



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

B.E	Electrical and Electronics Engineering
B.Tech	Information Technology
B.E	Mechanical Engineering
B.E	Open Elective Courses
B.E	Non Credit Courses



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ELECTRICAL AND ELECTRONICS ENGINEERING



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Regulation :	R17
Program Code :	EE
Program Name :	Electrical and Electronics Engineering

VISION OF THE DEPARTMENT

To produce professionally competent Electrical and Electronics Engineers to meet out the national and global needs in inter/multi disciplinary domains.

MISSION OF THE DEPARTMENT

The Department of Electrical and Electronics Engineering is committed to

- Equip the students with knowledge and skills to cater to the industrial needs.
- Engineer them to develop innovative, competent and ethical qualities to contribute technical advancements.
- Enable them to become responsible citizens of the country with a willingness to serve the society.

PROGRAM EDUCATIONAL OBJECTIVES(PEOs):

List of PEOs

PEO 1:	Basic Engineering Analysis	To provide fundamental knowledge to the students in Basic Sciences for the efficient practice of Engineering.
PEO 2:	Continuous Learning	To equip the students with the necessary subject knowledge in the design and analysis of Electrical and Electronic Systems
PEO 3:	Higher Education	To prepare students for the modern work environment that emphasizes the need for lifelong learning so as to bring out innovative applications.
PEO 4:	Leadership Qualities	To enrich the students with the necessary skills for prospective careers in the industry, government, pursuit of higher education and entrepreneurship
PEO 5:	Societal Benefits	To enable students to communicate effectively, both individually and within teams, demonstrating ethical, respectful, and professional behavior so as to take up leadership positions in the society.



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PROGRAM OUTCOMES:

ATTRIBUTE	GA'S
Engineering Knowledge	Apply knowledge of mathematics, science and engineering to domain specific applications.
Problem Analysis	Identify, analyze and formulate Electrical and Electronics Engineering problems based on the knowledge of basic sciences and engineering
Design And Development of Solutions	Design and develop Electrical and Electronic Engineering based solutions to meet the desired requirements.
Investigation of Complex Problems	Investigate complex problems in the areas of power, control and energy to provide suitable solutions.
Modern Tool Usage	Use the techniques, skills and modern engineering tools necessary for real world applications within realistic constraints
The Engineer and Society	Apply engineering solutions in societal and global contexts.
Environment & Sustainability	Understand the impact of the solutions on the environment to ensure sustainability
Ethics	Understanding of professional and ethical responsibility
Individual And Team Work	Function as an individual and as a part of multidisciplinary team to accomplish a common goal.
Communication	Communicate effectively in both verbal and written forms.
Project Management And Finance	Ability to use engineering and management principles, to manage projects and in multidisciplinary environments
Lifelong Learning	Recognition of the need for and ability to engage in lifelong learning.



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PROGRAM SPECIFIC OUTCOMES (PSOs) OF THE DEPARTMENT:

Graduates should be able to

PSO1:	Demonstrate knowledge and competence in the application of basic sciences, mathematics and fundamentals of electrical and electronics systems
PSO2:	Ability to explore complex engineering problems
PSO3:	Demonstrate the ability to communicate correctly, effectively work in a team and develop good personality
PSO4:	Apply appropriate techniques and modern engineering tools in core areas.



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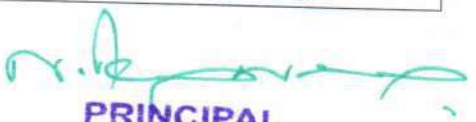
SEMESTER 1:

Course Code/ Course Name:	17EYA01/ PROFESSIONAL ENGLISH – I
Course Outcomes:	
1	The students will be able to construct clear, grammatically correct sentences using a variety of sentence structures and appropriate vocabulary.
2	The students will be able to utilize listening skills to articulate one's own point of view in different circumstances.
3	The students will be able to apply appropriate communication skills across settings, purposes, and audiences.
4	The students will be able to distinguish main ideas and supporting details and employ active reading strategies to understand texts at the maximum level.
5	The students will be able to equip themselves with writing skills needed for academic as well as workplace contexts.

Course Code/ Course Name:	17MYB01/CALCULUS AND SOLID GEOMETRY
Course Outcomes:	
1	The students will be able to apply the concept of orthogonal reduction to diagonalise the given matrix.
2	The students will be able to have knowledge about the geometrical aspects of sphere.
3	The students will be able to find the radius of curvature, circle of curvature and centre of curvature for a given curve.
4	The students will be able to classify the maxima and minima for a given function with several variables, through by finding stationary points.
5	The students will be able to demonstrate the use of double and triple integrals to compute area and volume.

Course Code/ Course Name:	17PYB01- PHYSICS FOR ENGINEERS
Course Outcomes:	
1	The students will be able to acquire knowledge regarding Acoustics and ultrasonic
2	The students will be able to apply knowledge in the fields of optics & laser technology
3	The students will be able to design the sensors using the knowledge of fiber optics
4	The students will be able to gain the knowledge of wave, particle nature and matter waves
5	The students will be able to analyze the different kind of crystal structures and crystal growth




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Course Code/ Course Name:	17CYB02 – APPLIED ELECTRO CHEMISTRY
Course Outcomes:	
1	Apply knowledge of fundamental principles of chemistry.
2	Define and solve engineering problems, including the utilization of creative and innovative skills .
3	Gain practical experience with chemical process equipment as well as to analyze and interpret data.
4	Understand the impact of engineering solutions in a global, economic, environmental and societal content.
5	Understand the management of electronic waste

Course Code/ Course Name:	17MEC01- ENGINEERING GRAPHICS
Course Outcomes:	
1	The students will be able to construct conic sections and special curves of required specifications
2	The students will be able to apply the concept of first angle projection to create project of straight lines, planes, solids and section of solids
3	The students will be able to develop a surface drawing of a solid model with given dimensions
4	The students will be able to build orthographic, isometric projections of a three dimensional object
5	The students will be able to make use of the knowledge of engineering drawing to create physical models

Course Code/ Course Name:	17CSC02 - PYTHON PROGRAMMING
Course Outcomes:	
1	The students will be able to understand the working of computers
2	The students will be able to understand the basics of Python Programming constructs
3	The students will be able to realize the need of strings, list, and tuples
4	The students will be able to design programs involving dictionaries and function
5	The students will be able to develop simple programs using file concept and modules




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Course Code/ Course Name:	17CSP02 -PYTHON PROGRAMMING LABORATORY
Course Outcomes:	
1	The students will be able to understand the basics of Python Programming constructs
2	The students will be able to understand the various operators of Python Programming.
3	The students will be able to realize the need of string manipulation, list, and tuples
4	The students will be able to design programs involving dictionaries, function and modules
5	The students will be able to develop simple programs with exception handling

Course Code/ Course Name:	17GYP02- ENGINEERING PRACTICES LABORATORY
Course Outcomes:	
1	The students will be able to understand various civil engineering practices like plumbing, carpentry and relevant tools
2	The students will be able to understand various manufacturing processes like welding, machining and sheet metal work
3	The students will be able to do residential house wiring and Measure energy and resistance to earth of an electrical equipment
4	The students will be able to perform the assembling and testing of the PCB based electronic circuits.
5	The students will be able to make / operate / utilize the simple engineering components.



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SEMESTER II

Course Code/ Course Name:	17EYA02 – PROFESSIONAL ENGLISH – II
Course Outcomes:	
1	The students will be able to communicate using a variety of sentence structures and appropriate vocabulary
2	The students will be able to comprehend conversations and short talks delivered in English and respond accordingly.
3	The students will be able to speak appropriately and effectively in various situations.
4	The students will be able to employ active reading strategies to understand texts at the maximum level.
5	The students will be able to equip themselves with writing formal letters and winning Job Application.

Course Code/ Course Name:	17MYB02 - COMPLEX ANALYSIS AND LAPLACE TRANSFORMS
Course Outcomes:	
1	The students will be able to predict the suitable method to solve second and higher order differential equations
2	The students will be able to apply the concepts of Differentiation and Integration to Vectors
3	The students will be able to compute an analytic function, when its real or imaginary part is known.
4	The students will be able to identify the Singularities and its corresponding Residues for the given function.
5	The students will be able to predict a suitable method to evaluate the Contour integration.

Course Code/ Course Name:	17PYB05 – PHYSICS OF SOLIDS
Course Outcomes:	
1	The students will be able to acquire knowledge about conductors, semiconductors and super conductors
2	The students will be able to distinguish between conductors, semiconductors and super conductors
3	The students will be able to understand the dielectrics and its applications
4	The students will be able to get the knowledge about fabrication of integrated circuits
5	The students will be able to know of recent trends in nanotechnology




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Course Code/ Course Name:	17CYB03-ENVIRONMENTAL SCIENCE
Course Outcomes:	
1	The students will be able to design a system, component, or process to meet desired needs.
2	The students will be able to identify, formulate, and solve environmental engineering problems
3	The students will be able to understand the professional and ethical responsibility as related to the practice of environmental engineering and the impact of engineering solutions in a global context.
4	The students will be able to use the techniques, skills, and modern engineering tools necessary for environmental engineering practice.
5	The students will be able to acquire the knowledge of information technology in environmental science.

Course Code/ Course Name:	17GYC01 – BASICS OF CIVIL AND MECHANICAL ENGINEERING
Course Outcomes:	
1	The students will be able to identify the usage of construction material and proper selection of construction materials
2	The students will be able to express building components and methods applicable to various structures.
3	The students will be able to identify the sources of energy and their conversion techniques.
4	The students will be able to explain the components of IC engines, fuel supply, cooling and lubricating systems
5	The students will be able to demonstrate the working principles of Refrigeration and Air conditioning systems

Course Code/ Course Name:	17EEC02 - ELECTRIC CIRCUIT THEORY
Course Outcomes:	
1	The students will be able to design electric circuits by using mesh and nodal methods.
2	The students will be able to find different circuit parameters using DC network theorems
3	The students will be able to measure voltage, current, power and phase shift in AC power circuits
4	The students will be able to design resonance and coupled circuits.
5	The students will be able to examine 3- phase circuits for impedance, voltage, current, power, phase shift and power factor.




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Course Code/ Course Name:	17GYP01 - PHYSICS AND CHEMISTRY LABORATORY
Course Outcomes:	
1	The students will be able to acquire the fundamental knowledge in optics such as interference, Diffraction and Understand about the spectral instruments etc
2	The students will be able to gain the basic knowledge about handling the laser light and Identify the basic parameters of an optical fibre
3	The students will be able to analyze the properties of matter with sound waves
4	The students will be able to apply knowledge of measurement of hardness producing ions, chloride, alkalinity, DO, conductance, EMF and pH
5	The students will be able to understand the impact of water quality and solve engineering problems

Course Code/ Course Name:	17EEP01 - ELECTRIC CIRCUIT LABORATORY
Course Outcomes:	
1	The students will be able to analyze the electrical circuits using various circuit laws
2	The students will be able to examine the network theorems and operation of typical electrical circuits
3	The students will be able to design an electric circuits under resonance to meet desired needs within realistic constraints
4	The students will be able to find power and power factor in three phase circuits using two wattmeter method.
5	The students will be able to design and find the accurate values for basic theorem using MATLAB.



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SEMESTER III

Course Code/ Course Name:	17MYB05-TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS
Course Outcomes:	
1	The students will be able to solve the Engineering problems in terms of Fourier analysis
2	The students will be able to know the formation of partial differential equations.
3	The students will be able to apply the partial differential equations to solve the various electrical and electronics application.
4	The students will be able to solve the problems using Fourier integral theorem and convolution theorem technique.
5	The students will be able to formulate the difference equations and solve them using Z-transform techniques

Course Code/ Course Name:	17EEC03-ELECTRONIC DEVICES AND CIRCUITS
Course Outcomes:	
1	The students will be able to learn about the various types of diodes
2	The students will be able to acquire knowledge about current controlled device
3	The students will be able to analyze various configurations of BJT Amplifiers
4	The students will be able to study the voltage controlled devices and its applications
5	The students will be able to analyze various configurations of FET Amplifiers

Course Code/ Course Name:	17EEC04 - ELECTRICAL MACHINES – I
Course Outcomes:	
1	The students will be able to understand the generation of EMF and Torque in rotating Machines.
2	The students will be able to illustrate the construction and principle of operation and characteristics of DC machines.
3	The students will be able to select appropriate DC motor as well as to choose an appropriate method of Speed control for any industrial application
4	The students will be able to identify the transformer parameters from the equivalent circuit
5	The students will be able to evaluate the performance of DC machines and transformers




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Course Code/ Course Name:	17EEEC05 - FIELD THEORY
Course Outcomes:	
1	The students will be able to learn the fundamentals of vector algebra and electromagnetic fields.
2	The students will be able to acquire knowledge about electrostatics, electrical potential, energy density and their applications.
3	The students will be able to get a wide knowledge about concepts of magneto statics, magnetic flux density, scalar and vector potential and its applications.
4	The students will be able to emphasize the ideas about faradays laws, induced emf and their applications.
5	The students will be able to understand the concepts of electromagnetic waves and poynting vector.

Course Code/ Course Name:	17EEEC06-POWER PLANT ENGINEERING
Course Outcomes:	
1	The students will be able to understand concepts of thermal power plants.
2	The students will be able to analyze the issues related with power plants.
3	The students will be able to acquire knowledge about nuclear power plants.
4	The students will be able to analyze the operation of various renewable energy sources.
5	The students will be able to know about tariff structure and Environmental issues.

Course Code/ Course Name:	17ITC03 - DATA STRUCTURES AND ALGORITHMS
Course Outcomes:	
1	The students will be able to understand and apply the concept of abstract data type to represent and implement heterogeneous data structures.
2	The students will be able to exemplify and implement how Stack ADT & Queue ADT can be implemented to manage the memory using static and dynamic allocations.
3	The students will be able to compare and contrast various techniques in Hashing and Trees.
4	The students will be able to understand the various types of shorting algorithms.
5	The students will be able to analyze and implement different types of sorting and searching algorithms.



A handwritten signature in blue ink, appearing to read 'N. Jeyaraj', is written above the printed name of the Principal.

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Course Code/ Course Name:	17EEP02-ELECTRONIC DEVICES AND CIRCUITS LABORATORY
Course Outcomes:	
1	The students will be able to build different characteristics of unipolar and bipolar devices
2	The students will be able to know the applications of Diode.
3	The students will be able to acquire knowledge about the various configuration of BJT
4	The students will be able to build different types of rectifiers and filter circuits.
5	The students will be able to attain information about regulators.

Course Code/ Course Name:	17EEP03-ELECTRICAL MACHINES - I LABORATORY
Course Outcomes:	
1	The students will be able to acquire knowledge on load characteristics of DC Generators and DC motors
2	The students will be able to know the characteristics of the DC machines independently
3	The students will be able to familiar to control and test the speed of DC motor under various loads
4	The students will be able to analyze the performance of single phase transformer under load condition
5	The students will be able to understand the various tests performed on transformer to acquire its efficiency



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SEMESTER IV

Course Code/ Course Name:	17MYB10- PROBABILITY, STATISTICS AND NUMERICAL METHODS
Course Outcomes:	
1	The students will be able to have a fundamental knowledge of the basic probability concepts
2	The students will be able to select a hypothesis testing method for the given numerical set of data to analyze the significance.
3	The students will be able to acquainted with the basic concepts in numerical methods and their uses.
4	When huge amounts of experimental data are involved, the methods discussed on interpolation will be useful in constructing approximate polynomial to represent the data and to find the intermediate values.
5	The students will be able to explain the consequences of finite precision and the inherent limits of the numerical methods considered.

Course Code/ Course Name:	17EEC07-ELECTRICAL MACHINES - II
Course Outcomes:	
1	The students will be able to analyze the performance of synchronous generator and compute EMF equation and voltage regulation by using different methods
2	The students will be able to elucidate the characteristics of synchronous motor and analyze its performance
3	The students will be able to analyze the characteristics, equivalent circuit and circle diagram of three phase induction motor and induction generator
4	The students will be able to apply suitable starting and speed control methods to enhance the performance of three phase induction motors
5	The students will be able to apply the double revolving field theory to develop equivalent circuit of single phase induction motor and examine the performance of special machines

Course Code/ Course Name:	17EEC08-LINEAR INTEGRATED CIRCUITS
Course Outcomes:	
1	The students will be able to Know about IC fabrication procedure
2	The students will be able to impart knowledge on characteristics of OP-AMP
3	The students will be able to get adequate knowledge on OP-AMP application
4	The students will be able to analyze and construct various application circuits using 555 timer.
5	The students will be able to recognize about the Oscillators and types




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Course Code/ Course Name:	17EEEC09-DIGITAL LOGIC CIRCUITS
Course Outcomes:	
1	The students will be able to study number systems and to simplify the mathematical expressions using Boolean functions
2	The students will be able to design combinational logic circuits
3	The students will be able to analyze and design various synchronous circuits
4	The students will be able to implement the asynchronous circuits
5	The students will be able to expose the concept of memory devices and logic families

Course Code/ Course Name:	17EEEC10-TRANSMISSION AND DISTRIBUTION
Course Outcomes:	
1	The students will be able to acquire knowledge about HVAC, HVDC, ac and dc distributors.
2	The students will be able to analyze line parameters using symmetrical and unsymmetrical spacing conductors.
3	The students will be able to design equivalent line parameters to obtain transmission efficiency and voltage regulation.
4	The students will be able to analyze the voltage distribution in insulator string, cables and method to improve the same.
5	The students will be able to design a transmission line and tower structure ,modern substation layout with grounding techniques

Course Code/ Course Name:	17EPEP04-ELECTRICAL MACHINES II LABORATORY
Course Outcomes:	
1	The students will be able to analyze performance of alternator by EMF, MMF, and ZPF Methods.
2	The students will be able to control the speed of three phase synchronous motor under various load conditions.
3	The students will be able to acquire knowledge of load characteristic of induction motor
4	The students will be able to analyze the performance of induction motor under loaded and unloaded condition to find the losses of induction motor.
5	The students will be able to analyze the load characteristics of single phase induction motor.




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Course Code/ Course Name:	17EEP05-LINEAR AND DIGITAL INTEGRATED CIRCUITS LABORATORY
Course Outcomes:	
1	The students will be able to analyze about the characteristics of OP-AMP
2	The students will be able to know the applications of OP-AMP and 555 IC
3	The students will be able to acquire knowledge about the various types of logic gates
4	The students will be able to understand about the code converters
5	The students will be able to acquire knowledge about checker and generator

SEMESTER V

Course Code/ Course Name:	17GEA02 – PRINCIPLES OF MANAGEMENT
Course Outcomes:	
1	The students will be able to acquire comprehensive knowledge on management concepts.
2	The students will be able to understand and apply planning concepts at different conditions and situations.
3	The students will be able to accomplish organizational structures and understand the staffing process.
4	The students will be able to employees motivation and project managements in working environments.
5	The students will be able to do the budgetary and non-budgetary control of projects.

Course Code/ Course Name:	17EEC11-MEASUREMENTS AND INSTRUMENTATION
Course Outcomes:	
1	The students will be able to apply the basic laws governing the operation of the instruments
2	The students will be able to calibrate measuring instruments.
3	The students will be able to apply analog and digital techniques to measure electrical quantities.
4	The students will be able to demonstrate about storage & display devices.
5	The students will be able to use various transducers and data acquisition system.



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Course Code/ Course Name:	17EEEC12-CONTROL SYSTEMS
Course Outcomes:	
1	The students will be able to understand the use of transfer function models for analysis physical systems and introduce the control system
2	The students will be able to provide adequate knowledge in the time response of systems and steady state error analysis.
3	The students will be able to accord basic knowledge in obtaining the open loop and closed-loop frequency responses of systems.
4	The students will be able to introduce stability analysis and design of compensators.
5	The students will be able to introduce state variable representation of physical systems and study the effect of state feedback

Course Code/ Course Name:	17EEEC13-POWER ELECTRONICS
Course Outcomes:	
1	The students will be able to remember the characteristics and the turn on methods of power devices.
2	The students will be able to remember the characteristics and the turn on methods of power devices.
3	The students will be able to understand the working principle of DC choppers.
4	The students will be able to understand the operation of inverter circuits.
5	The students will be able to understand the working principle of AC-AC Converter.

Course Code/ Course Name:	17EEEC14-COMMUNICATION ENGINEERING
Course Outcomes:	
1	The students will be able to learn the different methods of analog communication and their significance
2	The students will be able to understand the digital Communication methods for high bit rate transmission
3	The students will be able to realize the concepts of source and line coding techniques for enhancing the transmission rate
4	The students will be able to know various MAC protocols used in communication systems for enhancing the number of users
5	The students will be able to examine the various media for digital communicatio




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Course Code/ Course Name:	17EEP06-CONTROL AND INSTRUMENTATION LABORATORY
Course Outcomes:	
1	The students will be able to find the performance of first and second order systems
2	The students will be able to examine the model for electromechanical systems.
3	The students will be able to select and design suitable bridges for measuring R,L and C.
4	The students will be able to identify the process of calibration.

Course Code/ Course Name:	17EEP07-POWER ELECTRONICS LABORATORY
Course Outcomes:	
1	The students will be able to examine the working and characteristics of transistor & thyristor.
2	The students will be able to know the working operation of single phase converter.
3	The students will be able to observe the working operation of Three phase AC voltage controller.
4	The students will be able to examine the working of Chopper.
5	The students will be able to identify the operation of single phase Cycloconverter.

SEMESTER VI

Course Code/ Course Name:	17EEEC15-POWER SYSTEM ANALYSIS
Course Outcomes:	
1	The students will be able to describe the concept of power system
2	The students will be able to Infer about Power flow analysis
3	The students will be able to analyze various types of symmetrical faults.
4	The students will be able to interpret the various types of unsymmetrical faults
5	The students will be able to analyze the stability of the power system



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Email: principal@nandhaengg.org Mobile : 73737 12234

Course Code/ Course Name:	17EEEC16-MICROPROCESSOR AND MICROCONTROLLER
Course Outcomes:	
1	The students will be able to understand the internal operations of 8085 processor
2	The students will be able to develop skills in writing assembly language program
3	The students will be able to recognize the knowledge on interfacing the external devices to the processor according to the user requirements
4	The students will be able to understand the internal structure and instruction set of 8051 controller
5	The students will be able to develop PWM outputs using PIC microcontroller.

Course Code/ Course Name:	17EEP08- MICROPROCESSOR AND MICROCONTROLLER LABORATORY
Course Outcomes:	
1	The students will be able to apply fundamental of assembly language programming for microprocessor and microcontroller
2	The students will be able to apply computing platform for various engineering applications
3	The students will be able to work with standard microprocessor real time interfaces including serial ports, digital-to-analog converters and analog-to-digital converters
4	The students will be able to design circuits for various applications using microcontroller and microprocessor

SEMESTER VII

Course Code/ Course Name:	17EEEC17 - ELECTRIC DRIVES AND CONTROL
Course Outcomes:	
1	The students will be able to know the fundamental concept electrical drive, the selection process involved in drives and drive motor characteristics.
2	The students will be able to understand the operation of the converter, chopper fed dc drive and solve simple problems
3	The students will be able to study and analyze the speed control of induction motor drive.
4	The students will be able to use recent microcontroller for motor control and PLC based control of drives.
5	The students will be able analyze and design various controllers for drives




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Course Code/ Course Name:	17EEEC18- POWER SYSTEM PROTECTION AND SWITCH GEAR
Course Outcomes:	
1	The students will be able to know the layout of a typical substation
2	The students will be able to Select Fuses and Circuit breakers for a given situation
3	The students will be able to acquire knowledge to understand the principles of different types of protective relays
4	The students will be able to gain adequate knowledge in selection of different types of protective schemes
5	The students will be able to know the causes of abnormal operating conditions

Course Code/ Course Name:	17EEEC19-PRINCIPLES OF EMBEDDED SYSTEMS
Course Outcomes:	
1	The students will be able to understand the concept of composition, design and implementation of embedded systems.
2	The students will be able to learn the interfacing techniques between processors and peripheral devices related to embedded system.
3	The students will be able to know the concept of communication protocols and apply advanced technical knowledge in multiple contexts
4	The students will be able to acquire the basic concepts of system programming like operating system, assembler, compilers and to understand the management tasks needed for developing embedded system.
5	The students will be able to use various testing tools for hardware- software debugging and learn its applications

Course Code/ Course Name:	17EEEC20-POWER SYSTEM OPERATION AND CONTROL
Course Outcomes:	
1	The students will be able to determine the future load demand and predict the reserve capacity
2	The students will be able to construct the state variable model of frequency control loop in isolated and grid connected generating units.
3	The students will be able to analyze the transfer function model of excitation system and classify the system level control schemes.
4	The students will be able to prepare an economic load sharing schedule for a given demand based on generating units cost characteristics
5	The students will be able to explain the layout of SCADA system for power system monitoring and control



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Course Code/ Course Name:	17EEP09-POWER SYSTEM SIMULATION LABORATORY
Course Outcomes:	
1	The students will be able to learn about power system components
2	The students will be able to solve the load flow problems using efficient numerical methods
3	The students will be able to analyze the optimal dispatch problems and unit commitment in various power plants
4	The students will be able to analyze the power system fault in symmetrical and unsymmetrical components
5	The students will be able to understand control of real power by frequency control

Course Code/ Course Name:	17EED01 – PROJECT WORK-I
Course Outcomes:	
1	The students will be able to study problems in the field of Electrical and Electronics Engineering through literature survey and its reviews.
2	The students will be able Undertake problem identification, formulation and solution
3	The students will be able to Design engineering solutions to complex problems utilising a systems approach and develop projects
4	The students will be able to Communicate effectively and to present ideas clearly
5	The students will be able to demonstrate the knowledge, skills and work as a team to achieve common goal



A handwritten signature in green ink, appearing to be 'N. Srinivasan'.

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Principal
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SEMESTER VIII

Course Code/ Course Name:	17EED02 – PROJECT WORK II
Course Outcomes:	
1	The students will be able to study problems in the field of Electrical and Electronics Engineering through literature survey and its reviews.
2	The students will be able Undertake problem identification, formulation and solution.
3	The students will be able to Design engineering solutions to complex problems utilizing a systems approach and develop projects
4	The students will be able to Communicate effectively and to present ideas clearly
5	The students will be able to demonstrate the knowledge, skills and work as a team to achieve common goal

PROGRAM SPECIFIC ELECTIVES

Course Code/ Course Name:	17EEX01-FUNDAMENTALS OF FIBRE OPTICS AND LASER INSTRUMENTATION
Course Outcomes:	
1	The students will be able to analyze the theory and classification of fiber optics and fibre characteristics.
2	The students will be able to gain knowledge about the fibre optic sensor measurements
3	The students will be able to ensure ideas about the types of lasers and its applications.
4	The students will be able to learn about the industrial applications of laser.
5	The students will be able to know the basic principle and methods of Holographic interferometry and application of laser instruments in medical surgeries

Course Code/ Course Name:	17EEX02-ENERGY STUDIES
Course Outcomes:	
1	The students will be able to learn the various energy sources
2	The students will be able to know about the energy conversion methods
3	The students will be able to illustrate economic development and social transformation in global scenario
4	The students will be able to epitomize the concept of commercial and noncommercial forms of Indian scenario
5	The students will be able to explore the issues of energy policy across the state, national and global level



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Course Code/ Course Name:	17EEX03-SEMICONDUCTING MATERIALS AND DEVICES
Course Outcomes:	
1	The students will be able to understand the properties of semi conductor
2	The students will be able to gain adequate knowledge in carrier transport properties
3	The students will be able to acquire knowledge of P-N junction diode
4	The students will be able to familiar with operation of Bipolar Junction Transistor
5	The students will be able to get dynamic understanding of Optical Devices

Course Code/ Course Name:	17ITC08 - FUNDAMENTALS OF JAVA PROGRAMMING
Course Outcomes:	
1	The students will be able to learn fundamental concepts of Java.
2	The students will be able to design concepts with inheritance.
3	The students will be able to implement exception handling and Files.
4	The students will be able to create threads and interfaces in Java classes.
5	The students will be able to implement GUI and generics concepts.

Course Code/ Course Name:	17EEX04- NETWORK THEORY
Course Outcomes:	
1	The students will be able to analyze and solve problems involving Electrical networks by using various network theorems
2	The students will be able to develop and Solve the Electrical networks in the sdomain.
3	The students will be able to interpret the structure of 2-port networks.
4	The students will be able to solve circuits involving inputs of different wave forms using Fourier Analysis
5	The students will be able to design networks using passive filters




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Course Code/ Course Name:	17EEX05-COMPUTER ARCHITECTURE AND ORGANIZATION
Course Outcomes:	
1	The students will be able to compare the performance of different architectures and Develop applications for high performance computing systems
2	The students will be able to identify the issues involved in the instruction execution and various stages of instruction life stage
3	The students will be able to design a pipeline for consistent execution of instructions with minimum hazards.
4	The students will be able to analyze performance issues in processor and memory design of a digital computer.
5	The students will be able to predict various interrupts used for system organization

Course Code/ Course Name:	17ITC12- DATABASE SYSTEMS CONCEPTS
Course Outcomes:	
1	The students will be able to describe the role of Database Management System in an Organization.
2	The students will be able to study basic database concepts including the structure and operations of the relational data model.
3	The students will be able to construct simple and Moderately advanced database queries using SQL.
4	The students will be able to apply logical database design principles includes E-R diagrams & Normalization
5	The students will be able to explain various file organizing & Indexing structure.

Course Code/ Course Name:	17EEX06-DISCRETE TIME SYSTEMS AND SIGNAL PROCESSING
Course Outcomes:	
1	The students will be able to understand the basics of a signals and systems.
2	The students will be able to realize the frequency domain transformations and frequency domain analysis.
3	The students will be able to design IIR digital filters for the required order and cutoff specifications.
4	The students will be able to design FIR digital filters for the required order and cutoff specifications.
5	The students will be able to identify the suitable processor for the DSP applications along with required simulation tools.



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Course Code/ Course Name:	17EEX07-DESIGN OF ELECTRICAL MACHINES
Course Outcomes:	
1	The students will be able to remember the basic design concepts
2	The students will be able to understand the design of armature and field systems for D.C. machines.
3	The students will be able to understand the design of core, yoke, windings and cooling systems of transformers.
4	The students will be able to understand the design of stator and rotor of induction machines and rotor
5	The students will be able to understand the design of stator and rotor of synchronous machines

Course Code/ Course Name:	17EEX08-ENERGY MANAGEMENT AND AUDITING
Course Outcomes:	
1	The students will be able to ensure ideas about the types of energy and auditing techniques.
2	The students will be able to suggest methodologies for energy savings
3	The students will be able to learn about the various methods for energy management & power quality analyses.
4	The students will be able to learn about the lighting systems & cogeneration
5	The students will be able to know the basics of energy economics.

Course Code/ Course Name:	17EEX09-COMPUTER NETWORKS AND PROTOCOLS
Course Outcomes:	
1	The students will be able to understand the basics of data communication through transmission medium.
2	The students will be able to choose the required functionality at each layer for given application.
3	The students will be able to apply solution for network related problems in real time.
4	The students will be able to recognize process to process delivery concepts and protocols used in it.
5	The students will be able to analyze and recognize the application layer protocols and its applications.




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Course Code/ Course Name:	17EEX10-SPECIAL ELECTRICAL MACHINES
Course Outcomes:	
1	The students will be able to gain knowledge on basic synchronous reluctance motors
2	The students will be able to learn about Stepping motors and its different types
3	The students will be able to emphasize the ideas about operation and performance of switched reluctance motors
4	The students will be able to analyze the characteristics of permanent magnet brushless DC motors.
5	The students will be able to Know the basics of permanent magnet synchronous motors.

Course Code/ Course Name:	17EEX11-BIO MEDICAL INSTRUMENTATION AND ITS APPLICATIONS
Course Outcomes:	
1	The students will be able to know about the cell and parts of the human body
2	The students will be able to know how to measure the heart sound and the blood pressure range.
3	The students will be able to know how to measure the human body by using ECG, EMG and ERG.
4	The students will be able to know the different therapeutic equipments used for diagnostic and surgery purposes
5	The students will be able to know the latest medical imaging equipments and patient monitoring systems

Course Code/ Course Name:	17EEX12-WIND AND SOLAR ELECTRICAL SYSTEMS
Course Outcomes:	
1	The students will be able to know about the fundamentals of solar PV cells
2	The students will be able to design solar based application projects
3	The students will be able to understand the concepts of wind energy
4	The students will be able to implement the system running using wind energy
5	The students will be able to understand about other sources of energy



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Course Code/ Course Name:	17EEX13-POWER ELECTRONICS FOR RENEWABLE ENERGY SYSTEMS
Course Outcomes:	
1	The students will be able to know about the environmental aspects of electric energy conversion.
2	The students will be able to know about the operation of different electrical machines for renewable energy systems.
3	The students will be able to work in teams and independently for the design, development and testing of power electronics systems in various applications
4	The students will be able to recognize about the operation of different renewable energy conversion systems.
5	The students will be able to get the knowledge how to track the maximum power point for various renewable energy conversions.

Course Code/ Course Name:	17EEX14-COMPUTER AIDED DESIGN OF ELECTRICAL APPARATUS
Course Outcomes:	
1	The students will be able to give importance of computer aided design method.
2	The students will be able to provide basic electromagnetic field equations and the problem formulation for CAD applications.
3	The students will be able to get familiarized with Finite Element Method as applicable for Electrical Engineering
4	The students will be able to introduce the organization of a typical CAD package
5	The students will be able to introduce Finite Element Method for the design of different Electrical apparatus

Course Code/ Course Name:	17EEX16-HIGH VOLTAGE ENGINEERING
Course Outcomes:	
1	The students will be able to impart knowledge of over voltage phenomenon and insulation coordination in electrical Power systems
2	The students will be able to understand the breakdown mechanisms of dielectrics
3	The students will be able to acquire knowledge to understand high voltage and high current generation techniques
4	The students will be able to gain adequate knowledge in the measurements of high voltages & currents
5	The students will be able to conduct tests for various electrical equipments




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Course Code/ Course Name:	17EEX17-POWER SEMICONDUCTOR DEVICES AND APPLICATIO S
Course Outcomes:	
1	The students will be able to know about the construction, physics of operation, safe operating areas and protection circuits for various semiconductor devices.
2	The students will be able to distinguish about the construction and working principle of power diode and power BJT
3	The students will be able to identify regarding the static characteristics and switching characteristics of SCRS and GTOs
4	The students will be able to recognize about the construction, static characteristics, and switching characteristics of IGBT and power FET
5	The students will be able to get the knowledge how to use these devices for various converter.

Course Code/ Course Name:	17EEX18-POWER QUALITY
Course Outcomes:	
1	The students will be able to introduce the power quality problem.
2	The students will be able to educate on production of voltages sags and interruptions
3	The students will be able to study the overvoltage problems.
4	The students will be able to learn the sources and effect of harmonics in power system.
5	The students will be able to impart knowledge on various methods of power quality monitoring.

Course Code/ Course Name:	17ECX16 – INTERNET OF THINGS AND ITS APPLICATIONS
Course Outcomes:	
1	The students will be able to understand basics of Electrical circuits and Electronic devices
2	The students will be able to understand IOT characteristics and its essential components.
3	The students will be able to describe Arduino processor and working of Analog
4	The students will be able to understand Raspberry pi and its interface with other devices
5	The students will be able to implement a IoT system using Arduino/Raspberry Pi.




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Course Code/ Course Name:	17EEX19 - PLC AND AUTOMATION
Course Outcomes:	
1	The students will be able to get knowledge on the components for assembling PLC
2	The students will be able to acquire knowledge on advance programming methods to apply in areas like operator panels, text and integrated display, Industrial automation.
3	The students will be able to differentiate between SCADA &DCS Systems and their application areas.
4	The students will be able to select the right hardware for given application
5	The students will be able to get an idea of automation system as network communication and human machine interface.

Course Code/ Course Name:	17EEX20 -FLEXIBLE AC TRANSMISSION SYSTEMS
Course Outcomes:	
1	The students will be able to acquire an introduction about reactive power control techniques.
2	The students will be able to learn about Static VAR Compensator and its applications
3	The students will be able to gain knowledge on Thyristor Controlled Series Capacitor (TCSC).
4	The students will be able to understand the concept of STATCOM devices and applications.
5	The students will be able to know about the coordination techniques of FACTS controller.

Course Code/ Course Name:	17EEX21-POWER SYSTEM DYNAMICS
Course Outcomes:	
1	The students will be able to inherit the knowledge on stability consideration
2	The students will be able to develop the mathematical expressions for synchronous machine
3	The students will be able to epitomize the concept of dynamic behavior in synchronous machine
4	The students will be able to illustrate the characteristics, circuit parameters and effect of induction motor.
5	The students will be able to explore mathematical tools for stability analysis




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Course Code/ Course Name:	17EEX22-FUNDAMENTALS OF ELECTRIC POWER UTILIZATION
Course Outcomes:	
1	The students will be able to inherit the knowledge about the electric drives for power utilization
2	The students will be able to know about the lighting sources and there schemes
3	The students will be able to illustrate various heating and welding methods
4	The students will be able to epitomize the concept of electric traction system for power utilization.
5	The students will be able to explore electrolytic process and its importance

Course Code/ Course Name:	17EEX23- ENGINEERING AUTOMOTIVE ELECTRONIC SYSTEMS
Course Outcomes:	
1	The students will be able to develop charging and starting system and to design wiring for automotive component
2	The students will be able to design ignition system by electronic instrument
3	The students will be able to develop instrumentation system and sensors for different parameters
4	The students will be able to design braking and traction system by electronic instruments.
5	The students will be able to design lighting and security systems

Course Code/ Course Name:	17EEX24-THERMODYNAMICS
Course Outcomes:	
1	The students will be able to know the basics of thermodynamics
2	The students will be able to calculate the different process of expansion of gases related to thermodynamics
3	The students will be able to acquire knowledge to understand the principles of Carnot, Clausius inequality and Entropy
4	The students will be able to gain adequate knowledge in Otto cycle, diesel cycle, dual cycle and Bryton cycles
5	The students will be able to gain knowledge in vapor and gas refrigeration cycles




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Course Code/ Course Name:	17GEA03 - TOTAL QUALITY MANAGEMENT
Course Outcomes:	
1	The students will be able to acquire various concepts of quality management.
2	The students will be able to implement various principles of quality management.
3	The students will be able to impart quality using statistical process.
4	The students will be able to use the various tools to maintain quality
5	The students will be able to implement the quality system for ISO certification.

Course Code/ Course Name:	17GEA04 - PROFESSIONAL ETHICS AND HUMAN VALUES
Course Outcomes:	
1	The students will be able to know the concepts of ethics and values.
2	The students will be able to acquire the knowledge of interpersonal and organizational issues in ethics
3	The students will be able to will be able to Highlight the ethical issues related to engineering.
4	The students will be able to learn the concepts of engineer's responsibilities and their rights.
5	The students will be able to understand the role of global issues and professional bodies.

Course Code/ Course Name:	17ITX26- 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.




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Course Code/ Course Name:	17CSX31- 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:	17EEX25-ELECTRIC AND HYBRID VEHICLES
Course Outcomes:	
1	The students will be able to know the fundamentals of electric vehicles
2	The students will be able to acquire knowledge in the capacity of battery charging.
3	The students will be able to know about the requirements of electrical machines for electric vehicles.
4	The students will be able to gain adequate knowledge in electric vehicle drive train.
5	The students will be able to design the hybrid electric vehicles using different size of components.



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INFORMATION TECHNOLOGY



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Regulation :	R17
Program Code :	IT
Program Name :	INFORMATION TECHNOLOGY

VISION OF THE DEPARTMENT

To prepare professionally responsible and ethical engineers conforming to the International standard in the field of Information Technology through quality education, life skills and innovative research.

MISSION OF THE DEPARTMENT

Department of Information Technology is committed to


- Transform the students into innovative, competent and high quality IT professionals to meet the growing global challenges.
- Contribute significantly to the research and the discovery of innovative methods in computing, offer expertise, resources, and services to the community
- Gain practical knowledge through communication with Industries
- Produce proficient engineers with professional ethics and life skills.

PROGRAM EDUCATIONAL OBJECTIVES (PEOS):

List of PEOs

PEO 1:	To afford students with knowledge environment in mathematical, scientific and engineering basics necessary to evaluate, analyze and solve hardware/software engineering problems.
PEO 2:	To provide our graduates with core proficiency awareness of the lifelong learning needed for a successful specialized career.
PEO 3:	To scrutinize real life problems, design and develop solutions through the knowledge of basic computing and management principles that are publicly acceptable.




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PEO 4:	To apply multifaceted skills for employment and excel in IT professional careers and/or to continue their education in IT and/or related post graduate programmes.
PEO 5:	To create an interest for self learning, updating recent developments in the major area of study by way of inplant training and industrial visit and motivating to present in national / international forums for dissemination of knowledge.

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 acquired by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional Engineering practice.
Environment & Sustainability	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the




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	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.



N. Aravind
PRIN
Nandha Engineering College
(Autonomous)
Erode - 638 052.



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PROGRAM SPECIFIC OUTCOMES (PSOs) OF THE DEPARTMENT:

Graduates should be able to

PSO1:	Apply the acquired knowledge of basic skills, principles of computing, mathematical foundations, algorithmic principles, modeling and design of computer- based systems in solving engineering problems.
PSO2:	Relate and analyze the interdisciplinary problems for developing innovative sustained solutions with environmental concerns.
PSO3:	Able to update knowledge continuously in various technologies and programming languages to meet the industry standards.
PSO4:	Capable to handle efficiently as part of a team with professional behavior and ethics.



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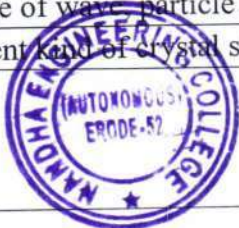
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SEMESTER 1:

Course Code/ Course Name:	17EYA01/ PROFESSIONAL ENGLISH – I
Course Outcomes:	
1	The students will be able to construct clear, grammatically correct sentences using a variety of sentence structures and appropriate vocabulary.
2	The students will be able to utilize listening skills to articulate one's own point of view in different circumstances.
3	The students will be able to apply appropriate communication skills across settings, purposes, and audiences.
4	The students will be able to distinguish main ideas and supporting details and employ active reading strategies to understand texts at the maximum level.
5	The students will be able to equip themselves with writing skills needed for academic as well as workplace contexts.

Course Code/ Course Name:	17MYB01/CALCULUS AND SOLID GEOMETRY
Course Outcomes:	
1	Apply the concept of orthogonal reduction to diagonalise the given matrix.
2	Have knowledge about the geometrical aspects of sphere.
3	Find the radius of curvature, circle of curvature and centre of curvature for a given curve.
4	Classify the maxima and minima for a given function with several variables, through by finding stationary points.
5	Demonstrate the use of double and triple integrals to compute area and volume.

Course Code/ Course Name:	17PYB02- PHYSICS FOR COMPUTER ENGINEERS
Course Outcomes:	
1	Acquire knowledge regarding Acoustics and ultrasonic
2	Applying knowledge in the fields of optics & laser technology
3	Design the sensors using the knowledge of fiber optics
4	Gain the knowledge of wave, particle nature and matter waves
5	Analyze the different kind of crystal structures and crystal growth




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Course Code/ Course Name:	17CYB03– ENVIRONMENTAL SCIENCE
Course Outcomes:	
1	The student will be able to design a system, component, or process to meet desired needs.
2	The student will be able to identify, formulate, and solve environmental engineering problems
3	The student will be able to understand the professional and ethical responsibility as related to the practice of environmental engineering and the impact of engineering solutions in a global context.
4	The student will be able to use the techniques, skills, and modern engineering tools necessary for environmental engineering practice.
5	The student will be able to acquire the knowledge of information technology in environmental science.

Course Code/ Course Name:	17CSC02 - PYTHON PROGRAMMING
Course Outcomes:	
1	The students will be able to understand the working of computers.
2	The students will be able to understand the basics of Python Programming constructs
3	The students will be able to realize the need of strings, list, and tuples
4	The students will be able to design programs involving dictionaries and function.
5	The students will be able to develop simple programs using file concept and Modules

Course Code/ Course Name:	17CSP02 -PYTHON PROGRAMMING LABORATORY
Course Outcomes:	
1	The students will be able to understand the basics of Python Programming constructs
2	The students will be able to understand the various operators of Python Programming.
3	The students will be able to realize the need of string manipulation, list, and tuples
4	The students will be able to design programs involving dictionaries, function and modules
5	The students will be able to develop simple programs with exception handling



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Course Code/ Course Name:	17MEP01 - ENGINEERING GRAPHICS LABORATORY
Course Outcomes:	
1	The students will be able to construct conic sections and special curves of required specifications
2	The students will be able to apply the concept of first angle projection to create project of straight lines, planes, solids and section of solids
3	The students will be able to develop a surface drawing of a solid model with given dimensions
4	The students will be able to build orthographic, isometric projections of a three dimensional object
5	The students will be able to make use of the knowledge of engineering drawing to create physical models

SEMESTER 2:

Course Code/ Course Name:	17EYA02 - PROFESSIONAL ENGLISH- II
Course Outcomes:	
1	The students will be able to communicate using a variety of sentence structures and appropriate vocabulary.
2	The students will be able to comprehend conversations and short talks delivered in English and respond accordingly
3	The students will be able to speak appropriately and effectively in various situations.
4	The students will be able to employ active reading strategies to understand texts at the maximum level.
5	The students will be able to equip themselves with writing formal letters and winning Job Application.

Course Code/ Course Name:	17MYB02 - COMPLEX ANALYSIS AND LAPLACE TRANSFORMS
Course Outcomes:	
1	The student will be able to predict the suitable method to solve second and higher order differential equations
2	The student will be able to apply the concepts of Differentiation and Integration to Vectors.




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3	The student will be able to compute an analytic function, when its real or imaginary part is known.
4	The student will be able to identify the Singularities and its corresponding Residues for the given function.
5	The student will be able to predict a suitable method to evaluate the Contour integration.

Course Code/ Course Name:	17PYB04 – APPLIED PHYSICS
Course Outcomes:	
1	The student will be able to acquire knowledge about electron theory of metals and conductivity
2	The student will be able to distinguish between conductors, semiconductors and super conductors
3	The student will be able to understand the magnetism and its applications
4	The student will be able to design various optoelectronic devices
5	The student will be able to aware of recent trends in nanotechnology

Course Code/ Course Name:	17CYB04 – CHEMISTRY FOR COMPUTER ENGINEERS
Course Outcomes:	
1	The student will be able to apply knowledge of fundamental principles of chemistry.
2	The student will be able to define and solve engineering problems, including the utilization of creative and innovative skills.
3	The student will be able to gain practical experience with chemical process equipment as well as to analyze and interpret data.
4	The student will be able to understand the impact of engineering solutions in a global, economic, environmental and societal content.
5	The student will be able to understand the management of electronic waste.




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Course Code/ Course Name:	17CSC03 – STRUCTURED PROGRAMMING
Course Outcomes:	
1	The student will be able to understand the terminology used in computer programming.
2	The student can use different data types and operators in a computer program.
3	The student will be able to design programs involving decision structures and loops.
4	The student will be able to write programs using arrays and strings.
5	The student will be able to develop programs using functions by different parameter passing techniques

Course Code/ Course Name:	17ECC04 – BASICS OF ELECTRONICS ENGINEERING
Course Outcomes:	
1	The Students can apply the Ohm's law and Kirchoff's law and investigates the behavior of electric circuits by analytical techniques.
2	The Students will be able to analyze and forecast the Network theorems in DC and AC circuits.
3	The Students will be able to understand the characteristics of semiconductor devices
4	The students will be able to understand the concept of rectifiers, filters and amplifiers
5	The students will be able to design transducers, measuring instruments and logic circuits.

Course Code/ Course Name:	17CSP03 – STRUCTURED PROGRAMMING LABORATORY
Course Outcomes:	
1	The student will be able to implement programs using decision making statements and looping
2	The student will be able to write simple programs on arrays of different dimensions.
3	The student will be able to develop function programs using recursion and pointers.
4	The student will be able to design structure and union programs
5	The student will be able to handle memory locations manually using dynamic memory allocation functions



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Course Code/ Course Name:	17ECP02 – ELECTRONICS LABORATORY
Course Outcomes:	
1	The Students can be able to analyze the characteristics of diodes and transistors.
2	The Students will be able to evaluate the characteristics of electronic devices such as BJT,FET and UJT
3	The Students will be able to verify the Half wave and Full wave Rectifier.
4	The students will be able to verify the theorems such as Thevenin's theorem, Norton theorems, KVL and KCL
5	The Students will be able to verify the Logic Gates.

SEMESTER III

Course Code/ Course Name:	17MYB04 – PROBABILITY AND STATISTICS
Course Outcomes:	
1	The students will be able to infer expectation, variance, standard deviation moments and moment generating function for discrete and continuous random variables.
2	The students will be able to apply the concept of expectation and moment generating functions to discrete and Continuous distributions and find the probability values for the defined distributions.
3	The students will be able to Acquire skills in handling situations involving more than one random variable and functions of random variables
4	The students will be able to select a hypothesis testing method for the given numerical set of data to analyze the significance
5	The students will be able to apply analysis of Variance for the data set of selected number factors for analyzing the significance.

Course Code/ Course Name:	17CSC04 – DATA STRUCTURES USING PYTHON
Course Outcomes:	
1	The students will be able to recall and familiarize python programming and implement Stack ADT.
2	The students will be able to compare the performance of our linked list implementation with Python's list implementation.
3	The students will be able to implement the ADTs queue, and deque using Python lists.
4	The students will be able to implement trees using classes and references.
5	The students will be able to design graph abstract data type using multiple internal representations.




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Course Code/ Course Name:	17ITC01 – OOPS USING JAVA
Course Outcomes:	
1	The students will be able to understand the basics of object oriented concepts in java.
2	The students will be able to develop applications using inheritance, packages and interfaces.
3	The students will be able to construct applications with exception handling.
4	The students will be able to build applications using threads and collection framework
5	The students will be able to build simple java application with neat GUI and database connectivity

Course Code/ Course Name:	17ITC02 – COMPUTER ARCHITECTURE AND ORGANIZATION
Course Outcomes:	
1	The students will be able to define the Purpose of functional units of the System
2	The students will be able to solve basic binary math operation
3	The students will be able to understand the variety of memory technologies
4	The students will be able to apply the appropriate interfacing techniques for the project
5	The students will be able to describe the instruction execution and Pipelining

Course Code/ Course Name:	17ECC22 – DIGITAL ELECTRONICS AND MICROPROCESSOR
Course Outcomes:	
1	The students will be able to understand the knowledge about Simplification of the Boolean equations by K-Map method.
2	The students will be able to Design/ test a Combinational and Sequential logic system using gates
3	The students will be able to Identify the basic elements and functions of simple microprocessor.
4	The students will be able to design programs in microprocessor to perform various tasks.
5	The students will be able to understand the advanced multicore processor architectures.



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Course Code/ Course Name:	17ITP01 – OOPS USING JAVA LABORATORY
Course Outcomes:	
1	The students will be able to create simple java programs using basic programming elements in java.
2	The students will be able to develop applications using inheritance, packages and interfaces.
3	The students will be able to construct applications with exception handling.
4	The students will be able to build applications using threads and collection framework
5	The students will be able to build simple java application with neat GUI and database connectivity

Course Code/ Course Name:	17ECP05 – DIGITAL ELECTRONICS AND MICROPROCESSOR LABORATORY
Course Outcomes:	
1	The students will be able to understand the knowledge about Simplification of the Boolean equations by K-Map method.
2	The students will be able to Design/ test a Combinational and Sequential logic system using gates
3	The students will be able to Identify the basic elements and functions of simple microprocessor.
4	The students will be able to design programs in microprocessor to perform various tasks.
5	The students will be able to understand the interfacing of different devices to the microprocessor.

SEMESTER IV:

Course Code/ Course Name:	17MYB08 – DISCRETE MATHEMATICS
Course Outcomes:	
1	The students will be able to rephrase real world statements as logical propositions and demonstrate whether the proposition is satisfiable, tautology or a contradiction.
2	The students will be able to infer whether a logical argument is valid from the given set of premises by applying the inference rules of predicate calculus.
3	The students will be able to show mathematical reasoning and arrive at conclusions about sets and relations.
4	The students will be able to construct the number of arrangements and selections using the principles of counting.
5	The students will be able to avail the concept of Lattices and its properties.




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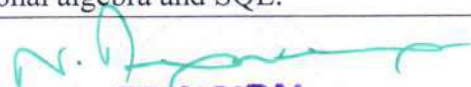
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Course Code/ Course Name:	17ITC04 – DESIGN AND ANALYSIS OF ALGORITHMS
Course Outcomes:	
1	The students will be able to analyze worst, best and average case running times of algorithms using asymptotic notations.
2	The students will be able to use different sorting techniques such as heap sort, merge sort, and quick sort.
3	The students will be able to design dynamic-programming algorithms and apply them to test for optimality.
4	The students will be able to analyze the complexities of various problems in different domain.
5	The students will be able to find solutions for problems that are difficult to solve algorithmically.

Course Code/ Course Name:	17ITC05 – COMPUTER NETWORKS AND INTERNETS
Course Outcomes:	
1	The students will be able to acquire the knowledge of network layered models, network communication using the layered concept, and able to compare and contrast Open System Interconnect (OSI) and the Internet Model.
2	The students will be able to examine the role of protocols in networking.
3	The students will be able to do about internetworking principles and how the Internet protocols IP, IPv6 and ICMP operate. Are aware of the routing protocols used on the Internet such as RIP, OSPF, and BGP
4	The students will be able to familiar with the protocols and understanding the concept of Congestion control and its algorithm.
5	The students will be able to Analyze the features and operations of various application layer protocols such as Http, DNS and SMTP.

Course Code/ Course Name:	17CSC07 – DATABASE MANAGEMENT SYSTEM
Course Outcomes:	
1	The students will be able to identify suitable data models for real time application and conceptualize a database system using ER Diagram
2	The students will be able to write queries in relational algebra and SQL.




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3	The students will be able to normalize the database design.
4	The students will be able to choose storage structure and process/optimize Queries.
5	The students will be able to apply concepts of query processing, transaction processing, and concurrency control.

Course Code/ Course Name:	17ITC06 – OPERATING SYSTEM PRINCIPALS
Course Outcomes:	
1	The students will be able to learn various Scheduling algorithms.
2	The students will be able to justify the principles of concurrency.
3	The students will be able to analyze deadlock, prevention and avoidance algorithms.
4	The students will be able to compare and contrast various memory management schemes.
5	The students will be able to implement a prototype file systems

Course Code/ Course Name:	17ITC07 – SOFTWARE ENGINEERING
Course Outcomes:	
1	The students will be able to use the process models related to their projects
2	The students will be able to design their project using design concepts.
3	The students will be able to realize and Model software system.
4	The students will be able to testing the different kinds of application according to their project.
5	The students will be able to manage project schedule, estimate project cost and effort required.

Course Code/ Course Name:	17ITP02 – COMPUTER NETWORKS AND INTERNETS LABORATORY
Course Outcomes:	
1	The students will be able to understand the working of network components.
2	The students will be able to understand Implementing networking protocols of various OSI layers in C / C++ / Java
3	The students will be able to realize the need of Studying client – server programming using TCP and UDP sockets.
4	The students will be able to understand important command line utilities involved in computer networks



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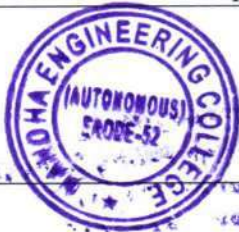
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Course Code/ Course Name:	17CSP05 – DATABASE MANAGEMENT SYSTEM LABORATORY
Course Outcomes:	
1	The students will be able to define database with various integrity constraints.
2	The students will be able to working with various DDL, DML queries.
3	The students will be able to create various views and make use of various types of joins and procedures and functions
4	The students will be able to do conceptual design using E-R model and normalize the design.
5	The students will be able to work with real time data base connectivity

Course Code/ Course Name:	17ITP03 – OPERATING SYSTEM PRINCIPLES LABORATORY
Course Outcomes:	
1	The students will be able to implement deadlock avoidance, and Detection Algorithms.
2	The students will be able to compare the performance of various CPU Scheduling Algorithm
3	The students will be able to critically analyze the performance of the various page replacement algorithms.
4	The students will be able to create processes and implement IPC.
5	The students will be able to creating threads and implement synchronization

SEMESTER V:

Course Code/ Course Name:	17ECC12 – DIGITAL SIGNAL PROCESSING
Course Outcomes:	
1	The Students can apply DFT and FFT for the analysis of digital signals & systems.
2	The students will be able to design and implement digital FIR filters.
3	The students will be able to design and implement digital IIR filters.
4	The students will be able to characterize finite Word length effect on filters.
5	The Students can apply real time applications.



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Course Code/ Course Name:	17ITC09 – INTERNET AND WEB PROGRAMMING
Course Outcomes:	
1	The students will be able to design a web page using HTML and CSS
2	The students will be able to make use of JavaScript client side coding
3	The students will be able to apply servlets for their web development
4	The students will be able to make use of JSP
5	The students will be able to make use of XML and Web Services

Course Code/ Course Name:	17ITC10 – OBJECT ORIENTED ANALYSIS AND DESIGN
Course Outcomes:	
1	The students will be able to interpret the object basics and object oriented life cycle
2	The students will be able to identify the classes and their relationships and methodologies
3	The students will be able to develop the UML diagrams for various projects
4	The students will be able to construct various UML models using the appropriate notation.
5	The students will be able to recognize need of software quality and testing.

Course Code/ Course Name:	17ITC11 – COMPUTER GRAPHICS AND MULTIMEDIA
Course Outcomes:	
1	The students will be able to implement two and three dimensional graphical structures
2	The students will be able to enhance the perspective of modern computer system
3	The students will be able to utilize 3Dimensional transformation, projections and various visible surface algorithms
4	The students will be able to gain knowledge of different media streams
5	The students will be able to determine the design practice used in multimedia authoring tools

Course Code/ Course Name:	17ITP04 – CASE TOOLS LABORATORY
Course Outcomes:	
1	The students will be able to design and implement Object Oriented Concepts
2	The students will be able to use the UML and Design Diagrams
3	The students will be able to design the UML Diagrams



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4	The students will be able to create code from UML Diagrams
5	The students will be able to compare and contrast various design techniques

Course Code/ Course Name:	17ITP05 – COMPUTER GRAPHICS AND MULTIMEDIA LABORATORY
Course Outcomes:	
1	The students will be able to create the basic shapes such as lines, circle and ellipse.
2	The students will be able to create the 3D graphical scenes using open graphics library suits
3	The students will be able to apply the transformations to the basic shapes and various clipping algorithms.
4	The students will be able to design animation sequences using Open source animation Software.
5	The students will be able to create videos using video editing Software.

SEMESTER VI:

Course Code/ Course Name:	17CSC09 – ARTIFICIAL INTELLIGENCE
Course Outcomes:	
1	The students will be able to understand the fundamentals of knowledge representation of agents.
2	The students will be able to an ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
3	The students will be able to understand the representation of states, algorithm for planning and real world problems.
4	The students will be able to analysis and compare the different learning process and apply to the probability theory.
5	The students will be able to understand the different limitations of current Artificial Intelligence techniques.



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Course Code/ Course Name:	17ITC13 – COMPILER DESIGN
Course Outcomes:	
1	The students will be able to describe each phase of compilation process
2	The students will able to solve the NFA and DFA.
3	The students will be able to implement the parsing techniques including Bottom-up and Top-down parsing for the given grammar
4	The students will be able to design experiments for Intermediate Code Generation in compiler
5	The students will be able to learn how to optimize and effectively generate machine codes

Course Code/ Course Name:	17ITC14 – CRYPTOGRAPHY AND NETWORK SECURITY
Course Outcomes:	
1	The students will be able to understand the requirement and concepts of security system.
2	The students will be able to analyze a given system with respect to security concepts.
3	The students will be able to create an understanding of public key cryptosystems and ability to solve Hash Functions & Digital Signature.
4	The students will be able to apply the System Security concepts to overcome the attacks.
5	The students will be able to design Secure Authentication Protocols, Email and IP Security.

Course Code/ Course Name:	17CSP09 – INTERNET OF THINGS LABORATORY
Course Outcomes:	
1	The students will able to gain programming knowledge in microcontroller.
2	The students will able to outline the basics of IoT applications.
3	The students will able to categorize and know to implement various sensors
4	The students will able to assess their own IoT applications and deploy it.
5	The students will able to compare the data and visualize the data received from sensors.




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SEMESTER VII:

Course Code/ Course Name:	17GEA01 – ENGINEERING ECONOMICS AND FINANCIAL ACCOUNTING
Course Outcomes:	
1	The students will be able to know the importance of Engineering Economics and Principles of Micro and Macro Economics.
2	The students will be able to estimate the market position with the knowledge in demand forecasting and supply.
3	The students will be able to develop and estimate cost for any project.
4	The students will be able to fix the price of the product with the knowledge in different market structure and taxation design.
5	The students will be able to analyze the financial statement to determine the optimal managerial decisions.

Course Code/ Course Name:	17ITC15 – MACHINE LEARNING TECHNIQUES
Course Outcomes:	
1	The students will be able to explain the concepts of supervised, unsupervised and semi-supervised learning
2	The students will be able to apply the appropriate machine learning strategy for any given problem
3	The students will be able to suggest supervised, unsupervised or semi-supervised learning algorithms for any given problem
4	The students will be able to design systems that uses the appropriate graph models of machine learning
5	The students will be able to modify existing machine learning algorithms to improve classification efficiency

Course Code/ Course Name:	17CSC18 – FULL STACK DEVELOPMENT
Course Outcomes:	
1	The students will be able to understand and develop web page using HTML and CSS
2	The students will be able to design and develop front end application using JavaScript
3	The students will be able to design and develop front end application using Bootstrap.




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4	The students will able to implement MVC and responsive design to scale well across PC, tablet and Mobile Phone using jQuery.
5	The students will able to implement MVC and responsive design to scale well across PC, tablet and Mobile Phone using jQuery Mobile.

Course Code/ Course Name:	17ITP06 – MACHINE LEARNING TECHNIQUES LABORATORY
Course Outcomes:	
1	Get the knowledge to work in the Python packages.
2	Leverage the full power of the scikit- learn API.
3	Use specific regression, classification, and clustering models skillfully to model their data and solve problems
4	Able to design a neural network with Tensor Flow.
5	Able to complete Mini Project for a classification problem.

Course Code/ Course Name:	17ITD01 – PROJECT WORK 1
Course Outcomes:	
1	The students will be able to demonstrate a sound technical knowledge of their selected project topic.
2	The students will be able to undertake problem formulation and solution legally for the sustainable development.
3	The students will be able to develop an attitude of team work and independent working on real time problems.
4	The students will be able to design engineering solutions to complex problems based on engineering and management principles.
5	The students will be able to communicate with engineers and the community at large in written and oral forms.



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SEMESTER VIII

Course Code/ Course Name:	17ITD02 – PROJECT WORK II
Course Outcomes:	
1	The students will be able to demonstrate a sound technical knowledge of their selected project topic.
2	The students will be able to undertake problem formulation and solution legally for the sustainable development.
3	The students will be able to develop an attitude of team work and independent working on real time problems.
4	The students will be able to design engineering solutions to complex problems based on engineering and management principles.
5	The students will be able to communicate with engineers and the community at large in written and oral forms.

PROGRAMME SPECIFIC ELECTIVES

Course Code/ Course Name:	17ITX01 – DATA SCIENCE AND BIG DATA ANALYTICS
Course Outcomes:	
1	The students will be able to understand the basic terminology of Data Science
2	Students will get knowledge about the basic terminology of Big 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



N. Anand
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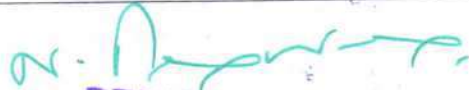
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Course Code/ Course Name:	17ITX02 – ADVANCED DATABASE MANAGEMENT SYSTEM
Course Outcomes:	
1	The students will be able to model procedural and structured query language.
2	The students will be able to classify how transactions are processed in a database.
3	The students will be able to assess the concepts of Distributed Databases and Data Warehousing and some database security issues.
4	The students will be able to analyze different techniques in Concurrency Control, Tune and Optimize some Database applications.
5	The students will be able to organize various kinds of database.

Course Code/ Course Name:	17ITX03 – OBJECT ORIENTED DATABASE MANAGEMENT SYSTEM
Course Outcomes:	
1	The student will be able to model basic concepts of relational databases.
2	The student will be able to analyze relational model in non-normalized structure.
3	The student will be able to evaluate object hierarchies.
4	The student will be able to assess the relation between the OQL and EOQL.
5	The student will be able to acquire knowledge aboutoo database management System Architecture.

Course Code/ Course Name:	17ITX04 – DATA MINING AND WAREHOUSING
Course Outcomes:	
1	The students will be able to describe the fundamental concepts, benefits and problem areas associated with data warehousing
2	The students will be able to describe OLAP and data mining as techniques for extracting knowledge from a data warehouse.
3	The students will be able to process raw data to make it suitable for various data mining algorithms.
4	The students will be able to measure interesting patterns from different kinds of databases.
5	The students will be able to apply the techniques of clustering, classification, association finding, feature selection and visualization to real world data.




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Course Code/ Course Name:	17ITX05 – PHP PROGRAMMING
Course Outcomes:	
1	The students will be able to create programs that include if, else, switch, for, while, and do loops to process statements repeatedly
2	The students will be able to write simple PHP code to perform some functionality for a web application
3	The students will be able to design and implement a typical static web pages and interactive, dynamic web applications
4	The students will be able to know the Object oriented programming techniques in PHP
5	The students will be able to build, populate, and access a database through server side programming to provide data access for a web application.

Course Code/ Course Name:	17ITX06 – PROGRAMMING WITH JAVA2 ENTERPRISE EDITION
Course Outcomes:	
1	The students will be able to design GUI components with Java FX.
2	The students will be able to develop database applications using JDBC.
3	The students will be able to implement Java networking APIs.
4	The students will be able to develop JSP and Servlet application.
5	The students will be able to learn Java Reflection API and XML.

Course Code/ Course Name:	17ITX07 – ADVANCED WEB PROGRAMMING
Course Outcomes:	
1	The students will be able to design a web page using Bootstrap
2	The students will be able to make use of Bootstrap grids.
3	The students will be able to demonstrate use Node JS outside of web browser
4	The students will be able to make use of Angular JS for web page designing.
5	The students will be able to make use of AJAX in web page development.



N. Anand
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Course Code/ Course Name:	17ITX08 – C# and .NET
Course Outcomes:	
1	The students will be able to explain the .NET framework.
2	The students will be able to explain how c# fits into the .NET Platform.
3	The students will be able to analyze the basic structure of a C# application and to develop real time application
4	The students will be able to debug, compile, and run a simple web based application on .NET.
5	The students will be able to develop programs using C# on.NET.

Course Code/ Course Name:	17ITX09 – RUBY PROGRAMMING
Course Outcomes:	
1	The students will be able to recall and describe basic of ruby programming.
2	The students will be able to know the concepts of operators, statements and control structures.
3	The students will be able to develop a program based on classes and modules
4	The students will be able to generate a Meta programming.
5	The students will be able to design a Ruby environment

Course Code/ Course Name:	17ITX10 – MOBILE COMMUNICATION
Course Outcomes:	
1	The students will be able to understand GSM, CDMA concepts and architecture, frame structure, system capacity, services provided.
2	The students will be able to understand the Study of evolution of mobile communication generations 2G, 2.5G, 3G with their characteristics and limitations.
3	The students will be able to analyze the Understand emerging technologies required for fourth generation mobile systems such as SDR, MIMO etc.
4	The students will be able to understand different indoor and outdoor propagation models related to losses and different types of fading
5	The students will be able to have overview of wireless systems.




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Course Code/ Course Name:	17ITX11 – PRINCIPLES OF CLOUD COMPUTING
Course Outcomes:	
1	The students will be able to outline the basic terminologies of cloud computing
2	The students will be able to outline the different virtualization techniques
3	The students will be able to apply security features to their cloud application
4	The students will be able to experiment with Hadoop and Map Reduce
5	The students will be able to rephrase the extension of cloud in smart devices and also its future.

Course Code/ Course Name:	17ITX12 – ETHICAL HACKING
Course Outcomes:	
1	The students will be able to realize the basic hacking tricks.
2	The students will be able to familiar about hack networking, web and password.
3	The students will be able to categorize the types of hacking attacks.
4	The students will be able to apply security threats and Hacking Techniques.
5	The students will be able to develop knowledge of contemporary cyber security issues, and use techniques, skills and modern engineering tools necessary for computer security engineering practice.

Course Code/ Course Name:	17ITX13 – SOCIAL MEDIA NETWORK ANALYSIS
Course Outcomes:	
1	The students will be able to develop semantic web related applications
2	The students will be able to represent knowledge using ontology
3	The students will be able to realize and Predict human behavior in social web and related communities
4	The students will be able to Visualize Web Social Networks.
5	The students will be able to personalize and develop Web Linkage Mining.



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Course Code/ Course Name:	17ITX14 – SOFTWARE TESTING
Course Outcomes:	
1	The students will be able to apply the concepts in software testing.
2	The students will be able to implement the concepts of manual testing.
3	The students will be able to design the test cases and to getting familiarity over major testing team process.
4	The students will be able to apply the testing tools exposure in real time applications.
5	The students will be able to use the testing tools to check the behavior of the real time application using management tools.

Course Code/ Course Name:	17CSX19 – SOFTWARE AGENTS
Course Outcomes:	
1	The students will be able to define the characteristics of an intelligent agent.
2	The students will be able to identify agents for learning and assistance.
3	The students will be able to describe the communication and collaboration among agents.
4	The students will be able to understand Agent architectures.
5	The students will be able to use agent development environment to develop the project.

Course Code/ Course Name:	17ITX15 – INFORMATION STORAGE MANAGEMENT
Course Outcomes:	
1	The students will be able to explain the concepts of Storage technology.
2	The students will be able to explain the storage system architecture.
3	The students will be able to realize the Understand network storage concepts.
4	The students will be able to explain Virtualization.
5	The students will be able to develop and Understand the concepts of Information storage on cloud.




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Course Code/ Course Name:	17CSX11 – HUMAN COMPUTER INTERACTION
Course Outcomes:	
1	The students will be able to explain the capabilities of both humans and computers from the viewpoint of human information processing
2	The students will be able to describe the typical human–computer interaction (HCI) models, styles, and various historic HCI paradigms
3	The students will be able to apply an interactive design process, standards, guidelines and universal design principles to designing HCI systems.
4	The students will be able to analyze and identify user models, user support, socio-organizational issues, and stakeholder requirements of HCI systems.
5	The students will be able to analyze and discuss HCI issues in groupware, ubiquitous computing, virtual reality, multimedia, and Word Wide Web-related environments.

Course Code/ Course Name:	17ITX16 – COMPOSING MOBILE APPS
Course Outcomes:	
1	The student will be able to outline the basics of mobility and scape.
2	The student will be able to rephrase about user interface designing and native data handling.
3	The student will be able to make use of add on features such as native hardware play, location awareness, graphics, and Multimedia.
4	The student will be able to experiment with various testing techniques available
5	The student will be able to summarize the techniques of apps marketing.

Course Code/ Course Name:	17ITX17 – BUILDING ENTERPRISE APPLICATIONS
Course Outcomes:	
1	The students will be able to outline the basics of enterprise applications.
2	The students will be able to demonstrate the enterprise applications further
3	The students will be able to experiment with various architectures and designs of enterprise applications
4	The students will be able to construct enterprise applications
5	The students will be able to measure the quality of enterprise applications




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Course Code/ Course Name:	17ITX18 – BUSINESS INTELLIGENCE
Course Outcomes:	
1	The students will be able to explain the technology and process associated with Business Intelligence.
2	The students will be able to explain the methodology and technology.
3	The students will be able to identify various models and their efficiencies.
4	The students will be able to learn the business intelligence application.
5	The students will be able to know about the scope of BI.

Course Code/ Course Name:	17ITX19 – INFORMATION SECURITY MANAGEMENT
Course Outcomes:	
1	The students will be able to explain the Security Baselines
2	The students will be able to explain the Roles of Computer Forensics and the Law in Information Security
3	The students will be able to explain management's role in information security
4	The students will be able to design programs involving security and privacy issues
5	The students will be able to design without risk

Course Code/ Course Name:	17ITX20 – FINITE AUTOMATA
Course Outcomes:	
1	The students will learn the key properties of formal languages and finite automata
2	The students will be able to design and describe the strings recognized by regular languages.
3	The students will be able to understand the properties of context-free languages and grammars
4	The students will be able to design a turing machine and push down automata that accomplish a specific task.
5	The students will be able to demonstrate the undecidable and intractable classes of problems




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Course Code/ Course Name:	17CSX20 – SOFTWARE QUALITY ASSURANCE
Course Outcomes:	
1	The students will be able to understand the quality and configuration management processes.
2	The students will be able to demonstrate the various activities of quality planning and quality control.
3	The students will be able to analyze the software metrics and apply the quality tools in software development.
4	The students will be able to analyze the software configuration standards and activities
5	The students will be able to compare the ISO 9000 Model with SEI's CMM Level 5.

Course Code/ Course Name:	17ITX21 – KNOWLEDGE MANAGEMENT TECHNIQUES
Course Outcomes:	
1	The students will be to use the Knowledge management tools.
2	The students will be to identify technologies that are most useful for capturing/acquiring, organizing, distributing, and sharing knowledge within an enterprise.
3	The students will be to develop knowledge management Applications.
4	The students will be to explain how to formulate a knowledge management strategy, identify major requirements
5	The students will be to design and develop enterprise applications.

Course Code/ Course Name:	17ITX22 – ENTERPRISE RESOURCE PLANNING
Course Outcomes:	
1	The students will be able to outline the overview and history of ERP
2	The students will be able to explain implementation strategies of ERP
3	The students will be able to summarize the supports provided for ERP
4	The students will be able to make use of different ERP function modules
5	The students will be able to classify the technology areas of ERP




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Course Code/ Course Name:	17CSX22 – NATURAL LANGUAGE PROCESSING
Course Outcomes:	
1	The students will be able to tag text with basic Language processing features
2	The students will be able to design an innovative application using NLP components.
3	The students will be able to implement a rule based system to tackle morphology/syntax of a Language.
4	The students will be able to design a tag set to be used for statistical processing keeping an application in mind.
5	The students will be able to design a Statistical technique for a new application.

Course Code/ Course Name:	17ITX23 – TEXT MINING TECHNIQUES
Course Outcomes:	
1	The students will be to analyze the natural language text.
2	The students will be to generate the document text.
3	The students will be to do machine translation.
4	The students will be to apply information retrieval techniques.
5	The students will be to develop Text Language Generator

Course Code/ Course Name:	17ITX24 – DISTRIBUTED SYSTEMS CONCEPTS AND DESIGN
Course Outcomes:	
1	The students will be able to describe the foundations of distributed systems, design issues and distributed computations.
2	The students will be able to distinguish various synchronization issues and global state for distributed systems.
3	The students will be able to relate the Mutual Exclusion and Deadlock detection algorithms in distributed systems
4	The students will be able to describe the agreement protocols and fault tolerance mechanisms in distributed systems.
5	The students will be able to outline the features of peer-to-peer and distributed shared memory systems.




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ERODE – 638 052 TAMILNADU

Email: principal@nandhaengg.org Mobile : 73737 12234

Course Code/ Course Name:	17ITX25 – VIDEO PROCESSING AND ANALYTICS
Course Outcomes:	
1	The students will be able to learn fundamental concepts of Java.
2	The students will be able to design concepts with inheritance.
3	The students will be able to implement exception handling and Files.
4	The students will be able to create threads and interfaces in Java classes.
5	The students will be able to implement GUI and generics concepts.

Course Code/ Course Name:	17MYB12 – BASIC STATISTICS AND NUMERICAL ANALYSIS
Course Outcomes:	
1	The students will be able to use statistical tools to solve problems from different fields.
2	The students will be able to acquaint the basic concepts in numerical methods and their uses.
3	The students will be able to represent the data and find the intermediate values, when huge amounts of experimental data are involved, the methods discussed on interpolation will be useful in constructing approximate polynomial.
4	The students will be able to explain the consequences of finite precision and the inherent limits of the numerical methods considered and by using differentiation and integration.
5	The students will be able to understand the solution of ordinary differential equations will be useful in attempting any engineering problem.

Course Code/ Course Name:	17ITX26 – 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.



N. Anand
PRINCIPAL
Nandha Engineering College
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Course Code/ Course Name:	17CSX31 – 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:	17ECX16 – INTERNET OF THINGS AND ITS APPLICATIONS
Course Outcomes:	
1	The students will be able to understand basics of Electrical circuits and Electronic devices
2	The students will be able to understand IOT characteristics and its essential components.
3	The students will be able to describe Arduino processor and working of Analog and Digital I/O pins
4	The students will be able to understand Raspberry pi and its interface with other devices
5	The students will be able to implement a IoT system using Arduino/Raspberry Pi.

Course Code/ Course Name:	17CSX29 – INTERNET OF THINGS
Course Outcomes:	
1	The students will be able to explain the internal architecture of microcontroller and the concepts and the cause of technology.
2	The students will be able to classify the sensors and controller as part of IoT.
3	The students will be able to plan a communication framework with fog computing.
4	The students will be able to plan the data analytical and data visualization platforms
5	The students will be able to discover knowledge on security in IoT.




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Course Code/ Course Name:	17ITX27 – 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 Python for manipulating data.
5	Students will be able to apply tool like Tableau to visualize data.

Course Code/ Course Name:	17ITX28 – AGILE SOFTWARE DEVELOPMENT
Course Outcomes:	
1	Deploy automated build tools and continuous integration
2	Explain the concepts of agile scrum framework
3	Drive development with unit tests using Test Driven Development
4	Apply design principles and refactoring to achieve Agility
5	Deploy different industrial trends of agile technologies



N. Arumugam
PRINCIPAL
Nandha Engineering College
(Autonomous)
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MECHANICAL ENGINEERING



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Email: principal@nandhaengg.org Mobile : 73737 12234

Regulation :	R17
Program Code :	ME
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 prefer career paths in teaching or 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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PROGRAM SPECIFIC OUTCOMES (PSOs) OF THE DEPARTMENT:

Graduates should be able to

PSO1:	Ability to update knowledge of faculty members in their area of specialization.
PSO2:	Ability to apply strategies for continual improvement of Mechanical Engineering programme.
PSO3:	Ability to infuse research activities in Mechanical Engineering.
PSO4:	Ability to become aware of environmental and social aspects through extracurricular activities.





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SEMESTER 1:

Course Code/ Course Name:	17EYA01 - PROFESSIONAL ENGLISH - I
Course Outcomes:	
1	The students will be able to construct clear, grammatically correct sentences using a variety of sentence structures and appropriate vocabulary.
2	The students will be able to utilize listening skills to articulate one's own point of view in different circumstances.
3	The students will be able to apply appropriate communication skills across settings, purposes, and audiences.
4	The students will be able to distinguish main ideas and supporting details and employ active reading strategies to understand texts at the maximum level.
5	The students will be able to equip themselves with writing skills needed for academic as well as workplace contexts.

Course Code/ Course Name:	17MYB01 Calculus and Solid Geometry
Course Outcomes:	
1	Apply the concept of orthogonal reduction to diagonalise the given matrix
2	Have knowledge about the geometrical aspects of sphere.
3	Find the radius of curvature, circle of curvature and centre of curvature for a given curve.
4	Classify the maxima and minima for a given function with several variables, through by finding stationary points.
5	Demonstrate the use of double and triple integrals to compute area and volume.

Course Code/ Course Name:	17PYB01 - PHYSICS FOR ENGINEERS
Course Outcomes:	
1	Knowledge regarding acoustics and ultrasonic Acquire
2	Applying knowledge in the fields of optics and laser technology
3	Design the sensors using the knowledge of fiber optics
4	Gain the knowledge of wave, particle nature and matter waves
5	Analyze the different kind of crystal structures and crystal growth





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Course Code/ Course Name:	17CYB01 – APPLIED CHEMISTRY
Course Outcomes:	
1	Apply knowledge of fundamental principles of chemistry
2	Define and solve engineering problems, including the utilization of creative and innovative skills
3	Gain practical experience with chemical process equipment as well as to analyze and interpret data
4	Understand the impact of engineering solutions in a global, economic, environmental and societal content
5	Understand the concept of engineering materials

Course Code/ Course Name:	17MEC01 ENGINEERING GRAPHICS
Course Outcomes:	
1	The Students can be able to construct conic sections and special curves of required specifications.
2	The Students can be able to apply the concept of first angle projection to create project of straight lines, planes, solids and section of solids.
3	The Students can be able to develop a surface drawing of a solid model with given dimensions.
4	The Students can be able to build orthographic, isometric projections of a three dimensional object.
5	The Students can be able to make use of the knowledge of engineering drawing to create physical models.

Course Code/ Course Name:	17ECC02 Basic Electrical, Electronics and Instrumentation Engineering
Course Outcomes:	
1	The Students will be able to solve electric circuits by using electric laws and theorems.
2	The Students will be able to identify the electrical components and explore the characteristics of electrical machines
3	The Students will be able to identify the various electronic devices and understand the principles of working of the semiconductor devices.
4	The Students will be able to explain working of rectifiers, filters and amplifiers.
5	The Students will be able to choose appropriate instruments for electrical measurement for a specific application.





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Course Code/ Course Name:	17GYP01 Physics and Chemistry Laboratory
Course Outcomes:	
1	The students will be able to acquire the fundamental knowledge in optics such as interference, Diffraction and Understand about the spectral instruments etc.
2	The students will be able to gain the basic knowledge about handling the laser light and Identify the basic parameters of an optical fibre.
3	The students will be able to analyze the properties of matter with sound waves.
4	The students will be able to apply knowledge of measurement of hardness producing ions, chloride, alkalinity, DO, conductance, EMF and pH.
5	The students will be able to understand the impact of water quality and solve engineering problems.

Course Code/ Course Name:	17GYP02 Engineering Practices Laboratory
Course Outcomes:	
1	The students will be able to understand various civil engineering practices like plumbing, carpentry and relevant tools.
2	The students will be able to understand various manufacturing processes like welding, machining and sheet metal work.
3	The students will be able to do residential house wiring and Measure energy and resistance to earth of an electrical equipment.
4	The students will be able to perform the assembling and testing of the PCB based electronic circuits.
5	The students will be able to make / operate / utilize the simple engineering components.

Course Code/ Course Name:	17EYA02 Professional English - II
Course Outcomes:	
1	The students will be able to communicate using a variety of sentence structures and appropriate vocabulary.
2	The students will be able to comprehend conversations and short talks delivered in English and respond accordingly.
3	The students will be able to speak appropriately and effectively in various situations.
4	The students will be able to employ active reading strategies to understand texts at the maximum level.
5	The students will be able to equip themselves with writing formal letters and winning Job Application.





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Course Code/ Course Name:	17MYB02 Complex Analysis and Laplace Transform
Course Outcomes:	
1	Predict the suitable method to solve second and higher order differential equations
2	Apply the concepts of Differentiation and Integration to Vectors.
3	Compute an analytic function, when its real or imaginary part is known.
4	Identify the Singularities and its corresponding Residues for the given function.
5	Predict a suitable method to evaluate the Contour integration.

Course Code/ Course Name:	17PYB03 Materials Physics
Course Outcomes:	
1	Understand the electrical and thermal conduction in different materials.
2	Understand magnetic properties of materials and maneuver those materials for different applications.
3	Understand the various form of heat conduction and thermal conductivity of good and bad Conductors
4	Examine the materials using different methods during the manufacturing process
5	Acquire information regarding new engineering materials and mechanical properties.

Course Code/ Course Name:	17CYB03 Environmental Science
Course Outcomes:	
1	Design a system, component, or process to meet desired needs.
2	Identify, formulate, and solve environmental engineering problems
3	Understand the professional and ethical responsibility as related to the practice of environmental engineering and the impact of engineering solutions in a global context.
4	Use the techniques, skills, and modern engineering tools necessary for environmental engineering practice.
5	Acquire the knowledge of information technology in environmental science.




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Course Code/ Course Name:	17MEC02 Engineering Mechanics
Course Outcomes:	
1	The students will be able to solve the engineering problems on stable particles using conditions for equilibrium
2	The students will be able to calculate the reaction forces of various supports and resultant forces on rigid bodies
3	The students will be able to solve the problems involving dry friction under equilibrium conditions
4	The students will be able to determine the centroid, centre of gravity and moment of inertia of various surfaces and solids
5	The students will be able to solve the problems involving dynamics of particles and rigid bodies

Course Code/ Course Name:	17CSC01 Problem Solving and Python Programming
Course Outcomes:	
1	The students will be able to understand the working of computers
2	The students will be able to solve problems using various strategies
3	The students will be able to understand the basics of Python Programming constructs
4	The students will be able to realize the need of strings, list, and tuples
5	The students will be able to design programs involving dictionaries and function

Course Code/ Course Name:	17MEP02 Computer Aided Modeling and Drafting Laboratory
Course Outcomes:	
1	The students will be able to create orthogonal views of given three dimensional object
2	The students will be able to make use of two dimensional model to represent three dimensional models
3	The students will be able to develop sectional view of various solids using drafting software
4	The students will be able to construct three dimensional model of simple objects
5	The students will be able to create 3D models of machine components





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Course Code/ Course Name:	17CSP01 Problem Solving and Python Programming Laboratory
Course Outcomes:	
1	The student will be able to use MS Word and MS Excel for document preparation.
2	The students will be able to understand the basics of Python Programming constructs
3	The students will be able to realize the need of string manipulation, list and tuples
4	The students will be able to design programs involving dictionaries, function and modules.
5	The students will be able to develop simple programs with exception handling

SEMESTER : III

Course Code/ Course Name:	17MYB03 Fourier Series and Partial Differential Equations
Course Outcomes:	
1	Ability to have fundamental understanding of Fourier series and give Fourier expansions of a given function.
2	Apply transform techniques to solve engineering problems.
3	Analyze and simulate the first and second order linear partial differential equations.
4	Demonstrate a firm understanding of the solution techniques for homogeneous linear PDE's.
5	Ability to apply partial differential techniques to solve the physical engineering problems.

Course Code/ Course Name:	17MEC03 Materials Engineering and Technology
Course Outcomes:	
1	Classify the materials and the types of defects
2	Identify the different forms of phases with respect to temperature and composition
3	Recommend suitable heat treatment method to enhance the surface characteristics of particular material
4	Measure the mechanical properties of materials using various equipment
5	Categorize the engineering applications of non-ferrous and advanced materials





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Course Code/ Course Name:	17MEC04 Engineering Thermodynamics
Course Outcomes:	
1	Describe the concepts of conservation of mass, conservation of energy, work interaction, heat transfer and first law of thermodynamics
2	Apply the concept of second law to analyze the performance of thermal equipments
3	Determine the performance characteristics of various gas power cycles
4	Demonstrate the stages in steam formation and/or analyze the properties of steam
5	Analyze the types of Psychrometric processes under various operating conditions

Course Code/ Course Name:	17MEC05 Fluid Mechanics and Machinery (Theory + Lab)
Course Outcomes:	
1	Explain the fluid properties and flow parameters
2	Analyze the complexities involved in solving the fluid flow problem
3	Demonstrate knowledge about the energy exchange process in fluid mechanics handling incompressible fluids
4	Find out the performance of various hydraulic machines
5	Analyze the performance of hydraulic pumps

Course Code/ Course Name:	17MEC06 Manufacturing Processes
Course Outcomes:	
1	Describe the principles of foundry and casting
2	Demonstrate the concept of metal forming processes for various applications
3	Select a metal joining process for various materials
4	Explain the manufacturing processes under powder metallurgy and plastics
5	Understand the manufacturing process for ceramics, glass and composite materials





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Course Code/ Course Name:	17MEP03 Manufacturing Processes Laboratory
Course Outcomes:	
1	Develop a fabricated product using welding joints
2	Create types of moulds based on the given patterns
3	Apply forging to fabricate a part with given specifications
4	Estimate the sand mould properties
5	Create sheet metal models using metal forming methods

Course Code/ Course Name:	17MEP04 Computer Aided Machine Drawing
Course Outcomes:	
1	Relate the standards of engineering drawing with machines and components
2	Develop a surface model of given product using a CAD package
3	Illustrate the steps involved in creating 3D drawings
4	Construct assembly drawing from the given part drawings
5	Interpret a drawing and identify the fit, form and functional aspects

Course Code/ Course Name:	17MYB06 Statistics and Numerical Methods
Course Outcomes:	
1	Ability to understand the common statistical techniques.
2	Apply Analysis of Variance for the data set of selected number factors for analyzing the significance
3	Apply the suitable numerical techniques to solve practical engineering problems.
4	Demonstrate the concept of interpolation and numerical integration when dealing with empirical data sets.
5	Make use of numerical methods in the solution of ordinary differential equations which are useful in solving engineering problems




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Course Code/ Course Name:	17MEC08 - KINEMATICS OF MACHINERY
Course Outcomes:	
1	Demonstrate the working of various mechanisms and machines
2	Analyze the velocity and acceleration of linkages in mechanism design
3	Select a layout of cam for specified motion in power transmission of machine elements
4	Investigate the gear drives with their selection for transmission of mechanical power in machines
5	Apply the concept of friction in various engineering applications like belt, clutch, brake etc.,

Course Code/ Course Name:	17MEC09 - THERMAL ENGINEERING SYSTEMS
Course Outcomes:	
1	Identify the various components and working of IC engine
2	Analyze the different properties of gas power cycles
3	Demonstrate the performance parameters of steam nozzles and turbines
4	Determine the various flow parameters of air compressors
5	Solve the practical problems based on Refrigeration cycles and/or explain the working of Air Conditioning systems

Course Code/ Course Name:	17MEC10 - SUBTRACTIVE MANUFACTURING PROCESSES
Course Outcomes:	
1	Describe the fundamentals of metal cutting in machining operations
2	Identify the components of lathe, milling machine and explain their functioning
3	List various machining processes such as shaping, planing, slotting and different drilling operations
4	Choose the process parameters in grinding operations, finishing operations and gear generations for the given material
5	Explain the working principles and process parameters of various Non- Traditional Machining processes




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Course Code/ Course Name:	17MEC11 - STRENGTH OF MATERIALS
Course Outcomes:	
1	Apply concepts of strength of materials to obtain solutions to real time engineering problems
2	Determine the stresses and deformations of objects under external loadings
3	Develop shear force and bending moment diagrams for various types of beams with given loading conditions
4	Find the slope and deflection of beams using double integration method, Macaulay's method, area moment theorems, conjugate beam method
5	Estimate torsional rigidity of given materials numerically using torsion equation, buckling effect of columns

Course Code/ Course Name:	17MEP05 - THERMAL ENGINEERING SYSTEMS LABORATORY
Course Outcomes:	
1	Conduct the experiments on various thermal engineering systems and analyze the performance
2	Analyze the performance of blowers, fan and internal combustion engines
3	Know how to balance the heat energy available in engine cylinder after the combustion process
4	Estimate the performance of air compressors
5	Determine performance of boiler and steam turbine

Course Code/ Course Name:	17MEP06 - SUBTRACTIVE MANUFACTURING PROCESSES LABORATORY
Course Outcomes:	
1	Machine cylindrical and prismatic parts using metal removal process
2	Estimate the cutting forces in machining operations of different materials
3	Develop gear model by using gear generation and gear hobbing processes
4	Identify the process parameters for machining various materials
5	Select a suitable machining process by considering the product requirements





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Course Code/ Course Name:	17MEC13 - DESIGN OF MACHINE ELEMENTS
Course Outcomes:	
1	Estimate the stresses acting on various machine elements by considering the operating conditions
2	Predict the variables stresses on the machine elements and/or design shafts for the given loading conditions.
3	Determine the maximum stresses acting on the temporary and/or permanent joints under static loads
4	Adapt the design procedures to select couplings and/or springs
5	Select a suitable type of bearing for the design requirements

Course Code/ Course Name:	17MEC14 - HEAT AND MASS TRANSFER
Course Outcomes:	
1	Determine the amount of heat transferred in various systems under steady state
2	Solve numerical problems on heat transfer with internal heat generation and/or transient heat transfer
3	Estimate the heat transfer coefficient and the amount of heat transferred under convection
4	Analyze the radiation heat transfer and/or heat transfer by boiling and condensation
5	Examine heat transfer in heat exchangers and/or diffusion and convective mass transfer

Course Code/ Course Name:	17MEC15 - DYNAMICS OF MACHINERY
Course Outcomes:	
1	Analyze the static and dynamic forces in mechanisms and flywheel
2	Balance the rotary and reciprocating masses of mechanical systems
3	Analyze the longitudinal vibrations of systems with single degree of freedom
4	Determine the frequency of transverse and torsional systems
5	Demonstrate the mechanism control systems like governors and gyroscopes





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Course Code/ Course Name:	17MEC16 - FLUID POWER SYSTEMS
Course Outcomes:	
1	The students will be able to list the importance of fluid power technology in industries
2	The students will be able to explain the working principles of hydraulic and pneumatic components
3	The students will be able to select the control components as per requirements
4	The students will be able to illustrate the application circuits and their components in fluid power industry
5	The students will be able to solve problems of fluid power systems in industries

Course Code/ Course Name:	17MEP08 - DYNAMICS OF MACHINERY LABORATORY
1	Measure the deflection of fixed and cantilever beams under various loading conditions
2	Determine the jump speed of given cam and plot the cam profile
3	Make use of experimental setups to find moment of inertia, natural frequency and whirling speed
4	Analyze the Characteristic curves of governors and/or gyroscopic couple
5	Adopt the methodology of dynamic balancing to determine the unbalance force and couple in rotating shafts

Course Code/ Course Name:	17MEC17 - MECHATRONICS
Course Outcomes:	
1	The students will be able to identify the elements of Mechatronics system and/or describe the working principles of controllers
2	The students will be able to recommend the suitable sensors and type of actuators to achieve the desired output motion
3	The students will be able to Discuss the architecture of microprocessor and microcontroller
4	The students will be able to demonstrate the knowledge on architecture of PLC and contrast it from PC
5	The students will be able to design Mechatronics systems with the help of Microprocessor, PLC, other Electrical and Electronics components for an engineering application





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Course Code/ Course Name:	17MEC18 - DESIGN OF TRANSMISSION SYSTEMS
Course Outcomes:	
1	Identify the design parameters of the Chain Drives and Belt Drives for power transmission
2	Recommend the suitable Gear drive for an industrial application among spur and helical gears
3	Design Bevel and Worm Gears by considering various operating conditions
4	Select the Gear Box for variable operating speeds
5	Design Clutches and Brakes for the automobiles

Course Code/ Course Name:	17MEC19 - METROLOGY AND MEASUREMENTS
Course Outcomes:	
1	Describe the limits, fits, tolerance, errors, correction and calibration
2	Explain the various methods of measuring mechanical parameters
3	Identify the types of linear and angular measurements for a component
4	Select a type of form measurement methods for an application
5	Summarize various laser metrology and its advances

Course Code/ Course Name:	17MEP09 - MECHATRONICS LABORATORY
Course Outcomes:	
1	The students will be able to simulate the electrical, hydraulic and pneumatic system using simulation software
2	The students will be able to design mechatronics system with Microprocessor, PLC and other Electrical and Electronics control
3	The students will be able to build interface between stepper motor and 8051 microcontroller
4	The students will be able to Apply the concepts of computerized data logging in mechatronics system
5	The students will be able to analyze the velocity and direction in fluid power circuits with the help of simulation software
5	The students will be able to develop the basics of linguistic tradition





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Course Code/ Course Name:	17MEC20 - CAD / CAM / CIM
Course Outcomes:	
1	Explain various CAD models, stages in geometric modeling
2	List the steps involved in 2D and 3D transformations in computer graphics
3	Summarize the steps involved in Computer Aided Manufacturing and process planning
4	Distinguish the NC, CNC and DNC systems and explain their working principles
5	Describe the importance of Computer Integrated Manufacturing and stages in production planning

Course Code/ Course Name:	17MEC21 - FINITE ELEMENT ANALYSIS
Course Outcomes:	
1	The students will be able to understand the use of the FEM to solve problems in Mechanical Engineering
2	The students will be able to use the Finite Element Method to solve one dimensional Structural and Eigen value problems
3	The students will be able to use the FEM to solve two dimensional scalar variable structural and heat transfer problems
4	The students will be able to use the FEM to solve two dimensional axisymmetric Problems and fluid mechanics problem
5	The students will be able to solve the problems involving Isoparametric, numerical integration approach

Course Code/ Course Name:	17MEC22 - POWER PLANT TECHNOLOGY
Course Outcomes:	
1	Summarize the working principles of steam power plant and Boilers
2	Describe the working of Gas Turbine power plant and their functions
3	Explain the operating principle of Nuclear Power Plant and solve the Economics problems in power plant.
4	Classify the type of energy sources and / or describe the working principle of hydroelectric power plant
5	Explain the operating principle of Power Plant and solve the Economics problems in power plant





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Course Code/ Course Name:	17MEP10 - CAD / CAM LABORATORY
Course Outcomes:	
1	Construct Three Dimensional CAD model of the machine component with given specifications
2	Develop Three Dimensional assembly model from the generated part models
3	Make use of Manual Part Programming to create the prismatic component using CNC Machining Centre
4	Apply Manual Part Programming to create cylindrical component using CNC Turning Centre
5	Create Cutter Location (CL) data and post process generation using CAM packages

Course Code/ Course Name:	17MEP11 - COMPUTER AIDED ANALYSIS LABORATORY
Course Outcomes:	
1	Solve structural analysis problems using one dimensional and two dimensional elements
2	Determine numerical solution of problem using axi-symmetric condition
3	Evaluate various model of failure of a machine component using Modal analysis
4	Apply Harmonic analysis to find the response of a structural system using simulation
5	Analyse engineering heat transfer problem under given boundary conditions

Course Code/ Course Name:	17MED01 - PROJECT WORK - I
Course Outcomes:	
1	Perform survey and infer the data to decide on area of project work
2	Formulate a problem definition in the field of Mechanical Engineering through literature survey
3	Identify the objectives of the project by thorough understanding of the problem
4	Develop methodology using appropriate tools for the problem
5	Identify the appropriate tools analyze the obtained data





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Course Code/ Course Name:	17MED02 - PROJECT WORK - II
Course Outcomes:	
1	Identify the objectives of the project by thorough understanding of the problem
2	Perform the Experimental Analysis to validate the analytical results
3	Improve the research and development activities
4	Conclude the results and submit the project report
5	Take up any challenging practical problems and find solutions

Course Code/ Course Name:	17MEX01 - COMPOSITE MATERIALS AND MECHANICS
Course Outcomes:	
1	List the types reinforcing materials and their composites
2	Recommend a manufacturing process for a composite material
3	Demonstrate the governing equations of composite laminates
4	Make use of strength analysis techniques to predict the failure of laminated plates
5	Estimate the Coefficient of Thermal Expansion of composites by selecting a thermal analysis

Course Code/ Course Name:	17MEX02 - MICRO ELECTRO MECHANICAL SYSTEMS
Course Outcomes:	
1	Explain the concept of MEMS with applications and/or working principles of microsensors and actuators
2	Identify the materials used for MEMS and Microsystems
3	Summarize the steps involved in various microsystem fabrication processes
4	Recommend a micro-manufacturing process for a particular material
5	List the stages of Microsystem packaging





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Course Code/ Course Name:	17MEX03 - ENGINEERING FAILURE ANALYSIS
Course Outcomes:	
1	Summarize the types of tools available for failure analysis and types of stresses induced under different loading conditions
2	Select the operating parameters of an equipment subjected to fatigue loading conditions
3	Analyze the failure of materials under corrosion, hydrogen exposure and creep
4	Outline the mechanisms of failure and the principles of fracture mechanics
5	Interpret the failure in various metals and alloys

Course Code/ Course Name:	17MEX04 - PRODUCT DESIGN
Course Outcomes:	
1	Describe the steps involved in product development process and product planning
2	Demonstrate the process of converting the customer requirements into technical requirements and methods of converting the requirement into product
3	Examine the ideas of concept generation for a new product and the development stages
4	Choose the architecture of the product considering various functional requirements
5	Identify the design and manufacturing constraints during product design and development process

Course Code/ Course Name:	17MEX05 - TOOL DESIGN
Course Outcomes:	
1	Determine the dimensions of single and multipoint cutting tools based on cutting forces
2	Identify the importance of work holding device
3	Design jigs and fixtures for the given work pieces
4	Calculate the required specifications of a press for required operations
5	Design tools and dies for required operations



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Course Code/ Course Name:	17MEX06 – TRIBOLOGY
Course Outcomes:	
1	Select tribological elements based on design considerations
2	Demonstrate the understanding of friction
3	Demonstrate the understanding of wear
4	Demonstrate skills to select lubricant
5	Apply the knowledge of wear and lubricants for different applications

Course Code/ Course Name:	17MEX07 - DESIGN FOR MANUFACTURING AND ASSEMBLY
Course Outcomes:	
1	Describe the manufacturing processes for various engineering materials
2	Demonstrate the design procedure for welding and forging processes.
3	Summarize the design rules for castings.
4	Contrast the design procedure for various machining processes.
5	Select the guidelines to minimize environmental impacts using recyclability and remanufacture concepts

Course Code/ Course Name:	17MEX08 - MECHANICAL VIBRATIONS
Course Outcomes:	
1	Derive the differential equation and obtain the linear mathematical model of real life Engineering systems with undamped and damped vibrations
2	Solve numerical problems on free and forced vibrations of machines, engines and structures which have single degree of freedom
3	Determine the solution for balancing problems on static and dynamic machines, rotors having two degrees of freedom and enumerate the working principles of vibration measuring instruments
4	Analyse the balancing problems numerically in multi degrees of freedom equipment
5	Apply skills in instrumentation, measurement and signal processing through vibration testing for several physical, mechanical and structural systems





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Course Code/ Course Name:	17MEX31 NEW PRODUCT DEVELOPMENT
Course Outcomes:	
1	Outline the stages in initiation of a new Product
2	Demonstrate the concept of value analysis and pricing strategies
3	Illustrate the managerial aspects during new product development
4	Interpret the manufacturing aspects during product design and development
5	Summarize the steps involved in product launching in the market

Course Code/ Course Name:	17MEX36 – BIOMECHANICS
Course Outcomes:	
1	The students will be able to utilize mechanics in medicine
2	The students will be able to explain the mechanics of physiological systems
3	The students will be able to distinguish the reason for abnormal patterns.
4	The students will be able to analyze the biomechanical systems using mathematical models
5	The students will be able to design and develop the models specific to orthopedic applications

Course Code/ Course Name:	17MEX37 - GEOMETRIC DIMENSIONING AND TOLERANCING
Course Outcomes:	
1	Communicate the drawing with standards precisely
2	Describe the cylindrical and planar feature of size
3	Able to indicate the structure of the parts using form symbols
4	Calculate the WCB of a FoS Controlled with TOP at RFS
5	Able to read the Industrial drawing of various components





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Course Code/ Course Name:	17MEX09 - FUELS AND COMBUSTION
Course Outcomes:	
1	List the type of fuels and their combustion characteristics
2	Summarize the combustion principles of various fuels and estimation methods
3	Identify the various types of emissions during combustion process and ways to minimizing emissions
4	Describe the working principle of measuring devices for combustion characteristics
5	Select the safety equipment for a particular industrial application

Course Code/ Course Name:	17MEX10 - REFRIGERATION AND AIR CONDITIONING
Course Outcomes:	
1	List the types of refrigerants and refrigeration cycles
2	Analyze the performance of vapour compression and vapour absorption refrigeration systems
3	Demonstrate an understanding on working principles of non conventional refrigeration systems and psychrometric processes
4	Identify the equipments and working principles of Air conditioning systems
5	Estimate the loads during the design of air conditioner

Course Code/ Course Name:	17MEX11 - CRYOGENIC ENGINEERING
Course Outcomes:	
1	Describe the thermodynamic analysis of cryogenic systems and their types
2	Classify the liquefaction processes for various gases
3	Explain the fundamentals of separation and purification processes
4	Select a measuring instrument to measure the parameters of cryogenic systems
5	Identify suitable Cryogenic storage and handling system for engineering applications





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Course Code/ Course Name:	17MEX12 - INTERNAL COMBUSTION ENGINES
Course Outcomes:	
1	Determine performance and combustion characteristics of SI engines
2	Summarize the combustion characteristics of CI engines
3	Estimate emissions from SI and CI engines using quantitative methods
4	Demonstrate the performance of IC engines using alternative fuels
5	Explain the recent trends in Internal combustion engines with applications

Course Code/ Course Name:	17MEX13 - GAS DYNAMICS AND JET PROPULSION
Course Outcomes:	
1	Evaluate the Mach number and describe compressibility effects, typical flow properties and wave propagation
2	Demonstrate the behavior of flow through variable area ducts
3	Solve numerical problems on Rayleigh and Fanno flow
4	Describe the concept of normal and oblique shock in compressible fluid flow
5	Explain the working principle of the rocket propulsion and various propellants

Course Code/ Course Name:	17MEX14 - COMPUTATIONAL FLUID DYNAMICS
Course Outcomes:	
1	Demonstrate the governing equations for various problems
2	Select a numerical method to solve CFD problems
3	Apply CFD concepts to solve heat conduction problems
4	Apply CFD concepts to solve heat convection problems
5	Analyze the heat transfer and fluid flow cases using finite volume method





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Email: principal@nandhaengg.org Mobile : 73737 12234

Course Code/ Course Name:	17MEX15 - SOLAR THERMAL SYSTEMS
Course Outcomes:	
1	Estimate solar radiation received on a surface using solar radiation measuring devices
2	Identify the solar thermal utilities for heating and drying applications
3	Predict and analyse the performance of solar utilities under varying operating conditions
4	Design a solar thermal utility working on active and passive modes
5	Demonstrate the solar power generation principles, design and performance

Course Code/ Course Name:	17MEX16 - AUTOMOBILE ENGINEERING
Course Outcomes:	
1	List the components of an automobile and/or demonstrate the working principles of cooling and lubrication systems
2	Identify the components of fuel supply and ignition systems of an automobile
3	Classify the types of clutches, gear boxes and other transmission systems
4	Describe the working principles of steering, braking and suspension systems
5	Summarize the emission levels of the automobiles and the types of advanced technologies

Course Code/ Course Name:	17MEX32 RENEWABLE SOURCES OF ENERGY
Course Outcomes:	
1	Possess the knowledge of global energy resources
2	Use the renewable technologies like solar, biomass, wind, hydrogen etc. to produce energy
3	Evaluate and select proper solar utilities
4	Select the appropriate energy conversion system
5	Involve in optimizing and selecting an alternate source of energy





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Course Code/ Course Name:	17MEX38 - FUEL CELLS AND APPLICATIONS
Course Outcomes:	
1	The students will be able to Understand the basics of fuel cell technology
2	The students will be able to Infer the concepts of fuel cell electrochemistry
3	The students will be able to Classify the major types of fuel cells and their modes of operation
4	The students will be able to Categorize the methods of production, storage and utilization of hydrogen as a fuel
5	The students will be able to Gain knowledge on application of fuel cells in power cogeneration

Course Code/ Course Name:	17MEX17 - NANOTECHNOLOGY
Course Outcomes:	
1	Summarize the concept of nanotechnology, classification and metallurgical aspects
2	Identify the synthesis routes of various nanomaterials
3	Select a characterization method for different type of nanomaterials
4	Describe the type of nanostructured materials and applications
5	Identify the engineering applications of various nanomaterials

Course Code/ Course Name:	17MEX18 - METAL CASTING TECHNOLOGY
Course Outcomes:	
1	Explain the principles of foundry technology and steps involved in sand molding process
2	Describe the types of metal molding processes and working principle of melting furnaces
3	Select the design parameters in casting and finishing operation for a casting process
4	Identify the inspection procedure and scope for mechanization
5	Summarize the steps involved management aspects and new developments in foundry





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Course Code/ Course Name:	17MEX19 - METAL FORMING TECHNOLOGY
Course Outcomes:	
1	Discuss the principles of metal forming, mechanical behaviour of materials and grain structure of materials during forming processes
2	Identify the components and explain the Working principles of forging and extrusion equipments
3	Recommend the process parameters of rolling or drawing for a particular engineering product
4	Illustrate the steps involved in sheet metal forming processes considering stress strain relations
5	Classify the newer forming processes and describe the working principles of various equipments

Course Code/ Course Name:	17MEX20 - WELDING ENGINEERING
Course Outcomes:	
1	Demonstrate the knowledge on welding technology for various materials
2	Describe the welding metallurgy and/or mathematical analysis of heat affected zone
3	Identify a welding method for joining materials and pipelines
4	Explain the procedures in welding, steps in process planning and inspection methods
5	Summarize the steps involved in underwater welding processes

Course Code/ Course Name:	17MEX21 - NON DESTRUCTIVE TESTING AND EVALUATION
Course Outcomes:	
1	Differentiate various defect types and select the appropriate NDT methods for better evaluation.
2	Complete theoretical understanding of the penetrants, penetrant testing and safety precautions.
3	Demonstrate the fundamentals of magnetization methods and magnetic testing techniques.
4	Apply radiation property for inspecting materials.
5	Implement various ultrasonic and eddy current inspection methods to find material imperfections.





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Course Code/ Course Name:	17MEX22 - ADDITIVE MANUFACTURING PROCESSES
Course Outcomes:	
1	Describe the fundamentals of rapid prototyping techniques
2	Demonstrate the concept of virtual prototyping, material selection and reverse engineering
3	Illustrate the types of rapid prototyping systems for various materials
4	Summarize the applications of Rapid Prototyping in casting and tooling
5	Explain the steps involved in Rapid Manufacturing and applications

Course Code/ Course Name:	17MEX23 - SURFACE ENGINEERING
Course Outcomes:	
1	Explain various properties of a surface and its importance during design of components
2	Identify a coating method for a product to improve surface characteristics
3	Demonstrate the concept of plasma coating technology and its application
4	Select a type of characterization method for a particular coating
5	List the types of coatings under hard and soft coatings

Course Code/ Course Name:	17MEX24 - PROCESS PLANNING AND COST ESTIMATION
Course Outcomes:	
1	Summarize the steps involved in process planning and/or computer aided process planning
2	Identify the elements of cost during manufacture of a product and/or apply the methods to estimate the cost
3	Estimate the material cost weight for a particular part
4	Determine the machining time of material removal processes in lathe, milling, shaping, planning and grinding
5	Adopt the methods of estimation in forging and welding processes to find cost of the process





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Course Code/ Course Name:	17MEX25 - INDUSTRIAL ENGINEERING AND MANAGEMENT
Course Outcomes:	
1	Demonstrate an understanding of the concept of industrial engineering, production systems and productivity
2	Describe the steps involved in work study and work measurement
3	Recommend a facility layout for the manufacturing operations and/or solve numerical problems on line balancing and inventory control
4	Summarize the principles of management, human resource management and marketing management
5	Estimate the duration of a project using Critical Path Method and/or Program Evaluation and Review Technique

Course Code/ Course Name:	17GEA05 - ENGINEERING ECONOMICS AND COST ANALYSIS
Course Outcomes:	
1	Apply the basics of economics and cost analysis to engineering applications
2	Summarize the steps involved in decision making with economic feasibility
3	Evaluate an alternative by considering the economic factors
4	Conclude the replacement and maintenance policies of industrial equipment
5	Determine the depreciation of industrial equipment over the operating periods using appropriate method

Course Code/ Course Name:	17MEX26 - NEW VENTURE PLANNING AND MANAGEMENT
Course Outcomes:	
1	Explain the concept of entrepreneurship and functions of an entrepreneur
2	Describe various theories of entrepreneurship
3	Identify the steps involved during new venture establishment and fund requirements
4	Summarize the entrepreneurial behavioural aspects and types entrepreneurship development programmes
5	Demonstrate the idea of Women and Rural entrepreneurship roles of entrepreneur





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Course Code/ Course Name:	17GEA03 - TOTAL QUALITY MANAGEMENT
Course Outcomes:	
1	Students can acquire various concepts of quality management
2	Students can implement various principles of quality management
3	Students will be able to impart quality using statistical process
4	Students can learn to use the various tools to maintain quality
5	Students can implement the quality system for ISO certification

Course Code/ Course Name:	17MEX27 - LEAN AND AGILE MANUFACTURING
Course Outcomes:	
1	Demonstrate the lean manufacturing principles to find and eliminate wastes
2	Identify the lean manufacturing tools and their potential applications
3	Summarize the usage of visual management, TPM and lean practices
4	Compare the technology drivers of agile manufacturing
5	Explain the technology drivers of agile manufacturing

Course Code/ Course Name:	17MEX28 - INDUSTRIAL ROBOTICS
Course Outcomes:	
1	Explain the basics of robots, types and work volumes
2	Summarize the methodology of manipulator path control and types of end effectors
3	Categorize the types sensors with applications and/or describe the use of machine vision in robots
4	Develop robot programming for various industrial applications
5	Demonstrate the types of robotic work cells and/or apply economic measures to select a robot for an application




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Course Code/ Course Name:	17MEX29 - OPERATIONS RESEARCH
Course Outcomes:	
1	Apply the concept of linear programming in formulation and solution of industrial problems
2	Determine the optimal transportation and/or assignment cost in manufacturing company
3	Recommend a suitable network model to solve the real time problems
4	Select a suitable waiting line model in production scheduling and/or decision under various risk levels
5	Predict the production time needed for the parts considering the schedule

Course Code/ Course Name:	17MEX30 - ENTREPRENEURSHIP DEVELOPMENT
Course Outcomes:	
1	Able to gain Knowledge about entrepreneurship
2	Able to achieve the benefits of entrepreneurial motivation
3	Able to derive a business plan with the available sources
4	Able to explain the financing and accounting details of business
5	Increased awareness and confidence about the entrepreneurship development for engineering decisions

Course Code/ Course Name:	17MEX33 – ARTIFICIAL INTELLIGENCE AND NEURO-FUZZY THEORY
Course Outcomes:	
1	Demonstrate the types of Artificial Neural Networks and various learning algorithms
2	Apply fuzzy logic model for solving engineering problems
3	Determine the optimum values of process variables for particular process using Genetic Algorithm
4	Make use of simulated annealing and particle swarm algorithms to locate the optimum point in search space
5	Utilize various AI techniques for real world applications




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Course Code/ Course Name:	17MEX34 - INDUSTRIAL INTERNET OF THINGS
Course Outcomes:	
1	The students will be able to understand basics of Electrical circuits and Electronic devices
2	The students will be able to understand IOT characteristics and its essential components
3	The students will be able to describe Arduino processor and working of Analog and Digital I/O pins
4	The students will be able to understand Raspberry pi and its interface with other devices
5	The students will be able to implement a IoT system using Arduino / Raspberry Pi in Mechanical Engineering stream

Course Code/ Course Name:	17MEX39 - 3D PRINTING TECHNOLOGY
Course Outcomes:	
1	The students will be able to apply 3D printing tools for component design
2	The students will be able to choose the contemporary technology available for 3D design and printing
3	The students will be able to design their own 3D printer based on application.
4	The students will be able to Apply various post processing methods involved in 3D printing technology
5	The students will be able to find the utility of various materials in 3D printing applications

Course Code/ Course Name:	17CSX31-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.





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Course Code/ Course Name:	17ITX26-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:	17MEX40- FLEXIBLE MANUFACTURING SYSTEMS
Course Outcomes:	
1	Explain the various products in the production system and interpret the scheduling system
2	Apply the various production systems, group technology coding and FMS, FMC systems.
3	Describe the tool management technology and processing stations of Production system.
4	Apply the various simulation techniques to FMS and use data base techniques.
5	Select appropriate type of computer control and software for the production system

Course Code/ Course Name:	17MEX41 - ADVANCED WELDING PROCESSES
Course Outcomes:	
1	Select appropriate type of gas or arc welding for various Fabrication processes.
2	Select appropriate type of resistance welding for an application
3	Choose suitable Solid State Welding Process for the various Fabrication processes.
4	Use the modern welding processes like thermit, electron beam, atomic hydrogen welding and its automation in industries.
5	Design the weld joint and understand the weldability of Al, Cu & stainless steels and testing of weldments





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NON CREDIT COURSES



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Non Credit Courses – Course Outcome

Course Code/ Course Name:	17GEP01 - PERSONAL VALUES
Course Outcomes:	
1	Become an individual in knowing the self
2	Acquire and express Gratitude, Truthfulness, Punctuality, Cleanliness & fitness.
3	Practice simple physical exercise and breathing techniques
4	Practice Yoga asana which will enhance the quality of life.
5	Practice Meditation and get benefited.

Course Code/ Course Name:	17GEP02 INTERPERSONAL VALUES
Course Outcomes:	
1	The students will be able to develop a healthy relationship & harmony with others
2	The students will be able to practice respecting every human being
3	The students will be able to practice to eradicate negative temperaments
4	The students will be able to acquire Respect, Honesty, Empathy, Forgiveness and Equality
5	The students will be able to practice Exercises and Meditation to lead a healthy life and Manage the cognitive abilities of an Individual

Course Code/ Course Name:	17GED01 – SOFT SKILLS – LISTENING AND SPEAKING
Course Outcomes:	
1	The students will be able to apply the knowledge of basic grammar to classify the types of verbs and questions and to construct the sentences
2	The students will be able to develop the listening skills through note completion, matching and multiple choice modes
3	The students will be able to organize a presentation on the given topic




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Course Code/ Course Name:	17GED02 SOFT SKILLS – READING AND WRITING
Course Outcomes:	
1	The students will be able to apply the knowledge to identify the parts of speech and construct the sentences
2	The students will be able to develop the reading skills through cloze texts, matching and multiple choice modes
3	The students will be able to interpret effectively through writing for a variety of purposes

Course Code/ Course Name:	17GED03 - PERSONALITY AND CHARACTER DEVELOPMENT
Course Outcomes:	
1	The students will be able to, <ul style="list-style-type: none">➤ Find a better career of their interest.➤ Make use of their knowledge during competitive exams and interviews.
2	The students will be able to, <ul style="list-style-type: none">➤ Take part in various events➤ Develop team spirit, leadership and managerial qualities
3	The students will be able to, <ul style="list-style-type: none">➤ Develop socially responsive qualities by applying acquired knowledge➤ Build character, social consciousness, commitment and discipline
4	The students will be able to, <ul style="list-style-type: none">➤ Apply the acquired knowledge in creating better solutions that meet new requirements and market needs➤ Develop skills on transforming new knowledge or new technology into viable products and services on commercial markets as a team
5	The students will be able to, <ul style="list-style-type: none">➤ Demonstrate positive leadership skills that contribute to the organizational effectiveness➤ Take part an active role in their personal wellness (emotional, physical, and spiritual) that supports a healthy lifestyle➤ Create inclination towards outdoor activity like nature study and Adventure.



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Course Code/ Course Name:	17GED08 ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE
Course Outcomes:	
1	The students will be able to Gain Knowledge about of Indian tradition and Indian traditional knowledge systems
2	The students will be able to Understand basics of technologies and its scientific perspectives.
3	The students will be able to study the basics of Indian traditional health care
4	The students will be able to know the basics of Indian artistic tradition
5	The students will be able To develop the basics of linguistic tradition

Course Code/ Course Name:	17GED06 COMPREHENSION
Course Outcomes:	
1	The student will be able to figure out and solve any given problem related to computer science & engineering field.

Course Code/ Course Name:	17GED07- CONSTITUTION OF INDIA
Course Outcomes:	
1	The students will be able to Gain Knowledge about the Constitutional Law of India
2	The students will be able to Understand the Fundamental Rights and Duties of a citizen
3	The students will be able to Apply the concept of Federal structure of Indian Government
4	The students will be able to Analyze the Amendments and Emergency provisions in the Constitution
5	The students will be able Develop a holistic approach in their life as a Citizen of India



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OPEN ELECTIVE COURSES



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LIST OF OPEN ELECTIVE COURSES:

S.No	Course Code	Course Name
1.	17AGZ01	Baking and Confectionery Technology
2.	17AGZ02	Food safety and quality control system
3.	17AGZ03	Farm Mechanization
4.	17AGZ04	Processing of Fruits and Vegetables
5.	17CHZ01	Waste Water Treatment
6.	17CHZ02	Piping Engineering
7.	17CHZ03	Process Automation
8.	17CHZ04	Process Instrumentation
9.	17CEZ01	Energy conservation in buildings
10.	17CEZ02	Air Pollution Management
11.	17CEZ03	Building Services
12.	17CEZ04	Road Safety Management
13.	17CSZ01	Design Thinking
14.	17CSZ02	Digital Marketing
15.	17CSZ03	Software Engineering
16.	17CSZ04	Unified Functional Testing
17.	17CSZ05	C Programming
18.	17CSZ06	Data Structures
19.	17ECZ01	Modern wireless Communication system
20.	17ECZ02	Consumer Electronics
21.	17ECZ03	Automotive Electronics
22.	17ECZ04	Electronic Testing
23.	17EEZ01	Renewable Energy Technology



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S.No	Course Code	Course Name
24.	17EEZ02	Smart Grid
25.	17EEZ03	Energy Auditing, Conservation and Management
26.	17EEZ04	Electrical Machines
27.	17EIZ01	Autotronix
28.	17EIZ02	Industrial Automation
29.	17EIZ03	Fiber Optic Sensors
30.	17EIZ04	Ultrasonic Instrumentation
31.	17ITZ01	Software Testing Tool
32.	17ITZ02	User Experience
33.	17ITZ03	Developing Mobile Apps
34.	17ITZ04	Software Project Management
35.	17ITZ05	Java Programming
36.	17MEZ01	Engineering Ergonomics
37.	17MEZ02	Energy Audit and Resource Management
38.	17MEZ03	Electric Vehicle Technology
39.	17MEZ04	Value Engineering
40.	17MEZ05	Smart Mobility
41.	17MYZ01	Mathematical Structures
42.	17MYZ02	Optimization Techniques
43.	17MYZ03	Statics for Engineers
44.	17MYZ04	Statistics for Engineers
45.	17PYZ01	Nanomaterials
46.	17PYZ02	Nuclear physics and Reactors



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S.No	Course Code	Course Name
47.	17PYZ03	Space science and technology
48.	17CYZ01	Chemistry for Every Day Life
49.	17CYZ02	E - Waste Management
50.	17CYZ03	Industrial Chemistry
51.	17EYZ01	Communicative Hindi
52.	17EYZ02	Fundamentals of German
53.	17EYZ03	Basics of Japanese
54.	17EYZ04	Employability Enhancement and Analytical Skills
55.	17EYX01	Effective Communication
56.	17GYZ01	Biology for Engineers
57.	17PYZ03	Space science and technology
58.	17CYZ01	Chemistry for Every Day Life