NANDHA ENGINEERING COLLEGE
(AUTONOMOUS)
(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)
ERODE – 638 052 TAMILNADU
Email : principal@nandhaengg.org Mobile : 73737 12234

Program Outcomes	
M.E	M.E. Structural Engineering
M.E	M.E. Computer Science and Engineering
M.E	M.E. VLSI Design
M.E	M.E. Engineering Design
MBA	Master of Business Administration
MCA	Master of computer Application

M.E - STRUCTURAL ENGINEERING

NANDHA ENGINEERING COLLEGE

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Regulation :	R17
Program Code :	SE
Program Name :	Structural Engineering

VISION OF THE DEPARTMENT

The Civil Engineering Department is committed to rendering our students with the latest technology and modern methods to acquire knowledge and skills in all sectors to make them nationally and globally competent Civil Engineers.

MISSION OF THE DEPARTMENT

- To make highly competent and technologically capable professionals by augmenting their knowledge through interactions and camps.

- To impart education to transfer the knowledge and skills for challenging applications such as computer based analysis, design using relevant standards, execution and maintenance of life line Civil Engineering projects.

- To imbibe the leadership quality, professional ethics, environmental consciousness and social responsibilities to serve the society through co-curricular and extra-curricular activities.

PROGRAM EDUCATIONAL OBJECTIVES (PEOS):

List of PEOs

PEO 1:	To become a successful Civil Engineer and to meet the demand driven needs so as to prepare them industry ready in the field of Civil Engineering and related profession.
PEO 2:	To exhibit good depth of knowledge in core areas of Civil and allied Engineering
PEO 3:	To communicate profound knowledge in fundamentals, techniques and design of Civil Engineering system that encourages them to develop innovative techniques in their professional practice.
PEO 4:	To develop an understanding of the multidisciplinary approach and an ability to relate Engineering issues to broader social and human context, in which their Engineering contributions will be utilized.
PEO 5:	To Engage in life-long continuous learning through independent study and participation in professional conferences, seminars and workshops.

PROGRAM OUTCOMES:

ATTRIBUTE	GA'S
Engineering Knowledge	To demonstrate knowledge of mathematics, science and basic engineering principles
Problem Analysis	To analyze and design various components of structures and conduct experiments to interpret data.
Design And Development of Solutions	To design advanced structural engineering elements and structures.
Investigation of Complex Problems	To critically identify, formulate and solve structural engineering problems
Modern Tool Usage	To use modern engineering tools, software and equipment to analyze problems.
The Engineer and Society	To have the broad education necessary to understand the impact of engineering solutions in a global, economic and societal context and also will be aware of contemporary issues.
Environment and Sustainability	To execute and manage the multidisciplinary projects with global standards
Ethics	To demonstrate knowledge of professional and ethical responsibilities.
Individual And Team Work	To demonstrate knowledge of advanced mathematics to analyze and solve complex structural engineering design problems
Communication	An ability to converse efficiently.
Project Management And Finance	An ability to apply, design and execute appliance tilting projects.
Lifelong Learning	To develop confidence for self-education and ability for life-long learning and research activities

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PROGRAM SPECIFIC OUTCOMES (PSOs) OF THE DEPARTMENT:

Graduates should be able to

PSO1:	Applying an analytical approach for the practical problems in the field of Structural Engineering.
PSO2:	Engage in lifelong learning, commitment to quality and continuous improvement.
PSO3:	Ability to work in multidisciplinary groups.
PSO4:	To create the mathematical equations regarding the Structural Elements to resolve the practical difficulties / demands.

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SEMESTER - I

Course Code/ Course Name:	17STA01 - ADVANCED MATHEMATICS
Course Outcomes:	
1	Students will be able to solve problems related to engineering applications by using Fourier transform techniques.
2	Understand the axiomatic formulation of modern Probability Theory and think of random variables as an intrinsic need forthe analysis of random phenomena.
3	To familiarize the students in the field of differential equations to solve boundary value problems associated with engineering applications
4	Understand the concept of eigen value problems
5	Demonstrate the specific applications to Poisson and Gaussian processes and representation of low pass and band pass noise models

Course Code/ Course Name:	17STB01 - ADVANCED REINFORCED CONCRETE STRUCTURES
Course Outcomes:	
1	Design the reinforced concrete beams, slabs and columns with reference to IS code.
2	Understand and analyze the behavior of RCC elements subjected to flexure, shear and axial loading
3	To familiarize the students to design the flat slabs and plates.
4	Enumerate the concept of reinforced concrete using moment redistribution & Baker's method.
5	Understand the detailing for ductility and quality control of concrete.

Course Code/ Course Name:	17STB02 - DYNAMICS OF STRUCTURES
Course Outcomes:	
1	Understand the response of structural systems to dynamic loads and displacements.
2	Realize the behaviour and response of linear and non-linear SDOF and MDOF structures with Various dynamic loading.
3	Understand the behaviour and response of MDOF structures with various dynamic loading
4	Find suitable solution for continuous system.
5	Analyze dynamic response by direct integration method.

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Course Code/ Course Name:	17STB03 - APPLIED ELASTICITY & PLASTICITY
Course Outcomes:	
1	Understand the concept of stresses and strains.
2	To obtain solutions for elasticity problems in rectangular and polar coordinates
3	Analyze torsion of non-circular sections and thin walled sections.
4	Analyze the beams and columns using energy methods
5	Analyze using Plastic theories

Course Code/ Course Name:	17STB04 - ADVANCED CONCRETE TECHNOLOGY
Course Outcomes:	
1	Gain knowledge the properties of material like grade of cement & testing of aggregate & chemical Compositions
2	Execute mix proportioning of concrete and describe how the strength of concrete can be modified by changing the proportions
3	Understand about Stress strain characteristics & Non-destructive tests as per IS Code
4	Use suitable concrete for different structures considering the prevailing weathering conditions.
5	Decide the correct concreting methods in the field depending upon the requirement and site Conditions

Course Code/ Course Name:	17STC01 - ADVANCED STRUCTURAL ENGINEERING LABORATORY
Course Outcomes:	
1	On completion of this laboratory course students will be able to cast and test RC beams for strength and deformation behaviour.
2	They will be able to test dynamic testing on steel beams, static cyclic load testing of RC frames and non destruction testing on concrete

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Course Code/ Course Name:	17STE01 TECHNICAL SEMINAR - I
Course Outcomes:	
1	At the end of the course the student will be able to read and review the research articles and Publish a technical Paper.

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SEMESTER - II

Course Code/ Course Name:	17STB05 - EXPERIMENTAL STRESS ANALYSIS AND TECHNIQUES
Course Outcomes:	
1	Choose the methodology of measuring errors and strains and calibrate the machineries.
2	Use various vibration measuring instruments and analyze the structures.
3	Measure distress in the structures using various electronic equipment
4	Perform advanced NDT methods in accessing the load testing of structures
5	To predict the behaviour of prototype structure by conducting model tests and analysis

Course Code/ Course Name:	17STB06 - BEHAVIOUR AND DESIGN OF STEEL STRUCTURES
Course Outcomes:	
1	Familiarize on behavior of members and connections
2	To know about the Design of industrial structures
3	To learn about the design of light gauge steel Sections
4	Practice on analysis and design of steel towers & chimneys
5	To know about the design philosophy for plastic analysis

Course Code/ Course Name:	17STB07 - ASEISMIC DESIGN OF STRUCTURES
Course Outcomes:	
1	Describe ground motion and its relationship to seismic design of structures.
2	Understand about the evaluation of Earthquake forces as per IS Code.
3	Design consideration on earthquake resistant features in masonry buildings
4	Apply the basic principles of conceptual design for earthquake resistant RC building
5	Adopt vibration control methods for buildings located in earthquake zone.

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Course Code/ Course Name:	17STB08 - FINITE ELEMENT ANALYSIS
Course Outcomes:	

1	Develop finite element formulations of one degree of freedom problems and solve them
2	Perform modal analysis to determine its natural frequencies, and analyze harmonically-forced vibrations.
3	Use finite element analysis programs based upon either "p-method" or "h- method" finite element mathematical formulations
4	Analysis the plane stress, plain strain and axis symmetric problems related to Triangular and Quadrilateral elements.
5	Analysis on application of beams, columns using finite element analysis.

Course Code/ Course Name:	17STC02 - STRUCTURAL ANALYSIS &DESIGN LABORATORY
Course Outcomes:	

1	Use analysis and design package for designing structural elements and structures and also to Utilize drafting packages Simulate, model and analyse trusses, steel beams, RC beams and Columns using software

Course Code/ Course Name:	17STE02 - TECHNICAL SEMINAR - II
Course Outcomes:	

1	At the end of the course the student will be able to read and review the research articles and Publish a technical Paper.

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SEMESTER - III

Course Code/ Course Name:	17STE03 - PROJECT WORK PHASE - I
Course Outcomes:	
1	At the end of the course the students will have a clear idea of his/her area of work and they are in a position to carry out the remaining phase II work in a systematic way.

SEMESTER – IV

Course Code/ Course Name:	17STE04 - PROJECT WORK PHASE - II
Course Outcomes:	
1	On completion of the project work students will be in a position to take up any challenging practical problem and find better solutions

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PROGRAM SPECIFIC ELECTIVES (PSE)

Course Code/ Course Name:	17STX01 – SOIL – STRUCTURE INTETRACTION	
Course Outcomes:		
1	To Demonstrate soil and foundation behavior	
2	To know about the analysis finite and infinite beam	
3	Analysis the various types of plates on elastic medium	
4	To Analyze various types of piles	
5	To Analyze laterally loaded piles	

Course Code/ Course Name:	17STX02 – DESIGN OF STRUCTURAL OPTIMIZATION	
Course Outcomes:		
1	Apply the basic ideas in optimization to make the structures as lightly as possible	
2	Use linear programming techniques in Engineering Optimization	
3	Evaluate the Constrained and Unconstrained Techniques	
4	Understand the methods in solving the problems related to geometric and dynamic Programming	
5	Design of structural elements water tanks using plastic theory	

Course Code/ Course Name:	17STX03 – PREFABRICATED STRUCTURES	
Course Outcomes:		
1	Understand the basic concepts of prefabrication and their needs in construction industry	
2	Know the behavior of prefabricated structures.	
3	Design the cross section and joints of prefabricated units.	
4	Exhibit their knowledge in designing and detailing of prefabrication units	
5	Design the industrial structures, folded plate loads using the hand book provisions	

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Course Code/ Course Name:	17STX04 – DESIGN OF SUB STRUCTURES
Course Outcomes:	
1	Be capable of ensuring investigation & design concepts of shallow foundation
2	Be efficient in selecting suitable type of pile for different soil stratum
3	Enumerate the Design & construction of well foundation
4	Understand the basic principles of design of machine foundation & vibration analysis.
5	Deliver the design concepts for transmission line tower foundation

Course Code/ Course Name:	17STX05 – BEHAVIOUR AND ANALYSIS OF TALL BUILDINGS
Course Outcomes:	
1	Knowledge on design principles and different types of loading
2	Describe the various structural systems used in the construction of tall structures
3	Capable of analyse and Design the tall structures
4	Design of structural elements for secondary effects
5	Execute stability analysis, overall buckling analysis of frames, and analysis for various effects

Course Code/ Course Name:	17STX06 – DESIGN OF PLATES, SHELL AND SPATIAL STRUCTURES
Course Outcomes:	
1	Analyse various shapes of plates using various methods
2	Understand the behavior folded plates
3	Know the structural ehavior and philosophy of shells
4	Analysis & design the space frame
5	Application of Formex

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Course Code/ Course Name:	17STX07 - DESIGN OF STEEL - CONCRETE COMPOSITE STRUCTURES
Course Outcomes:	
1	Possess knowledge of the composite behaviour of structures.
2	Design various composite structural elements such as beams, columns, floors, slabs
3	Analyse the connection behaviour and design
4	Enumerate the behaviour of box girder bridges and the design concepts of the same.
5	Have practical knowledge of construction and design of various structural elements and design concepts through case studies.

Course Code/ Course Name:	17STX08 - STRUCTURAL STABILITY
Course Outcomes:	
1	Know about the concept of equilibrium, Eigen value problems & numerical approach.
2	Examine the behavior of beam columns and frames with and without side sway using classical and stiffness methods
3	Be well versed in the lateral buckling, torsional buckling, flexural torsional buckling of various beams and non-circular sections.
4	Evaluate buckling of thin plates using energy methods and various numerical techniques
5	Execute and work out the inelastic buckling using various methodologies

Course Code/ Course Name:	17STX09 - DESIGN OF INDUSTRIAL STRUCTURES
Course Outcomes:	
1	Know the planning and functional requirements of various industries
2	Get an idea about the materials used and design of industry structural elements
3	Realize the basic concepts and design of power plant structures.
4	Design on power transmission structures.
5	Possess the ability to understand the design concepts of chimneys, bunkers and silos

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Course Code/ Course Name:	17STX10 - MAINTENANCE AND REHABILITATION OF STRUCTURES

Course Outcomes:

1	Recognize the mechanisms of degradation of concrete structures
2	Plan towards the strength and durability of existing concrete structures
3	Realize the basic concepts and materials& techniques available for repair works.
4	Knowledge on strengthening and stabilization on existing concrete structures
5	Posses the ability to find out suitable techniques for repair and demolition process

Course Code/ Course Name:	17STX11 - DESIGN OF OFFSHORE STRUCTURES

Course Outcomes:

1	Knowledge of finite amplitude wave theory for wave generation process
2	Know about types of forces on offshore structures.
3	Analyse the content of offshores oil foundation modeling
4	Design the capacity of dynamic analysis for offshore structures
5	Learnt about design of helipads, cables and pipe lines.

Course Code/ Course Name:	17STX12 - WIND AND CYCLONE EFFECTS ON STRUCTURES

Course Outcomes:

1	Knowledge on Wind velocity, calculation of speed & aspect ratio
2	Gain the knowledge of Wind Tunnel and its types & Aero- elastic models.
3	Analyse the Wind on structures under static and dynamic effects
4	Design & construction the buildings, chimneys, shelters with reference to IS code.
5	Design on cyclone effect on structures & cladding

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Course Code/ Course Name:	17STX13 - DESIGN OF BRIDGES
Course Outcomes:	
1	Understand the design theories for super structure and sub structure of bridges
2	Design short span bridges
3	Understand the behaviour of continuous bridges, box girder bridges
4	Design prestressed concrete bridges
5	Know the Different types of bearings, abutments, piers and various types of foundations for Bridges

Course Code/ Course Name:	17STX14 - FRACTURE MECHANICS
Course Outcomes:	
1	Understand the design theories for super structure and sub structure of bridges
2	Design short span bridges.
3	Understand the behaviour of continuous bridges, box girder bridges
4	Design prestressed concrete bridges
5	Know the Different types of bearings, abutments, piers and various types of foundations for Bridges

Course Code/ Course Name:	17STX15 MECHANICS OF COMPOSITE MATERIALS
Course Outcomes:	
1	Identify the fiber types and classify the composite material.
2	Relate the stress - strain properties, longitudinal and transverse properties of composites
3	Analyse the laminated composites and compute the lamina strength
4	Find the failure criterion and fracture mechanics of composites
5	

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Course Code/ Course Name:	17STX16 - NON-LINEAR ANALYSIS OF STRUCTURES
Course Outcomes:	
1	Understand the elastic analysis with various boundary conditions of structural members
2	Understand the elastic analysis
3	Analyze of structural models under cyclic loading.
4	Analyze of uniform and variable thickness plates
5	Instability analysis of elastic flexural members.

Course Code/ Course Name:	17STX17 - ADVANCED STRUCTURAL ANALYSIS
Course Outcomes:	
1	Understand the basic concept of flexibility and stiffness
2	Transform the flexibility and from system coordinates to element coordinates
3	Identify the degree of freedom and to formulate flexibility matrix of components of structures
4	Formulate the stiffness matrix
5	Analyse the frame through the iteration methods

Course Code/ Course Name:	17STX18 - SMART STRUCTURES
Course Outcomes:	
1	Handle various smart materials and devices
2	Carryout analytical approach on vibration absorbers
3	Workout various strain measurement using smart materials
4	Deliver control strategies of smart structures
5	Apply principles of smart structures to civil engineering field

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Course Code/ Course Name:	17STX19 - DESIGN OF PRESTRESSED CONCRETE STRUCTURES
Course Outcomes:	
1	Knowledge on the principle, types and systems of prestressing and analyze the deflections.
2	Determine the flexural strength and design the flexural members, end blocks
3	Analyze the statically indeterminate structures
4	Design the tension and compression members
5	Analyze the stress, deflections, flexural and shear strength and apply it for the design of Bridges

Course Code/ Course Name:	17STX20 - SOLID AND HAZARDOUS WASTE MANAGMENT
Course Outcomes:	
1	To know the various types and sources of solid waste.
2	Gain knowledge of characterization of waste
3	Know the ideas about, storage and transfer the solid wastes
4	Gain the knowledge of waste processing technologies
5	choose the types of waste disposal and landfill remediation

Course Code/ Course Name:	17STX21 - ENERGY EFFICIENT STRUCTURES
Course Outcomes:	
1	Get introduced to various energy consumptions
2	Master the climate and environmental factors affecting building design.
3	Gain knowledge of design of buildings according to thermal environment
4	Acquire the skills of utilization of appliances and the principles behind them
5	Obtain the knowledge of energy audit in buildings

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Course Code/ Course Name:	17STX22 - STRUCTURAL HEALTH MONITORING		
Course Outcomes:			
1	Understand the structural health monitoring process		
2	Identify Structural Health Monitoring Methods		
3	Analyze the damage identification methods		
4	Identify the sensors for structures based on damage level		
5	Apply the structural health monitoring strategy for various structures		

Course Code/ Course Name:	17BAZ01 - RESEARCH METHODOLOGY		
Course Outcomes:			
1	Demonstrate the concepts of research and its methodologies, sources of information for literature review		
2	Formulate appropriate research design, data collection and conduct the experiments using systematic methods.		
3	Identify the design for coding, editing and analysis of data		
4	Choose the process like drawing and drafting tools and reviewing research papers		
5	Formulate the design for Intellectual property rights and code of ethics		

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M.E - COMPUTER SCIENCE AND ENGINEERING

Regulation :	R17
Program Code :	CP
Program Name :	Computer Science and Engineering

VISION OF THE DEPARTMENT

To achieve excellence in Computer Science and Engineering education to meet the ever growing needs of the society.

MISSION OF THE DEPARTMENT

Computer Science and Engineering department is committed to

- To ensure quality in major areas of Computer Science and Engineering keeping pace with the latest developments.
- To create the ability in the students to design, develop and test world class software systems.
- To promote lifelong learning in core and emerging areas.
- To inculcate strong ethical values and leadership abilities in the minds of students so as to work towards the advancement of the society.

PROGRAM EDUCATIONAL OBJECTIVES (PEOS):

List of PEOs

PEO1	Graduates will be employed in IT industries to solve industrial technological issues.
PEO2	Graduates will take up masters and pursue career paths in teaching and research.
PEO3	Graduates will be an entrepreneur who develops, deploys and maintains Real-time software.
PEO4	Graduates will continuously learn and adopt new technologies to solve communal issues.
PEO5	Graduates will enhance leadership skills and contribute towards societal growth.

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PROGRAM OUTCOMES:

ATTRIBUTE	GA'S
Engineering Knowledge	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
Problem Analysis	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
Design and Development of Solutions	Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
Investigation of Complex Problems	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
Modern Tool Usage	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
The Engineer and Society	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
Environment and Sustainability	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
Individual and Team Work.	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
Communication	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
Project Management and Finance	Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
Lifelong Learning	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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PROGRAM SPECIFIC OUTCOMES (PSOs) OF THE DEPARTMENT:

Graduates should be able to

PSO1:	Ability to understand the principles and working of hardware and software aspects in a computer system
PSO2:	Ability to demonstrate knowledge in mathematical models, algorithms and software development methodologies
PSO3:	Ability to develop practical competency in programming languages and open source platforms
PSO4:	Ability to provide a foundation for higher studies, research and entrepreneurship

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SEMESTER 1:

Course Code/ Course Name:	17CPA01 THEORETICAL FOUNDATIONS OF COMPUTER SCIENCE
Course Outcomes:	
1	The Students will be able to check the validity of the arguments.
2	The Students will be able to check whether a particular combination of words is a valid sentence or not.
3	The Students will be able to solve propositional logic, including modelling English description with propositions and connectives and doing with truth analysis and will be conversant in predicate logic.
4	The Students will be able to expose the basic characteristic features of a queuing system and acquire skills in analyzing queuing models.
5	The Students will be able to solve problems using formal languages and automata.

Course Code/ Course Name:	17CPA02 DESIGN AND MANAGEMENT OF COMPUTER NETWORKS
Course Outcomes:	
1	The student will be able to understand the network analysis and its management application.
2	The student will be able to able to know the design requirements, capacity for development and system requirements.
3	The student will be able to understand the network flow and flow related algorithms.
4	The student will be able to use the network architecture components and different architecture models.
5	The student will be able to apply the protocols and techniques for designing the network.

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Course Code/ Course Name:	17CPB01 OBJECT ORIENTED SOFTWARE ENGINEERING
Course Outcomes:	
1	The student will be able to construct static and dynamic models of software using UML.
2	The student will be able to understand various techniques for gathering and analyzing user's requirements.
3	The student will be able to design plan software solutions to problems.
4	The student will be able to understand OO concepts and software engineering process.
5	The student will be able to apply advanced techniques for design and analysis of the software system.

Course Code/ Course Name:	17CPB02 ADVANCED DATA STRUCTURES AND ALGORITHMS
Course Outcomes:	
1	The student will be able to use recursive design.
2	The student will be able to implement the main data structures and use them to solve computational problems.
3	The student will be able to master different algorithm design techniques.
4	The student will be able to apply and implement learned algorithm design techniques to solve problems
5	The student will be able to design complex and advanced data structures

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Course Code/ Course Name:	17CPB03 MULTICORE ARCHITECTURE AND PROGRAMMING

Course Outcomes:

1	The student will be able to understand about multi-core architectures.
2	The student will be able to write parallel programs.
3	The student will be able to know the issues of operating system, compiler for multi-core system.
4	The student will be able to understand the issues related to processors, memories, I/O devices.
5	The student will be able to use memory technologies, interfacing techniques and subsystem devices efficiently.

Course Code/ Course Name:	17CPP01 DATA STRUCTURES LABORATORY

Course Outcomes:

1	Student will be able to formulate new solutions for programming problems
2	The students will be able to identify the appropriate data structure for given problem.
3	The students will have practical knowledge on the application of data structures.
4	Student will be able to handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.
5	Student will be able to determine and demonstrate divide and conquer operations with data structures.

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SEMESTER 2:

Course Code/ Course Name:	17CPB04 WEB SERVICES

Course Outcomes:

1	The student will be able to analyze a web page and identify its elements and attributes.
2	The student will be able to Relate to XML Presentation Oriented Publishing (POP) applications and XML Message Oriented Middleware (MOM) applications
3	The student will be able to develop web services using SOAP and WSDL technologies.
4	The student will be able to build and consume web services using SOAP and UDDI, UDDI, JAX-RPC.
5	The student will be able to implement client server applications using JAX and RPC.

Course Code/ Course Name:	17CPB05 ADVANCED DATABASE TECHNOLOGY

Course Outcomes:

1	The students will be able to select the appropriate high performance database like parallel and distributed database.
2	The students will be able to model and represent the real world data using object oriented database.
3	The students will be able to design a semantic based database to meaningful data access
4	The students will be able to embed the rule set in the database to implement intelligent databases.
5	The students will be able to demonstrate competency in designing and selecting a particular NoSQL database for specific use cases.

Course Code/ Course Name:	17CPB06 SECURITY PRINCIPLES AND PRACTICES

Course Outcomes:

1	The students will be able to understand the mathematical foundations of security principles
2	The students will be able to understand block cipher and stream cipher models

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3	The students will be able to appreciate the different aspects of encryption techniques
4	The students will be able to understand the role played by authentication in security
5	The students will be able to appreciate the current trends of security practices

Course Code/ Course Name:	17CPB07 ADVANCED OPERATING SYSTEMS
Course Outcomes:	
1	The students will be able to understand the potential benefits of distributed operating systems.
2	The students will be able to implement various distributed operating system concepts.
3	The students will be able to allocate various resources efficiently for all the distributed processes.
4	The students will be able to familiar with protection and security mechanisms of operating system.
5	The students will be able to identify the requirements of database operating systems.

Course Code/ Course Name:	17CPP02 DATABASE TECHNOLOGY LABORATORY
Course Outcomes:	
1	The students will be able to evaluate and apply Advanced Database Development Techniques. Evaluate Database Systems.
2	The students will be able to administer Database Systems.
3	The students will be able to design & implement advanced database systems.

Course Code/ Course Name:	17CPE01 TECHNICAL TERM PAPER
Course Outcomes:	
1	At the end of the course the student will be able to read and review the research articles and publish a technical paper

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LIST OF PROFESSIONAL ELECTIVES (PE)

Course Code/ Course Name:	17CPX01 TCP/IP TECHNOLOGY
Course Outcomes:	
1	The student will be able to gain practical experience in designing communication protocols.
2	The student will be able to outline the various ways of connecting a network.
3	The student will be able to gain practical experience of IP addresses and the fundamentals of IP routing.
4	The student will be able to build the trade–offs between UDP and TCP and its uses.
5	The student will be able to transmit data without congestion.

Course Code/ Course Name:	17CPX02 DATA WAREHOUSING AND DATA MINING
Course Outcomes:	
1	The student will be able to learn the concepts of database technology evolutionary path which has led to the need for data mining and its applications.
2	The student will be able to evaluate and implement a wide range of emerging and newly-adopted methodologies and technologies to facilitate the knowledge discovery Discover and measure interesting patterns from different kinds of databases.
3	The student will be able to discuss the role of data warehousing and enterprise intelligence in industry and government.
4	The student will be able to summarize the dominant data warehousing architectures and their support for quality attributes.
5	The student will be able to apply and work with clustering algorithms and recent trends.

Course Code/ Course Name:	17CPX03 DISTRIBUTED SYSTEMS
Course Outcomes:	
1	The students will be able to present the main characteristics of distributed systems, as well as the related problems and the most common solutions.
2	The students will be able to implement small- scale distributed systems.
3	The students will be able to synchronize all the process in a distributed system
4	The students will have clear understanding of fault tolerance.
5	The students will be able to explore about various file systems.

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Course Code/ Course Name:	17CPX04 MOBILE COMPUTING

Course Outcomes:

1	The students will be able to understand the concept of wireless communication and mobile technologies
2	The students will be able to develop applications that are used in mobile device using SDK
3	The students will be able to develop applications that are used in mobile device using different environments.
4	The students will be able to develop applications with renowned features.
5	The students will be able to develop mobile applications with all advanced features.

Course Code/ Course Name:	17CPX05 SOFTWARE PROJECT MANAGEMENT

Course Outcomes:

1	The students will be able to provide how different project contexts will impact upon all aspects of a software development project
2	The students will be able to identify and describe the key phases of project management and the key skills associated
3	The students will be able to determine an appropriate project management approach through an evaluation of the business context and project scope and knowledge of agile and traditional project management approaches
4	The students will be able to demonstrate through application, knowledge of the key project management skills, such as product and work break-down structure, schedule; governance including progress reporting, risk and quality management.
5	The students will be able to obtain character based project learning

Course Code/ Course Name:	17CPX06 HIGH SPEED NETWORKS

Course Outcomes:

1	The students will have a strong foundation of OSI model and various protocols used in each layer
2	The student will be able to get an insight into circuit switched networks.
3	The student will become familiar with ATM networks and its layers.
4	The student will be able to identify the need of optical networks.
5	The student will be able to gain thorough knowledge in Wi-MAX and UWB

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Course Code/ Course Name:	17CPX07 DATA SCIENCE AND BIG DATA ANALYTICS

Course Outcomes:

1	The students will be able to identify the need for big data analytics for a domain.
2	The students will be able to deploy the Data Analytics Lifecycle to address big data analytics projects.
3	The students will be able to select appropriate data visualizations to clearly communicate analytic insights to business sponsors and analytic audiences.
4	The students will be able to design efficient algorithms for mining the data from large volumes.
5	The students will be able to design applications using Map Reduce Concepts.

Course Code/ Course Name:	17CPX08 PARALLEL ALGORITHMS

Course Outcomes:

1	The students will be able to discuss the classification of parallel architectures and identify suitable programming models
2	The students will be able to perform sorting on CRCW, CREW, EREW Models
3	Search a sorted as well as random sequence
4	The students will be able to develop and analyze algorithms for different applications like matrix multiplication, shortest path, job sequencing and the knapsack problem.
5	The students will be able to find the complexity of the parallel algorithms.

Course Code/ Course Name:	17CPX09 COMPILER CONSTRUCTION AND OPTIMIZATION

Course Outcomes:

1	The students will be able to design Compilers for a programming language.
2	The students will be able to map the process of Compilation for a programming paradigm and design compiler for the same.
3	The students will be able to data log Implementation leads to a more efficient implementation of the dataflow analysis.
4	The students will be able to combine different optimization techniques to achieve the overall objective of program efficiency.
5	The students will be able to explore on inter procedural analysis techniques.

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Course Code/ Course Name:	17CPX10 AD HOC NETWORKS

Course Outcomes:

1	The students will be able to describe the unique issues in adhoc
2	The students will be able to describe current technology trends for the implementation and deployment of ad
3	The students will be able to insight in medium access mechanisms in WLAN and IEEE 802.11.
4	The students will be able to explore on the challenges in designing routing and transport protocols for wireless Ad- hoc/sensor networks.
5	The students will be able to have broad knowledge on future wireless networks and awareness of a few new trends within the area of ad

Course Code/ Course Name:	17CPX11 MACHINE LEARNING TECHNIQUES

Course Outcomes:

1	The students will be able to implement a neural network for an application of your choice using an available tool.
2	The students will be able to implement probabilistic discriminative and generative algorithms for an application of your choice and analyze the results.
3	The students will be able to use a tool to implement typical clustering algorithms for different types of applications.
4	The students will be able to identify applications suitable for different types of machine learning with suitable Justification
5	Modify existing machine learning algorithms to improve classification efficiency

Course Code/ Course Name:	17CPX12 DIGITAL IMAGE PROCESSING AND APPLICATION

Course Outcomes:

1	The students will be able to apply principles and techniques of digital image processing in applications related to digital imaging system design and analysis.
2	The students will be able to acquire the fundamental concepts of a digital image processing system.
3	The students will be able to analyze and implement image processing algorithms
4	The students will be able to use image compression and segmentation Techniques
5	The students will be able to apply all image enhancement techniques.

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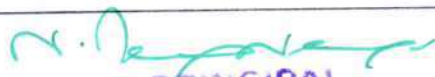
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Course Code/ Course Name:	17CPX13 SOFTWARE REQUIREMENT ENGINEERING

Course Outcomes:

1	The students will be able to define a process for requirement engineering.
2	The students will be able to design a software engineering system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturing and sustainability.
3	The students will be able to understand the professional and ethical responsibilities of a software engineer.

Course Code/ Course Name:	17CPX14 WIRELESS SENSOR NETWORKS

Course Outcomes:

1	The students will be able to explain about the various applications, Constraints and Challenges of wireless sensor networks.
2	The students will be able to work on Localization and Tracking.
3	The students will be able to summarize IEEE standards and routing protocols.
4	The students will be able to develop applications on wireless motes, smart phones and other embedded platforms.
5	The students will be able to identify suitable tools and techniques for sensor network applications

Course Code/ Course Name:	17CPX15 VIRTUALIZATION TECHNIQUES

Course Outcomes:

1	The students will be able to understand the main concepts, key technologies, strengths, and limitations of virtualization.
2	The students will be able to develop the infrastructure of interfacing, including public cloud, private cloud, and hybrid cloud.
3	The students will be able to manage capabilities for planning, deploying, managing, and optimizing virtual infrastructure.
4	The students will be able to solve the appropriate machine learning solutions and then recommended.
5	The students will be able to apply the Microsoft Virtual Server Environment in virtual machine.

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Course Code/ Course Name:	17CPX16 SOFT COMPUTING
Course Outcomes:	
1	Students will be able to understand the soft computing techniques and their roles in building intelligent Machines.
2	Students will be able to apply genetic algorithms to combinatorial optimization problems.
3	Students will be able to differentiate supervised and unsupervised learning neural networks.
4	Students will be able to solve fuzzy logic to handle uncertainty engineering problems.
5	Students will be able to apply neuro fuzzy modeling to pattern classification and regression problems

Course Code/ Course Name:	17CPX17 MOBILE APPLICATION DEVELOPMENT
Course Outcomes:	
1	The students will be able to describe the requirements for mobile applications.
2	The students will be able to explain the challenges in mobile application design and development.
3	The students will be able to design mobile applications for specific requirements.
4	The students will be able to develop the design using Android SDK and iOS SDK.
5	The students will be able to deploy mobile applications in Android and iPhone.

Course Code/ Course Name:	17CPX18 NETWORK OPTIMIZATION TECHNIQUES
Course Outcomes:	
1	The students will be able to identify the network optimization problems and algorithms for solving them.
2	The students will be able to develop algorithmic thinking skills.
3	The students will be able to categorize nonlinear network optimization problems.
4	The students will be able to solve the network flow problems.
5	The students will be able to select suitable techniques used for network problems.

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Course Code/ Course Name:	17CPX19 PATTERN RECOGNITION
Course Outcomes:	
1	The students will be able to explain about the pattern recognition problems.
2	The students will be able to build appropriate clustering techniques for various problems.
3	The students will be able to gain insight into the principles and commonly used grammars for structural pattern recognition.
4	The students will be able to analyze about feature extraction and subset selection methods for various real world applications.
5	The students will be able to apply the neural network concepts in real world applications.

Course Code/ Course Name:	17CPX20 EVOLUTIONARY COMPUTING
Course Outcomes:	
1	The students will be able to explain different historical branches of evolutionary computation.
2	The students will be able to describe the basic properties of evolutionary computation.
3	The students will be able to implement a variety of evolutionary approaches for problem solving.
4	The students will be able to gain experience in applying various optimization algorithms.
5	The students will be able to apply the methods of optimization in real life situation.

Course Code/ Course Name:	17CPX21 SEMANTIC WEB
Course Outcomes:	
1	The students will be able to understand the fundamental concepts of the semantic web.
2	The students will be able to outline for semantic syntax and schema.
3	The students will be able to design ontology using Web Ontology Language (OWL).
4	The students will be able to differentiate monotonic and non-monotonic rules.
5	The students will be able to apply Semantic web technology to real world application

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Course Code/ Course Name:	17CPX22 INTERNET OF THINGS

Course Outcomes:

1	The students will be able to identify the components of IOT
2	The students will be able to design a portable IOT using appropriate boards
3	The students will be able to program the sensors and controller as part of IOT
4	The students will be able to develop schemes for the applications of IOT in real time scenarios
5	The students will be able to establish the communication to the cloud through Wi-Fi / Bluetooth

Course Code/ Course Name:	17CPX23 - CLOUD COMPUTING TECHNOLOGIES

Course Outcomes:

1	The students will be able to Employ the concepts of storage virtualization, network virtualization and its management
2	The students will be able to Apply the concept of virtualization in the cloud computing
3	The students will be able to Identify the architecture, infrastructure and delivery models of cloud computing
4	The students will be able to Develop services using Cloud computing
5	The students will be able to Apply the security models in the cloud environment

Course Code/ Course Name:	17CPX24 NEXT GENERATION NETWORKS

Course Outcomes:

1	The students will be able to understand the issues and challenges of wireless domain in future generation network design.
2	The students will be able to explore the LTE concepts and technologies.
3	The students will be able to understand the integration of SDN with LTE.
4	The students will be able to understand the functioning of NGN
5	The students will be able to understand the NGN management and standardizations.

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Course Code/ Course Name:	17CPX25 WEB ENGINEERING
Course Outcomes:	

1	The students will be able to explain the characteristics of web applications.
2	The students will be able to model web applications.
3	The students will be able to design web applications.
4	The students will be able to test web applications.
5	The students will be able to promote and manage web applications.

OPEN ELECTIVE COURSES (OE)

Course Code/ Course Name:	17BAZ01- RESEARCH METHODOLOGY
Course Outcomes:	

1	Demonstrate the concepts of research and its methodologies, sources of information for literature review
2	Formulate appropriate research design, data collection and conduct the experiments using systematic methods.
3	Identify the design for coding, editing and analysis of data
4	Choose the process like drawing and drafting tools and reviewing research papers
5	Formulate the design for Intellectual property rights and code of ethics

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M.E – VLSI DESIGN

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Program Code:	**EC**
Program Name:	**PG- VLSI Design**
Regulation:	**R17**

PROFESSIONAL CORE (PC)

SEMESTER 1:

Course Code/ Course Name:	17VLA01 APPLIED MATHEMATICS FOR ELECTRONICS ENGINEERS
Course Outcomes:	
1	To understands the basic principles of fuzzy logic.
2	Demonstrate ability to manipulate and compute determinants.
3	To develop efficient algorithms for solving dynamic programming problems, to acquire skills in handling situation involving random variable.
4	To learn the basics and gained the skill for specialized studies and research.
5	To exposed the basic characteristic features of a queuing system and acquire skills in analyzing queuing models.

Course Code/ Course Name:	17VLA02 DIGITAL SYSTEM DESIGN
Course Outcomes:	
1	The students will be able toanalysis and Design of Synchronous and Asynchronous sequential machines
2	The students will be able todraw a ASM chart for digital designs
3	The students will be able todetect and diagnosis different faults in digital circuits
4	The students will be able tohave knowledge of PLD's and architecture of FPGA's
5	The students will be able to design the digital systems through VHDL programming.

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Course Code/ Course Name:	17VLB01 DSP INTEGRATED CIRCUITS	
Course Outcomes:		
1	Implement various signal processing algorithms.	
2	Diagnose the design and methodologies in hardware and software design.	
3	Identify new developments in Application specific processors.	
4	The students will be able to analyze the transformation applied to various transform.	
5	The Students can implement the project using multiplier and number system.	

Course Code/ Course Name:	17VLB02 CMOS VLSI DESIGN	
Course Outcomes:		
1	The Students can be able to Aware about the trends in MOS transistor theory and second order effects	
2	The Students will be able to a Learn design rules and CMOS technology process.	
3	The Students will be able to Recognize the inverter characteristics and logic structures	
4	The students will be able to Analyze scaling principles and performance estimation	
5	The Students can examine the physical design process	

Course Code/ Course Name:	17VLB03 DEVICE MODELING AND SIMULATION	
Course Outcomes:		
1	The students can able to know about the basics of MOSFET device modeling and noise modeling.	
2	The students can understand and apply the concepts of noise modeling in system design.	
3	The students can apply the mathematical techniques for device simulations.	
4	The students will be able to implement equations for different space domain.	
5	The students can realize concepts about process variation and quality assurance.	

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Course Code/ Course Name:	17VLP01 VLSI DESIGN LABORATORY I
Course Outcomes:	

1	The Students will be able todesign sequential & combinational circuits
2	The Students will be able to perform Transient ,DC analysis and Power analysis of transistor level designs
3	The Students will be able to implement digital signal processing circuits using FPGA
4	The Students will be able to design and analysis digital filters using modeling tools
5	The Students will able to develop real world applications using FPGA

Course Code/ Course Name:	17VLE01 TECHNICAL SEMINAR-I
Course Outcomes:	

1	At the end of the course the student will be able to write a technical report and to enhance their presentation skills

SEMESTER 2:

Course Code/ Course Name:	17VLB04 CAD FOR VLSI SYSTEMS
Course Outcomes:	

1	The Students can be able to examine VLSI design methodologies
2	The Students will be able to aLearn design rules and placement algorithms
3	The Students will be ableevaluate and analyze the floor planning and routing concepts
4	The students will be able to Simulate gate level and switch level model
5	The Students will be able to gain knowledge of modeling and synthesis

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Course Code/ Course Name:	17VLB05 ANALOG IC DESIGN

Course Outcomes:

1	The Students can be able to design MOS single stage, multistage amplifiers.
2	The Students will be able to develop OPAMP for desired frequencies..
3	The Students will be able to analyze Stability of single stage & multistage amplifiers.
4	The students will be able to analyze noise in MOS single stage & multistage amplifiers.
5	The Students will be able to design current mirrors and reference circuits.

Course Code/ Course Name:	17VLB06 ADVANCED EMBEDDED SYSTEMS

Course Outcomes:

1	The student will be able to know about various Requirements, Specification and Architectural Design for Embedded system design process.
2	The student will be able to understand and apply interfacing concepts of SHARC and ARM processors.
3	The student will be able to realize concepts about various Embedded Network using I2C, CAN Bus and SHARC bus for industry based applications.
4	The student will be able to apply the programming skills for peripheral interfacing and real time applications.
5	The student will be able to apply the concepts of RTOS for real-time systems design.

Course Code/ Course Name:	17VLB07 ADVANCED COMPUTER ARCHITECTURE

Course Outcomes:

1	The Students can be able to analyze parallel computing model
2	The Students will be able to analyze the performance matrices and measures of Parallel processing
3	The Students will be able to analyze the various memory organizations
4	The students will be able to analyze the operation of SIMD computers, Scalable, Multithreaded and data flow architectures.
5	The Students will be able to distinguish the various Languages and compilers employed in the Parallel program development

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Course Code/ Course Name:	17VLP02 VLSI DESIGN LABORATORY -II
Course Outcomes:	

1	The Students will have knowledge about digital system design and implement the same in FPGAs
2	The Students will able to develop real world applications using FPGA
3	The Students will be able to perform SPICE analysis
4	The Students will be able to do layout level design entries
5	The Students will have an ability to design FPGA based systems

Course Code/ Course Name:	17VLE02 TECHNICAL SEMINAR-II
Course Outcomes:	

1	At the end of the course the student will be able to write a technical report and to enhance their presentation skills

PROFESSIONAL ELECTIVES (PE)

Course Code/ Course Name:	17VLX01 ANALOG VLSI DESIGN
Course Outcomes:	

1	Learn the basics of CMOS and BICMOS circuit techniques.
2	Gain a well founded knowledge on filters and converters.
3	Obtain knowledge on testability and VLSI interconnects.
4	Grasp the concept of statistical modeling and simulation.
5	Comprehend the concepts of Neural Network.

Course Code/ Course Name:	17VLX02 LOW POWER VLSI DESIGN
Course Outcomes:	

1	The Students can be able to understand the various sources of Power dissipation in CMOS circuits.
2	The Students will be able to analyze the various power optimization techniques.
3	The Students will be able to understand the low power CMOS circuits.
4	The students will be able to analyze the power estimation.
5	The Students are able to do synthesis and software code design.

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Course Code/ Course Name:	17VLX03 PHYSICAL DESIGN OF VLSI CIRCUITS
Course Outcomes:	
1	The Students will be to Design the circuit layouts by analyzing the performance issues of circuits.
2	The Students will be to Solve practical engineering problems pertaining to the field of VLSI designs.
3	The students will be able to understand partitioning and routing methodologies.
4	The students will be able to understand CMOS processing technology on compaction models and placement
5	The Students will be able to understand the characterize the different synthesis.

Course Code/ Course Name:	17VLX04 VLSI PROCESS TECHNOLOGY
Course Outcomes:	
1	The Students will be to use metallization techniques to create three-dimensional device structures and devices.
2	The Students will be to know methodology to fabricate an IC's.
3	The students will be able to understand CMOS processing technology.
4	The students will be able to understand CMOS processing technology and Basic CMOS circuits, characteristics and performance.
5	The Students will be able to understand the characterize the different packaging techniques.

Course Code/ Course Name:	17VLX05 ASIC AND FPGA DESIGN
Course Outcomes:	
1	Understand the basics of ASIC design flow and library design.
2	Gain a well founded knowledge of logical cells and i/o cells.
3	Apply various logic synthesis techniques, simulation and testing in digital system design.
4	Implement the ASIC construction, floor planning, placement and routing.
5	Design and develop high performance algorithms and its applications in ASICs.

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Course Code/ Course Name:	17VLX06 VLSI SYSTEM TESTING
Course Outcomes:	
1	Detect faults occurring in digital systems and modelling of the faults to simplifying the detection
2	Generate test vectors to detect and diagnose the faults using various algorithms
3	Design testable Combinational and Sequential circuits
4	Design testable memory units
5	Understand system level fault diagnosis

Course Code/ Course Name:	17VLX07 VLSI FOR WIRELESS COMMUNICATION
Course Outcomes:	
1	The Students can be able to design components using low noise amplifiers.
2	The Students will be able to analyze characteristics of mixers for various operations.
3	The Students will be able to design concept of PLL and various Oscillators.
4	The students will be able to analyze the operation data convertors and equalizers.
5	The Students can implement the project using VLSI architecture for Multitier Wireless System.

Course Code/ Course Name:	17VLX08 VLSI SIGNAL PROCESSING
Course Outcomes:	
1	The Students will be able to implement the various DSP design using FPGA technology.
2	The Students will be able to design arithmetic operations using critical path reduction.
3	The Students will be able to design recursive IIR filters using Algorithmic strength reduction methods.
4	The students will be able to design FIR filters using Pipelined Digital techniques
5	The Students will be able study the performance parameters, viz. area, speed and power through Synchronous and asynchronous pipelining

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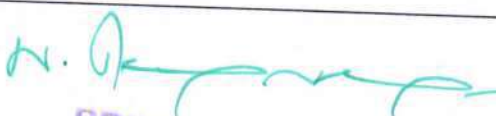
Course Code/ Course Name:	17VLX09 NETWORKS ON CHIP
Course Outcomes:	

1	The Students will be able to Compare different architecture design.
2	The Students will be able to implement different routing algorithms.
3	The Students will be able to Optimize design in terms of test and fault tolerance of Noc
4	The Students will be able to Implement three dimensional networks - on-chip architectures.
5	The Students will be able to Optimize Chip Protocols & On-Chip Processor traffic.

Course Code/ Course Name:	17VLX10 SCRIPTING LANGUAGES FOR VLSI
Course Outcomes:	

1	The Students can be able to apply scripting languages.
2	The Students will be able to develop different designs using advanced PERL
3	The Students can implement the designs using TK and Java script.
4	The Students will be able to implement designs using TCL.
5	The students will be able to know the concepts of security issues.

Course Code/ Course Name:	17VLX11 GENETIC ALGORITHMS AND APPLICATIONS
Course Outcomes:	

1	Design architectures for GA
2	Implementation of GA through VLSI technology
3	Perform the new algorithm in genetic area
4	Optimize design in terms of power.
5	Incorporate various genetic algorithms in the system design

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Course Code/ Course Name:	17VLX12 SECURITY SOLUTIONS IN VLSI
Course Outcomes:	
1	The Students can be able to design architectures for security threats.
2	The Students will be able to Optimize design in terms of area, speed and power.
3	The Students will be able to understand the characteristics of cyber laws.
4	The students will be able to analyze various network threats.
5	The Students can implement the various cryptography algorithms in the design.

Course Code/ Course Name:	17VLX13 SYSTEM LEVEL HARDWARE SOFTWARE CO-DESIGN
Course Outcomes:	
1	The Students can be able to understand and apply hardware software co-design
2	The Students can be able to know various techniques of prototyping and emulation
3	The Students can be able to develop applications with FPGAs.
4	The students will be able to analyze the operation of various prototyping and emulation techniques .
5	The Students can implement the project using specific language.

Course Code/ Course Name:	17VLX14 ELECTROMAGNETIC INTERFERENCE AND COMPATIBILITY IN ELECTRONIC SYSTEM DESIGN
Course Outcomes:	
1	The Students can be able to understand the basics of EMI/EMC concepts
2	The Students will be able to analyze the EMI coupling principles.
3	The Students will be able to analyze the EMI control Techniques
4	The students will be able to design high speed Printed Circuit board with minimum interference
5	The Students can able to know about the EMI measurements and standards

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Course Code/ Course Name:	17VLX15 ROBOTICS
Course Outcomes:	

1	The Students can be able to understand robot locomotion and mobile robot kinematics
2	The Students will be able to analyze and apply kinematics models and constraints.
3	The Students will be able to implement vision algorithms for robotics
4	The students will be able to analyze the mobile robot mapping using SLAM algorithm
5	The Students can implement the project using obstacle avoidance techniques and navigation architecture.

Course Code/ Course Name:	17VLX16 RF SYSTEM DESIGN
Course Outcomes:	

1	Understand the problems created in RF design.
2	Know about the RF filter design
3	Gain knowledge on active RF components.
4	Design the RF amplifier circuits.
5	Learn the uses of Oscillators and Mixers in RF designs.

Course Code/ Course Name:	17VLX17 RECONFIGURABLE COMPUTING
Course Outcomes:	

1	The Students can be able to design General Purpose Computing.
2	The Students will be able to develop applications with reconfigurable devices.
3	The Students will be able to understand the characteristics of various device architectures.
4	The students will be able to Apply the HDL programming with the development environment.
5	The Students can design various placement and routing protocols.

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Course Code/ Course Name:	17VLX18 DSP WITH FIELD PROGRAMMABLE GATE ARRAYS
Course Outcomes:	
1	The Students can be able to acquire knowledge in DSP with FPGA applications
2	The Students will be able to develop arithmetic applications using DSP
3	The Students will be able to understand the characteristics of advanced transforms.
4	The students will be able to Apply the concept of adaptive filters in development environment
5	The Students will be able to design Microprocessor based systems using FPGA

Course Code/ Course Name:	17VLX19 ELECTRONICS PACKAGING
Course Outcomes:	
1	The Students can be able to develop an electronic system PCB or integrated circuit design specifications.
2	The Students will be able to develop Semiconductor packages.
3	The Students will be able to select the appropriate packaging style, design procedure and solution for the same.
4	The students will be able to develop SMD based applications.
5	The Students will be able to apply embedded passive technology in electronic packaging.

Course Code/ Course Name:	17VLX20 NANO SCALE DEVICES
Course Outcomes:	
1	The Students can be able to design circuits using nano scaled MOS transistors.
2	The Students will be able to develop systems with physical insight of their functional characteristics.
3	The Students will be able to design using nano scale MOS transistor .
4	The students will be able to develop circuits using nano wire FETS.
5	The Students will be able to prevent radiation effects in MOSFETS.

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Course Code/ Course Name:	17VLX21 DESIGN OF ANALOG FILTERS AND SIGNAL CONDITIONING CIRCUITS
Course Outcomes:	
1	The Students can be able to design CMOS circuits.
2	The Students will be able to develop analog filter architectures.
3	The Students will be able to design signal conditioning circuits.
4	The students will be able to develop systems with Mixed signal IC environment.
5	The Students will be able to apply the operational and design principles for active analog filter configurations

Course Code/ Course Name:	17VLX22 SOFT COMPUTING
Course Outcomes:	
1	The Students will be able to acquire sound knowledge about the fuzzy logic components and Neural networks.
2	TheStudentswillbeabletodevelopsystemsusingmachinelearningthroughSupportvectormachines.
3	The Students will be able to apply Neuro - Fuzzy Control for system design.
4	The Students will be able to develop systems using Neuro Fuzzy modeling.
5	The Students will be able to develop applications using AI.

Course Code/ Course Name:	17VLX23 MULTICORE ARCHITECTURE
Course Outcomes:	
1	The Students can be able to design systems using Multicore processors.
2	The Students will be able to develop pipelined systems.
3	The Students will be able to design systems using Multiprocessors and analyze different issues.
4	The students will be able to apply concepts to develop systems with warehouse scale architecture
5	The Students will be able to apply the multicore principles for embedded system development

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Course Code/ Course Name:	17VLX24 SIGNAL INTEGRITY FOR HIGH SPEED DESIGN
Course Outcomes:	
1	To understands the basic principles of signal propagation on transmission lines.
2	To build up Lossless and minimized cross-talk models in multi-conductor transmission lines.
3	To develop efficient design with minimum non ideal effects parameters like routing parasitic, Parasitic inductance and capacitance.
4	To learn the basics and gained the skill for power optimization specialized studies and research.
5	To improve the signal transmission characteristics with optimized clock distribution circuit design.

OPEN ELECTIVES (OE)

Course Code/ Course Name:	17BAZ01- RESEARCH METHODOLOGY
Course Outcomes:	
1	Demonstrate the concepts of research and its methodologies, sources of information for literature review
2	Formulate appropriate research design, data collection and conduct the experiments using systematic methods.
3	Identify the design for coding, editing and analysis of data
4	Choose the process like drawing and drafting tools and reviewing research papers
5	Formulate the design for Intellectual property rights and code of ethics

Course Code/ Course Name:	17CPZ01 MACHINE VISION
Course Outcomes:	
1	The student will be able to apply the vision concepts in various mechatronics applications
2	The student will be able to recognize the Image acquisition techniques and tools
3	The student will be able to apply the image processing tools and libraries
4	The student will be able to analyze the images in the case of Robotic or IoT applications
5	The student will be able to select the right machine vision system for implementing in industrial applications

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M.E – ENGINEERING DESIGN

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Regulation :	R17
Program Code :	ED
Program Name :	DEPARTMENT OF MECHANICAL ENGINEERING

VISION OF THE DEPARTMENT

To be a premier centre for learning in Mechanical Engineering in the country.

MISSION OF THE DEPARTMENT

➢ To offer state-of-the-art undergraduate, postgraduate and research programmes in engineering.

➢ To develop skilled and employable graduates to meet the challenges in emerging fields of Engineering.

➢ To prepare the students for prosperous career in Engineering / Entrepreneurship by inculcating the leadership qualities with professional and ethical responsibilities for the benefit of the society.

➢ To encourage Research & Development in the thrust areas of Engineering.

PROGRAM EDUCATIONAL OBJECTIVES (PEOS):

List of PEOs

PEO 1:	Graduates will be successful practitioners in solving industry's technological problems
PEO 2:	Graduates will be entrepreneurs and contribute to the economic growth of the country
PEO 3:	Graduates will pursue higher studies in engineering or management successfully
PEO 4:	Graduates will make successful career paths in teaching / industry / research
PEO 5:	Graduates will function in their career with professional and ethical responsibilities

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PROGRAM OUTCOMES:

ATTRIBUTE	GA'S
Engineering Knowledge	an ability to apply knowledge of mathematics, science and engineering
Problem Analysis	an ability to design and conduct experiments, as well as to analyze and interpret data
Design and Development of Solutions	an ability to design a system, component or process to meet desired needs within realistic constraints such as economic, environmental, social, ethical, safety, manufacturability and sustainability
Investigation of Complex Problems	an ability to function on multidisciplinary teams to solve complex problems
Modern Tool Usage	an ability to use the techniques, skills and modern engineering tools necessary for engineering practice
The Engineer and Society	an ability to infer societal, health, safety, legal & cultural issues and consequent responsibilities relevant to the professional engineering practice
Environment and Sustainability	an ability to explain, compare and summarize the impact of engineering solutions for sustainable development with societal and environmental perspective
Ethics	an understanding of professional and ethical responsibility
Individual and Team Work.	an ability to function effectively as an individual / team in different environments
Communication	an ability to communicate effectively
Project Management and Finance	an ability to apply knowledge of engineering and management principles to the projects
Lifelong Learning	an ability to recognize the need for life-long learning

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Course Code/ Course Name:	17EDA01 ADVANCED NUMERICAL METHODS
Course Outcomes:	

1	Derive appropriate numerical methods to solve algebraic and transcendental equations.
2	Solve an ordinary differential equation using an appropriate numerical method
3	Solve a partial differential equation using an appropriate numerical method
4	Familiar with the use of finite difference methods for boundary value problem
5	Solve a partial differential equation using an appropriate numerical method under finite element method.

Course Code/ Course Name:	17EDA02 CONCEPTS OF ENGINEERING DESIGN
Course Outcomes:	

1	Apply the design concepts in various industrial products based on customer requirements.
2	Utilize the statistical tools in monitoring the performance of products.
3	Be familiar with the design concepts to improve the reliability and productivity.
4	Apply the material selection process and design for manufacture.
5	Gain knowledge about the failure mode effect analysisand green design process.

Course Code/ Course Name:	17EDB01 MECHANICAL VIBRATIONS
Course Outcomes:	

1	Understand the basics of vibration and its importance in engineering field.
2	Various vibration measuring instruments, vibration control and analysis techniques.
3	Familiar with the Multi-degree freedom system and continuous system.
4	Apply the vibration control system
5	Gain knowledge about the experimental methods in vibration analysis

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Course Code/ Course Name:	17EDB02 FAILURE ANALYSIS AND DESIGN
Course Outcomes:	
1	Understand the various modes of failure and material behavior in fracture loading.
2	Demonstrate fracture mechanisms and fracture, creep, fatigue, corrosion and wear failures.
3	Illustrate the type's fatigue analyzing process.
4	Implement of failure analysis principles in innovative applications.
5	Explain the failure analysis tools.

Course Code/ Course Name:	17EDB03 COMPUTER APPLICATIONS IN DESIGN
Course Outcomes:	
1	Integrate CAD and gain the advantages of lead time reduction
2	Create CAD packages for various products which include parts, assembly etc.,
3	Understand the meaning of CAD and transfer of product data in various software.
4	Describe the types nurbs and solid modeling
5	Demonstrate the knowledge of assembly modeling and tolerance analysis

Course Code/ Course Name:	17EDB04 DESIGN FOR MANUFACTURE, ASSEMBLY AND ENVIRONMENTS
Course Outcomes:	
1	Estimate tolerances for different dimension of a product based on the selected manufacturing process
2	Select material for particular product Based on the functional requirement.
3	Apply a systematic understanding of knowledge in the field of metal casting and machining.
4	Select the various machining processes depends upon the materials and its applications.
5	Design the components based on environmental issues.

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Course Code/ Course Name:	17EDP01 COMPUTER AIDED MODELING LAB
Course Outcomes:	

1	Read the drawing and Interpret the data and dimensions
2	Create CAD models for various products which include parts, assembly etc.
3	Understand various practices like Modeling and drafting of Mechanical Components
4	Understand various CAD Study of Sketcher Solid modeling
5	Read the drawing and Interpret the data and dimensions

Course Code/ Course Name:	17EDB05 ADVANCED FINITE ELEMENT ANALYSIS
Course Outcomes:	

1	Apply finite elements technique in engineering problem solving for various applications.
2	Derive finite element equation and to solve the real time 1D and 2Dstructural and thermal problems.
3	Solve and analysis the engineering problems using isoparametric and parametric elements.
4	Estimate the solve structural dynamic analysis
5	Create nonlinear problems and error method

Course Code/ Course Name:	17EDB06 MECHANISMS DESIGN AND SIMULATION
Course Outcomes:	

1	Design the linkages for particular applications and analyze the velocity and acceleration of various mechanisms.
2	Gain ability to research concepts, simulate, and test working conditions and application of modeling.
3	Identify the path curvature theory and coupler curve of common engineering problems
4	Select a layout of synthesis of four bar mechanisms
5	Study and use of mechanism using simulation software packages

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Course Code/ Course Name:	17EDB07 INTEGRATED MECHANICAL DESIGN

Course Outcomes:

1	Apply concepts of design of shafts to obtain solutions to real time engineering problems
2	Identify the gear tooth failure modes and design of gears
3	Integrated design of brakes and clutches for machine tools
4	Categorize the engineering applications of Integrated design of machine elements
5	Apply the concepts of integrated design in transmission systems

Course Code/ Course Name:	17EDP02 ANALYSIS AND SIMULATION LABORATORY

Course Outcomes:

1	Analyse the engineering problem using a simulation model and find out the solutions.
2	Get familiarized with the computer aided finite element analysis packages which are necessary to solve the engineering problems numerically.
3	Design the mechanical systems to meet thermal and fluid flow requirements for various applications
4	Usage of commercial FE softwares to solve complex engineering problems with an understanding of their limitations.
5	Design the mechanical components to meet optimization, Buckling, Modal, Fatigue and Harmonic analysis for various applications

Course Code/ Course Name:	17EDE01 TECHNICAL SEMINAR

Course Outcomes:

1	Review, prepared and present technological developments
2	Get practice of oral and written skills.
3	Improve personal and communicative skills (e.g. speaking, listening, reading, and/or writing).
4	Adequate to understand inductive and deductive reasoning, and increase their general problem solving skills.
5	Develop the report and also on the interaction during the seminar.

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Course Code/ Course Name:	17EDE02 PROJECT WORK (PHASE I)
Course Outcomes:	
1	At the end of the course the students will have a clear idea of their area of work and they will be in a position to carry out the phase II project work in a systematic way.

Course Code/ Course Name:	17EDE03 INDUSTRIAL TRAINING
Course Outcomes:	
1	At the end of the course the students will have a clear idea in their area of work and they will be in a position to carry out the phase II project work in a systematic way phase I

Course Code/ Course Name:	17EDE04 PROJECT WORK (PHASE II)
Course Outcomes:	
1	On completion of the project work students will be in a position to take up any challenging practical problem in the field of engineering design and find better solutions to it.

Course Code/ Course Name:	17EDX01 DESIGN OF FLUID POWER SYSTEMS
Course Outcomes:	
1	Acquire knowledge about pumps and valves used in fluid power systems
2	Develop fluid power circuits depends upon the applications.
3	Discuss the use the integration of hydraulic and pneumatic systems in other countries and its impact on products design, manufacturing, employment, safety, and economy.
4	Recognize the various methods of pneumatic systems and circuits design of the different components used in fluid power and pneumatics systems
5	Know the installation and maintenance of the hydraulic and pneumatic circuits

Course Code/ Course Name:	17EDX02 COMPOSITE MATERIALS AND MECHANICS
Course Outcomes:	
1	Describe the properties of various available composite materials.
2	Understand the mechanics and design related to layered components such as fiber reinforced polymer composites ,isotropic layered structures (example electronic chips) etc and its manufacturing methodologies.
3	Basic understanding of lamina constitutive equations and lamina properties from laminate tests
4	Use the ideas developed in the lamina strength analysis and analysis of laminated flat plates
5	Select suitable composite or thermal analysis for industrial oriented applications

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Course Code/ Course Name:	17EDX03 MECHANICAL BEHAVIOR OF MATERIALS

Course Outcomes:

1	Students will demonstrate an understanding of the mechanical properties and behavior of materials.
2	Gain knowledge in selection of materials for the design of engineering structures.
3	Know the properties and applications of various materials
4	Demonstrate the ability to identify engineering problems involving plastic deformation, fatigue, and fracture, and the tools required to solve these problems.
5	Familiarize in the area of material behaviour under different loading and temperature conditions.

Course Code/ Course Name:	17EDX04 MAINTENANCE ENGINEERING

Course Outcomes:

1	Be familiar with the basics of maintenance systems.
2	Gain ability to plan and schedule maintenance activities.
3	Be familiar with the safety and other aspects of maintenance functions.
4	Establish maintenance strategies according to system characteristics and design transition programs to implement these strategies
5	Describe different types of accidents and hazards.

Course Code/ Course Name:	17EDX05 DESIGN OF MATERIAL HANDLING EQUIPMENT

Course Outcomes:

1	Design the various equipments for material handling in industries.
2	Determine the requirement of different material handling equipments for various applications.
3	Identify engineering problems and to carry out the engineering design of a design or component to meet desired needs
4	Research concept, simulate, test working conditions and applications of modeling methods and their impact on the desired system
5	To design the elevators with loading and bucket arrangements in consideration of safety.

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Course Code/ Course Name:	17EDX06 EXPERIMENTAL STRESS ANALYSIS

Course Outcomes:

1	Recognize the area of application for this methods for the health monitoring systems the structures
2	Evaluate the stress at the critical points and to measure the severity of damage that occur due to the expose of the structures to the adverse loading condition
3	Measure the severity of damage under complex loadings for the load bearing structures
4	Understand basic principles of photo elasticity, and use it as an analysis tool
5	Aviation of control to develop trend and technique ability by applying the Non destructive testing methods.

Course Code/ Course Name:	17EDX07 ADVANCED TOOL DESIGN

Course Outcomes:

1	Apply the design concepts in various industrial applications
2	Gain knowledge about standards in tool design
3	Design the tools for NC machines
4	Design fixtures for milling, boring, lathe, grinding, welding; identify fixtures and cutting tools for NC machine tools.
5	Describe tool design methods and punch and die manufacturing techniques.

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Course Code/ Course Name:	17EDX08 BIOMECHANICS
Course Outcomes:	
1	Describe the mechanics of physiological systems.
2	Analyze the biomechanical systems.
3	Gain knowledge about bone structure & composition mechanical properties
4	Design orthopaedic applications.
5	Explain the ergonomics and Injury mechanics

Course Code/ Course Name:	17EDX09 MECHATRONICS IN MANUFACTURING SYSTEMS
Course Outcomes:	
1	Describe the various types of sensors and transducers.
2	Program the microprocessor.
3	Select suitable components for industrial automation.
4	Gain the knowledge to design the fluid power circuits and analysis of hydraulic circuits.
5	Understand the basic knowledge of sensors, actuators and various instruments involved in mechatronics system.

Course Code/ Course Name:	17EDX10 BEARING DESIGN AND ROTOR DYNAMICS
Course Outcomes:	
1	Explain different types of bearings available for machine design and their operating principles
2	Acquisition of knowledge in the analysis of all types of bearings.
3	Ability to make specifications of all types of bearings
4	Skill for conducting dynamic / vibration analysis and troubleshooting of bearings
5	Analysis the vibrating devices and critical speed of shafts.

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Course Code/ Course Name:	17EDX11 ADDITIVE MANUFACTURING
Course Outcomes:	

1	Apply the tools and techniques for rapid production of products with complicated shapes at low cost.
2	Determine the suitable rapid prototyping technology and their potential to support design and manufacturing.
3	Be familiar with challenges associated with reverse engineering and data processing tools and the case studies relevant to rapid manufacturing and tooling.
4	Select the appropriate fabrication technology while considering the reverse engineering and CAD modelling.
5	Gain the knowledge in Direct tooling and indirect tooling for various manufacturing process.

Course Code/ Course Name:	17EDX12 ADVANCED METALFORMING TECHNIQUES
Course Outcomes:	

1	learn the basics of plasticity and forming
2	Attain proficiency in basic metal forming techniques, forging, extrusion, drawing and rolling.
3	Develop the product using sheet metal forming with conventional process.
4	Fabricate basic parts and assemblies using powered and non-powered machine shop equipment in conjunction with mechanical documentation.
5	Describe the latest metal forming techniques and help them decide on the suitable method to form the metals for various industrial applications.

Course Code/ Course Name:	17EDX13 OPTIMIZATION TECHNIQUES IN DESIGN
Course Outcomes:	

1	Solve one dimensional minimization problems using elimination or interpolation methods
2	Determine optimal solution for constrained/unconstrained optimization problems using appropriate method
3	Describe the methods of optimization techniques(indirect and direct methods)
4	Describe the steps involved in geometric, Stochastic programming and modern methods of optimization.
5	Demonstrate the knowledge of modern methods of optimization.

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Course Code/ Course Name:	17EDX14 COMPUTATIONAL FLUID DYNAMICS

Course Outcomes:

1	Classify the basic equations of fluid dynamics
2	Solve complex problems in the field of heat transfer.
3	Solve complex problems in the field of CFD
4	Analysis of accuracy and stability of finite difference methods for model equations.
5.	Examine and assessing basic numerical methods for fluid flow problems

Course Code/ Course Name:	17EDX15 DESIGN OF PRESSURE VESSEL AND PIPING

Course Outcomes:

1	Predict the thermal behavior and carry out a stress analysis in pressure vessels.
2	Design the pressure vessels and piping layout for industrial applications.
3	Analyze the failure of pressure vessels and safety measures taken for avoiding failure
4	Determine the stresses in pressure vessels to design the system.
5	To create the flow diagram and layout of piping with consideration of stress and thermal analysis.

Course Code/ Course Name:	17EDX16 DESIGN OF HEAT EXCHANGERS

Course Outcomes:

1	Apply the concepts and knowledge get to design and analyze the sizing and rating of the heat
2	Calculate the efficiency of heat exchanger.
3	Analyze heat transfer depending on nature of problem and available data
4	Process the design of plate heat exchanger.
5	Ability to design and analyze the performance of the condensers and cooling towers.

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Course Code/ Course Name:	17EDX18 DESIGN FOR INTERNET OF THINGS
Course Outcomes:	
1	Understand the vision of IoT from a global context.
2	Determine the market perspective of IoT.
3	Understand the use of devices, gateways and IoT networking.
4	Build state of the art architecture in IoT.
5	Apply of IoT in an industrial and commercial building automation and real world design constraints.

Course Code/ Course Name:	17EDX19 DESIGN FOR SIX SIGMA
Course Outcomes:	
1	Understand Six Sigma Methodology and how it applies to their day-to-day work.
2	Relate the tools and techniques of lean sigma to increase productivity.
3	Familiar with methodology to produce products with minimum wastages and maximum Productivity
4	Get familiarized in six sigma.
5	Ability to create the control chart, analysis performance with Simulation

Course Code/ Course Name:	17EDX20 ADVANCED STRENGTH OF MATERIALS
Course Outcomes:	
1	Apply the failure theory concepts, while designing products
2	Gain knowledge about stress distribution
3	Explain the types of stresses in flat plates
4	Calculate the torsion and stresses in sections used in various applications
5	Demonstrate the knowledge of radial and tangential stresses in solid disc

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Course Code/ Course Name:	17EDX21 TRIBOLOGY IN DESIGN
Course Outcomes:	
1	Select material / surface properties based on the tribological requirements
2	Get Methodology for deciding lubricants and lubrication regimes for different operating conditions
3	Get Analysis ability of different types of bearings for given load/ speed conditions.
4	Understand the fundamental principles of thermo hydrodynamic lubrication to determine the temperature distribution in the lubricant film under variable viscosity conditions.
5	Familiar with mathematical tools used to analyze tribological processes

Course Code/ Course Name:	17EDX22 NANOMATERIALS AND NANO TECHNOLOGY
Course Outcomes:	
1	Acquire the knowledge of the representatives of nano particles and feature techniques of NM
2	Familiar with new trends in engineering, namely nanotechnology and nanofabrication and with their applications in modern industries.
3	Get knowledge in the field of nano technology and nano materials
4	Know about mode of heat transfer in nanoparticles and nanomaterials
5	Understanding nanoscale of fluids and applications of nanofluids

Course Code/ Course Name:	17EDX23 MICRO ELECTRO MECHANICAL SYSTEMS
Course Outcomes:	
1	Gain knowledge about MEMS and Microsystems
2	Familiarize with the materials used in MEMS and micro systems
3	Choosing the suitable fabrication technique processes.
4	Apply knowledge of micro manufacturing techniques and applications to the design and manufacturing of an MEMS device or a micro system
5	Understand the unique selection of packaging materials of MEMS

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Course Code/ Course Name:	17EDX24 SURFACE ENGINEERING
Course Outcomes:	
1	Demonstrate the knowledge on friction for various surfaces
2	Describe the International standards in friction and wear measurements.
3	Identify the types and classification of corrosion for various surfaces
4	Explain the procedures in various surface treatment process
5	Summarize the steps involved in engineering material sand to solve the industrial practical problems that arise and also for the research.

Course Code/ Course Name:	17EDX25 ENGINEERING FRACTURE MECHANICS
Course Outcomes:	
1	Gain knowledge on stationary crack, crack growth and fatigue crack growth.
2	Analyze crack growth for cyclic loading and crack initiation under large scale.
3	Analyze the different effects of cracks, thermal and residual stresses.
4	Gain knowledge about the behavior of engineering materials having microscopic flaws, learning the component design methods in fracture mechanics taking fracture toughness into account.
5	Learning the application of fracture mechanics in large scale yielding

Course Code/ Course Name:	17EDX26 INDUSTRIAL ROBOTICS AND EXPERT SYSTEMS
Course Outcomes:	
1	Understand the robot kinematics and dynamics.
2	Acquire the ability to write basic program to control robot.
3	Gain knowledge about sensors used in robotics field.
4	Summarize the stages in robot dell design
5	Explain the steps involved in robot programming

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Course Code/ Course Name:	17EDX27 PRODUCT LIFECYCLE MANAGEMENT
Course Outcomes:	
1	Understand history, concepts and terminology of PLM.
2	Apply the functions and features of PLM/PDM.
3	Understand different modules offered in commercial PLM/PDM tools.
4	Understand PLM/PDM implementation approaches.
5	Integrate PLM/PDM with other applications.

Course Code/ Course Name:	17EDX28 – QUALITY CONCEPTS IN DESIGN
Course Outcomes:	
1	Explain the concepts of Quality Function Deployment, design of experiments and experimental design.
2	Describe the modes of failure and its effects using FMEA process.
3	Apply design of experiments method and statistical analysis of experiments
4	Use statistical techniques and statistical process control methods for constructing charts and concepts of reliability
5	Employ SIX SIGMA concepts.

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MASTER OF BUSINESS ADMINISTRATION

Regulation :	R17
Program Code :	BA
Program Name :	Master of Business Administration

VISION OF THE DEPARTMENT

To become top ranking knowledge center for management education.

MISSION OF THE DEPARTMENT

To strive to achieve Academic Excellence and to produce value based business leaders through
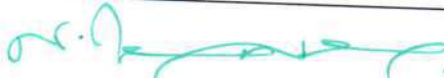
- Quality Teaching.
- Research and application of knowledge.
- Innovative courses and Pedagogy of learning.

PROGRAM EDUCATIONAL OBJECTIVES (PEOS):

List of PEOs

PEO1	**Employability:** Management graduates should be well prepared for successful employment and be engaged in learning, understanding and holistic application of management theory and practice for real life problem solving in an increasingly global, technology oriented, diverse and changing business environment.
PEO2	**En Entrepreneurship:** Management graduates desirous of self-employment should be able to start their own business ventures or demonstrate their entrepreneurial capabilities.
PEO3	**Re Research, Consultancy and Higher Studies:** Management graduates with academic interest and aptitude should be actively pursuing advanced studies and

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	engaged in research, teaching-learning or consultancy assignments.
PEO4	**Well informed, Ethical and Committed Professional:** Management graduates will become well informed, ethical and committed corporate citizens contributing to the management profession and the community in an effective manner.
PEO5	**Environmental Concerns and Social Responsibility:** Enhance students' appreciation of challenges facing businesses in today's complex world in the context of achieving efficiency while considering social responsibility, legal and ethical principles, and corporate governance fundamentals.

PROGRAM OUTCOMES:

On completion of Master's Degree in Business Administration from NANDHA, the Student will be able to

Apply knowledge of management theories and practices to solve business problems.

1. Foster Analytical and critical thinking abilities for data-based decision making.

2. Ability to develop Value based Leadership ability.

3. Ability to understand, analyze and communicate global, economic, legal, and ethical aspects of business.

4. Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team.

5. Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team.

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PROGRAM SPECIFIC OUTCOMES (PSOs) OF THE DEPARTMENT:

Graduates should be able to

PSO1: Exhibit knowledge of management principles

PSO2: Demonstrate critical-thinking and problem solving skills

PSO3: Manifest leadership qualities

PSO4: Prove an awareness of own values

PSO5: Show a sense of responsibility

PSO6: Evince an ability to recognize when change is needed and adapt to change

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SEMESTER 1:

Course Code/ Course Name:	17BAB01-PRINCIPLES OF MANAGEMENT	
Course Outcomes:		
1.1	Evaluate the context for taking Managerial actions of planning, organizing and controlling.	
2.1	Assess situation, including opportunities and threats that will impact management of an organization	

Course Code/ Course Name:	17BAB02-STATISTICS FOR MANAGEMENT	
Course Outcomes:		
1.1	Have a fundamental knowledge of the basic statistical concepts.	
2.1	Understand the probability and learn how to apply the distributions in business decision making.	
3.1	Find the application of correlation, regression and time series analysis in various aspects.	
4.1	Perform Test of Hypothesis as well as calculate confidence interval for a population parameter for single sample and two sample cases.	
5.1	Compare more than two population means using analysis of variance	

Course Code/ Course Name:	17BAB03-ECONOMIC ANALYSIS FOR BUSINESS	
Course Outcomes:		
1.1	Familiarize with both principles of micro and macroeconomics.	
2.1	Apply the principles to appreciate the functioning of both product and input markets as well as the economy.	
2.2	Perform and evaluate present worth, future worth and annual worth analyses on one of more economic alternatives.	

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Course Code/ Course Name:	17BAB04-TOTAL QUALITY MANAGEMENT
Course Outcomes:	

1.1	Apply quality philosophies and tools to facilitate continuous improvement and ensure customer delight.
1.2	Know the principles of total quality management and peculiarities of their implementation
1.3	Use quality management methods analyzing and solving problems of organization

Course Code/ Course Name:	17BAB05-ORGANIZATIONAL BEHAVIOUR
Course Outcomes:	

1.1	Understand some of the main theories of Organizational Behavior
1.2	Analyze how these theories and empirical evidence can help to understand contemporary organizational issues
1.3	Apply theories to practical problems in organizations in a critical manner

Course Code/ Course Name:	17BAB06-ACCOUNTING FOR MANAGEMENT
Course Outcomes:	

1.1	Prepare various costing schedules where an analysis of cost classification, behavior, and types
2.1	Analyze cost-volume-profit techniques to determine optimal managerial decisions
2.2	Apply and analyze different types of activity-based management tools through the preparation of estimates

Course Code/ Course Name:	17BAB07-LEGAL ASPECTS OF BUSINESS
Course Outcomes:	

1.1	Acquire Basic knowledge and understanding of the principles governing the business organization.
1.2	Ability to analyze legal issues facing a company with the knowledge gained.
1.3	Understand key concepts of business law relating to contract formation, the selection of a business organization etc.

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Course Code/ Course Name:	17BAP01- EXECUTIVE COMMUNICATION	
Course Outcomes:		
1.1	Get into the habit of business communication regularly	
2.1	Express themselves in different genres of communication from creative to critical to factual communication	
2.2	Take part in print and online media communication	
2.3	Read quite widely to acquire a style of writing	
2.4	Identify their areas of strengths and weaknesses in writing and reading	

Course Code/ Course Name:	17BAP02 - PERSONAL AND PROFESSIONAL ETHICS	
Course Outcomes:		
1.1	Understand the decision process one goes through in determining what is right and wrong and Understand the decisions affect a person's character both in personal and professional life.	
2.1	Evaluate situations and Apply ethical principles both in personal and professional life	

SEMESTER 2:

Course Code/ Course Name:	17BAB08- OPERATIONS MANAGEMENT	
Course Outcomes:		
1.1	Understand the role of operations management in the overall business strategy of the firm	
2.1	Understand the interdependence of the operating system with other key functional areas of the firm	
2.2	Identify and evaluate the key factors and the interdependence of these factors in the design of effective operating systems	

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Course Code/ Course Name:	17BAB09- FINANCIAL MANAGEMENT
Course Outcomes:	
1.1	Describe what determines the value of firm's securities and how management can influence these values
2.1	Analyze a firm's performance to determine its strengths and weaknesses, and be able to use financial analysis to improve performance
2.2	Forecast a firm's financial needs

Course Code/ Course Name:	17BAB10- MARKETING MANAGEMENT
Course Outcomes:	
1.1	Define and apply knowledge of the following key marketing concepts
2.1	Apply theories of consumer behavior to the formulation of effective marketing strategy
3.1	Recognize trends based on current research related to consumer behavior

Course Code/ Course Name:	17BAB11-HUMAN RESOURCE MANAGEMENT
Course Outcomes:	
1.1	Discuss how to strategically plan for the human resources needed to meet organizational goals and objectives
1.2	Define the process of job analysis and discuss its importance as a foundation for human resource management practice
1.3	Understand the human resource management and evaluative practices

Course Code/ Course Name:	17BAB12- MANAGEMENT INFORMATION SYSTEM
Course Outcomes:	
1.1	Describe basic information systems concepts and terminology
1.2	Identify the range and importance of information systems applications in modern organizations
1.3	Describe the role of databases and database management systems in organizations

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Course Code/ Course Name:	17BAB13-APPLIED OPERATIONS RESEARCH
Course Outcomes:	
1.1	Understand the optimization techniques under limited resources for the engineering and business problems
1.2	Expose the basic characteristics features of a queuing system and acquires skills in analyzing queuing models
1.3	Facilitate quantitative solutions in business decision making under conditions of certainty, risk and uncertainty.

Course Code/ Course Name:	17BAP03- RESEARCH IMMERSION PROJECT
Course Outcomes:	
1.1	Acquaint with the scientific methodology in business research domain
2.1	Become analytically skillful
3.1	Design and Carryout a Business research project to support Organizational decision making

Course Code/ Course Name:	17BAP04- DATA ANALYSIS AND BUSINESS MODELING
Course Outcomes:	
1.1	Knowledge of spreadsheets and data analysis software for business modeling [Business models studied in theory to be practiced using Spreadsheet / Analysis Software]
1.2	Apply spreadsheet for solving decision making problems in investment and portfolio management

Course Code/ Course Name:	17BAP05 - COMMUNITY IMMERSION AND ENTREPRENEUR IMMERSION
Course Outcomes:	
1.1	Entrepreneurship training stimulates powers of observation, develops creative and critical thinking.
2.1	Able to understand and find sustainable Solutions for pressing community needs.

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SEMESTER 3:

Course Code/ Course Name:	17BAB14-INTERNATIONAL BUSINESS MANAGEMENT
Course Outcomes:	
1.1	Understand how international factors affect domestic concerns
1.2	Explain regional economic integration and economic and political integration
1.3	Analyze the main institutions that shape the global marketplace

Course Code/ Course Name:	17BAB15-STRATEGIC MANAGEMENT
Course Outcomes:	
1.1	Understand the integrative nature of strategic management
1.2	Display a knowledge of principal models of strategic management
1.3	Appreciate the importance of environmental and industry analysis in formulating strategy

Functional Specialization : Marketing Management

Course Code/ Course Name:	17BAX01-BRAND MANAGEMENT
Course Outcomes:	
1.1	Understand, explain, apply and critically examine the disciplines of Branding
1.2	Take an academic approach to the solving of problems in a marketing communications context, and understand the connections between academic study and its application in business
1.3	Understand how to apply the knowledge of Branding to practical cases

Course Code/ Course Name:	17BAX02-RETAIL MANAGEMENT
Course Outcomes:	
1.1	Manage the retail chains and understand the retail customer's behavior
1.2	Understand what marketing means to business executives and academics
1.3	Understand the ways that retailers use marketing tools and techniques to interact with their customers

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Course Code/ Course Name:	17BAX03-DIGITAL MARKETING
Course Outcomes:	
1.1	Find out how forward thinking companies are using digital media effectively to build up their brands
1.2	Develop a far deeper understanding of the changing digital landscape
1.3	Identify some of the latest digital marketing trends and skill sets needed for today's marketer

Course Code/ Course Name:	17BAX04-INTEGRATED MARKETING COMMUNICATION
Course Outcomes:	
1.1	Understand the role of marketing strategy in achieving a firm's goals
1.2	Manage the allocation of resources across a portfolio of products in a variety of markets
1.3	Understand how synergy may be derived from the marketing mix variables

Course Code/ Course Name:	17BAX05-CUSTOMER RELATIONSHIP MANAGEMENT
Course Outcomes:	
1.1	Use strategic customer acquisition and retention techniques in CRM.
1.2	Apply critical thinking skills to be able to recommend appropriate outcomes in business situation
1.3	Recognize and apply appropriate ethical, social and diversity standards within the business environment

Course Code/ Course Name:	17BAX06- RURAL MARKETING
Course Outcomes:	
1.1	Understand the Perspectives of rural marketing
2.1	Gain knowledge of the emerging managerial initiatives
3.1	Develop Relevant frameworks in rural marketing

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Course Code/ Course Name:	17BAX07-ADVERTISING AND SALES PROMOTION
Course Outcomes:	

1.1	Analyze the expanding environment of media and communication techniques.
1.2	Assess the strengths, weaknesses, opportunities and threats (SWOT) of different kinds of promotional campaigns.
1.3	Examine the importance market segmentation, position and action objectives to the development of an advertising and promotion program

Course Code/ Course Name:	17BAX08-SOCIAL MEDIA MARKETING
Course Outcomes:	

1.1	Discuss the evolution of social media marketing and identify related ethical issues to communicate its impact on businesses
1.2	Explain how to develop effective social media marketing strategies for various types of industries and businesses
1.3	Describe the major social media marketing portals that can be used to promote a company, brand, product, service or person

Course Code/ Course Name:	17BAX09-CONSUMER BEHAVIOUR
Course Outcomes:	

1.1	Appreciate the centrality of consumer analyses to the design, implementation, and evaluation of marketing strategies and programs.
2.1	Discover how consumer insights inform managerial decision making about both strategic and tactical matters.
3.1	Learn the basic analytic frameworks and concepts that managers use to better understand their customers, as well as broader marketplace behaviors and consumption trends.

Course Code/ Course Name:	17BAX100-SERVICES MARKETING
Course Outcomes:	

1.0	Will be able to apply the concepts of services marketing in promoting services.

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Functional Specialization :Financial Management

Course Code/ Course Name:	17BAX10-SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT
Course Outcomes:	
1.1	Analyze and evaluate financial markets, how securities are traded, mutual funds, investment companies, and investor behavior
1.2	Construct optimal portfolios and illustrate the theory and empirical applications of asset pricing models
1.3	Explain macro and industry analysis, equity valuation, fundamental analysis and technical analysis

Course Code/ Course Name:	17BAX11 - MERCHANT BANKING AND FINANCIAL SERVICES
Course Outcomes:	
1.1	Possess Good knowledge on merchant banking activities
2.1	Differentiate Products in the Indian Market e.g Equity, Debt and Derivatives
2.2	Capital market structure in India and the role of capital market in the economy

Course Code/ Course Name:	17BAX12-INTERNATIONAL TRADE FINANCE
Course Outcomes:	
1.1	Possess good knowledge on international trade and the documentation involved in it.
2.1	Set and enforce rules for international trade
2.2	Provide a forum for negotiating and monitoring further trade liberalization

Course Code/ Course Name:	17BAX13-CORPORATE FINANCE
Course Outcomes:	
1.1	Identify the key themes in corporate finance
2.1	Explain and analyse the interrelationship between finance and governance
2.2	Analyse the relationship between strategic decision making and corporate financing decisions.

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Course Code/ Course Name:	17BAX14-MICRO FINANCE	
Course Outcomes:		
1.1	Possess good knowledge in micro finance management	
2.1	Understand the concept and principles of microfinance	
2.2	Appraise the state of microfinance in the country	

Course Code/ Course Name:	17BAX15-BANKING FINANCIAL SERVICES MANAGEMENT	
Course Outcomes:		
1.1	Understand Project Financial Statements (B/S, I/S, budgets, etc.)	
2.1	Use Financial Statements to obtain Cash Flows for the firm and equity holders	
2.2	Use Financial Statements to evaluate firm performance	

Course Code/ Course Name:	17BAX16-FINANCIAL DERIVATIVES	
Course Outcomes:		
1.1	Identify and distinguish between the various forms of derivatives instruments	
2.1	Apply option strategies such as covered calls, spreads and combinations	
2.2	Apply futures strategies for long and short hedging	

Course Code/ Course Name:	17BAX98- TAXATION	
Course Outcomes:		
1.1	Understanding of the tax, its nature and characteristics, and the basic concepts in tax, analysing tax evasion, tax avoidance and tax planning	
2.1	Understanding the various sources of income for an individual and applying the concept to calculate the total income and tax liability of an individual	

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Functional Specialization : Human Resource Management

Course Code/ Course Name:	17BAX17-MANAGERIAL BEHAVIOR AND EFFECTIVENESS	
Course Outcomes:		
1.1	Contrast different attitudes and assumptions of managers about human nature and behaviour at work	
2.1	Examine managerial styles in terms of concern for production and concern for people	
2.2	Assess different systems of management	

Course Code/ Course Name:	17BAX18-TRAINING AND DEVELOPMENT	
Course Outcomes:		
1.1	Describe knowledge, skills/abilities, attitudes, or values	
2.1	Describe actions which can be demonstrated, can be observed, and can be measured	
2.2	Define specific outcomes or competencies to be achieved in terms of skills, content mastery, attitudes, or values.	

Course Code/ Course Name:	17BAX19-ORGANISATIONAL THEORY, DESIGN AND DEVELOPMENT	
Course Outcomes:		
1.1	Analyze organizations more accurately and deeply by applying organization theory	
1.2	Understand the historical and theoretical basis of organizational design and the relationship between organisational elements and the business strategy	
1.3	Understand the key factors to be considered in the design of organisations and the implications for the management and development of people and resources	

Course Code/ Course Name:	17BAX20-INDUSTRIAL RELATIONS AND LABOUR WELFARE	
Course Outcomes:		
1.1	Know the impact of industrial relations	
1.2	Know how to resolve the human relations problems and promote welfare of industrial labour	

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Course Code/ Course Name:	17BAX21-LABOUR LEGISLATIONS	
Course Outcomes:		
1.1	To appreciate the application of labour laws. Legal Provision relating to Wages	
1.2	Working Conditions and Labour Welfare	
2.1	Industrial Relations	
2.2	Social Security	

Course Code/ Course Name:	17BAX22-STRATEGIC HUMAN RESOURCE MANAGEMENT
Course Outcomes:	
1.1	Understand the strategic tools and techniques used by organizations
1.2	Meet and resolve challenges in human resource management

Course Code/ Course Name:	17BAX99 - HR METRICS AND ANALYTICS
Course Outcomes:	
1.1	Facilitate and communicate the human resources component of the organization's business plan.
1.2	Develop, implement, and evaluate organizational development strategies aimed at promoting organizational effectiveness.

Course Code/ Course Name:	17BAX101-STRESS MANAGEMENT
Course Outcomes:	
1.1	Students will be able to understand the management of work related stress at an individual and organizational level and will help them to develop and implement effective strategies to prevent and manage stress at work

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Functional Specialization : Systems Management

Course Code/ Course Name:	17BAX23-ADVANCED DATABASE MANAGEMENT SYSTEMS
Course Outcomes:	
1.1	Develop awareness of database models
2.1	Acquire Knowledge of database technologies

Course Code/ Course Name:	17BAX24-e-BUSINESS MANAGEMENT
Course Outcomes:	
1.1	Understand the key concepts and trends associated with eBusiness and eCommerce
1.2	Familiarise with the leading tools and techniques used in the customer –facing aspects of eBusiness and eCommerce
	Possess Conceptual and practical education in the best practices used by industry leaders to produce suprior business results in the management of eBusiness

Course Code/ Course Name:	17BAX25-SOFTWARE PROJECT AND QUALITY MANAGEMENT
Course Outcomes:	
1.1	Knowledge of software development process and quality models
2.1	Knowledge of software project estimation and quality assurance

Course Code/ Course Name:	17BAX26-DATA MINING FOR BUSINESS INTELLIGENCE
Course Outcomes:	
1.1	Understand Big Data Management
2.1	Appreciate the techniques of knowledge discovery for business applications

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Course Code/ Course Name:	17BAX27-DECISION SUPPORT SYSTEM
Course Outcomes:	
1.1	Ability to select appropriate modeling techniques for supporting semi- structured business decision making
2.1	Ability to identify and select appropriate decision support systems for generating innovative business solutions

Course Code/ Course Name:	17BAX28-SYSTEM ANALYSIS AND DESIGN
Course Outcomes:	
1.1	Explain at least three ways in which information systems support business requirements.
1.2	Describe how systems analysts interact with users, management, and other information systems

Functional Specialization :Operations Management

Course Code/ Course Name:	17BAX29-LOGISTICS AND SUPPLY CHAIN MANAGEMENT
Course Outcomes:	
1.1	Gain knowledge on effective management of the logistics and supply
1.2	Evaluate both domestic and international transportation problems and effectively develop and present actionable solutions.
1.3	Apply inventory models and techniques to create and recommend appropriate stocking solutions in various business.

Course Code/ Course Name:	17BAX30-SERVICES OPERATIONS MANAGEMENT
Course Outcomes:	
1.1	Understand how service performance can be improved by studying services operations management
1.2	Obtain an overview of the successful Service Operations Management (SOM) function through the introduction of the topics traditionally associated with the study of Service Operations Management.
1.3	Develop an understanding of the terminology and responsibilities that relate to Service Operations Management.

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Course Code/ Course Name:	17BAX31-PROJECT MANAGEMENT
Course Outcomes:	
1.1	Apply project management principles in business situations
1.2	Optimize resource utilization and time optimization

Course Code/ Course Name:	17BAX32-LEAN SIX SIGMA
Course Outcomes:	
1.1	Relate the tools and techniques of lean sigma to increase productivity
1.2	Identify Strategies to reduce cycle time of production/process, reduce inputs to the processes and increases the customer satisfaction.
1.3	Understand the benefits of Lean and Sigm

Course Code/ Course Name:	17BAX33-WORLD CLASS MANUFACTURING
Course Outcomes:	
1.1	Have access to the right information
2.1	Engage their employees
3.1	Employ up-to-date techniques

Course Code/ Course Name:	17BAX34-COMPUTER INTEGRATED MANUFACTURING
Course Outcomes:	
1.1	Acquaint with data bases and numerical analysis related to CIM
1.2	Have understanding of Computer Aided Manufacturing (CAM) systems

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Sectoral Specialization : Entrepreneurship Management

Course Code/ Course Name:	17BAX36-LEGAL AND REGULATORY FRAME WORK FOR ENTREPRENEURSHIP
Course Outcomes:	
1.1	Capable of setting up a suitable enterprise
2.1	Ability to analyze the appropriateness of forms of organization
3.1	Capable of applying taxation rules and regulations

Course Code/ Course Name:	17BAX37-CREATIVITY, INNOVATION AND ENTREPRENEURSHIP
Course Outcomes:	
1.1	Manage the emotions effectively
2.1	Build strong interpersonal skills
3.1	Follow business etiquettes

Course Code/ Course Name:	17BAX38-SOFT SKILLS FOR ENTREPRENEURS
Course Outcomes:	
1.1	Analyze organizations more accurately and deeply by applying organization theory
1.2	Understand the historical and theoretical basis of organizational design and the relationship between organisational elements and the business strategy
1.3	Understand the key factors to be considered in the design of organisations and the implications for the management and development of people and resources

Course Code/ Course Name:	17BAX39-BUSINESS PLAN
Course Outcomes:	
1.1	Familiarise in writing a business plan
2.1	Conduct a feasibility study
3.1	Analyse ways and means to raise capital for the business

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Course Code/ Course Name:	17BAX40-BUILDING A SUSTAINABLE ENTERPRISE
Course Outcomes:	
1.1	Be familiar with strategies for expanding business
2.1	Build business with the help of e- commerce
3.1	Plan for succession and internationalization

Course Code/ Course Name:	17BAX41-FAMILY BUSINESS MANAGEMENT
Course Outcomes:	
1.1	Understand developmental needs of family members at various stages of the businesses
2.1	Develop the management and communication skills to build trust and understanding
3.1	Identify and cope with foreseeable obstacles to continuity of a family business

Course Code/ Course Name:	17BAP09-ENTREPRENEURSHIP LABORATORY
Course Outcomes:	
1.1	Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
2.1	Develop capabilities and skills necessary to assume entrepreneurial activity

Sectoral Specialization : Commercial Bank Management

Course Code/ Course Name:	17BAX42-MONEY AND BANKING
Course Outcomes:	
1.1	Understand the interdependence between financial markets and interest Rates
1.2	Comprehend the behavioral analysis of interest rates: risk, liquidity and term structure
1.3	Identify the role played by the Central Bank and instruments of credit control

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Course Code/ Course Name:	17BAX43-CREDIT MANAGEMENT
Course Outcomes:	
1.1	Analyse general statements that serves as a guide for credit decision making.
1.2	Streamline and standardize the Credit Department's functions for achieving the objectives such as DSO (Days Sales Outstanding) targets / collection targets set by the management.

Course Code/ Course Name:	17BAX44- COMMERCIAL BANKING
Course Outcomes:	
1.1	Possess in depth knowledge of financial management in the banking organisations
1.2	Familiarise with the new banking practices and processes

Course Code/ Course Name:	17BAX45-RURAL BANKING AND MICRO FINANCE
Course Outcomes:	
1.1	Know the role of Technology & its impact in the rural areas
1.2	Explain the several alternative means of financing like micro financial institutions and self-help

Course Code/ Course Name:	17BAX46-CORPORATE BANKING SMALL AND MEDIUM ENTERPRISE BANKING
Course Outcomes:	
1.1	Ensure availability of adequate and timely credit to MSE sector.
2.1	Devise an organizational structure at all levels for handling MSE credit portfolio in a more focused manner.

Course Code/ Course Name:	17BAX47-EXPORT AND IMPORT FINANCING
Course Outcomes:	
1.1	Be familiar with various financial services rendered to the beneficiaries by agencies authorized to render such services
1.2	Understand fundamentals of investment and the concept of equilibrium in the market and to provide the various techniques available for minimizing risk and optmising return for a combination of financial assets.

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Course Code/ Course Name:	17BAX48-RISK MANAGEMENT IN BANKS
Course Outcomes:	
1.1	Understand the systems and procedures needed to track, monitor and manage these risks
1.2	Have an understanding of how the bank's capital is allocated to each of these risks from both a regulatory and management perspective

Sectoral Specialization : Hospital And Healthcare Management

Course Code/ Course Name:	17BAX49-HOSPITAL AND HEALTH CARE POLICY AND PLANNING
Course Outcomes:	
1.1	Understanding about reinsurance and its types
2.1	To know about the basic principles of underwriting knowledge about disaster and its types
3.1	To familiarize the students in disaster preparedness, planning, drill, committee in hospital
4.1	Triage area behind emergency department

Course Code/ Course Name:	17BAX50-ORGANIZATION AND MANAGEMENT OF HOSPITAL AND HEALTH
Course Outcomes:	
1.1	To know about dying declaration and the procedure
2.1	To acquaint the students about the death certificate issuing procedure and its content, importance of death certificate
3.1	To know about malpractice in health care
4.1	Understanding about medical jurisprudence

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Course Code/ Course Name:	17BAX51-EPIDEMIOLOGY IN MEDICAL AND HEALTH SYSTEMS
Course Outcomes:	
1.1	Understanding about infectious disease epidemiology
2.1	To know about the basic principles of underwriting knowledge about disaster and its types
3.1	To familiarize the students in disaster preparedness, planning, drill , committee in hospitals
4.1	Triage area behind emergency department

Course Code/ Course Name:	17BAX52-QUALITY ASSURANCE AND MANAGEMENT IN HOSPITALS
Course Outcomes:	
1.1	Assisting students to know about the process control management in hospitals,
2.1	Implementation of SPC, SQC, quality control tools and its application.
3.1	knowledge about SOP and its application in various departments in hospitals

Course Code/ Course Name:	17BAX53-RISK MANAGEMENT AND HEALTH INSURANCE
Course Outcomes:	
1.1	To give emphasis on TPA claims management and its process.
2.1	Understanding about social security and its benefits.
3.1	Getting knowledge about ratemaking-pricing of insurance.

Course Code/ Course Name:	17BAX54-LEGAL FRAMEWORK FOR HOSPITALS
Course Outcomes:	
1.1	To acquaint the students about the death certificate issuing procedure and its content, importance of death certificate.
2.1	To know about malpractice in health care
3.1	Understanding about medical jurisprudence
4.1	To know about patient's Rights and provider's responsibility

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Sectoral Specialization : Travel And Tourism Management

Course Code/ Course Name:	17BAX55-TRAVEL AND TOURISM MANAGEMENT
Course Outcomes:	
1.1	Demonstrate ability to perform basic and supervisory level job function in travel and tourism Careers.
2.1	To get dept knowledge about current trends and practices in the tourism and travel operations.
3.1	Students know the set up the travel agency and their practices.
4.1	A student gets more knowledge about different types of tour itinerary and practices their operations.

Course Code/ Course Name:	17BAX56-ADVANCED FOOD PRODUCTION MANAGEMENT
Course Outcomes:	
1.1	Students will understand the kitchen hygiene and sanitation and food handling procedure and storage methods and food sampling used in the industry
2.1	Students will understand the production planning and volume of cooking. Students will study on the types of catering establishment and planning the menu based on production work flow in the industry
3.1	Students will understand the purchasing polices control for store procedures of ordering ingredients perishable and nonperishable ingredients issuing quantity of cooking based on standard recipes and standard portion control in the industry

Course Code/ Course Name:	17BAX57-FOOD SERVICE FACILITIES PLANNING AND MANAGEMENT
Course Outcomes:	
1.1	The course would enhance the knowledge of the students in setting up with food and beverage knowledge
2.1	In –depth knowledge of each and every step involved in the process and the knowledge about the operation efficiency of different outlets
3.1	Would be able to do costing at different areas and budget planning

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Course Code/ Course Name:	17BAX58-TOURISM PRODUCT
Course Outcomes:	
1.1	To gain knowledge about famous ancient temples of India, famous forts in India.
2.1	To understand and will know the background of tourism product, its concepts, development and scope.
3.1	To get in depth understanding and knowledge about Tamilnadu tourism products.
4.1	To gain and knowledge about medical tourism and spiritual tourism etc.

Course Code/ Course Name:	17BAX59-INTERNATIONAL TOURISM MANAGEMENT
Course Outcomes:	
1.1	The Students can learn to apply and critically challenge the understanding of the industries in practical contexts, particularly in the work-related learning module and during the Industry Placement.
2.1	They can also critically examine the sustainability of the international tourism industry.
3.1	Can enhance their employability skills, such as communications and team- working, which are vital for rapid career development.

Course Code/ Course Name:	17BAX60-ACCOMMODATION OPERATION
Course Outcomes:	
1.1	Student knows operational models and the inter-relationship between different divisions of the accommodation business.
2.1	Students can identify potential customers and segments, understands and anticipates customer expectations and needs.
3.1	Student understands the economical and operational requirements of a business.

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Sectoral Specialization : Agri Business Management

Course Code/ Course Name:	17 BAX66-AGRI ECONOMICS

Course Outcomes:	
1.1	Completion of the course the student will learn to list and explain different agricultural economic fields, including the food industry, demand theory (e.g., demand and price analysis, consumer behavior, and market price determination)
2.1	Completion of the course the student will learn to explain different supply theory (e.g., production economics, cost analysis, and optimal output levels), and competitive environments (e.g., perfect and imperfect competition)

Course Code/ Course Name:	17 BAX67-AGRI IMPORT AND EXPORT MANAGEMENT

Course Outcomes:	
1.1	The students can stand firm in the world of global competition. This course can give a wide scope to the students interested in working in the Import & Export Management fields
2.1	The goal is to prepare candidates to be ready to take up leadership positions in the export and import companies in India and abroad. Programs will help you to understand various flaws of marketing at an international level and concept of foreign exchange
3.1	To understand on International trade barriers and risk management

Course Code/ Course Name:	17BAX68-AGRI LOGISTICS AND SUPPLY CHAIN MANAGEMENT

Course Outcomes:	
1.1	The student at the end of the course should be able to understand the various logistics operations and their importance in improving the business of retailers
2.1	The student has to design suitable invoice management system for a retailer for improving the efficiency of procuring, packing, transporting and delivery of goods in time or as per the customer expectations
3.1	The student has to nuances in invoice management and fulfilling customer orders

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Course Code/ Course Name:	17BAX70-MICRO FINANCE AND SOCIAL ENTREPRENEURSHIP
Course Outcomes:	
1.1	Appreciate the importance of balance between local social innovations and global network of support for balance growth and sustainable development
2.1	Appreciate the use of innovative technologies for resolving social and environmental issues
3.1	Appreciate the role social entrepreneurship plays in addressing complex social and environmental problems

Course Code/ Course Name:	17BAX71-AGRI TECHNOLOGY MANAGEMENT
Course Outcomes:	
1.1	Student will be able to understand: Importance of Technological Innovation
2.1	Importance of Research and development in technology management
2.2	Forecasting of Technology

Sectoral Specialization : Sports Management

Course Code/ Course Name:	17BAX72-ORGANISATION AND MANAGEMENT IN SPORTS
Course Outcomes:	
1.1	Demonstrate knowledge in all areas of a sport organization.
2.1	Demonstrate critical thinking and analytical abilities in the creation of a culminating project to highlight their professional capabilities
3.1	Recognize and evaluate ethical decision- making and the economic priorities and social responsibilities of sport organizations in society

Course Code/ Course Name:	17BAX73-ETHICS IN SPORTS
Course Outcomes:	
1.1	Recognize the activities of the School and University Sports as a means of promoting sports ethics within the educational community
2.1	Promote, disseminate and practice the global teaching of human values where sport ethically practiced serves as a tool and a special means to achieve this

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Course Code/ Course Name:	17BAX74-LEADERSHIP PRINCIPLES IN SPORTS
Course Outcomes:	

1.1	Demonstrate comprehension of content- specific knowledge and the ability to apply it in theoretical, personal, professional, or societal contexts
2.1	Demonstrate proficient written communication by articulating a clear focus, synthesizing arguments, and utilizing standard formats in order to inform and persuade others
3.1	Reflect on values that inspire high standards of professional and ethical behavior

Course Code/ Course Name:	17BAX75-SPORTS FACILITIES PLANNING AND MANAGEMENT
Course Outcomes:	

1.1	Obtain capital funding that is available from a variety of sources
2.1	Develop a management plan to reflect operational strategies and design priorities
3.1	Ensure the proposed facility supports the organisation's strategic plan

Course Code/ Course Name:	17BAX76-MANAGING AND PROMOTING SPORTING EVENTS
Course Outcomes:	

1.1	Identify the roles of advertising, sales promotion, public relations, and personal selling in sports marketing
2.1	Identify the demographics and marketing mix for the sports and entertainment industries
3.1	Be able to effectively evaluate a major sports event

Course Code/ Course Name:	17BAX77-PSYCHOLOGY OF SPORTS
Course Outcomes:	

1.1	The instruction and training of psychological skills for performance improvement, applied sport psychology may include work with athletes, coaches, and parents regarding injury, rehabilitation, communication, team building, and career transitions
2.1	Its provide a more thorough understanding of how psychological principles play out in competitive situations

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Sectoral Specialization : Logistics and Supply Chain Management

Course Code/ Course Name:	17BAX78-SOURCING AND SUPPLY MANAGEMENT
Course Outcomes:	
1.1	To Understand basic functions and nuances
2.1	To Understand the holistic dimensions of SCM & corporate perspectives
3.1	Learn to acquire skills to become a sourcing professional

Course Code/ Course Name:	17BAX79-SUPPLY CHAIN INVENTORY MANAGEMENT
Course Outcomes:	
1.1	At the end of this course, the students can confidently approach their supply chain inventory issues and they can use different tools appropriately to solve the problems and enhance the performance of their supply chains.
2.1	the students can gives a multi- dimensional view to approacha problem
3.1	Ensure the proposed facility supports the organisation's strategic plan

Course Code/ Course Name:	17BAX80-SUPPLY CHAIN INFORMATION SYSTEM
Course Outcomes:	
1.1	The students will be able to understand the various enterprise information system and its architecture and benefits.
2.1	Students can gain knowledge about various e-commerce models, e-SCM, benefits and communication networks.

Course Code/ Course Name:	17BAX81-WAREHOUSE MANAGEMENT
Course Outcomes:	
1.1	At the end of the course, the students will be able to get complete insight in to warehouse concepts, various inventory control techniques and application of inventory management in supply chain
2.1	the students will be able to get complete insight in to customer service in detail

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Course Code/ Course Name:	17BAX82-TRANSPORTATION AND DISTRIBUTION MANAGEMENT
Course Outcomes:	
1.1	Gain knowledge about the distribution requirements planning.
2.1	Predict the scope and relationship of transportation with other business functions
2.2	Make use of the advantages and disadvantages of the various models.

Course Code/ Course Name:	17BAX83-REVERSE AND CONTRACT LOGISTICS
Course Outcomes:	
1.1	The students will be able to understand the basics of contract logistics, third party logistics industry and third party logistics providers.
2.1	Helps to gain knowledge about Make in India concept and its impact on the GDP growth

Course Code/ Course Name:	17BAX84-AIR CARGO MANAGEMENT
Course Outcomes:	
1.1	Provide the basics concepts of airports and aircrafts and various participants in air cargo transportation.
2.1	Students will come to know about roles of the customs and the government in air transport.
3.1	Students will come to know about setup of air cargo processes

Course Code/ Course Name:	17BAX85-CONTAINERIZATION AND ALLIED BUSINESS
Course Outcomes:	
1.1	The students will learn the practices and ways to promote containerization and allied businesses
2.1	The learners will have a complete idea about the different concepts, trends and strategies used for containerization and allied businesses

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Course Code/ Course Name:	17BAX86-EXIM	
Course Outcomes:		
1.1	The students would be aware about the formalities of export and import industry	
2.1	The students will be able to comprehend the importance of exim management.	

Course Code/ Course Name:	17BAX87-FUNDAMENTALS OF SHIPPING	
Course Outcomes:		
1.1	The students would be acquainted with the basics of shipping management	
2.1	The students will learn the skills needed for shipping industry	

Course Code/ Course Name:	17BAX88-PORT AND TERMINAL MANAGEMENT	
Course Outcomes:		
1.1	The students would be aware about skills pertaining to port and terminal management	
2.1	The students should be able to understand the principles and applications for port and terminal management	

Sectoral Specialization : Infrastructure and Real Estate Management

Course Code/ Course Name:	17BAX89-CONTRACTS AND ARBITRATION	
Course Outcomes:		
1.1	Understand the laws on contracts for construction industry in india	
1.2	Apply knowledge of contracts in preparation of contract document and tendering process	

Course Code/ Course Name:	17BAX90-PROJECT MANAGEMENT FOR INFRASTRUCTURE	
Course Outcomes:		
1.1	Explain the concept of projects, its process, objectives and functions of project management	
1.2	Analyze and manage time in projects through gantt charts, cpm and pert techniques	
1.3	Balance resource requirements of projects so as to avoid idling of resources	

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Course Code/ Course Name:	17BAX91-MANAGEMENT OF HUMAN RESOURCES, SAFETY AND QUALITY
Course Outcomes:	
1.1	Identify the need and importance of human resource management, labour laws relating to construction industry
1.2	Identify the need and measures to improve safety in construction industry and safety audit
1.3	Enumerate the need, importance, elements of quality and significance of quality assurance in industry

Course Code/ Course Name:	17BAX92-DISASTER MITIGATION AND MANAGEMENT
Course Outcomes:	
1.1	Understand the various types of disaster viz hydrological, coastal and marine disasters, atmospheric disasters, geological, mass movement and land disasters, wind and water drivendisasters.
2.1	To identify the potential deficiencies of existing buildings for eq disaster and suggest suitable remedial measures.
2.2	Derive the guide lines for the precautionary measures and rehabilitation measures for eq disaster.

Course Code/ Course Name:	17BAX93-ECONOMICS AND FINANCIAL MANAGEMENT IN CONSTRUCTION
Course Outcomes:	
1.1	On completion of this course the students will be able to know the concepts in Economics and Finance in Construction.

Course Code/ Course Name:	17BAX94-URBAN ENVIRONMENT MANAGEMENT
Course Outcomes:	
1.1	Understand planning of a city and identify various urban environmental issues
2.1	Apply and prepare project plans to integrate urban water resource

Course Code/ Course Name:	17BAX95-SMART MATERIALS, TECHNIQUES AND EQUIPMENTS FOR INFRASTRUCTURE
Course Outcomes:	
1.1	Explain the properties and applications of special concretes, composites,smart and intelligent materials
1.2	Identify and explain advanced construction techniques used for sub structure construction
1.3	Select appropriate techniques for super structure construction of buildings

Course Code/ Course Name:	17BAX96-STRATEGIC AIRPORT INFRASTRUCTURE MANAGEMENT
Course Outcomes:	
1.1	Explain the classification of airports airfield components
1.2	Explain the main governance patterns in the airport business
1.3	Identify the evolutionary patterns for airport enterprises. explain the primary actors in the air transport value chain

Course Code/ Course Name:	17BAX97-REAL ESTATE MARKETING AND MANAGEMENT
Course Outcomes:	
1.1	Explain the fundamental concepts and techniques involved in real estate development process
1.2	Explain the procedure and laws relating to transfer of completed project
1.3	Explain the procedure and laws relating to transfer of completed project

Stream/ Specialization : Non-Functional Elective

Course Code/ Course Name:	17BAX61-DISASTER MANAGEMENT
Course Outcomes:	
1.1	Know the key personnel or specialists related to disaster management and associate them with the types of disasters and phases in which they are useful.
2.1	Understand the six elements of disaster management.
3.1	Would be able to do costing at different areas and budget planning

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Course Code/ Course Name:	17BAX62-ENVIRONMENTAL MANAGEMENT
Course Outcomes:	
1.1	Describe organizations as systems and their role in environmental management
1.2	Understand the usefulness of systems thinking in relation to environmental management in organizations

Course Code/ Course Name:	17BAX63-INTELLECTUAL PROPERTY RIGHTS
Course Outcomes:	
1.1	Adhere to the norms and procedures stated by various laws pertaining to IPR for getting the rights registered
2.1	Understand the relationship between intellectual property rights and economic development
3.1	Stop infringements of intellectual property rights and legally claim damages

Course Code/ Course Name:	17BAX64-EXPORT AND IMPORT MANAGEMENT
Course Outcomes:	
1.1	Communicate effectively using basic international business vocabulary with specific emphasis on terms associated with international trade and import / export operations
2.1	Select between common modes of export in order to fit the business needs of exporting organizations.
2.2	Identify factors that indicate strong potential export markets in order to define market selection models or drive market selection systems

Course Code/ Course Name:	17BAX65-BUSINESS ETHICS, CORPORATE SOCIAL RESPONSIBILITY AND GOVERNANCE
Course Outcomes:	
1.1	Understand ethical components of managerial decision making
1.2	Develop thinking and analytical skills using ethical frame Works
1.3	Draw upon a range of models to aid ethical decision-making

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Course Code/ Course Name:	17BAP06-PROFESSIONAL SKILL DEVELOPMENT
Course Outcomes:	
1.1	Speak confidently with any speakers of English, including native speakers
1.2	Speak effortlessly in different contexts –informal and formal
1.3	Think on feet' even in difficult circumstances
1.4	Hold interesting and meaningful conversations with others, including strangers

Course Code/ Course Name:	17BAP07- CORPORATE INTERNSHIP
Course Outcomes:	
1.1	Understanding the functions of the departments of an organization

Course Code/ Course Name:	17BAE01 - PROJECT WORK
Course Outcomes:	
1.1	Identify authentic business problems with an aim to solving the same within the stipulated time
2.1	Undertake research using appropriate recognized methodology and framework
3.1	Assess meaningful entrepreneurial opportunities from a business and personal perspective

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MASTER OF COMPUTER APPLICATION

Regulation :	R17 Revised
Program Code :	CA
Program Name :	Master of Computer Application

VISION OF THE DEPARTMENT

Department of Computer Applications aspires to become a technically advanced department on par with international standards through continuous improvement. To provide value, need based quality education to upgrade the talents of students.

MISSION OF THE DEPARTMENT

Department of Computer Applications is committed to

- provide quality education and training in software technology
- prepare the students for equipping them to contribute technically to the software industry.
- pursue in every area to provide training to develop professionalism among the students and set path to leadership.

PROGRAM EDUCATIONAL OBJECTIVES (PEOS):

List of PEOs

PEO 1:	To excel in fundamentals, problem solving and programming skills in the various computing fields of IT Industries or for to pursue higher studies in the fields of teaching and research.
PEO 2:	To demonstrate the capabilities in scientific knowledge, logical thinking and fundamental concepts of Computer Application.
PEO 3:	To develop the ability to plan, analyze, design, code, test, implement & maintain software products for real time system.
PEO 4:	To experience the students in finding solutions and developing system based applications for real time problems in various domains involving technical, managerial, entrepreneurial, economical & social constraints.

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PROGRAM OUTCOMES:

GRADUATE ATTRIBUTEs	PROGRAMME OUTCOMEs
Multidisciplinary Knowledge	Understand and Apply mathematical foundation, computing and domain knowledge for the conceptualization of computing model of problems.
Investigative and Analytical Skills	Identify, Analyze the computing requirements of a problem and solve those using computing principles.
Design and Development of Solutions	Design and Evaluate a computer based system, components and process to meet the specific needs of applications.
Lifelong Learning	Recognize the need for and develop the ability to engage in continuous learning as a Computing professional.
Managerial and Leadership Skill	Apply understanding of management principles with computing knowledge to manage projects in multidisciplinary environments.
Communication	Communicate effectively with the computing community as well as society by being able to comprehend effective documentations and presentations.
Ethical, Environmental Concern and Social Responsible, Sustainability	Understand economical, environmental, social, health, legal, ethical issues within local and global contexts and consequential responsibilities relevant to professional practice.
Individual and Team Work	Function effectively in a team environment to accomplish a common goal.
Project Management and Finance	Identify opportunities and use innovative ideas to create value and wealth for the betterment of the individual and society.
Research and Consultancy	Use knowledge to analyze, interpret the data and synthesis the information to derive valid conclusions using research methods.
Modern Tool Usage	Ability to use the techniques, skills, and be familiar with modern software tools necessary for Computer Application practice.
Proficiency	Expertise in developing application with required domain knowledge.

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PROGRAM SPECIFIC OUTCOMES (PSOs) OF THE DEPARTMENT:

Graduates should be able to

PSO1:	Ability to understand the principles and working of software aspects in the computer system.
PSO2:	Ability to demonstrate knowledge in mathematical models, algorithms and software development methodologies.
PSO3:	Ability to develop practical competency in programming languages and open source platforms.
PSO4:	Ability to provide a foundation for research and entrepreneurship.

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SEMESTER 1:

Course Code/ Course Name:	17RAA01/ RESOURCE MANAGEMENT TECHNIQUES AND STATISTICS
Course Outcomes:	
1	Students will be able to construct and solve linear programming models to answer business optimization problems.
2	Students will be able to apply transportation and assignment models to find optimal solution in warehousing and Travelling.
3	Students will be able to appraise theoretical predictions obtained from Game Theory analyses against real world conflicts
4	Students will be able to prepare project scheduling using PERT and CPM.
5	Students will be able to construct Charts for variables and attributes.

Course Code/ Course Name:	17RAB01/ DATABASE MANAGEMENT SYSTEMS
Course Outcomes:	
1	Students will be able to understand database architecture, data models and utilize a wide range of features available in a DBMS package.
2	Students will be able to use SQL- the standard language of relational databases.
3	Students will be able to use PL/SQL - procedural language extension to Structured Query Language.
4	Students will be able to understand the functional dependencies and their relationship to keys
5	Students will be able to understand the concept of Transaction processing and next generation databases.

Course Code/ Course Name:	17RAB02/ DATA STRUCTURES USING C
Course Outcomes:	
1	Students will be able choose appropriate data types, variables and statements for solving simple problems.
2	Students will be able construct programs using arrays and pointers for a given scenario and able generate appropriate structure and union representations for handling compound data.
3	Students will be able to understand the behavior of basic data structure and able to implement Linked list.
4	Students will be able to implement stack and Queue Applications.
5	Students will be able to implement the tree and search the element in the trees and graph traversal.

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Course Code/ Course Name:	17RAB03 / COMPUTER ORGANIZATION AND OPERATING SYSTEMS

Course Outcomes:

1	Understand the number system and conversion. Also able to trace the execution sequence of an instruction through the processor.
2	Acquire knowledge about processor, Instruction sets and ALU.
3	Understand about Process, semaphores and deadlocks.
4	Understand about Paging and segmentation
5	Understand about file system and I/O device management.

Course Code/ Course Name:	17RAB04 / PROBLEM SOLVING AND PROGRAMMING

Course Outcomes:

1	The students will be able to understand the basics of Python Programming constructs.
2	The students will be able to design programs involving selection structure
3	The students will be able to design programs involving function, modules and loops.
4	The students will be able to realize the need of strings.
5	The students will be able to realize the need of list, tuples and dictionary.

Course Code/ Course Name:	17RAP01/ DATABASE MANAGEMENT SYSTEMS LABORATORY

Course Outcomes:

1	Students will be able to design and implement a database schema for a given problem domain.
2	Students will be able to query and populate using database.
3	Students will be able to create and maintain tables using PL/SQL.
4	Students will be able to create triggers and functions
5	The students will be able to develop the simple project and prepare reports.

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Course Code/ Course Name:	17RAP02 / DATA STRUCTURES USING C LABORATORY

Course Outcomes:

1	Students will be able to develop programs using C language.
2	Students will be able to write programs using arrays.
3	Students will be able to write programs using function.
4	Students will be able to implement stack and queue.
5	Students will be able to write programs for binary tree and binary search tree operations.

Course Code/ Course Name:	17RAP03 / PROBLEM SOLVING AND PROGRAMMING LABORATORY

Course Outcomes:

1	Students will be able to write simple programs for solving problems.
2	Students will be able to use different decision making statements and looping statements.
3	Students will be able to write, debug and run simple Python programs using functions and modules.
4	Students will be able to implement different data structures in Python.
5	Students will be able to code to use methods to manipulate dictionaries.

Course Code/ Course Name:	17RAE01 / CAREER DEVELOPMENT SKILLS

Course Outcomes:

1	Develop communicative proficiency by articulating words and sentences undoubtedly and improve vocabulary and syntax with accuracy and clarity.
2	Prepare, organize and deliver an engaging oral presentation and articulate their own ideas in relation to other voices and ideas.
3	Write effectively for a variety of professional and social settings.

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SEMESTER 2:

Course Code/ Course Name:	17RAB05 / COMPUTER NETWORKS
Course Outcomes:	

1	Student will be able to identify the data flow in network using protocols, functionality of layers and transmission media.
2	Student will be able to acquire knowledge about methods of error detection and correction, data link layer protocols and services, and various versions of IEEE Project 802.
3	Student will be able to acquire knowledge about various switching networks, addressing methods and finding shortest routing algorithms.
4	Student will be able to acquire knowledge about various functionalities of protocols such as TCP, UDP and its usage.
5	Student will be able to acquire knowledge about WWW, DNS and various functionalities of protocols such as HTTP, FTP, SMTP and its usage.

Course Code/ Course Name:	17RAB06 / SOFTWARE ENGINEERING
Course Outcomes:	

1	Become competent in recognizing different models, its features and issues.
2	Understand about Requirements, Prototyping and Techniques.
3	Understand about importance of Design.
4	Understand about testing and its features.
5	Well-known about various Estimation Methods and Agile Software Management.

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Course Code/ Course Name:	17RAB07 / PROBLEM SOLVING AND ALGORITHMIC SKILLS

Course Outcomes:

1	The students will be able to understand the basics of object oriented concepts in python.
2	The students will be able to develop applications using inheritance and polymorphism
3	The students will be able to implement the ADTs and trees
4	The students will be able to design graph abstract data type and heap
5	The students will be able to implement the sorting techniques and shortest path algorithms.

Course Code/ Course Name:	17RAP04 / SOFTWARE ENGINEERING LABORATORY

Course Outcomes:

1	Able to design the Front End using GUI.
2	Able to perform different commands in Back End.
3	Able to implement connectivity like ADODC, ADO.
4	Able to implement code for application projects.
5	Able to check and finalize the applications.

Course Code/ Course Name:	17RAP05 / COMPUTER NETWORKS LABORATORY

Course Outcomes:

1	Able to identify components used in networking, IP configuration and usage of network commands.
2	Able to design a network for an organization.
3	Able to develop socket programming for communicating client and server programs using TCP and UDP.
4	Able to implement algorithm for routing and flow control of data.
5	Able to use various tools for packet capturing, analyzing and network simulation.

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Course Code/ Course Name:	17RAP06 / PROBLEM SOLVING AND ALGORITHMIC SKILLS LABORATORY

Course Outcomes:	
1	Students will be able to identify the appropriate data structure for given problem.
2	Students will be able to write functions to implement Breadth-First Search and Depth-First Search.
3	Students will be able to identify appropriate sorting algorithms for the given problem.
4	Students will be able to implement basic graph algorithm.
5	Students will be able to choose appropriate data structure to solve various computing problems.

SEMESTER 3:

Course Code/ Course Name:	17RAB08 / MACHINE LEARNING

Course Outcomes:	
1	Students will be able to acquire knowledge about the types of machine learning and its functions.
2	Students will be able to acquire knowledge for predicting real values, and classification of problems.
3	Students will be able to understand various predictive modeling machine learning.
4	Students will be able to understand entire training dataset.
5	Students will be able to use HMM by Speech Recognition and Part-of-Speech Tagging, and Information Extraction. Also know about applications of machine learning.

Course Code/ Course Name:	17RAB09 / WEB PROGRAMMING

Course Outcomes:	
1	Students will be able to understand how to validate the web page.
2	Students will be able to create a dynamic page.
3	Students will be able to develop a server side program.
4	Students will be able to create a Website.
5	Students will be able to understand concepts of XML and Web Services.
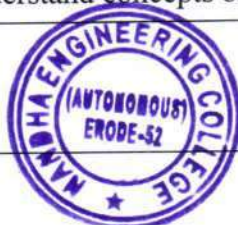
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Course Code/ Course Name:	17RAP07 / MACHINE LEARNING LABORATORY

Course Outcomes:

1	Students will be able to acquire knowledge about how to develop algorithm by their own.
2	Students will be able to apply probability distribution concepts in dice and coin toss.
3	Students will be able to implement for predicting real values, and classification of problems.
4	Students will be able to implement various predictive modeling machine learning.
5	Students will be able to implement entire training dataset.

Course Code/ Course Name:	17RAP08 / WEB PROGRAMMING LABORATORY

Course Outcomes:

1	Students will be able to implement interactive web page(s) using HTML, CSS and JavaScript.
2	Students will be able to design a responsive web site using HTML5 and CSS3
3	Students will be able to build Dynamic web site using server side Programming and Database connectivity.
4	Students will be able to create a Website.
5	Students will be able to build well-formed XML Document and implement Web Service using Java.

Course Code/ Course Name:	17RAE02 / MINI PROJECT

Course Outcomes:

1	Students will be able to identify the problem and analyze the project requirements.
2	Students will be able to apply current techniques and software tools necessary for solving complex modules.
3	Students will be able to show their individuality and inspiration in the mini project by designing a specific to real time applications.
4	Students will be able to improve their individuality and work as team player.
5	Students will be able to interpret the data and synthesis the information to derive conclusion for implementation of project.

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SEMESTER 4:

Course Code/ Course Name:	17RAE03 / PROJECT WORK
Course Outcomes:	

1	Students will be able to acquire knowledge by applying various techniques in plan, analyze, design and implement software project.
2	Students will be able to apply engineering principles such cost estimation and time estimation for project.
3	Students will be able to get motivated to work as a team and to focus on getting a working project done on time with each student being held accountable for their part of the project.
4	Students will be able to demonstrate the ability to communicate effectively in speech.
5	Students will be able to demonstrate professional ethics while working within team.
6	Students will be able to apply programming language concepts for the project development.
7	Students will be able to choose from various software development process models appropriate for project.
8	Students will be able to demonstrate the ability in writing the project details in document.

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Course Code/ Course Name:	17RAX01 / OBJECT ORIENTED PROGRAMMING IN JAVA
Course Outcomes:	
1	Students will be able to understand about basics of java.
2	Students will be able to understand about constructor and classes.
3	Students will be able to send and receive data using files.
4	Students will be able to understand about reusability concepts.
5	Students will be able to understand about how to run the java program without interruption.

Course Code/ Course Name:	17RAX02 / C# AND .NET FRAMEWORK
Course Outcomes:	
1	To understand programming concepts in C#
2	To understand about connectivity with ADO.NET.
3	To understand designing of various form controls.
4	Be able to design web applications and web services.
5	To understand advanced .NET concepts.

Course Code/ Course Name:	17RAX03 / UNIX AND NETWORK PROGRAMMING
Course Outcomes:	
1	Students will be able to understand Unix OS environment and gain good understanding of various commands.
2	Students will be able to get knowledge about the Unix file System.
3	Students will be able to know about creating processes.
4	Students will be able to create processes and intercommunication of two processes.
5	Students will be able to create client / server programs through sockets using TCP, UDP and SCTP protocols.

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Course Code/ Course Name:	17RAX04 / RUBY ON RAILS FRAMEWORK

Course Outcomes:

1	Students will be able to write programs and know about Ruby Gem.
2	Students will be able to develop application in Ruby on Rail.
3	Students will be able to know how to work with database, implement code and view data.
4	Students will be able to apply knowledge to deploy Rails.
5	Students will be able to know about prototype, generators, pagination, RESTful rail, etc.,

Course Code/ Course Name:	17RAX05 / XML & WEB SERVICES

Course Outcomes:

1	To understand programming concepts in XML.
2	To understand about web Services.
3	To understand about XML in E-Business
4	To understand XML in E-Business
5	To understand XML and content management

Course Code/ Course Name:	17RAX06 / MOBILE APPS DEVELOPMENT

Course Outcomes:

1	Students will be able to gain knowledge in various Mobile App developments Environment.
2	Students will be able to understand about interface designing and SQLite Database.
3	Students will be able to extract knowledge in Audio/Video playback and Record during App development.
4	Students will be able to apply knowledge in various testing during App development.
5	Students will be able to gain awareness about distributing apps on mobile market place.

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Course Code/ Course Name:	17RAX07 / CLOUD SUITE BUSINESS AND SYTELINE ENVIRONMENT
Course Outcomes:	
1	Students will be able to create form view and retrieve data.
2	Students will be able to do entries in various business transactions.
3	Students will be able to customize data in the database.
4	Students will be able to do data maintenance, data view and data search.
5	Students will be able to report configuration and authorization.

Course Code/ Course Name:	17RAX08 / INTERNET OF THINGS AND ITS APPLICATIONS
Course Outcomes:	
1	Students will be able to understand basics of Electrical circuits and Electronic devices
2	Students will be able to understand IOT characteristics and its essential components.
3	Students will be able to describe Arduino processor and working of Analog and Digital I/O pins.
4	Students will be able to understand Raspberry pi and its interface with other devices.
5	Students will be able to implement a IoT system using Arduino/Raspberry Pi.

Course Code/ Course Name:	17RAX09 / BIG DATA ANALYTICS
Course Outcomes:	
1	Students will get knowledge about the basic terminology of Big Data Analytics.
2	Students will get knowledge about how data will discover, prepare, plan and build model in data analytics.
3	Students will get knowledge of Data mining tool and practical experience of applying data mining algorithms.
4	Students will be able to recognize and make appropriate use of different types of data structures.
5	Students will be able to design and write functions in R and to create sophisticated figures and graphs.

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Course Code/ Course Name:	17RAX10 / DATA MINING AND DATA WAREHOUSING
Course Outcomes:	
1	Students will be able to understand various types of data that can be mined.
2	Students will be able to gain awareness about the importance of data cleaning.
3	Students will be able to know about various classification methods and the Evaluation of clustering.
4	Students will be able to apply a various patterns in data mining.
5	Students will be able to acquire knowledge about various data warehousing design and its usage.

Course Code/ Course Name:	17RAX11 / CLOUD COMPUTING
Course Outcomes:	
1	Students will be able to identify the architecture, infrastructure and delivery models of cloud computing.
2	Students will be able to choose the appropriate cloud player, Programming Models and approach.
3	Students will be able to compare the strengths and limitations of cloud computing.
4	Students will be able to design Cloud Services and Set a private cloud.
5	Students will be able to evaluate File Storage and Explore Sharing.

Course Code/ Course Name:	17RAX12 / BUSINESS INTELLIGENCE
Course Outcomes:	
1	Students will be able to know about various business intelligence architectures.
2	Students will be able to gain awareness in knowledge delivery.
3	Students will be able to extract various business intelligence efficiency measures.
4	Students will be able to apply different business intelligence applications.
5	Students will be able to know about future beyond Technology in business intelligence.

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Course Code/ Course Name:	17RAX13 / ORGANIZATIONAL BEHAVIOR AND ENTREPRENEURSHIP
Course Outcomes:	
1	Students will be able to human behavior within groups or organizations and how this behavior can be modeled through analysis.
2	Students will be able to various leadership styles and the power to resist and manage.
3	Students will be able to understand process of entrepreneur to be as own boss.
4	Students will be able to acquire knowledge about motivation through training, self-assessment and how to manage stress.
5	Students will be able to acquire knowledge about management of capital and tax details.

Course Code/ Course Name:	17RAX14 / SOFTWARE TESTING
Course Outcomes:	
1	Students can know the importance of software testing to measure software quality.
2	Students will know about Software Testing methodologies.
3	Students will be able to design the test cases and to getting familiarity over testing tools.
4	Students can practice unit testing tool JUnit Testing Tool
5	Students can practice test management tool Jira.

Course Code/ Course Name:	17RAX15 / CRYPTOGRAPHY AND NETWORK SECURITY
Course Outcomes:	
1	Students will be able to classify the symmetric encryption techniques
2	Students will be able to gain knowledge various Public key cryptographic techniques.
3	Evaluate the authentication and hash algorithms.
4	Summarize the intrusion detection and its solutions to overcome the attacks
5	Basic concepts of system level security.

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Course Code/ Course Name:	17RAX16 / MOBILE COMPUTING

Course Outcomes:

1	Students will be able to gain knowledge in Wireless communications.
2	Students will be able to know about the working mechanism of GSM & GPRS.
3	Students will be able to extract knowledge in Wireless Networks.
4	Students will be able to apply knowledge in MANET Applications.
5	Students will be able to gain awareness in WAP Architecture.

Course Code/ Course Name:	17RAX17 / HEALTH CARE MANAGEMENT

Course Outcomes:

1	Students will be able to understand basic healthcare information laws and standards.
2	Students will be able to know current and emerging clinical information system.
3	Students will be able to design a suitable HIS architecture.
4	Students will be able to use research methods and analysis together to plan the management of IT challenges.
5	Students will be able to use research methods and analysis together and do IT initiatives and Case Studies.

Course Code/ Course Name:	17RAX18 / TECHNICAL DOCUMENTATION

Course Outcomes:

1	Students will be able to write documentation of projects or products, so that readers can understand the documentation.
2	Students will be able to develop appropriate process steps and documentation for effective and successful projects and products.
3	Students will be able to develop process and use documentation tools.
4	Students will be able to plan disaster management and recovery.
5	Students will be able to know various standards and templates.

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Course Code/ Course Name:	17RAX19 / DATABASE ADMINISTRATION

Course Outcomes:

1	Students will be able to practice in Database Architecture.
2	Students will be able to gain knowledge in Storage Management.
3	Students will be able to extract knowledge in Data Dictionary.
4	Students will be able to apply Database Tuning and Managing Transactions.
5	Students will be able to gain awareness about Recovery and Security methods in DB Administration.

Course Code/ Course Name:	17RAX20 / SOCIAL NETWORK ANALYSIS

Course Outcomes:

1	Students will be able to proceed with various Applications of Social Network
2	Students will be able to gain awareness about ontology and their in semantic web.
3	Students will be able to know about various communities of in social networks.
4	Students will be able to know about Understanding and predicting human behavior for social communities.
5	Students will be able to understand various applications of social networks.

Course Code/ Course Name:	17RAX21 / OBJECT ORIENTED ANALYSIS AND DESIGN

Course Outcomes:

1	Students will be able to identify state & behavior of real world objects.
2	Students will be able to understand various object oriented methodologies and choose the appropriate one for solving the problem with the help of various case studies.
3	Students will be able to understand the concept of analysis and identify object, relationships, attributes, methods.
4	Students will be able to implement design in developing a software project.
5	Students will be able to understand importance of quality assurance and testing strategies.

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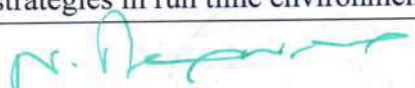
Course Code/ Course Name:	17RAX22 / ADVANCED DATABASE MANAGEMENT SYSTEMS
Course Outcomes:	
1	Students will be able to proceed transaction properties, concurrency control techniques and Deadlock handling.
2	Students will be able to gain awareness about Recovery and Security methods in Database.
3	Students will be able to extract XML Documents from Relational Databases.
4	Students will be able to apply a various Current Trends in Distributed Databases
5	Students will be able to understand various types of advanced database concepts such as Spatial database, Multimedia database.

Course Code/ Course Name:	17RAX23 / WEB SERVER ADMINISTRATION
Course Outcomes:	
1	Students will be able to know about web environment, server environment and network details.
2	Students will be able to know about server, hardware details, file system selection, configuration of TCP/IP in Windows and Linux and configuration of DNS in Windows and Linux.
3	Students will be able to gain knowledge about managing users and groups, managing file system permissions and the details about websites in IIS, Apache servers.
4	Students will be able to gain understandability in email services, FTP services and Telnet and terminal services.
5	Students will be able to gain knowledge about threats, how to secure data transmission, server applications and analysis about tools for web servers.

Course Code/ Course Name:	17RAX24 / COMPILER DESIGN
Course Outcomes:	
1	The students will be able to apply the knowledge of lex tool, yacc tool to develop a scanner & parser.
2	The students will be able to design experiments for Intermediate Code Generation in compiler
3	The students will be able to design a software system for backend of the compiler.
4	The students will be able to learn how to optimize and effectively generate machine codes
5	The students will be able to analyze the storage allocation strategies in run time environment.

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Course Code/ Course Name:	17RAX25 / DISTRIBUTED COMPUTING
Course Outcomes:	

1	Students will be able to familiar about basics of Distributed computing, Distributed Operating System and Message Passing
2	Students will be able to implement RPC Mechanism.
3	Students will be able to familiar design and implementation of DSM
4	Students will be able to explore various approaches of resource and process management
5	Students will be able to know how to access files located in different locations and naming convention.

Course Code/ Course Name:	17RAX26 / PROFESSIONAL ETHICS
Course Outcomes:	

1	Students will be able to deal with complex situations with the people in the society in making the work environment congenial, encouraging and loving.
2	Students will be able to understand the basic ethical theories discussing the ethics of good and bad patterns of character.
3	Students will be able to understand the basics regarding the code of ethics and get a balanced outlook on law.
4	Students will be able to implement the concepts in one's career for achieving excellent job satisfaction.
5	Students will be able to understand the global issues and get expertise and provide moral leadership.

Course Code/ Course Name:	17RAX27 / SOFTWARE PROJECT MANAGEMENT
Course Outcomes:	

1	Express the Project planning and estimation activities during the project scheduling of any software application.
2	Practice the knowledge about project evaluation and costing of the project.
3	Predict the knowledge to create reliable, replicable cost estimation that links to the requirement of project planning and managing.
4	Solve the Risk and create risk mitigation plan.
5	Apply software quality management for better quality software delivery

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Course Code/ Course Name:	17RAX28 / CYBER SECURITY

Course Outcomes:

1	Students will be able to understand various types of attacks in networks.
2	Students will be able to gain awareness about security design in operating system and denial of service in network.
3	Students will be able to know about Firewalls and Prevention methods.
4	Students will be able to apply a various emerging technologies in cyberspace.
5	Students will be able to understand security planning and dealing with disaster.

Course Code/ Course Name:	17RAX29 / IMAGE PROCESSING

Course Outcomes:

1	Students will be able to understand steps in image processing and various types of file formats, operations, etc.
2	Students will be able to gain awareness about image processing, filtering, smoothing and sharpening details.
3	Students will be able to know how to segment an image and work with edges, boundary and how to analysis features.
4	Students will be able to aware about image pyramids and various compression methods.
5	Students will be able to aware about classifying and recognizing image and know about steganography, mosaics, etc..

Course Code/ Course Name:	17RAX30 / NATURAL LANGUAGE PROCESSING

Course Outcomes:

1	Students will be able to impart knowledge about syntax, semantics and pragmatics of Natural Language Processing.
2	Students will be able to gain awareness about the linguistic essentials and Hidden Markov Models.
3	Students will be able to know about formation of grammar, parsing with Context Free Grammars.
4	Students will be able to know about various approaches and semantic parsing.
5	Students will be able to get knowledge applications such as machine translation, question answering, word alignment, etc.

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Course Code/ Course Name:	17RAX31 / DATA SCIENCE TECHNIQUES
Course Outcomes:	

1	Students will be able to use metrics to analyze the predications for the problem.
2	Students will be able to extract the data using tools like SSIS, RPA.
3	Students will be able to explore and analyze the data.
4	Students will be able to code IPython for manipulating data.
5	Students will be able to apply tool like Tableau to visualize data.

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