM and ADM).
			CO6	Illustrate waveform coding, multiplexing and synchronization techniques and articulate their importance in baseband digital transmission.
4	204194	**Object Oriented Programming**	CO1	Describe the principles of object oriented programming.
			CO2	Apply the concepts of data encapsulation, inheritance in C++.
			CO3	Understand Operator overloading and friend functions in C++.
			CO4	Apply the concepts of classes, methods inheritance and polymorphism to write programs C++

Scanned with OKEN Scanner

			CO5	Apply Templates, Namespaces and Exception Handling concepts to write programs in C++.
			CO6	Describe and use of File handling in C++
5	204195	**Signals & Control System Lab**	CO1	Simulate elementary signals using Matlab
			CO2	Analyse signals with the help of fourier analysis.
			CO3	Perform spectral analysis of real time signals.
			CO4	Resolve the signals in complex frequency domain using Laplace Transform, and will be able to apply and analyze the LTI systems using Laplace Transforms
			CO5	Define and Describe the probability, random variables and random signals. Compute the probability of a given event, model, compute the CDF and PDF.
			CO6	Compute the mean, mean square, variance and standard deviation for given random variables using PDF.
6	204196	**Principle of Communication Systems Lab**	CO1	Compute & compare the bandwidth and transmission power requirements by analyzing time and frequency domain spectra of signal required for modulation schemes under study.
			CO2	Describe and analyze the techniques of generation, transmission and reception of Amplitude Modulation Systems
			CO3	Explain generation and detection of FM systems and compare with AM systems
			CO4	Exhibit the importance of Sampling Theorem and correlate with Pulse Modulation technique (PAM,PWM, and PPM).
			CO5	Characterize the quantization process and elaborate digital representation techniques (PCM, DPCM, DM and ADM).
			CO6	Illustrate waveform coding, multiplexing and synchronization techniques and articulate their importance in baseband digital transmission.
7	**204197**		CO1	Describe the principles of object oriented programming.

Scanned with OKEN Scanner

		Object Oriented Programming Lab	CO2	Apply the concepts of data encapsulation, inheritance in C++.
			CO3	Understand Operator overloading and friend functions in C++.
			CO4	Apply the concepts of classes, methods inheritance and polymorphism to write programs C++
			CO5	Apply Templates, Namespaces and Exception Handling concepts to write programs in C++.
			CO6	Describe and use of File handling in C++
8	204198	Data Analytics Lab	CO1	Install Python Jupyter and describe the different packages offered by python for data science and analysis.
			CO2	Write programs to visualize output using various graphs and plots
			CO3	Write a program to perform Data Wrangling
			CO4	Write a program to perform Statistical Data Analysis
			CO5	Write a program to perform Exploratory Data Analysis
			CO6	Complete an end to end project related to data analysis.
9	204199	Employability Skill Development	CO1	Develop & express essential communication skills (writing, verbal and non-verbal)
			CO2	Identify the skills for aptitude tests & apply them.
			CO3	Identify,develop and implement analytical abilities.
			CO4	Develop the skill for correct usage of English grammar in writing and speaking
			CO5	Develop & implement presentation skill and be ready for facing interviews.
			CO6	Develop team and lead it for problem solving.

TE Electronics & Telecommunication Engineering SEM-V (2019 Pattern)

SN	Course Code	Course Name	Course Outcomes (COs)	
1	304181	Digital Communication	CO1	Apply the statistical theory for describing various signals in a communication system.
			CO2	Describe and explain BFSK,BPSK,QPSK digital modulation techniques used in digital communication

Scanned with OKEN Scanner

				systems and analyse their performance in presence of AWGN noise
			CO3	Describe and Explain QASK,MFSK,MSK digital modulation techniques used in digital communication systems
			CO4	Describe and analyse the digital communication system with spread spectrum modulation
			CO5	Analyse a communication system using information theoretic approach
			CO6	Use error control coding techniques to improve performance of a digital communication system.
2	304182	**Electromagnetic Field Theory**	CO1	Apply the basic electromagnetic principles and determine the fields (E & H) due to the given source.
			CO2	Apply boundary conditions to the boundaries between various media to interpret behavior of the fields on either sides.
			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.
			CO4	Formulate, Interpret and solve simple uniform plane wave (Helmholtz Equations) equations, and analyze the incident/reflected/transmitted waves at normal incidence.
			CO5	Interpret and Apply the transmission line equation to transmission line problems with load impedance to determine 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 line using Smith Chart.
			CO6	Carry out a detailed study, interpret the relevance and applications of Electromagnetics
3	304183	**Database Management**	CO1	Implement the underlying concepts of a database system.

Scanned with OKEN Scanner

			CO2	Design and implement a database schema for a given problem-domain using data model.
			CO3	Formulate, using SQL/DML/DDL commands, solutions to a wide range of query and update problems.
			CO4	Implement transactions, concurrency control, and be able to do Database recovery.
			CO5	Illustrate various Parallel Database Architectures and its applications.
			CO6	Illustrate various Distributed Databases and its applications
4	304184	**Microcontrollers**	CO1	Understand the fundamentals of microcontroller and programming.
			CO2	Interface various electronic components with microcontrollers.
			CO3	Analyze the features of PIC 18F XXXX.
			CO4	Describe the programming details in peripheral support.
			CO5	Develop interfacing models according to applications.
			CO6	Evaluate the serial communication details and interfaces.
5	304185	**Computer Networks (Elective - I)**	CO1	Design LAN using appropriate networking architecture, topologies, transmission media, and networking devices.
			CO2	Understand the working of controlling techniques for flawless data communication using data link layer protocols.
			CO3	Learn the functions of network layer, various switching techniques and internet protocol addressing.
			CO4	Explore various interior and exterior, unicasting and multicasting protocols.
			CO5	Analyze data flow using TCP/UDP Protocols, congestion control techniques for QoS
			CO6	Illustrate the use of protocols at application layer.
6	304185	**Fundamentals of JAVA**	CO1	Know the basic principles of Java programming language

Scanned with OKEN Scanner

		Programming (Elective - I)	CO2	Apply the concepts of classes and objects to write programs in Java
			CO3	Demonstrate the concepts of methods & Inheritance
			CO4	Use the concepts of interfaces & packages for program implementation
			CO5	Understand multithreading and Exception handling in Java to develop robust programs
			CO6	Use Graphics class, AWT packages and manage input and output files in Java
7	304186	**Digital Communication Lab**	CO1	Implementation of BFSK and BPSK transmitter & receiver using hardware setup
			CO2	Implementation of DSSS transmitter and receiver and Analyze Baseband receiver performance in presence of Noise using suitable hardware setup.
			CO3	Simulation of Performance of BPSK, M-ary PSK
			CO4	Simulation of random processes and Analyze statistical parameters of the random process
			CO5	Simulation of Source Coding technique and Entropy Techniques.
			CO6	Simulation of different types of coding techniques.
8	304187	**Database Management Lab**	CO1	Implement the underlying concepts of a database system.
			CO2	Design and implement a database schema for a given problem-domain using data model.
			CO3	Formulate, using SQL/DML/DDL commands, solutions to a wide range of query and update problems.
			CO4	Implement transactions, concurrency control, and be able to do Database recovery.
			CO5	Illustrate various Parallel Database Architectures and its applications.
			CO6	Illustrate various Distributed Databases and its applications
9	304188	**Microcontroller Lab**	CO1	Demonstrate the architecture of 8051 using Simple Programs on memory Transfer

Scanned with OKEN Scanner

			CO2	Design and illustrate port Programming of 8051 .
			CO3	Interface the Actuators like stepper motor to MCS 51 microcontroller
			CO4	Interface the IO peripherals to 8 bit PIC microcontroller
			CO5	Demonstrate the concept of advanced peripherals like PWM of 8 bit PIC microcontroller.
			CO6	Design of 8 bit microcontroller based system using serial protocols.
10	304189	**Elective I Lab Computer Networks**	CO1	Design LAN using appropriate networking architecture, topologies, transmission media, and networking devices.
			CO2	Understand the working of controlling techniques for flawless data communication using data link layer protocols.
			CO3	Learn the functions of network layer, various switching techniques and internet protocol addressing.
			CO4	Explore various interior and exterior, unicasting and multicasting protocols.
			CO5	Analyze data flow using TCP/UDP Protocols, congestion control techniques for QoS
			CO6	Illustrate the use of protocols at application layer.

TE Electronics & Telecommunication Engineering SEM-VI (2019 Pattern)

SN	Course Code	Course Name	Course Outcomes (COs)	
	304192	**Cellular Networks**	CO1	Illustrate fundamentals of wireless communications.
			CO2	Discuss and study OFDM and MIMO concepts.
			CO3	Elaborate fundamentals of mobile communication.
			CO4	Describes aspects of wireless system planning.
			CO5	Explore modern and futuristic wireless networks architecture.
			CO6	Summarize different issues in performance analysis.
2	304193	**Project Management**	CO1	Apply the fundamental knowledge of project management for effectively handling the projects.

Scanned with OKEN Scanner

			CO2	Identify and select the appropriate project based on feasibility study and undertake its effective planning.
			CO3	Assimilate effectively within the organizational structure of project and handle project management related issues in an efficient manner.
			CO4	Apply the project scheduling techniques to create a Project Schedule Plan and accordingly utilize the resources to meet the project deadline.
			CO5	Identify and assess the project risks and manage finances in line with Project Financial Management Process.
			CO6	Develop new products assessing their commercial viability and develop skill sets for becoming successful entrepreneurs while being fully aware of the legal issues related to Product development and Entrepreneurship.
3	304194	**Power Devices & Circuits**	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	To design triggering / driver circuits for various power devices
			CO3	To evaluate and analyze various performance parameters of the different converters and its topologies.
			CO4	To understand significance and design of various protections circuits for power devices.
			CO5	To evaluate the performance of uninterruptible power supplies, switch mode power supplies and battery.
			CO6	To understand case studies of power electronics in applications like electric vehicles, solar systems etc.
4	304195	**Elective-II Digital Image Processing**	CO1	Apply knowledge of mathematics for image understanding and analysis.
			CO2	Implement spatial domain image operations.
			CO3	Design and realize various algorithms for image segmentation.

Scanned with OKEN Scanner

			CO4	Design and realize various algorithms for image Compression.
			CO5	Apply restoration to remove noise in the image.
			CO6	Describe the object recognition system.
5	304196	**Cellular Networks Lab**	CO1	Compute various system parameters required for deploying a wireless network.
			CO2	Perform analysis for communication network.
			CO3	Evaluate different issues in performance analysis.
			CO4	Compute the RMS delay spread for a power profile of a communication network.
			CO5	Compute the parameters in moving communication system.
			CO6	Analyze a cellular system.
6	304197	**Power Devices & Circuits Lab**	CO1	Analyse voltage and current relationship for power devices IGBT and MOSFET
			CO2	Analyse voltage and current relationship for power devices SCR
			CO3	Analyse output voltage waveforms for converters.
			CO4	Explore output voltage waveforms for inverters .
			CO5	To evaluate the performance of uninterruptible power supplies, switch mode power supplies and battery .
			CO6	Explore output voltage waveforms for AC controllers.
7	304197	**Elective-II Lab Digital Image Processing**	CO1	Apply knowledge of mathematics for image understanding and analysis.
			CO2	Implement spatial domain image operations.
			CO3	Design and realize various algorithms for image segmentation.
			CO4	Design and realize various algorithms for image Compression.
			CO5	Apply restoration to remove noise in the image.
			CO6	Describe the object recognition system.

BE Electronics & Telecommunication Engineering SEM-VII (2019 Pattern)			
SN	**Course Code**	**Course Name**	**Course Outcomes (COs)**

Scanned with OKEN Scanner

1	404181	**Radiation & Microwave Theory**	CO1	Apply the fundamentals of electromagnetic to derive free space propagation equation and distinguish various performance parameters of antenna.
			CO2	Identify various modes in the waveguide. Compare: coaxial line, rectangular waveguides & striplines and identify applications of the same.
			CO3	Explore construction and working of principles passive microwave devices/components.
			CO4	Explore construction and working of principles active microwave devices/components.
			CO5	Analyze the structure, characteristics, operation, equivalent circuits and applications of various microwave solid state active devices.
			CO6	Know the various microwave systems, devise set ups of microwave measurement devices and Identify the effect of radiations on environmental sustainability
2	404182	**VLSI Design and Technology**	CO1	Develop effective HDL codes for digital design.
			CO2	Apply knowledge of real time issues in digital design
			CO3	Model digital circuit with HDL, simulate, synthesis and prototype in PLDs.
			CO4	Design CMOS circuits for specified applications.
			CO5	Analyze various issues and constraints in design of an ASIC.
			CO6	Apply knowledge of testability in design and build in self test(BIST) circuit.
3	404183	**Cloud Computing**	CO1	Understand the basic concepts of Cloud Computing.
			CO2	Describe the underlying principles of different Cloud Service Models
			CO3	Classify the types of Virtualization
			CO4	Examine the Cloud Architecture and understand the importance of Cloud Security.
			CO5	Develop applications on Cloud Platforms.
			CO6	Evaluate distributed computing and the Internet of Things.
4	404184	**Elective - 3 Modernized IoT**	CO1	Comprehend and analyze concepts of sensors, actuators, IoT and IoE.
			CO2	Interpret IoT Architecture Design Aspects.
			CO3	Comprehend the operation of IoT protocols.
			CO4	Describe various IoT boards, interfacing, and programming for IoT
			CO5	Illustrate the technologies, Catalysts, and precursors of IIoT using suitable use cases.
			CO6	Provide suitable solution for domain specific applications of IoT.
5	404185	**Elective - 4 Electronic Product Development**	CO1	State and explain design flow of design of electronics product.
			CO2	Illustrate hardware design process and testing methods.
			CO3	Illustrate software development and testing methods
			CO4	Summarize printed circuit boards and different parameters

Scanned with OKEN Scanner

			CO5	Illustrate steps of product debugging & testing
			CO6	Describe special design considerations and importance of documentation
6	404186	**Lab Practice - 1 (RMT & Cloud Computing)**	1	Design, simulate and compare performance of microwave antennas and Distinguish various antenna performance parameters .
			CO1	Analyze and verify working principles of passive microwave devices/components.
			CO2	Analyze and verify working principles of active microwave devices/components.
			CO3	Understand the basic concepts of Cloud Computing.
			CO4	Describe the underlying principles of different Cloud Service Models
			CO5	Develop applications on Cloud Platforms.
7	404187	**Lab Practice - 2 (VLSI Design & Elective -3)**	CO1	Develope VHDL code and testbench code for ALU,Universal Shift Register,FIFO,LCD Interface.
			CO2	Synthesis and Implementaion of VHDL code on PLD.
			CO3	Design and simulate CMOS layout of NAND,NOR, 2:1 Multiplexer, Half Adder in selected technology.
			CO4	Describe various IoT boards, interfacing, and programming for IoT
			CO5	Illustrate the technologies, Catalysts, and precursors of IIoT using suitable use cases.
			CO6	Provide suitable solution for domain specific applications of IoT.
8	404188	**Project Stage - I**	CO1	Identify a real world problem and review literature.
			CO2	Formulate the problem statement and suggest its solution.
			CO3	Identify objectives and methodology of project undertaken.
			CO4	Estimate the cost of project and prepare work plan.
			CO5	Design and develop solutions for problems defined using various tools in coordination with team.
			CO6	Comprehend the Engineering activities with effective presentation and report and Interpret the findings with appropriate technological / research citation.

BE Electronics & Telecommunication Engineering SEM-VIII (2019 Pattern)

SN	Course Code	Course Name	Course Outcomes (COs)	
1	404190	**Fiber Optic Communication**	CO1	Explain the working of components and measurement equipment's in optical fiber networks.
			CO2	Calculate the important parameters associated with optical components used in fiber optic telecommunication systems.
			CO3	Compare and contrast the performance of major components in optical links.
			CO4	Evaluate the performance viability of optical links using the power and rise time budget analysis.

Scanned with OKEN Scanner

			CO5	Design digital optical link by proper selection of components and check its viability using simulation tools.
			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.
2	404191	**Elective - 5 Mobile Computing**	CO1	Understand concepts of Mobile Communication.
			CO2	Analyse next generation Mobile Communication System.
			CO3	Understand network layers of Mobile Communication.
			CO4	Understand IP and Transport layers of Mobile Communication.
			CO5	Study of different mathematical models.
			CO6	Understand different mobile applications.
3	404192	**Elective - 6 Digital Marketing**	CO1	Design websites using free tools like Wordpress and explore it for digital marketing.
			CO2	Apply various keywords for a website & to perform SEO.
			CO3	Understand the various SEM Tools and implement the Digital Marketing Tools.
			CO4	Illustrate the use of Facebook, Instagram and Youtube for Digital Marketing in real life.
			CO5	Use Linked in platform for various campaigning.
			CO6	Understand the importance of recent trends in digital marketing.
4	404193	**Innovation & Entrepreneurs hip**	CO1	Understand Innovation, Entrepreneurship and characteristics of an entrepreneur.
			CO2	Develop a strong understanding of the Design Process and its application in variety of business settings
			CO3	Develop a strong understanding of the Design Process and its application in variety of business settings
			CO4	Explore various processes required to be an entrepreneur.
			CO5	Understand patents and its process of filing.
			CO6	Choose and use appropriate social media for marketing.
5	404194	**Digital Business Management**	CO1	Identify drivers of digital business.
			CO2	Illustrate various approaches and techniques for E-business and management.
			CO3	Familiarize with E-commerce.
			CO4	Illustrate E-business .
			CO5	Illustrate E-business strategies.
			CO6	Prepare E-business plan.
		Fiber Optic Lab	CO1	Explain the working of components and measurement equipment's in optical fiber networks.
			CO2	Calculate the important parameters associated with optical components used in fiber optic telecommunication systems.

Scanned with OKEN Scanner

6	404195		CO3	Compare and contrast the performance of major components in optical links.
			CO4	Evaluate the performance viability of optical links using the power and rise time budget analysis.
			CO5	Design digital optical link by proper selection of components and check its viability using simulation tools.
			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.
7	404196	**Lab Practice - 3 (Elective - 5)**	CO1	Design websites using free tools like Wordpress and explore it for digital marketing.
			CO2	Apply various keywords for a website & to perform SEO.
			CO3	Understand the various SEM Tools and implement the Digital Marketing Tools.
			CO4	Illustrate the use of Facebook, Instagram and Youtube for Digital Marketing in real life.
			CO5	Use Linked in platform for various campaigning.
			CO6	Understand the importance of recent trends in digital marketing.
8	404197	**Project Stage - II**	CO1	Simulate and analyze experiment result and validate the same.
			CO2	Create a hardware/software system, validate its conformance and Perform data analysis and provide valid conclusions.
			CO3	Assess health, safety and legal relevance to professional engineering practices and Comply the environmental needs and sustainable development.
			CO4	Justify ethical principles in engineering practices and Perform multi-disciplinary task as an individual and / or team member to manage the project/task.
			CO5	Comprehend the Engineering activities with effective presentation and report and Interpret the findings with appropriate technological / research citation.
			CO6	Present and publish the project work.

Scanned with OKEN Scanner