SARANATHAN COLLEGE OF ENGINEERING

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai-25)

Venkateswara Nagar, Panjappur, Tiruchirappalli - 620 012, Tamil Nadu.

INDEX

CRITERION: 2.6.1

Programme and course outcomes for all Programmes offered by the institution are stated and displayed on website and communicated to teachers and students.

2022 - 2023

Link for additional Information

http://172.16.1.19/Sarastaff/nba_entire_dept_outcomes_print.jsp

Artificial Intelligence & Data Science

Programme:

Course OutComes for the Academic Year : 2022-23

Title:PROFESSIONAL ENGLISH-II,Subject Code:HS3252 NBA Code for the Subject :108 ,Semester : 2 [22-23EVEN]Target :65 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
108.1	To compare and contrast products and ideas through technical texts in essays with appropriate grammatical usage and contextual meanings.
108.2	To enhance learners¿ awareness of general rules of writing for specific audiences through professional emails and responses to complaints.
108.3	To help learners understand the purpose, audience, contexts of different types of letters/essays/checklists
108.4	To analyze problems in order to arrive at feasible solutions and communicate them orally and in the written format. To report events and the processes of technical and industrial nature
108.5	To make use of grammatical items effectively in writing recommendations and in transcoding the graphs
108.6	To write a winning job/internship application-cover letter and resume / SoP-Statement of purpose

Title:Tamils and Technology,Subject Code:GE3252 NBA Code for the Subject :111 ,Semester : 2 [22-23EVEN]Target :65 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
111.1	Understand the Weaving and Ceramic Technology in the ancient days
111.2	Explain the design and construction technology
111.3	Understand the various manufacturing technology in the ancient days
111.4	Analyze the different methodologies of Agriculture and Irrigation.
111.5	Describe the development of Scientific Tamil in Tamil Computing
111.6	Understand the Tamil and its uses in technology

Title:PHYSICS FOR INFORMATION SCIENCE,Subject Code:PH3256 NBA Code for the Subject :C111 ,Semester : 2 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C111.1	Gain knowledge on classical mechanics, quantum theory and energy band structure
C111.2	Acquire knowledge on basics of semiconductor physics
C111.3	Get knowledge on magnetic properties of materials and their applications
C111.4	Have necessary understanding on the functioning of optical materials for opto electronics

C111.5	Understand the basics of quantum structures
C111.6	Basics and applications of quantum computing.

Title:STATISTICS AND NUMERICAL METHODS,Subject Code:MA3251 NBA Code for the Subject :C112 ,Semester : 2 [22-23EVEN]Target :60 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C112.1	Apply the concept of testing of hypothesis for small and large samples in real life problems.
C112.2	Apply the basic concepts of classifications of design of experiments in the field of agriculture.
C112.3	Solve algebraic, transcendental equations and simultaneous equations by direct method.
C112.4	Solve simultaneous equations by iterative method and Eigen value problems.
C112.5	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.
C112.6	Gain the knowledge of various techniques and methods to solve first order ordinary differential equations with initial conditions in engineering applications.

Title:BASIC ELECTRICAL AND ELECTRONICS ENGINEERING,Subject Code:BE3251 NBA Code for the Subject :C113 ,Semester : 2 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C113.1	Compute the DC electric circuit parameters for simple problems
C113.2	Compute the AC parameters for simple problems
C113.3	Explain the working principle and applications of electrical machines
C113.4	Analyze the characteristics of analog electronic devices
C113.5	Explain the basic concepts of digital electronics
C113.6	Explain the operating principles of measuring instruments

Title:ENGINEERING GRAPHICS,Subject Code:GE3251 NBA Code for the Subject :C113 ,Semester : 2 [22-23EVEN]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C113.1	Student will be able to draw the various types of engineering curves.
C113.2	Student will be able to draw the projection of points, lines and plain surfaces
C113.3	Student will be able to drawing orthographic projection of solids
C113.4	Student will be able to draw the freehand sketch of simple objects

C113.5	Student will be able to draw the development of solids and section of solids.
C113.6	Student will be able to draw the isometric and perspective projections of simple solids.

Title:DATA STRUCTURE DESIGN,Subject Code:AD3251 NBA Code for the Subject :C116 ,Semester : 2 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C116.1	Explain Abstract Data Type, OOP introduction, Classes and Objects, Inheritance, Analysis of algorithms and Recursion
C116.2	Learn List, Stack, Queue and their implementations and applications
C116.3	Implement Sorting and Searching algorithms
C116.4	Implement Hash functions and its types, Rehashing and its efficiency
C116.5	Learn Tree data structure and traversals and their types (Binary, AVL, Heaps) to solve various problems
C116.6	Discuss the Graph, representation and traversals, DAG and Topological Sorting

Title:ENGINEERING PRACTICES LABORATORY,Subject Code:GE3271 NBA Code for the Subject :C117 ,Semester : 2 [22-23EVEN]Target :60 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C117.1	Students will be able to distinguish residential house wiring, fluorescent lamp wiring and stair case wiring.
C117.2	Students will be able to define electrical quantities like voltage, current, energy and resistance and their measurement using CRO.
C117.3	Students will be able to analyze different logic gates, clock, rectifier and to solder devices and components.
C117.4	Students will able to understand the pipe connections for the home application and industrial constructions
C117.5	Students will able to understand the pipe connections for the home application and industrial constructions
C117.6	Students will be able to understand the concept of joining the metal by welding.

Title:DATA STRUCTURE DESIGN LAB,Subject Code:AD3271 NBA Code for the Subject :C119 ,Semester : 2 [22-23EVEN]Target :65 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C119.1	Implement ADT, Classes and Objects, Recursive algorithms
C119.2	Implement List ADT in Arrays, Linked list implementations of Lists, Stack, Queue and their applications
C119.3	Implement Sorting and Searching algorithms
C119.4	Implement various Hashing functions

C119.5	Implement Tree and its traversals, Binary Search trees and heaps
C119.6	Implement Graph and its traversals, Shortest path algorithms and minimum spanning trees

Title:DISCRETE MATHEMATICS,Subject Code:MA3354 NBA Code for the Subject :C201 ,Semester : 3 [22-23ODD]Target :60 Credits:4	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C201.1	Have knowledge of the concepts needed to test the logic of a program.
C201.2	Use proof techniques to check the truthfulness of a real life situation.
C201.3	Be aware of a class of functions which transforms a finite set into another finite set which relate to input and output functions in computer science and counting principles.
C201.4	Use graph theory to formulate the problem and solve it.
C201.5	Be exposed to concepts and properties of algebraic structure such as groups, rings and fields.
C201.6	Analyse the basic knowledge gained by Lattices, Boolean algebra and apply them. Analyse the basic knowledge gained by Lattices, Boolean algebra and apply them. Analyse the basic knowledge gained by Lattices, Boolean algebra and apply them.

Title:DATABASE DESIGN AND MANAGEMENT,Subject Code:AD3391 NBA Code for the Subject :C203 ,Semester : 3 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C203.1	understand the database development life cycle and apply conceptual modeling
C203.2	Apply SQL and programming in SQL to create, manipulate and query the database
C203.3	Apply the conceptual-to-relational mapping and normalization to design relational database
C203.4	determine the serializability of any non-serial schedule using concurrency techniques
C203.5	Apply the data model and querying in Object-relational Databases
C203.6	Learn the basics of No-SQL databases.

Title:DESIGN AND ANALYSIS OF ALGORITHMS,Subject Code:AD3351 NBA Code for the Subject :C204 ,Semester : 3 [22-23ODD]Target :65 Credits:4	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C204.1	Analyze the efficiency of recursive and non-recursive algorithms mathematically
C204.2	Analyze the efficiency of brute force algorithmic techniques
C204.3	Analyze the efficiency of divide and conquer, decrease and conquer, Transform and conquer algorithmic techniques

C204.4	Implement and analyze the problems using dynamic programming and greedy algorithmic techniques
C204.5	Solve the problems using iterative improvement techniques for optimization
C204.6	Compute the limitations of algorithmic power and solve the problems using backtracking and branch and bound techniques

Title:DATA EXPLORATION AND VISUALIZATION,Subject Code:AD3301 NBA Code for the Subject :C205 ,Semester : 3 [22-23ODD]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C205.1	Understand the fundamentals of exploratory data analysis
C205.2	Implement data visualisation using Matplotlib
C205.3	Perform univariate data exploration and analysis
C205.4	Apply bivariate data exploration and analysis
C205.5	Use data exploration techniques for Mutlivariate and time series data
C205.6	Use visualisation techniques for Mutlivariate and time series data

Title:ARTIFICIAL INTELLIGENCE,Subject Code:AL3391 NBA Code for the Subject :C206 ,Semester : 3 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C206.1	Explain Intelligent Agent Frameworks
C206.2	Apply Problem Solving Techniques
C206.3	Apply Game Playing Techniques
C206.4	Apply Constraint Satisfaction Problem Techniques
C206.5	Perform Logical Reasoning
C206.6	Perform probabilistic reasoning under uncertainty

Title:DIGITAL PRINCIPLES AND COMPUTER ORGANIZATION,Subject Code:CS3351 NBA Code for the Subject :c202 ,Semester : 3 [22-23ODD]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
c202.1	Understand the basic concepts of number system,logic gates and boolean theorems
c202.2	Analyze and design the various combinational circuits using logic gates like adder,subtracted, comparator and conversion
c202.3	Analyze and design the synchronous sequential circuits
c202.4	Understand the fundamentals of computer systems and analyze the execution of an instruction
c202.5	Analyze different types of control design and identify hazards

c202.6	Understand the characteristics of various memory systems and I/O Communication

Title:DATABASE DESIGN AND MANAGEMENT LABORATORY,Subject Code:AD3381 NBA Code for the Subject :C207 ,Semester : 3 [22-23ODD]Target :65 Credits:1.5	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C207.1	Understand the database development life cycle
C207.2	Design relational database using conceptual-to-relational mapping, Normalization
C207.3	Apply SQL for creation, manipulation and retrieval of data
C207.4	Develop a database applications for real-time problems
C207.5	Design and query object-relational databases
C207.6	Learn the basics of No-SQL databases.

Title:ARTIFICIAL INTELLIGENCE LABORATORY,Subject Code:AD3311 NBA Code for the Subject :C208 ,Semester : 3 [22-23ODD]Target :65 Credits:1.5	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C208.1	Design and implement search strategies
C208.2	Implement A* and memory bounded A* algorithms
C208.3	Implement game playing techniques
C208.4	Implement Constraint Satisfaction Problem techniques
C208.5	Develop logical reasoning systems
C208.6	Develop probabilistic reasoning systems

Title:ENVIRONMENTAL SCIENCES AND SUSTAINABILITY,Subject Code:GE3451 NBA Code for the Subject :C 215 ,Semester : 4 [22-23EVEN]Target :65 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C 215.1	Infer the importance of environment and explain the concept, types, structure and function of ecosystem
C 215.2	Recall the various functions, values, levels, threats and conservation of biodiversity
C 215.3	Explain the different types of pollution and propose the suitable methods to prevent the same to enhance the environment
C 215.4	Discuss the conservation of different energy sources, optimal usage and the importance
C 215.5	Discuss the aspect of sustainability and the means of sustainability management to realize the sustainable development goals
C 215.6	Lists the various environment management systems, protection and discuss the green solutions for energy to materials for sustainability

Title:OPERATING SYSTEMS,Subject Code:AL3452 NBA Code for the Subject :C211 ,Semester : 4 [22-23EVEN]Target :75 Credits:4	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C211.1	Analyze various scheduling algorithm and process synchronization.
C211.2	Explain Deadlock prevention and avoidance algorithms.
C211.3	Compare and contrast various memory management schemes.
C211.4	Explain the functionality of file systems I/O systems.
C211.5	Explain the functionality of virtualization.
C211.6	Compare iOS and Android operating system.

Title:MACHINE LEARNING,Subject Code:AL3451 NBA Code for the Subject :C212 ,Semester : 4 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C212.1	Explain the basic concepts of machine learning
C212.2	Construct supervised learning models
C212.3	Learn the concepts in Bayesian analysis from probability models and methods
C212.4	Construct unsupervised learning models
C212.5	Analyze the concept of neural networks for learning linear and non-linear activation functions
C212.6	Evaluate and compare different models

Title:FUNDAMENTALS OF DATA SCIENCE AND ANALYTICS,Subject Code:AD3491 NBA Code for the Subject :C213 ,Semester : 4 [22-23EVEN]Target :60 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C213.1	To understand the techniques and processes of data science
C213.2	To apply descriptive data analytics
C213.3	To visualize data for various applications
C213.4	To understand inferential data analytics
C213.5	To analysis and build predictive models from data
C213.6	To learn about time series analysis and survival analysis

Title:COMPUTER NETWORKS,Subject Code:CS3591 NBA Code for the Subject :C214 ,Semester : 4 [22-23EVEN]Target :65 Credits:4	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C214.1	Explain the basics layers and its functions in computer networks

C214.2	Understand the basics of how data flows from one node to another
C214.3	Analyze the Routing Algorithms
C214.4	Describe the protocols for various function sin the networks
C214.5	Analyze the working of various application layer protocols
C214.6	Understanding the different Switching Mechanism.

Title:PROBABILITY AND STATISTICS,Subject Code:MA3391 NBA Code for the Subject :C301 ,Semester : 4 [22-23EVEN]Target :60 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C301.1	Understand the fundamental concepts of probability and to apply them in real time problems.
C301.2	Understand the basic concepts of one dimensional random variables and have knowledge of standard d distributions which can describe real life phenomenon.
C301.3	Understand the knowledge of two dimensional random variables and apply in engineering applications.
C301.4	Understand the concept of point estimation and interval estimation
C301.5	To learn the different types of statistical test when the distributional assumptions of more common procedure are not satisfied
C301.6	Acquire knowledge on the traditional statistical quality control methods and develop charting techniques

Title:DATA SCIENCE AND ANALYTICS LABORATORY,Subject Code:AD3411 NBA Code for the Subject :C217 ,Semester : 4 [22-23EVEN]Target :60 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C217.1	To develop the python program to handle data using numpy and pandas
C217.2	To develop data analytics code in python
C217.3	To to be able to use python libraries for handling data
C217.4	To perform inferential data analytic in python
C217.5	Build model of predictive analytics in python
C217.6	To perform data visualization using plots

Title:MACHINE LEARNING LABORATORY,Subject Code:AL3461 NBA Code for the Subject :C217 ,Semester : 4 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C217.1	Apply suitable algorithms for selecting the appropriate features for analysis.
C217.2	Implement supervised machine learning algorithms on standard datasets and evaluate the performance.
C217.3	Apply unsupervised machine learning algorithms on standard datasets and evaluate the performance

C217.4	Build the graph based learning models for standard data sets
C217.5	Find different approaches to improve the accuracy of the learning model
C217.6	Assess and compare the performance of different ML algorithms and select the suitable one based on the application

CIVIL Engineering

Programme:

Course OutComes for the Academic Year : 2022-23

Title:PROBLEM SOLVING AND PYTHON PROGRAMMING,Subject Code:GE3151 NBA Code for the Subject :105 ,Semester : 1 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
105.1	To understand the basics of algorithmic problem solving
105.2	To learn to solve problems using Python conditionals and loops.
105.3	To define Python functions and use function calls to solve problems.
105.4	To use Python data structures - lists, tuples, dictionaries to represent complex data.
105.5	To learn about usage of python packages and modules
105.6	To do input/output with files in Python

Title:MATRICES AND CALCULUS,Subject Code:MA3151 NBA Code for the Subject :C102 ,Semester : 1 [22-23ODD]Target :60 Credits:4	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C102.1	Eigenvalues and eigenvectors, diagonalization of a matrix,symmetric matrices, Positive definite matrices and similar matrices.
C102.2	Understand the limit, continuity and derivative of the functions. Solve various functions and its maxima /minima using differentiation rules.
C102.3	Apply the total and partial derivatives in Taylor series expansion of functions and the extremum of functions.
C102.4	Evaluate the integrals both by using Riemann sums and by using the Fundamental theorem of Calculus. Evaluate integrals using various techniques of integration.
C102.5	Understand the concepts of double integration and determine the area using integration. Also understands the concepts of the change of order of integration and Change of variables in integrals.
C102.6	Understand the concepts of Triple integration and determine the volume using integration.

Title:ENGINEERING PHYSICS,Subject Code:PH3151 NBA Code for the Subject :C103 ,Semester : 1 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C103.1	Understand the importance of mechanics
C103.2	Express their knowledge in electromagnetic waves
C103.3	Demonstrate a strong foundational knowledge in optics and lasers
C103.4	Understand the importance of quantum physics.

C103.5	Comprehend and apply quantum mechanical principles towards the formation of energy bands
C103.6	Demonstrate a strong foundational knowledge in oscillations.

Title:ENGINEERING CHEMISTRY,Subject Code:CY3151 NBA Code for the Subject :C1O4 ,Semester : 1 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C1O4.1	To infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water
C1O4.2	To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engg and tech. applications
C1O4.3	To apply the knowledge of phase rule and composites for materials selection requirements.
C1O4.4	To recommend suitable fuel for engg. processes and applications
C1O4.5	To analyse combustion process and its calculations
C1O4.6	To recognize different forms of energy resources and apply them for suitable applications in energy sectors.

Title:PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY,Subject Code:GE3171 NBA Code for the Subject :106 ,Semester : 1 [22-23ODD]Target :80 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
106.1	To understand the problem solving approaches.
106.2	To learn the basic programming constructs in Python
106.3	To learn the programming constructs in Python like loop, function, recursion.
106.4	To practice various computing strategies for Python-based solutions to real world problems.
106.5	To use Python data structures-lists, tuples, dictionaries.
106.6	To do input/output with files in Python.

Title:ENGLISH LABORATORY,Subject Code:GE3172 NBA Code for the Subject :C101 ,Semester : 1 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C101.1	To improve the communicative competence of learners by throwing light on vocabulary and basic grammar
C101.2	To improve the communicative competence of learners by throwing light on vocabulary and basic grammar
C101.3	To build on students¿ English language skills by engaging them in listening, speaking and grammar learning activities those are relevant to authentic contexts.

C101.4	C101.4 To build on students¿ English language skills by engaging them in listening, speaking and grammar learning activities those are relevant to authentic contexts.
C101.5	C101.5 To use language efficiently in expressing their opinions via various media and graphical representation.
C101.6	C101.6 Participate effectively in informal conversations; introduce themselves and their friends and express opinion in English with different types of sentences

Title:PHYSICS AND CHEMISTRY LABORATORY,Subject Code:BS3171 NBA Code for the Subject :C107 ,Semester : 1 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C107.1	gain knowledge about elasticity, modulus, oscillations and also able to calculate Young's,rigidity modulus, moment of inertia of regular and irregular bodies.
C107.2	understand the application of interference and diffraction in finding thickness of the given sample and wavelength of the source respectively
C107.3	calculate the variation of resistance with respect to temperature and also able to calculate the band gap of semiconductor
C107.4	Analyse various water quality parameters-Hardness, alkalinity and DO in water sample.
C107.5	Acquire practical skills by using instruments like conductivity meter, pH meter and potentiometer.
C107.6	Finding the strength and amount of nickel in steel.

Title:PHYSICS FOR CIVIL ENGINEERING,Subject Code:PH3201 NBA Code for the Subject :111 ,Semester : 2 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
111.1	Students will have knowledge heat transfer through materials and the thermal performance of buildings
111.2	Students will acquire knowledge about the ventilation of buildings and different types of AC systems
111.3	Students will get knowledge about the acoustics of buildings and various lighting designs for buildings
111.4	Students will gain knowledge on the properties and performance of new engineering materials
111.5	Students will understand the hazards of buildings.and the concept of Seismology , Seismic waves and Earth quake ground motion
111.6	Students Acquire knowledge on Fire hazards and fire protection, fire-proofing of materials, fire safety regulations and fire fighting equipment

Title:PROFESSIONAL ENGLISH-II,Subject Code:HS3252 NBA Code for the Subject :C108 ,Semester : 2 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description

C108.1	To compare and contrast products and ideas through technical texts in essays with appropriate grammatical usage and contextual meanings.
C108.2	To enhance learners¿ awareness of general rules of writing for specific audiences through professional emails and responses to complaints.
C108.3	To help learners understand the purpose, audience, contexts of different types of letters/essays/checklists
C108.4	To analyze problems in order to arrive at feasible solutions and communicate them orally and in the written format. To report events and the processes of technical and industrial nature
C108.5	To make use of grammatical items effectively in writing recommendations and in transcoding the graphs
C108.6	To write a winning job/internship application-cover letter and resume / SoP-Statement of purpose

Title:BASIC ELECTRICAL ELECTRONICS AND INSTRUMENTATION ENGINEERING,Subject Code:BE3252 NBA Code for the Subject :C112 ,Semester : 2 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C112.1	Compute the electric circuit parameters for simple problems
C112.2	Explain the concepts of Magnetic circuit parameters
C112.3	Explain the concepts of Magnetic circuit parameters
C112.4	Explain the concepts of domestics wiring and protective devices
C112.5	Analyze the characteristics of analog electronic devices
C112.6	Explain the types and operating principles of sensors and transducers

Title:STATISTICS AND NUMERICAL METHODS,Subject Code:MA3251 NBA Code for the Subject :C112 ,Semester : 2 [22-23EVEN]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C112.1	Apply the concept of testing of hypothesis for small and large samples in real life problems.
C112.2	Apply the basic concepts of classifications of design of experiments in the field of agriculture.
C112.3	Solve algebraic, transcendental equations and simultaneous equations by direct method.
C112.4	Solve simultaneous equations by iterative method and Eigen value problems.
C112.5	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.
C112.6	Gain the knowledge of various techniques and methods to solve first order ordinary differential equations with initial conditions in engineering applications.

Title:ENGINEERING GRAPHICS,Subject Code:GE3251 NBA Code for the Subject :C113 ,Semester : 2 [22-23EVEN]Target :65 Credits:4

At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C113.1	Student will be able to draw the various types of engineering curves.
C113.2	Student will be able to draw the projection of points, lines and plain surfaces
C113.3	Student will be able to drawing orthographic projection of solids
C113.4	Student will be able to draw the freehand sketch of simple objects
C113.5	Student will be able to draw the development of solids and section of solids.
C113.6	Student will be able to draw the isometric and perspective projections of simple solids.

Title:Tamils and Technology,Subject Code:GE3252 NBA Code for the Subject :C115 ,Semester : 2 [22-23EVEN]Target :80 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C115.1	asdhfhgjkfgfddffghgg
C115.2	-asdhfhgjkfgfddffghgg
C115.3	-asdhfhgjkfgfddffghgg
C115.4	-asdhfhgjkfgfddffghgg
C115.5	-asdhfhgjkfgfddffghgg
C115.6	-asdhfhgjkfgfddffghgg

Title:ENGINEERING PRACTICES LABORATORY,Subject Code:GE3271 NBA Code for the Subject :C115 ,Semester : 2 [22-23EVEN]Target :80 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C115.1	distinguish residential house wiring, fluorescent lamp wiring and stair case wiring.
C115.2	define electrical quantities like voltage, current, energy and resistance and their measurement using CRO.
C115.3	analyze different logic gates, clock, rectifier and to solder devices and components.
C115.4	understand the pipe connections for the home application and industrial constructions
C115.5	do plan the real geometry of the shapes for industrial applications.
C115.6	understand the concept of joining the metal by welding.

Title:BASIC ELECTRICAL ELECTRONICS AND INSTRUMENTATION ENGINEERING LAB,Subject Code:BE3272 NBA Code for the Subject :C116 ,Semester : 2 [22-23EVEN]Target :80 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**

C116.1	Students will be able to distinguish residential house wiring, fluorescent lamp wiring and stair case wiring.
C116.2	Students will be able to define electrical quantities like voltage, current, energy and resistance and their measurement using CRO.
C116.3	Students will be able to analyse different logic gates, clock, rectifier and to solder devices and components.
C116.4	Students will able to understand the pipe connections for the home application and industrial constructions
C116.5	students will be able to do plan the real geometry of the shapes for industrial applications.
C116.6	Students will be able to understand the concept of connecting the metal by welding.

Title:TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS,Subject Code:MA3351 NBA Code for the Subject :C201 ,Semester : 3 [22-23ODD]Target :60 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C201.1	Solve the given partial differential equations
C201.2	Apply Fourier series analysis which plays a vital role in engineering applications
C201.3	Apply Fourier series techniques to solve one dimensional wave, one and two dimensional heat equations
C201.4	Gain the knowledge in Fourier transform techniques to solve the problems of engineering.
C201.5	Formulate some of the physical problems of engineering using difference equations
C201.6	Apply Z-transform techniques to solve the difference equations.

Title:ENGINEERING MECHANICS,Subject Code:ME3351 NBA Code for the Subject :C202 ,Semester : 3 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C202.1	Illustrate the vector and scalar representation of forces and moments
C202.2	Analyse the rigid body in equilibrium
C202.3	Evaluate the properties of distributed forces
C202.4	Determine the friction and the effects by the laws of friction
C202.5	Perform kinematic analysis of particles
C202.6	Calculate dynamic forces exerted on a body

Title:FLUID MECHANICS,Subject Code:CE3301 NBA Code for the Subject :C203 ,Semester : 3 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description

C203.1	Students will be able to describe about the Fluid Properties and Fluid Statics.
C203.2	Students will be able to explain about the Fluid kinematics and Dynamics.
C203.3	Students will be able to work out and explain about Dimensional Analysis.
C203.4	Students will be able to distinguish between Laminar and Turbulent flow through pipes
C203.5	Students will be able to understand the Boundary layer concepts.
C203.6	Students will be able to describe about Drag Co-efficients.

Title:CONSTRUCTION MATERIALS AND TECHNOLOGY,Subject Code:CE3302 NBA Code for the Subject :C204 ,Semester : 3 [22-23ODD]Target :80 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C204.1	Identify the good quality brick, stone and blocks for construction.
C204.2	Identify the good quality blocks and Lime for construction.
C204.3	Recognize the market forms of timber, steel, aluminum and applications of various composite materials.
C204.4	Identify the best construction and service practices such as thermal insulations and air conditioning of the building.
C204.5	Select various equipments for construction works conditioning of building
C204.6	Understand the construction planning and scheduling techniques.

Title:WATER SUPPLY AND WASTEWATER ENGINEERING,Subject Code:CE3303 NBA Code for the Subject :C205 ,Semester : 3 [22-23ODD]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C205.1	To understand the various components of water supply scheme and design of intake structure and conveyance system for water transmission.
C205.2	To understand on the characteristics and composition of sewage,ability to estimate sewage generation and design sewer system including sewage pimping stations.
C205.3	To understand the process of conventional treatment and design of water and wastewater treatment system and gain knowledge of selection of treatment process and biological treatment process.
C205.4	To design and evaluate water distribution system and water supply in buildings.
C205.5	To understand the self purification of streams and sludge and sewage disposal methods.
C205.6	To understand and design the various advanced treatment system and knowledge about the recent advances in water and wastewater treatment process and reuse of sewage.

Title:SURVEYING AND LEVELLING,Subject Code:CE3351 NBA Code for the

Subject :C206 ,Semester : 3 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C206.1	Introduce the rudiments of various surveying and its principles.
C206.2	Imparts knowledge in computation of levels of terrain and ground features
C206.3	Imparts concepts of Theodolite Surveying for complex surveying operations
C206.4	Understand the procedure for establishing horizontal
C206.5	Understand the procedure for establishing vertical control
C206.6	Imparts the knowledge on modern surveying instruments

Title:SURVEYING AND LEVELLING LABORATORY,Subject Code:CE3361 NBA Code for the Subject :C207 ,Semester : 3 [22-23ODD]Target :65 Credits:1.5	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C207.1	Impart knowledge on the usage of basic surveying instruments like chain/tape instruments
C207.2	Impart knowledge on the usage of basic surveying instruments like compass, levelling instruments
C207.3	Able to use levelling instrument for surveying operations
C207.4	Able to use theodolite for various surveying operations
C207.5	Able to carry out necessary surveys for social infrastructures
C207.6	Able to prepare planimetric maps

Title:WATER AND WASTEWATER ANALYSIS LABORATORY,Subject Code:CE3311 NBA Code for the Subject :C208 ,Semester : 3 [22-23ODD]Target :65 Credits:1.5	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C208.1	Calibrate and standardize the equipment
C208.2	Collect proper sample for analysis
C208.3	To know the sample preservation methods
C208.4	To perform field oriented testing of water
C208.5	To perform field oriented testing of wastewater
C208.6	To perform coliform analysis

Title:PROFESSIONAL DEVELOPMENT,Subject Code:GE3361 NBA Code for the Subject :C210 ,Semester : 3 [22-23ODD]Target :65 Credits:1	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C210.1	Describe the basics of Professionalism

C210.2	To develop the student utilize the modern tool for their professional need
C210.3	Train the students to work in the software
C210.4	train them to use MS office
C210.5	Train the students to know and work well in the MS excel
C210.6	Train the students to prepare detail report for any project using MS office programme

Title:APPLIED HYDRAULICS ENGINEERING,Subject Code:CE3401 NBA Code for the Subject :C210 ,Semester : 4 [22-23EVEN]Target :65 Credits:4	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C210.1	Describe the basics of open channel flow, its classification and analysis of uniform flow in steady state conditions with specific energy concept and its application.
C210.2	Analyse steady gradually varied flow, water surface profiles and its length calculation using direct and standard step methods with change in water surface profiles due to change in grades.
C210.3	Derive the relationship among the sequent depths of steady rapidly varied flow and estimating energy loss in hydraulic jump with exposure to positive and negative surges.
C210.4	Design turbines and explain the working principle.
C210.5	Differentiate pumps and explain the working principle with characteristic curves and design centrifugal pumps.
C210.6	Differentiate pumps and explain the working principle with characteristic curves and design Reciprocating pumps.

Title:STRENGTH OF MATERIALS PCC 3 0 0 3,Subject Code:CE3402 NBA Code for the Subject :C211 ,Semester : 4 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C211.1	Understand the concepts of stress and strain, principal stresses and principal planes.
C211.2	Determine Shear force and bending moment in beams and understand concept of theory of simple bending.
C211.3	Calculate the deflection of beams by different methods and selection of method for determining slope or deflection.
C211.4	Analyze propped cantilever, fixed beams and continuous beams for external loadings and support settlements.
C211.5	Determine the stresses due to Unsymmetrical bending of beams, locate the shear center
C211.6	study the various theories of failure

Title:CONCRETE TECHNOLOGY PCC 3 0 0 3 3,Subject Code:CE3403 NBA Code for the Subject :C212 ,Semester : 4 [22-23EVEN]Target :65 Credits:3
At the end of this course, Student will be able to

CO-Code	Course outcome Description
C212.1	THE VARIOUS REQUIREMENTS OF CEMENT, AGGREGATES AND WATER FOR MAKING CONCRETE
C212.2	THE EFFECT OF ADMIXTURES ON PROPERTIES OF CONCRETE
C212.3	THE CONCEPT AND PROCEDURE OF MIX DESIGN AS PER IS METHOD
C212.4	THE PROPERTIES OF CONCRETE IN FRESH STATE
C212.5	THE PROPERTIES OF CONCRETE IN HARDENED STATE
C212.6	THE IMPORTANCE AND APPLICATION OF SPECIAL CONCRETE

Title:SOIL MECHANICS PCC 3 0 0 3 3,Subject Code:CE3404 NBA Code for the Subject :C213 ,Semester : 4 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C213.1	Demonstrate an ability to identify various types of soil and its Properties, formulate and solve engineering Problems.
C213.2	Show the basic understanding of flow through soil medium and its impact of engineering solution.
C213.3	Understand the basic concept of stress distribution in loaded soil medium and soil settlement due to consolidation.
C213.4	Show the understanding of shear strength of soils and its impact of engineering solutions to the loaded soil medium and also will be aware of contemporary issues on shear strength of soils.
C213.5	Demonstrate an ability to design both finite and infinite slopes, component and process as per needs and specifications.
C213.6	Understand the basic concept of compaction and demonstrate an ability to perform test on soil.

Title:HIGHWAY AND RAILWAY ENGINEERING,Subject Code:CE3405 NBA Code for the Subject :C214 ,Semester : 4 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C214.1	Plan a highway according to the principles and standards adopted in various institutions in India.
C214.2	Design the geometric features of road network and components of pavement.
C214.3	Test the highway materials and construction practice methods and know its properties and able to perform pavement evaluation and management.
C214.4	Understand the methods of route alignment and design elements in railway planning and constructions.
C214.5	Understand the construction techniques of track laying and railway stations.
C214.6	Understand the maintenance of track laying and railway stations.

Title:ENVIRONMENTAL SCIENCES AND SUSTAINABILITY,Subject Code:GE3451 NBA Code for the Subject :C215 ,Semester : 4

[22-23EVEN]Target :65 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C215.1	Infer the importance of environment and explain the concept, types, structure and function of ecosystem.
C215.2	Recall the various functions, values, levels, threats and conservation of biodiversity
C215.3	Explain the different types of pollution and propose the suitable methods to prevent the same to enhance the environment
C215.4	Discuss of conservation different energy sources, optimal usage and the importance
C215.5	Discuss the aspect of sustainability and the means of sustainability management to realize the sustainable development goals
C215.6	Lists the various environment management systems, protection and discuss the green solutions for energy to materials for sustainability

Title:HYDRAULIC ENGINEERING LABORATORY,Subject Code:CE3411 NBA Code for the Subject :C216 ,Semester : 4 [22-23EVEN]Target :80 Credits:1.5	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C216.1	Apply Bernoulli equation for calibration of flow measuring devices.
C216.2	Measure friction factor in pipes and compare with Moody diagram.
C216.3	Determine the performance characteristics of rotodynamic pumps.
C216.4	Determine the performance characteristics of positive displacement pumps.
C216.5	Determine the performance characteristics of turbines.
C216.6	Measure minor losses in pipes.

Title:SOIL MECHANICS LABORATORY PCC 0 0,Subject Code:CE3413 NBA Code for the Subject :C216 ,Semester : 4 [22-23EVEN]Target :80 Credits:1.5	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C216.1	sdgddghgghghjmhjyuukjjkl
C216.2	sdffgdhjmkjkkjkjjkjkjkkjk
C216.3	cdfdfghjjhjkjkkjkjkjjkjkk
C216.4	ddfgfghjmjjhjhkjjkkjkkkkkj
C216.5	ggggkhmkhkkhkjkjkjkjkj
C216.6	gfgffgfkhkjkjlkjljkkjkjkjkjjk

Title:MATERIALS TESTING LABORATORY PCC,Subject Code:CE3412 NBA Code for the Subject :C218 ,Semester : 4 [22-23EVEN]Target :60 Credits:2
At the end of this course, Student will be able to

CO-Code	Course outcome Description
C218.1	Determine the mechanical properties of steel.
C218.2	Determine the physical properties of cement.
C218.3	Determine the physical properties of fine aggregate.
C218.4	Determine the physical properties of coarse aggregate.
C218.5	Determine the workability and compressive strength of concrete.
C218.6	Determine the strength of brick and wood.

Title:DESIGN OF REINFORCED CEMENT CONCRETE ELEMENTS,Subject Code:CE8501 NBA Code for the Subject :C301 ,Semester : 5 [22-23ODD]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C301.1	To introduce the various design Philosophies for the design of RC Elements.
C301.2	To practice more problems on Rectangular sections by Working Stress Method and Limit State Method.
C301.3	To understand the Analysis and Design the Flanged beams for Shear and Torsion by Limit State Method.
C301.4	To Design the various types of Slabs and Staircase by Limit State Method.
C301.5	To Design the Columns for Axial, Uniaxial and Biaxial Eccentric Loadings by Limit State Method.
C301.6	To Design Footing by Limit State Method.

Title:STRUCTURAL ANALYSIS I,Subject Code:CE8502 NBA Code for the Subject :C302 ,Semester : 5 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C302.1	Analyze continuous beams, pin-jointed indeterminate plane frames and rigid frames by strain energy method.
C302.2	Analyze continuous beams by slope deflection method.
C302.3	Analyze plane and inclined rigid frames by slope deflection method.
C302.4	Understand the concept of moment distribution and analysis of continuous beams and rigid frames with and without sway.
C302.5	Analyze the indeterminate pin-jointed plane frames, continuous beams and rigid frames using matrix flexibility method.
C302.6	Understand the concept of matrix stiffness method and analysis of continuous beams, pin-jointed truss and rigid plane frames.

Title:WATER SUPPLY ENGINEERING,Subject Code:EN8491 NBA Code for the Subject :C303 ,Semester : 5 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description

C303.1	Students will have an insight into the structure of drinking water supply systems
C303.2	Students will have an understanding of water quality criteria and standards, and their relation to public health
C303.3	Students will have an insight into the structure of water transport, treatment and distribution
C303.4	Students will have the knowledge in various unit operations and processes in water treatment
C303.5	Students will have an ability to design the various functional units in water treatment
C303.6	Students will have the ability to design and evaluate water supply project alternatives on basis of chosen criteria

Title:FOUNDATION ENGINEERING,Subject Code:CE8591 NBA Code for the Subject :C304 ,Semester : 5 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C304.1	Understand the site investigation, methods and sampling
C304.2	Get knowledge on bearing capacity and testing methods
C304.3	Gain knowledge on Designing of shallow footings
C304.4	Get knowledge on Determining the load carrying capacity and settlement of pile foundation
C304.5	Gain knowledge on Determining the earth pressure on retaining walls
C304.6	Get knowledge on Analyzing the stability of retaining walls

Title:DISASTER MANAGEMENT,Subject Code:GE8071 NBA Code for the Subject :C305 ,Semester : 5 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C305.1	Get Knowledge on Differentiating the types of disasters
C305.2	Get Information about causes and their impact on environment and society
C305.3	Assess vulnerability
C305.4	Gather Information about various methods of risk reduction measures as well as mitigation
C305.5	Draw the hazard and vulnerability profile of India, Scenarious in the Indian context
C305.6	Understand about Disaster damage assessment and management

Title:ENVIRONMENT AND AGRICULTURE,Subject Code:OAI551 NBA Code for the Subject :C306 ,Semester : 5 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description

C306.1	Students will appreciate the role of environment in current practice of agriculture
C306.2	Students will understand the impact of agriculture on environment
C306.3	Students will concern of climate change and emerging global issues
C306.4	Students will have exposure to current agricultural practices
C306.5	Ecological context of agriculture will be understood
C306.6	Students will gain knowledge on sustainability aspects of agriculture

Title:SOIL MECHANICS LABORATORY,Subject Code:CE8511 NBA Code for the Subject :C307 ,Semester : 5 [22-23ODD]Target :80 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C307.1	To test the soils for their index properties
C307.2	To test the soils for engineering properties
C307.3	To characterize the soil based on their properties
C307.4	To determine the in situ density
C307.5	To determine the Compaction Characteristics
C307.6	To determine the shear strength of soils

Title:WATER AND WASTE WATER ANALYSIS LABORATORY,Subject Code:CE8512 NBA Code for the Subject :C308 ,Semester : 5 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C308.1	Students will have an ability to determine various physical characteristics of water & wastewater
C308.2	Students will have an ability to determine various chemical characteristics of water & wastewater
C308.3	Students will have an ability to determine strength of wastewater
C308.4	Students will have an ability to determine the amount of salts in water & wastewater
C308.5	Students will gain knowledge on type of treatment and disposal
C308.6	Students will gain knowledge on type of microorganisms in sludge and wastewater

Title:DESIGN OF STEELSTRUCTURAL ELEMENTS,Subject Code:CE8601 NBA Code for the Subject :C310 ,Semester : 6 [22-23EVEN]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C310.1	Students will be able to Recognize the design philosophy of steel structures
C310.2	Students will be able to design the common connections and identify the different failure modes of bolted and welded connections, and determine their design strengths

C310.3	Students will be able to analyze and design tension members and understand the effect of shear leg
C310.4	Students will be able to understand the analysis and design concept of Steel Compression Members and column base connections
C310.5	Students will be able to design the various types of Steel built up Beams and Plate Girders by limit State Method.
C310.6	Students will be able to design Roof Trusses and and Gantry Girder for various loadings.

Title:STRUCTURAL ANALYSIS II,Subject Code:CE8602 NBA Code for the Subject :C311 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C311.1	Draw influence lines for statically determinate structures and calculate critical stress resultants for beams and trusses
C311.2	Understand Muller Breslau principle and draw the influence lines for statically indeterminate beams.
C311.3	Analyse the three hinged, two hinged and fixed arches.
C311.4	Analyse the suspension bridges with stiffening girders.
C311.5	Understand the concept of Plastic analysis.
C311.6	Determine the method of analyzing beams and rigid frames.

Title:IRRIGATION ENGINEERING,Subject Code:CE8603 NBA Code for the Subject :C312 ,Semester : 6 [22-23EVEN]Target :75 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C312.1	Have knowledge and skills on crop water requirements.
C312.2	Understand the methods and management of Irrigation.
C312.3	Gain knowledge on types of Impounding structures.
C312.4	Understand methods of Irrigation including canal irrigation.
C312.5	Get knowledge on water management on optimization of water use.
C312.6	Gather knowledge on types of Diversion structures.

Title:HIGHWAY ENGINEERING,Subject Code:CE8604 NBA Code for the Subject :C313 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C313.1	Get knowledge on planning and aligning of highway.
C313.2	Get knowledge on Geometric design of highways.
C313.3	Get knowledge on Design of flexible and rigid pavements.
C313.4	Gain knowledge on Highway construction materials, properties, testing methods.

C313.5	Understand the concept of pavement management system, evaluation of distress.
C313.6	Understand the concept of maintenance of pavements.

Title:WASTEWATER ENGINEERING,Subject Code:EN8592 NBA Code for the Subject :C314 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C314.1	have an ability to estimate sewage generation
C314.2	have an ability to design sewer system including sewage pumping stations
C314.3	have the required understanding on the characteristics and composition of sewage, self purification of streams
C314.4	have an ability to perform basic design of the unit operations and processes that are used in sewage treatment
C314.5	understand the methods for disposal of sewage
C314.6	gain knowledgs on sludge treatment and disposal

Title:IRRIGATION AND ENVIRONMENTAL ENGINEERING DRAWING,Subject Code:CE8612 NBA Code for the Subject :317 ,Semester : 6 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
317.1	Design and draw various units of Municipal water treatment plants
317.2	Design and draw various units of sewage disposal arrangements
317.3	Design and draw various units of sewage treatment plants
317.4	Design and draw tank surplus weir
317.5	Design and draw impounding and cross drainage structures
317.6	Design and draw canal regulation structures

Title:PROFESSIONAL COMMUNICATION,Subject Code:HS8581 NBA Code for the Subject :C308 ,Semester : 6 [22-23EVEN]Target :65 Credits:1

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C308.1	To enhance the learners speaking skill through various activities like group discussion, telephonic conversation, presentation skill etc.,
C308.2	To develop listening and speaking skills through communicative functions
C308.3	Enhance the Employability and Career Skills of student
C308.4	Orient the students towards grooming as a professional
C308.5	Make them Employability Graduates
C308.6	Develop their confidence and help them attend interviews successfully.

Title:HIGHWAY ENGINEERING LABORATORY,Subject Code:CE8611 NBA Code for the Subject :C316 ,Semester : 6 [22-23EVEN]Target :75 Credits:2

At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C316.1	Students will be able to knows the techniques to characterize various pavement materials through aggregate test
C316.2	Students will be able to knows the techniques to characterize various pavement materials through bitumen test
C316.3	Students will be able to knows the techniques to characterize various pavement materials through bituminous mixes test
C316.4	Students will be able to knows the techniques to characterize various pavement materials through skid resistance test
C316.5	Students will be able to knows the techniques to characterize various pavement materials through benkelman beam test
C316.6	Students will be able to knows the techniques to characterize various pavement materials through relavant test

Title:ESTIMATION, COSTING AND VALUATION ENGINEERING,Subject Code:CE8701 NBA Code for the Subject :C401 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C401.1	The students will be able to Estimate the quantities for buildings.
C401.2	The students will be able to Estimate the quantities for Roads and other irrigation Structures.
C401.3	The students will be able to analyse the rates for all Building works and Cost Estimate.
C401.4	To Understand types of specifications, principles for report preparation, tender notices types.
C401.5	The students will be able to Gain knowledge on types of contracts
C401.6	The students will be able to Evaluate valuation for building and land

Title:RAILWAYS AIRPORTS AND HARBOUR ENGINEERING,Subject Code:CE8702 NBA Code for the Subject :C402 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C402.1	Students will be able to describe about various activities regarding railway planning.
C402.2	Students will be able to explain about the construction and maintenance of railways.
C402.3	Students will be able to describe about the various activities regarding airport planning.
C402.4	Students will be able to explain about the various design aspects of airports.
C402.5	Students will be able to describe about various activities regarding harbour planning.

C402.6	Students will have the ability to design various civil engineering aspects of harbour.

Title:STRUCTURAL DESIGN DRAWING,Subject Code:CE8703 NBA Code for the Subject :C403 ,Semester : 7 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C403.1	Design and draw reinforced concrete Cantilever and Counterfort Retaining Walls.
C403.2	Design and draw flat slab as per codal provisions.
C403.3	Design and draw reinforced concrete bridges and water tanks.
C403.4	Design and draw steel bridges and water tanks.
C403.5	Design and detail the various steel trusses.
C403.6	Design and detail plate girder and gantry girder.

Title:INDUSTRIAL SAFETY,Subject Code:OME754 NBA Code for the Subject :C405 ,Semester : 7 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C405.1	Students will be able to understand and prevent the problems related to fire safety.
C405.2	Students must be able to identify and prevent chemical hazards.
C405.3	Students must be able to recognize and prevent environmental hazards.
C405.4	Students will be able to learn various methods of hazard analysis.
C405.5	Students will obtain knowledge on various safety regulations.
C405.6	Students must be able to apply proper safety techniques on safety engineering and management.

Title:CREATIVE AND INNOVATIVE PROJECT (ACTIVITY BASED -SUBJECT RELATED),Subject Code:CE8711 NBA Code for the Subject :C406 ,Semester : 7 [22-23ODD]Target :65 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C406.1	Selection of a problem for project work by team work
C406.2	Collect, Review and infer from the literature available on the chosen problem
C406.3	Come out with the methodology to solve the identified problem
C406.4	Apply the principles, tools, modern construction materials and techniques to solve the problem
C406.5	Develop understanding of technical dissertation presentation and writing
C406.6	Improve presentation skills.

Title:MUNICIPAL SOLID WASTE MANAGEMENT,Subject Code:EN8591 NBA Code for the Subject :C406 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C406.1	Students will have an understanding of the nature and characteristics of municipal solid wastes
C406.2	Students will have an understanding of the regulatory requirements regarding municipal solid waste management
C406.3	Students will have the ability to plan waste minimization and storage design
C406.4	Students will have the ability to plan collection and transportation of waste
C406.5	Students will have the knowledge of processing of waste
C406.6	Students will understand and design the various methods of disposal of municipal solid waste

Title:INDUSTRIAL TRAINING (4 WEEKS DURING VI SEMESTER ?SUMMER),Subject Code:CE8712 NBA Code for the Subject :C407 ,Semester : 7 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C407.1	The intricacies of implementation textbook knowledge into practice
C407.2	The concepts of developments and implementation of new techniques
C407.3	Getting Acquainted with Current Trends and Industry
C407.4	Meeting New People and Enlarging Networks
C407.5	To get better and in-depth understanding of the field in which they want to take their careers ahead.
C407.6	Understand the various rules and Regulations to be adopted

Title:MAINTENANCE, REPAIR AND REHABILITATION OF STRUCTURES,Subject Code:CE8020 NBA Code for the Subject :C409 ,Semester : 8 [22-23EVEN]Target :60 Credits:3

At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C409.1	Understand the importance of maintenance and assessment method of distressed structures.
C409.2	Understand strength and durability properties, their effects due to climate and temperature.
C409.3	Understand about recent developments in concrete.
C409.4	Understand about the techniques for repair and protection methods.
C409.5	Understand about repair and rehabilitation of structures.
C409.6	Understand about retrofitting of structures and demolition methods.

Title:PROJECT WORK,Subject Code:CE8811 NBA Code for the Subject :C410 ,Semester : 8 [22-23EVEN]Target :65 Credits:10

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C410.1	Selection of a problem for project work by team work
C410.2	Collect, Review and infer from the literature available on the chosen problem
C410.3	Come out with the methodology to solve the identified problem
C410.4	Apply the principles, tools, modern construction materials and techniques to solve the problem
C410.5	Develop understanding of technical dissertation presentation and writing
C410.6	Improve presentation skills.

Computer Science & Business Systems Engineering

Programme:

Course OutComes for the Academic Year : 2022-23

Title:PROFESSIONAL ENGLISH-II,Subject Code:HS3252 NBA Code for the Subject :108 ,Semester : 2 [22-23EVEN]Target :65 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
108.1	To compare and contrast products and ideas through technical texts in essays with appropriate grammatical usage and contextual meanings.
108.2	To enhance learners¿ awareness of general rules of writing for specific audiences through professional emails and responses to complaints.
108.3	To help learners understand the purpose, audience, contexts of different types of letters/essays/checklists
108.4	To analyze problems in order to arrive at feasible solutions and communicate them orally and in the written format. To report events and the processes of technical and industrial nature
108.5	To make use of grammatical items effectively in writing recommendations and in transcoding the graphs
108.6	To write a winning job/internship application-cover letter and resume / SoP-Statement of purpose

Title:PHYSICS FOR INFORMATION SCIENCE,Subject Code:PH3256 NBA Code for the Subject :C111 ,Semester : 2 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C111.1	Gain knowledge on classical and quantum electron theories, and energy band structures
C111.2	Acquire knowledge on basics of semiconductor physics
C111.3	Get knowledge on magnetic properties of materials and their applications in data storage
C111.4	Have the necessary understanding on the functioning of optical materials for optoelectronics
C111.5	Understand the basics of quantum structures
C111.6	Applications and basics of quantum computing

Title:BASIC ELECTRICAL AND ELECTRONICS ENGINEERING,Subject Code:BE3251 NBA Code for the Subject :C112 ,Semester : 2 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C112.1	Compute the DC electric circuit parameters for simple problems
C112.2	Compute the AC parameters for simple problems
C112.3	Explain the working principle and applications of electrical machines
C112.4	Analyze the characteristics of analog electronic devices

C112.5	Explain the basic concepts of digital electronics
C112.6	Explain the operating principles of measuring instruments

Title:STATISTICS AND NUMERICAL METHODS,Subject Code:MA3251 NBA Code for the Subject :C112 ,Semester : 2 [22-23EVEN]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C112.1	Apply the concept of testing of hypothesis for small and large samples in real life problems.
C112.2	Apply the basic concepts of classifications of design of experiments in the field of agriculture.
C112.3	Solve algebraic, transcendental equations and simultaneous equations by direct method.
C112.4	Solve simultaneous equations by iterative method and Eigen value problems.
C112.5	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.
C112.6	Gain the knowledge of various techniques and methods to solve first order ordinary differential equations with initial conditions in engineering applications.

Title:ENGINEERING GRAPHICS,Subject Code:GE3251 NBA Code for the Subject :C113 ,Semester : 2 [22-23EVEN]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C113.1	Student will be able to draw the various types of engineering curves.
C113.2	Student will be able to draw the projection of points, lines and plain surfaces
C113.3	Student will be able to drawing orthographic projection of solids
C113.4	Student will be able to draw the freehand sketch of simple objects
C113.5	Student will be able to draw the development of solids and section of solids.
C113.6	Student will be able to draw the isometric and perspective projections of simple solids.

Title:DATA STRUCTURE DESIGN,Subject Code:AD3251 NBA Code for the Subject :C116 ,Semester : 2 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C116.1	Explain abstract data types
C116.2	Design, implement, and analyse linear data structures, such as lists, queues, and stacks, according to the needs of different applications
C116.3	Explain sorting algorithms
C116.4	Explain searching and hashing algorithms

C116.5	Design, implement, and analyse efficient tree structures for different applications
C116.6	Model problems as graph problems and implement efficient graph algorithms to solve them

Title:ENGINEERING PRACTICES LABORATORY,Subject Code:GE3271 NBA Code for the Subject :C115 ,Semester : 2 [22-23EVEN]Target :65 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C115.1	Students will be able to distinguish residential house wiring, fluorescent lamp wiring and stair case wiring.
C115.2	Students will be able to define electrical quantities like voltage, current, energy and resistance and their measurement using CRO, soldering and connectivity of circuit
C115.3	Students will be able to assemble and disassemble LED, Mobile and computer
C115.4	Students will able to understand the pipe connections for the home application and industrial constructions
C115.5	Students will be able to do plan the real geometry of the shapes for industrial applications.
C115.6	Students will be able to understand the concept of joining the metal by welding.

Title:DATA STRUCTURE DESIGN LAB,Subject Code:AD3271 NBA Code for the Subject :C119 ,Semester : 2 [22-23EVEN]Target :65 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C119.1	1mplement ADModel problems as graph problems and implement efficient graph algorithms to solve them Ts as Python classes
C119.2	Implement List ADT using Python arrays and Linked list for different applications
C119.3	Design, implement, and analyse linear data structures - queues and stacks according to the needs of different applications
C119.4	Implement searching, sorting and hashing algorithms
C119.5	Design, implement, and analyse efficient tree structures to meet requirements such as searching, indexing, and sorting
C119.6	Model problems as graph problems and implement efficient graph algorithms to solve them

Title:DISCRETE MATHEMATICS,Subject Code:MA3354 NBA Code for the Subject :C201 ,Semester : 3 [22-23ODD]Target :60 Credits:4	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C201.1	Have knowledge of the concepts needed to test the logic of a program.
C201.2	Use proof techniques to check the truthfulness of a real life situation.

C201.3	Be aware of a class of functions which transforms a finite set into another finite set which relate to input and output functions in computer science and counting principles.
C201.4	Use graph theory to formulate the problem and solve it.
C201.5	Be exposed to concepts and properties of algebraic structure such as groups, rings and fields.
C201.6	Analyse the basic knowledge gained by Lattices, Boolean algebra and apply them.

Title:DIGITAL PRINCIPLES AND COMPUTER ORGANIZATION,Subject Code:CS3351 NBA Code for the Subject :C202 ,Semester : 3 [22-23ODD]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C202.1	Understand the basic concepts of number systems ,logic gates and Boolean expression
C202.2	Analyze and design the various combinational circuits using logic gates
C202.3	Analyze and design the synchronous sequential circuits
C202.4	Understand the fundamentals of computer systems and analyze the execution
C202.5	Analyze different types of control design and identify hazards
C202.6	Understand the characteristics of various memory systems and I/O

Title:FUNDAMENTALS OF ECONOMICS,Subject Code:CW3301 NBA Code for the Subject :C203 ,Semester : 3 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C203.1	To analyze the supporting of price, income and substitution effects in the consumers and producers surplus
C203.2	To compare the equilibrium of a firm under perfect competition, monopoly and monopolistic competition
C203.3	To study the concepts of demand for money and supply of money with appropriate model in macro economic analysis
C203.4	To determine economic variables including inflation, unemployment, poverty, GDP, etc.
C203.5	To analyze macroeconomic policies including fiscal and monetary policies of India
C203.6	To examine and evaluate the problems of voluntary and involuntary unemployment

Title:OBJECT ORIENTED PROGRAMMING,Subject Code:CS3391 NBA Code for the Subject :C204 ,Semester : 3 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C204.1	To understand Object Oriented Programming concepts and basics of Java programming language

C204.2	To know the principles of packages, inheritance and interfaces
C204.3	To develop a java application with threads and generics classes
C204.4	To define exceptions
C204.5	To learn use I/O streams
C204.6	To design and build Graphical User Interface Application using JAVAFX

Title:DESIGN AND ANALYSIS OF ALGORITHMS,Subject Code:AD3351 NBA Code for the Subject :C205 ,Semester : 3 [22-23ODD]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C205.1	Design algorithms for various computing problems and analyze the time and space complexity
C205.2	Design algorithm for problems using Brute Force technique & Analyze it
C205.3	Design algorithm for problems using Divide & Conquer technique & Analyze it
C205.4	Design algorithm for problems using Dynamic Programming, Greedy techniques & Analyze it
C205.5	Design algorithms for problems based on iterative improvement
C205.6	Design algorithm for problems using Divide & Conquer technique & Analyze it

Title:FUNDAMENTALS OF DATA SCIENCE AND ANALYTICS,Subject Code:AD3491 NBA Code for the Subject :C206 ,Semester : 3 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C206.1	To understand the techniques and processes of data science
C206.2	To apply descriptive data analytics
C206.3	To visualize data for various applications
C206.4	To understand inferential data analytics
C206.5	To analysis and build predictive models from data
C206.6	To learn about time series analysis and survival analysis

Title:OBJECT ORIENTED PROGRAMMING LABORATORY,Subject Code:CS3381 NBA Code for the Subject :208 ,Semester : 3 [22-23ODD]Target :80 Credits:1.5

At the end of this course, Student will be able to

CO-Code	Course outcome Description
208.1	To execute simple java program
208.2	To design and develop java programs using object oriented programming concepts
208.3	To develop simple applications using object oriented concepts such as package, exceptions

208.4	To create GUIs and event driven programming applications for real world problems
208.5	To implement multithreading, and generics concepts
208.6	To implement and deploy web applications using Java

Title:BUSINESS COMMUNICATION LABORATORY I,Subject Code:CW3311 NBA Code for the Subject :C208 ,Semester : 3 [22-23ODD]Target :65 Credits:1.5

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C208.1	Speak fluently in English without errors and present themselves as effective communicators.
C208.2	Use business vocabulary and take part comfortably in business conversations in English.
C208.3	Draft letters and reports with appropriate formats and choice of words.
C208.4	Perform well in team and group, resolve conflicts in workplaces and acquire leadership skills.
C208.5	Understand women in all spheres and cultural behaviours of the people and approach them with positive human values
C208.6	Develop their confidence and help them attend interviews successfully.

Title:DATABASE MANAGEMENT SYSTEMS,Subject Code:CS3492 NBA Code for the Subject :213 ,Semester : 4 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
213.1	Study the fundamentals of data models and to represent a database system
213.2	Apply ER model to Relational model to perform database design effectively and to perform normalization in databases.
213.3	Understand and analyze the fundamental concepts of transactions
213.4	Compare and contrast various indexing strategies in different database systems
213.5	Illustrate and construct query optimization technique in database systems
213.6	Appraise the difference between advanced databases and traditional databases.

Title:PROBABILITY AND STATISTICS,Subject Code:MA3391 NBA Code for the Subject :C210 ,Semester : 4 [22-23EVEN]Target :60 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C210.1	Understand the fundamental concepts of probability,Bays theorem and to apply them in real time problems.
C210.2	Understand the basic concepts of one dimensional random variables and have knowledge of standard d distributions which can describe real life phenomenon.

C210.3	Understand the knowledge of two dimensional random variables and apply in engineering applications.
C210.4	Apply the concept of Estimation theory in real life problems.
C210.5	Apply the basic concepts of classifications of non parametric tests.
C210.6	Have the notion of s statistical quality control measurement used in engineering and control chats problems.

Title:INTRODUCTION TO BUSINESS SYSTEMS,Subject Code:CW3401 NBA Code for the Subject :C213 ,Semester : 4 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C213.1	To analyze the supporting of price, income and substitution effects in the consumers and producers surplus
C213.2	To compare the equilibrium of a firm under perfect competition, monopoly and monopolistic competition
C213.3	To study the concepts of demand for money and supply of money with appropriate model in macro economic analysis
C213.4	To examine and evaluate the problems of voluntary and involuntary unemployment
C213.5	To develop and strengthen business quality and motivation in students
C213.6	To understanding to run a business efficiently and effectively

Title:MACHINE LEARNING,Subject Code:AL3451 NBA Code for the Subject :C214 ,Semester : 4 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C214.1	To understand the basic concepts of machine learning
C214.2	To Learn basics of linear algebra and statistics for machine learning
C214.3	To understand and build supervised learning models
C214.4	To understand and build unsupervised learning models
C214.5	To understand the concepts of neural networks
C214.6	To evaluate the algorithms based on corresponding metrics identified

Title:OPERATING SYSTEMS,Subject Code:AL3452 NBA Code for the Subject :C214 ,Semester : 4 [22-23EVEN]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C214.1	C214.1 Explain the basic concepts and functions of operating systems and discuss evolution and organization of operating systems
C214.2	C214.2 Understand about Processes and Threads, their synchronization issues and analyse the various CPU scheduling algorithms
C214.3	C214.3 Understand deadlock, prevention and avoidance algorithms.
C214.4	C214.4 Compare and contrast various memory management schemes.

C214.5	C214.5 Understand the functionality of file systems
C214.6	C214.6 Perform administrative tasks on Linux Servers and Compare iOS and Android Operating Systems.

Title:ENVIRONMENTAL SCIENCES AND SUSTAINABILITY,Subject Code:GE3451 NBA Code for the Subject :C215 ,Semester : 4 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C215.1	Infer the importance of environment and explain the concept, types, structure and function of ecosystem
C215.2	Recall the various functions, values, levels, threats and conservation of biodiversity
C215.3	Explain the different types of pollution and propose the suitable methods to prevent the same to enhance the environment
C215.4	Discuss the conservation of different energy sources, optimal usage and the importance
C215.5	Discuss the aspect of sustainability and the means of sustainability management to realize the sustainable development goals
C215.6	Lists the various environment management systems, protection and discuss the green solutions for energy to materials for sustainability

Title:DATABASE MANAGEMENT SYSTEMS LABORATORY,Subject Code:CS3481 NBA Code for the Subject :216 ,Semester : 4 [22-23EVEN]Target :75 Credits:1.5

At the end of this course, Student will be able to

CO-Code	Course outcome Description
216.1	Create database tables, add constraints, insert, update and delete rows using SQL DDL and DML Commands
216.2	Construct simple and complex SQL queries using DML and DCL commands
216.3	Use SQL Functions, View, Joins, Sub Queries and Nested Queries Concepts
216.4	Use advanced features such as stored procedures and triggers
216.5	Create an XML database and validate with meta-data (XML schema)
216.6	Create and manipulate data using NOSQL database.

Title:BUSINESS COMMUNICATION LABORATORY II,Subject Code:CW3411 NBA Code for the Subject :C207 ,Semester : 4 [22-23EVEN]Target :65 Credits:1.5

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C207.1	Speak fluently in English without errors in the sentence construction and hence present themselves as effective English communicators
C207.2	Differentiate between vocabularies used as adjectives, verbs..
C207.3	Deliver a public speech according to the need of the audience and also be aware of positive body language to be manifested during a speech

C207.4	Deal with the deeper parameters of working in teams like team motivation, multicultural team activity and team conflict resolution
C207.5	Set realistic goals in terms of personal and professional growth
C207.6	Set realistic goals in terms of personal and professional growth

Title:MACHINE LEARNING LABORATORY,Subject Code:AL3461 NBA Code for the Subject :C217 ,Semester : 4 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C217.1	Apply suitable algorithms for selecting the appropriate features for analysis.
C217.2	Implement supervised machine learning algorithms on standard datasets and evaluate the performance.
C217.3	Apply unsupervised machine learning algorithms on standard datasets and evaluate the performance
C217.4	Build the graph based learning models for standard data sets
C217.5	Assess the performance of different ML algorithms and select the suitable one based on the application.
C217.6	Compare the performance of different ML algorithms and select the suitable one based on the application.

Computer Science Engineering

Programme:B.E. Computer Science and Engineering

Course OutComes for the Academic Year : 2022-23

Title:PROBLEM SOLVING AND PYTHON PROGRAMMING,Subject Code:GE3151 NBA Code for the Subject :105 ,Semester : 1 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
105.1	To understand the basics of algorithmic problem solving
105.2	To learn to solve problems using Python conditionals and loops.
105.3	To define Python functions and use function calls to solve problems.
105.4	To use Python data structures - lists, tuples, dictionaries to represent complex data.
105.5	To learn about usage of python packages and modules
105.6	To do input/output with files in Python

Title:MATRICES AND CALCULUS,Subject Code:MA3151 NBA Code for the Subject :C102 ,Semester : 1 [22-23ODD]Target :60 Credits:4	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C102.1	Eigenvalues and eigenvectors, diagonalization of a matrix,symmetric matrices, Positive definite matrices and similar matrices.
C102.2	Understand the limit, continuity and derivative of the functions. Solve various functions and its maxima /minima using differentiation rules.
C102.3	Apply the total and partial derivatives in Taylor series expansion of functions and the extremum of functions.
C102.4	Evaluate the integrals both by using Riemann sums and by using the Fundamental theorem of Calculus. Evaluate integrals using various techniques of integration.
C102.5	Understand the concepts of double integration and determine the area using integration. Also understands the concepts of the change of order of integration and Change of variables in integrals.
C102.6	Understand the concepts of Triple integration and determine the volume using integration.

Title:ENGINEERING PHYSICS,Subject Code:PH3151 NBA Code for the Subject :C103 ,Semester : 1 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C103.1	Understand the importance of mechanics
C103.2	Express their knowledge in electromagnetic waves
C103.3	Demonstrate a strong foundational knowledge in optics and lasers
C103.4	Understand the importance of quantum physics.

C103.5	Comprehend and apply quantum mechanical principles towards the formation of energy bands
C103.6	Demonstrate a strong foundational knowledge in oscillations.

Title:ENGINEERING CHEMISTRY,Subject Code:CY3151 NBA Code for the Subject :C1O4 ,Semester : 1 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C1O4.1	To infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water
C1O4.2	To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engg and tech. applications
C1O4.3	To apply the knowledge of phase rule and composites for materials selection requirements.
C1O4.4	To recommend suitable fuel for engg. processes and applications
C1O4.5	To analyse combustion process and its calculations
C1O4.6	To recognize different forms of energy resources and apply them for suitable applications in energy sectors.

Title:PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY,Subject Code:GE3171 NBA Code for the Subject :106 ,Semester : 1 [22-23ODD]Target :80 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
106.1	To understand the problem solving approaches.
106.2	To learn the basic programming constructs in Python
106.3	To learn the programming constructs in Python like loop, function, recursion.
106.4	To practice various computing strategies for Python-based solutions to real world problems.
106.5	To use Python data structures-lists, tuples, dictionaries.
106.6	To do input/output with files in Python.

Title:ENGLISH LABORATORY,Subject Code:GE3172 NBA Code for the Subject :C101 ,Semester : 1 [22-23ODD]Target :65 Credits:1

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C101.1	To improve the communicative competence of learners by throwing light on vocabulary and basic grammar
C101.2	To improve the communicative competence of learners by throwing light on vocabulary and basic grammar
C101.3	To build on students¿ English language skills by engaging them in listening, speaking and grammar learning activities those are relevant to authentic contexts.

C101.4	C101.4 To build on students¿ English language skills by engaging them in listening, speaking and grammar learning activities those are relevant to authentic contexts.
C101.5	C101.5 To use language efficiently in expressing their opinions via various media and graphical representation.
C101.6	C101.6 Participate effectively in informal conversations; introduce themselves and their friends and express opinion in English with different types of sentences

Title:PHYSICS AND CHEMISTRY LABORATORY,Subject Code:BS3171 NBA Code for the Subject :C107 ,Semester : 1 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C107.1	gain knowledge about elasticity, modulus, oscillations and also able to calculate Young's,rigidity modulus, moment of inertia of regular and irregular bodies.
C107.2	understand the application of interference and diffraction in finding thickness of the given sample and wavelength of the source respectively
C107.3	calculate the variation of resistance with respect to temperature and also able to calculate the band gap of semiconductor
C107.4	Analyse various water quality parameters-Hardness, alkalinity and DO in water sample.
C107.5	Acquire practical skills by using instruments like conductivity meter, pH meter and potentiometer.
C107.6	Finding the strength and amount of nickel in steel.

Title:BASIC ELECTRICAL AND ELECTRONICS ENGINEERING,Subject Code:BE3251 NBA Code for the Subject :109 ,Semester : 2 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
109.1	able to solve given DC and AC ckts
109.2	Able to explain principle of operation different electrical macbines
109.3	able to explain the working principle of different electronic devices
109.4	able to explain the gates and digital ckts
109.5	able to explain the operation of measrementr devices
109.6	able to explain basic of electrical and electronics engineering

Title:PROFESSIONAL ENGLISH-II,Subject Code:HS3252 NBA Code for the Subject :C108 ,Semester : 2 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C108.1	To compare and contrast products and ideas through technical texts in essays with appropriate grammatical usage and contextual meanings.
C108.2	To enhance learners¿ awareness of general rules of writing for specific audiences through professional emails and responses to complaints.

C108.3	To help learners understand the purpose, audience, contexts of different types of letters/essays/checklists
C108.4	To analyze problems in order to arrive at feasible solutions and communicate them orally and in the written format. To report events and the processes of technical and industrial nature
C108.5	To make use of grammatical items effectively in writing recommendations and in transcoding the graphs
C108.6	To write a winning job/internship application-cover letter and resume / SoP-Statement of purpose

Title:PHYSICS FOR INFORMATION SCIENCE,Subject Code:PH3256 NBA Code for the Subject :C111 ,Semester : 2 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C111.1	Gain knowledge on classical and quantum electron theories, and energy band structures
C111.2	Acquire knowledge on basics of semiconductor physics
C111.3	Get knowledge on magnetic properties of materials and their applications in data storage
C111.4	Have the necessary understanding on the functioning of optical materials for optoelectronics
C111.5	Understand the basics of quantum structures
C111.6	Applications and basics of quantum computing

Title:STATISTICS AND NUMERICAL METHODS,Subject Code:MA3251 NBA Code for the Subject :C112 ,Semester : 2 [22-23EVEN]Target :60 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C112.1	Apply the concept of testing of hypothesis for small and large samples in real life problems.
C112.2	Apply the basic concepts of classifications of design of experiments in the field of agriculture.
C112.3	Solve algebraic, transcendental equations and simultaneous equations by direct method.
C112.4	Solve simultaneous equations by iterative method and Eigen value problems.
C112.5	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.
C112.6	Gain the knowledge of various techniques and methods to solve first order ordinary differential equations with initial conditions in engineering applications.

Title:ENGINEERING GRAPHICS,Subject Code:GE3251 NBA Code for the Subject :C113 ,Semester : 2 [22-23EVEN]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description

C113.1	to draw the various types of engineering curves
C113.2	to draw the projection of points, lines and plain surfaces
C113.3	to drawing orthographic projection of solids
C113.4	to draw the freehand sketch of simple objects
C113.5	to draw the development of solids and section of solids
C113.6	to draw the isometric and perspective projections of simple solids

Title:PROGRAMMING IN C,Subject Code:CS3251 NBA Code for the Subject :C114 ,Semester : 2 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C114.1	Demonstrate knowledge on C Programming constructs
C114.2	Develop simple applications in C using basic constructs
C114.3	Design and implement applications using arrays and strings
C114.4	Develop and implement modular applications in C using functions.
C114.5	Develop applications in C using structures and pointers.
C114.6	Design applications using sequential and random access file processing.

Title:ENGINEERING PRACTICES LABORATORY,Subject Code:GE3271 NBA Code for the Subject :C114 ,Semester : 2 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C114.1	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
C114.2	yyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyy
C114.3	zzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzz
C114.4	aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
C114.5	bbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbb
C114.6	ccccccccccccccccccccccccccccccccccccccc

Title:PROGRAMMING IN C LABORATORY,Subject Code:CS3271 NBA Code for the Subject :C117 ,Semester : 2 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C117.1	Demonstrate knowledge on C programming construct
C117.2	Develop simple applications in C using basic constructs
C117.3	Design and implement applications using arrays and strings
C117.4	Develop and implement modular applications in C using functions.
C117.5	Develop applications in C using structures and pointers.
C117.6	Design applications using sequential and random access file processing

Title:DISCRETE MATHEMATICS,Subject Code:MA3354 NBA Code for the Subject

:C201 ,Semester : 3 [22-23ODD]Target :60 Credits:4	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C201.1	Have knowledge of the concepts needed to test the logic of a program
C201.2	Use proof techniques to check the truthfulness of a real life situations
C201.3	Be aware of a class of functions which transforms a finite set into another finite set which relate to input and output functions in computer science and counting principles
C201.4	Use graph theory to formulate the problem and solve it
C201.5	Be exposed to concepts and properties of algebraic structure such as groups, rings and fields
C201.6	Analyse the basic knowledge gained by Lattices , Boolean algebra and apply them

Title:DIGITAL PRINCIPLES AND COMPUTER ORGANIZATION,Subject Code:CS3351 NBA Code for the Subject :C202 ,Semester : 3 [22-23ODD]Target :65 Credits:4	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C202.1	Understand the basic concepts of number system,logic gates and boolean theorems
C202.2	Analyze and design the various combinational circuits using logic gates like adder,subtracted, comparator and data conversions
C202.3	Analyze and design the synchronous sequential circuits
C202.4	Understand the fundamentals of computer systems and analyze the execution of an instruction
C202.5	Analyze different types of control design and identify hazards
C202.6	Understand the characteristics of various memory systems and I/O Communication

Title:FOUNDATIONS OF DATA SCIENCE,Subject Code:CS3352 NBA Code for the Subject :C203 ,Semester : 3 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C203.1	Define the data science process
C203.2	Understand different types of data description for data science process
C203.3	Gain knowledge on relationships between data
C203.4	Use the Python Libraries for Data Wrangling
C203.5	Apply visualization Libraries in Python to interpret Data
C203.6	Apply visualization Libraries in Python to explore Data

Title:DATA STRUCTURES,Subject Code:CS3301 NBA Code for the Subject :C204 ,Semester : 3 [22-23ODD]Target :65 Credits:3
At the end of this course, Student will be able to

CO-Code	Course outcome Description
C204.1	Define linear and non-linear data structures.
C204.2	Implement linear and non¿linear data structure operations.
C204.3	Use appropriate linear/non¿linear data structure operations for solving a given problem.
C204.4	Implement multi-way search tree, traversals and their types (B, B+) to solve various problems.
C204.5	Apply appropriate graph algorithms for graph applications.
C204.6	Analyze the various searching and sorting algorithms.

Title:OBJECT ORIENTED PROGRAMMING,Subject Code:CS3391 NBA Code for the Subject :C205 ,Semester : 3 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C205.1	"To understand Object Oriented Programming concepts and basics of Java programming language
C205.2	To know the principles of packages, inheritance and interfaces
C205.3	To develop a java application with threads and generics classes
C205.4	To define exceptions
C205.5	To learn use I/O streams
C205.6	To design and build Graphical User Interface Application using JAVAFX

Title:DATA STRUCTURES LABORATORY,Subject Code:CS3311 NBA Code for the Subject :C206 ,Semester : 3 [22-23ODD]Target :65 Credits:1.5

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C206.1	Implement Linear data structure algorithms.
C206.2	Implement applications using Stacks and Linked lists.
C206.3	Implement Binary Search tree and AVL tree operations.
C206.4	Implement heaps using Priorty Queues.
C206.5	Implement graph algorithms.
C206.6	Analyze the various searching and sorting algorithms.

Title:OBJECT ORIENTED PROGRAMMING LABORATORY,Subject Code:CS3381 NBA Code for the Subject :C207 ,Semester : 3 [22-23ODD]Target :65 Credits:1.5

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C207.1	Design and develop java programs using object oriented programming concepts
C207.2	Develop simple applications using object oriented concepts such as package,

C207.3	To develop a java application with threads and generics classes
C207.4	To define exceptions
C207.5	To learn use I/O streams
C207.6	Create GUIs and event driven programming applications for real world problems

Title:DATA SCIENCE LABORATORY,Subject Code:CS3361 NBA Code for the Subject :C208 ,Semester : 3 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C208.1	Make use of the python libraries for data science
C208.2	Make use of the python libraries for data science
C208.3	Perform descriptive analytics on the benchmark data sets.
C208.4	Perform correlation and regression analytics on standard data sets
C208.5	Present data using visualization packages in Python
C208.6	Interpret data using visualization packages in Python

Title:ENVIRONMENTAL SCIENCES AND SUSTAINABILITY,Subject Code:GE3451 NBA Code for the Subject :C104 ,Semester : 4 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C104.1	Infer the importance of environment and explain the concept, types, structure and function of ecosystem
C104.2	Recall the various functions, different values, levels, threats and conservation of biodiversity
C104.3	Explain the different type of pollution and propose the suitable methods to prevent the same to enhance the environment
C104.4	Discuss the types of energy resources and conservation
C104.5	Discuss the aspect of sustainability and the means of sustainability management to realize the SDG targets
C104.6	List the various environmental management systems(EMS) for environmental protection and discusses the given solutions for energy to materials for sustainability

Title:THEORY OF COMPUTATION,Subject Code:CS3452 NBA Code for the Subject :C210 ,Semester : 4 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C210.1	Construct automata theory using Finite Automata
C210.2	Write regular expressions for any pattern
C210.3	Design context free grammar and Pushdown Automata
C210.4	Describe CFL and Normal Forms

C210.5	Design Turing machine for computational functions
C210.6	Differentiate between decidable and undecidable problems

Title:ALGORITHMS,Subject Code:CS3401 NBA Code for the Subject :C213 ,Semester : 4 [22-23EVEN]Target :65 Credits:4	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C213.1	Analyze the efficiency of algorithms using various frameworks
C213.2	Apply graph algorithms to solve problems and analyze their efficiency.
C213.3	Make use of algorithm design techniques like divide and conquer, dynamic programming to solve problems
C213.4	Make use of algorithm design technique greedy techniques to solve problems
C213.5	Use the state space tree method for solving problems.
C213.6	Solve problems using approximation algorithms and randomized algorithms

Title:DATABASE MANAGEMENT SYSTEMS,Subject Code:CS3492 NBA Code for the Subject :C213 ,Semester : 4 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C213.1	Study the fundamentals of data models and to represent a database system
C213.2	Apply ER model to Relational model to perform database design effectively and to perform normalization in databases.
C213.3	Understand and analyze the fundamental concepts of transactions
C213.4	Compare and contrast various indexing strategies in different database systems
C213.5	Illustrate and construct query optimization technique in database systems
C213.6	Appraise the difference between advanced databases and traditional databases.

Title:INTRODUCTION TO OPERATING SYSTEMS,Subject Code:CS3451 NBA Code for the Subject :C214 ,Semester : 4 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C214.1	Explain the basic concepts and functions of operating systems and discuss evolution of OS
C214.2	Analyze various scheduling algorithms and process synchronization
C214.3	Explain deadlock prevention and avoidance algorithms
C214.4	Compare and contrast various memory management schemes.
C214.5	Explain the functionality of file systems, I/O systems, and Virtualization
C214.6	Compare iOS and Android Operating Systems

Title:ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING,Subject Code:CS3491 NBA Code for the Subject :cs3491 ,Semester : 4 [22-23EVEN]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
cs3491.1	Understand the concepts of Informed and Heuristic search techniques
cs3491.2	Techniques for reasoning under uncertainty
cs3491.3	Understand Machine Learning and supervised learning algorithms
cs3491.4	Build the supervised learning models
cs3491.5	Understand the unsupervised learning algorithms ensembling and unsupervised models
cs3491.6	Understand the basics of deep learning using neural networks and able to build it.

Title:OPERATING SYSTEMS LABORATORY,Subject Code:CS3461 NBA Code for the Subject :216 ,Semester : 4 [22-23EVEN]Target :65 Credits:1.5

At the end of this course, Student will be able to

CO-Code	Course outcome Description
216.1	Define and implement UNIX Commands
216.2	Compare the performance of various CPU Scheduling Algorithms
216.3	Compare and contrast various Memory Allocation Methods
216.4	Define File Organization strategies
216.5	Define File Allocation Strategies
216.6	: Implement various Disk Scheduling Algorithm

Title:DATABASE MANAGEMENT SYSTEMS LABORATORY,Subject Code:CS3481 NBA Code for the Subject :C218 ,Semester : 4 [22-23EVEN]Target :65 Credits:1.5

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C218.1	Study the fundamentals of data models and to represent a database system
C218.2	Apply ER model to Relational model to perform database design effectively and to perform normalization in databases.
C218.3	Understand and analyze the fundamental concepts of transactions
C218.4	Compare and contrast various indexing strategies in different database systems
C218.5	Illustrate and construct query optimization technique in database systems
C218.6	Appraise the difference between advanced databases and traditional databases.

Title:ALGEBRA AND NUMBER THEORY,Subject Code:MA8551 NBA Code for the Subject :C301 ,Semester : 5 [22-23ODD]Target :60 Credits:4

At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C301.1	Apply the basic notions of groups which will then be used to solve related problems.
C301.2	Apply the basic notions rings, fields which will then be used to solve related problems.
C301.3	Demonstrate accurate and efficient use of advanced algebraic techniques.
C301.4	Understand the basic concepts in number theory.
C301.5	Demonstrate their mastery by solving non-trivial problems related to the concepts, and proving simple theorems.
C301.6	Apply integrated approach to number theory.

Title:COMPUTER NETWORKS,Subject Code:CS8591 NBA Code for the Subject :C302 ,Semester : 5 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C302.1	To study OSI layer model, transmission media and different switching types
C302.2	To study the various protocols and technologies at the data link layer
C302.3	To understand the logical addressing and subnetting
C302.4	To study various routing algorithms and protocols
C302.5	To understand TCP and UDP
C302.6	To understand the working of various application layer protocols

Title:MICROPROCESSORS AND MICROCONTROLLERS,Subject Code:EC8691 NBA Code for the Subject :C303 ,Semester : 5 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C303.1	Able to describe the architecture and organization of 8086 microprocessor
C303.2	Able to write structured understandable programs in assembly language using 8086.
C303.3	Understand techniques for interfacing I/O devices to the microprocessor including several specific standard I/O devices
C303.4	Student able to describe the architecture, interrupt structure, Timer, counter of 8051 microcontroller
C303.5	Student will be able to design of a microcontroller based minimal system for a particular application
C303.6	Design of Memory interfacing circuits

Title:THEORY OF COMPUTATION,Subject Code:CS8501 NBA Code for the Subject :C304 ,Semester : 5 [22-23ODD]Target :65 Credits:3
At the end of this course, Student will be able to

CO-Code	Course outcome Description
C304.1	Analyze and design finite automata
C304.2	Understand the key notions in regular language and Regular expression,computability through problem solving.
C304.3	Understand and construct grammars and Pushdown Automata.
C304.4	Describe CFL and Normal Forms
C304.5	Describing the turing machine problems, solvable unsolvable problems.
C304.6	Explain the Decidability or Undecidability of various problems and analyze complexity

Title:OBJECT ORIENTED ANALYSIS AND DESIGN,Subject Code:CS8592 NBA Code for the Subject :C305 ,Semester : 5 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C305.1	To understand and differentiate Unified Process from other approaches
C305.2	Express software design with UML diagrams
C305.3	Design software applications using OO concepts.
C305.4	Identify various scenarios based on software requirements
C305.5	Transform UML based software design into pattern based design using design patterns
C305.6	Understand the various testing methodologies for OO software

Title:GEOGRAPHIC INFORMATION SYSTEM,Subject Code:OCE552 NBA Code for the Subject :C305OE ,Semester : 5 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C305OE.1	Have basic idea about the fundamentals of GIS
C305OE.2	Understand the types of data models
C305OE.3	Gain knowledge on data quality and standards
C305OE.4	Get knowledge about data input and topology
C305OE.5	Understand data management functions and data output and Analysis
C305OE.6	Have basic idea about GIS applications

Title:MICROPROCESSORS AND MICROCONTROLLERS LABORATORY,Subject Code:EC8681 NBA Code for the Subject :C307PC ,Semester : 5 [22-23ODD]Target :80 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C307PC.1	Implement arithmetic and Logical operation, Code conversion, decimal arithmetic and Matrix operations using 8086
C307PC.2	Implement Floating point operations, string manipulations, sorting and searching using 8086

C307PC.3	Implement Counters and Time Delay, Password checking, Print RAM size and system datedevices
C307PC.4	Implement Traffic light control, Stepper motor control and digital clock using 8086
C307PC.5	Implement Key board and Display, ADC, DAC, Serial interface and Parallel interface using 8086
C307PC.6	Implement Square and Cube program, Find 2¿s complement of a number and Unpacked BCD to ASCII using 8051

Title:OBJECT ORIENTED ANALYSIS AND DESIGN LABORATORY,Subject Code:CS8582 NBA Code for the Subject :C308 ,Semester : 5 [22-23ODD]Target :80 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C308.1	Perform OO analysis and design for a given problem specification
C308.2	Identify and map basic software requirements in UML mapping.
C308.3	draw the UML diagrams for the given specification
C308.4	Improve the software quality using design patterns and to explain the rationale behind
C308.5	applying specific design patterns
C308.6	Test the compliance of the software with the SRS. Test the compliance of the software with the SRS.

Title:NETWORKS LABORATORY,Subject Code:CS8581 NBA Code for the Subject :C309 ,Semester : 5 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C309.1	To learn various network related commands, topology and protocols
C309.2	To learn about error correcting codes
C309.3	Attain knowledge about the socket programming and its applications in websites
C309.4	Students will have a clear knowledge about the concepts of TCP and UDP sockets and its some of the applications
C309.5	Able to integrate information learned about network simulator OPNET with congestion control algorithm
C309.6	To study analyze various routing algorithms

Title:DISTRIBUTED SYSTEMS,Subject Code:CS8603 NBA Code for the Subject :314 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
314.1	To elucidate the foundations and issues of distributed systems.
314.2	To understand logic time.

314.3	To understand the various synchronization issues and global state for distributed systems.
314.4	To understand the Mutual Exclusion and Deadlock detection algorithms in distributed systems
314.5	To describe the agreement protocols and fault tolerance mechanisms in distributed systems.
314.6	To describe the features of peer-to-peer systems and distributed shared memory

Title:INTERNET PROGRAMMING,Subject Code:CS8651 NBA Code for the Subject :C310 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C310.1	Construct Basic Websites using HTML and CSS
C310.2	Learn to Build Dynamic Webpages using Javascript.
C310.3	Developing serverside programs using Servlet
C310.4	Developing serverside programs using JSP
C310.5	Construct Simple Websites using PHP and represent data in XML format
C310.6	Use AJAX and webservices to develop interactive web applications

Title:ARTIFICIAL INTELLIGENCE,Subject Code:CS8691 NBA Code for the Subject :C311 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C311.1	Define and Describe AI and Intelligent agent, its characteristics and Problem solving approach
C311.2	Learn Problem formulation and algorithms like BFS,DFS, Hill Climbing and Heuristic functions and solve Constraint Satisfaction Problems
C311.3	Explain Game playing like MinMax and Alpha Beta Pruning and optimal decisions
C311.4	Learn the Knowledge representation and Resolution using Predicate Logic and Prolog Programming, Forward and Backward chaining. Describe the Ontological Engineering through categories, objects and even
C311.5	Explain the architecture of Intelligent Agents, communication, negotiations, argumentation among multi-agents
C311.6	Describe the Information Retrieval & Extraction, Natural Language Processing Using AI and Robotics ¿its hardware, perception, planning and motion.

Title:MOBILE COMPUTING,Subject Code:CS8601 NBA Code for the Subject :C312 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C312.1	Explain the Basics of Mobile Computing
C312.2	To Learn the Basics of Mobile telecommunication

C312.3	Demonstrate the Adhoc Network concepts and its routing protocol
C312.4	To learn mobile IP and mobile TCP
C312.5	To Learn the basics of transport and application layer protocol
C312.6	To gain the knowledge about different mobile platforms and application development

Title:COMPILER DESIGN,Subject Code:CS8602 NBA Code for the Subject :C313 ,Semester : 6 [22-23EVEN]Target :65 Credits:4	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C313.1	Understand the different phases of compiler. Design a lexical Analyzer for a sample language
C313.2	Apply different parsing Algorithms to develop the parsers for a given grammar
C313.3	Design and implement a scanner and a parser using LEX and YACC tools
C313.4	Understand Syntax Directed translation and type checking
C313.5	Understand the concept of runtime environment
C313.6	Learn to implement code optimization techniques and a sample code generator

Title:INFORMATION RETRIEVAL TECHNIQUES,Subject Code:CS8080[8] NBA Code for the Subject :C410 ,Semester : 6 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C410.1	To apply the information retrieval models,to apply information retrieval models dfdg
C410.2	To design web search engine
C410.3	To use link analysis
C410.4	To use hadoop and map reduce
C410.5	To apply document text mining techniques
C410.6	To remember the concepts of supervised and unsupervised machine learning tehniques

Title:PROFESSIONAL COMMUNICATION,Subject Code:HS8581 NBA Code for the Subject :C308 ,Semester : 6 [22-23EVEN]Target :65 Credits:1	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C308.1	To enhance the learners speaking skill through various activities like group discussion, telephonic conversation, presentation skill etc.,
C308.2	To develop listening and speaking skills through communicative functions
C308.3	Enhance the Employability and Career Skills of student
C308.4	Orient the students towards grooming as a professional
C308.5	Make them Employability Graduates

C308.6	Develop their confidence and help them attend interviews successfully.

Title:INTERNET PROGRAMMING LABORATORY,Subject Code:CS8661 NBA Code for the Subject :C316 ,Semester : 6 [22-23EVEN]Target :80 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C316.1	Construct webpages using HTML and CSS
C316.2	Build dynamic webpages with validation using javascript objects and apply different event handling mechanism
C316.3	Develop dynamic webpages using Servlets
C316.4	Develop dynamic webpages using JSP
C316.5	Construct webpages using XML and use PHP programming to develop web applications
C316.6	Construct web applications using AJAX and webservices

Title:MOBILE APPLICATION DEVELOPMENT LABORATORY,Subject Code:CS8662 NBA Code for the Subject :C317 ,Semester : 6 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C317.1	Develop mobile applications using GUI and Layouts
C317.2	Develop mobile applications using Event Listener
C317.3	Develop mobile applications using Database
C317.4	Develop mobile applications using RSS Feed, internal/eternal Storage
C317.5	Develop mobile applications using SMS, Multi threading and GPS
C317.6	Analyze and discover own mobile app for simple needs

Title:MINI PROJECT,Subject Code:CS8611 NBA Code for the Subject :C318 ,Semester : 6 [22-23EVEN]Target :65 Credits:1

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C318.1	Gather and interpret technical literature to formulate a project proposal to solve challenging practical problems.
C318.2	Identify SDLC model and prepare software requirements specification.
C318.3	Design the software architecture
C318.4	Apply modern tools for implementation using best coding practices and testing at various levels of the project.
C318.5	Document the technical report on identified topic and present the ideas with effective communication skills
C318.6	Learn the concepts of project management and to work effectively as a member in team.

Title:CRYPTOGRAPHY AND NETWORK SECURITY,Subject Code:CS8792 NBA Code for the Subject :C401 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C401.1	Understand the OSI security architecture and classical encryption techniques
C401.2	Learn the importance of number theory in cryptography
C401.3	Learn various block cipher, stream cipher and public key cryptosystems
C401.4	Discuss the requirements and functionalities of various authentication algorithms
C401.5	Understand the implementation of cryptographic algorithms and system security
C401.6	Discuss IPSec,Email Security and Web Security

Title:PRINCIPLES OF MANAGEMENT,Subject Code:MG8591 NBA Code for the Subject :C401 ,Semester : 7 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C401.1	To understand the fundamentals of management principles and practices in the organizations.
C401.2	To know the various types of planning and decision making in the context of organizations.
C401.3	To learn the significance of organising resources, jobs and manpower for effective management.
C401.4	To understand the various motivational techniques influencing and directing the human behaviour in the organization.
C401.5	To measure the performance of organization and suggest suitable actions for improving productivity.
C401.6	To identify the various controlling techniques used by managers in the business world.

Title:CLOUD COMPUTING,Subject Code:CS8791 NBA Code for the Subject :C403 ,Semester : 7 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C403.1	Articulate the main concepts, key technologies, strengths and limitations of cloud computing.
C403.2	Learn the key and enabling technologies that help in the development of cloud.
C403.3	Develop the ability to understand and use the architecture of compute and storage cloud, service and delivery models
C403.4	Explain the core issues of cloud computing such as resource management and security.
C403.5	Be able to install and use current cloud technologies.
C403.6	Evaluate and choose the appropriate technologies, algorithms and approaches for implementation and use of cloud.

Title:HOSPITAL MANAGEMENT,Subject Code:OBM752 NBA Code for the

Subject :C404E12 ,Semester : 7 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C404E12.1	To understand the fundamentals of hospital administration and managemen
C404E12.2	To infer the importance of environment and explain the concept, types, structure and functions of hospital.
C404E12.3	To know the market related research process.
C404E12.4	To explore various information management systems of hospital.
C404E12.5	To be familiar with the relative supportive services.
C404E12.6	To learn the quality and safety aspects in hospital.

Title:PROFESSIONAL ETHICS IN ENGINEERING,Subject Code:GE8076[8] NBA Code for the Subject :C409E7 ,Semester : 7 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C409E7.1	To understand Human values
C409E7.2	To learn ethics in Engineering professional life
C409E7.3	To learn code of ethics and experimentation
C409E7.4	To learn safety, risk, risk analysis
C409E7.5	To understand Intellectual Property Rights
C409E7.6	To learn multinational, environment and computer ethics

Title:SOFTWARE PROJECT MANAGEMENT,Subject Code:IT8075 NBA Code for the Subject :c405 ,Semester : 7 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
c405.1	Gain extensive knowledge about the basic project management concepts, framework and the process models
c405.2	Obtain adequate knowledge about software process models and software effort estimation techniques
c405.3	Estimate the risks involved in various project activities
c405.4	Understand Project Management principles while developing software.
c405.5	Define the checkpoints,project reporting structure,project progress and tracking mechanisms using project management principles
c405.6	Learn staff selection process and the issues related to people management

Title:CLOUD COMPUTING LABORATORY,Subject Code:CS8711 NBA Code for the Subject :C407 ,Semester : 7 [22-23ODD]Target :65 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C407.1	Configure various virtualization tools such as Virtual Box, VMware workstation.

C407.2	Design and deploy a web application in a PaaS environment link layer
C407.3	Demonstrate generic cloud environment that can be used as a private cloud
C407.4	Learn how to simulate a cloud environment to implement new schedulers
C407.5	Apply Hadoop single node cluster and run simple applications
C407.6	Manipulate large data sets in a parallel environment

Title:SECURITY LABORATORY,Subject Code:IT8761 NBA Code for the Subject :C408 ,Semester : 7 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C408.1	To implement classical encryption techniques
C408.2	To build cryptosystems by applying symmetric key encryption algorithm
C408.3	To build cryptosystems by applying public key encryption algorithm
C408.4	To build authentication algorithms
C408.5	Develop a signature scheme using digital signature standard
C408.6	Demonstrate the network security using open source tools

Title:PROJECT WORK,Subject Code:CS8811 NBA Code for the Subject :C411 ,Semester : 8 [22-23EVEN]Target :80 Credits:10

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C411.1	Organize the team and apply the knowledge of mathematical concepts and engineering fundamentals to find solutions for social and environmental issues.
C411.2	Identify, formulate the problem and do literature survey for the project ethically.
C411.3	Design the solution based on SDLC approach for the project and identify the tools to be used.
C411.4	Implement and Test the project using modern tools in a cooperative manner.
C411.5	Work efficiently both as an individual and as a member in the multidisciplinary team, document the technical content.
C411.6	Identify the future work and promote the research in the problem domain

Computer Science Engineering-Artificial Intelligence & Machine Learning

Programme:

Course OutComes for the Academic Year : 2022-23

Title:PROFESSIONAL ENGLISH-II,Subject Code:HS3252 NBA Code for the Subject :C108 ,Semester : 2 [22-23EVEN]Target :65 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C108.1	To write a winning job/internship application-cover letter and resume / SoP-Statement of purpose
C108.2	emails and responses to complaints. To enhance learners¿ awareness of general rules of writing for specific audiences through professional
C108.3	To help learners understand the purpose, audience, contexts of different types of letters/essays/checklists
C108.4	To help learners understand the purpose, audience, contexts of different types of letters/essays/checklists
C108.5	To make use of grammatical items effectively in writing recommendations and in transcoding the graphs
C108.6	To make use of grammatical items effectively in writing recommendations and in transcoding the graphs

Title:PHYSICS FOR INFORMATION SCIENCE,Subject Code:PH3256 NBA Code for the Subject :C111 ,Semester : 2 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C111.1	Gain knowledge on classical mechanics, quantum theory and energy band structure.
C111.2	Acquire knowledge on basics of semiconductor physics.
C111.3	Get knowledge on magnetic properties of materials and their applications.
C111.4	Have necessary understanding on the functioning of optical materials for opto electronics
C111.5	Understand the basics of quantum structures.
C111.6	Basics and applications of quantum computing.

Title:BASIC ELECTRICAL AND ELECTRONICS ENGINEERING,Subject Code:BE3251 NBA Code for the Subject :C112 ,Semester : 2 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C112.1	Compute Electric DC Circuit parameters for simple problems
C112.2	Compute the AC parameters for simple problems
C112.3	Explain the working principle and applications of electrical machines
C112.4	Analyze the characteristics of analog electronic devices

C112.5	Explain the basic concepts of digital electronics
C112.6	Explain the operating principles of measuring instruments

Title:STATISTICS AND NUMERICAL METHODS,Subject Code:MA3251 NBA Code for the Subject :C112 ,Semester : 2 [22-23EVEN]Target :60 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C112.1	Apply the concept of testing of hypothesis for small and large samples in real life problems.
C112.2	Apply the basic concepts of classifications of design of experiments in the field of agriculture.
C112.3	Solve algebraic, transcendental equations and simultaneous equations by direct method.
C112.4	Solve simultaneous equations by iterative method and Eigen value problems.
C112.5	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.
C112.6	Gain the knowledge of various techniques and methods to solve first order ordinary differential equations with initial conditions in engineering applications.

Title:ENGINEERING GRAPHICS,Subject Code:GE3251 NBA Code for the Subject :C113 ,Semester : 2 [22-23EVEN]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C113.1	Student will be able to draw the various types of engineering curves
C113.2	Student will be able to draw the projection of points, lines and plane surfaces
C113.3	Student will be able to drawing orthographic projection of solids
C113.4	Student will be able to draw the freehand sketch of simple objects
C113.5	Student will be able to draw the development of solids and section
C113.6	Student will be able to draw the isometric and perspective projections of simple solids.

Title:PROGRAMMING IN C,Subject Code:CS3251 NBA Code for the Subject :C116 ,Semester : 2 [22-23EVEN]Target :80 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C116.1	Demonstrate knowledge on C Programming constructs
C116.2	Develop simple applications in C using basic constructs
C116.3	Design and implement applications using arrays and strings
C116.4	Develop and implement modular applications in C using functions
C116.5	Develop applications in C using structures and pointers

C116.6	Design applications using sequential and random access file processing

Title:ENGINEERING PRACTICES LABORATORY,Subject Code:GE3271 NBA Code for the Subject :C116 ,Semester : 2 [22-23EVEN]Target :65 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C116.1	Students will be able to distinguish residential house wiring, fluorescent lamp wiring and stair case wiring
C116.2	Students will be able to define electrical quantities like voltage, current, energy and resistance and their measurement using CRO.
C116.3	Students will be able to analyze different logic gates, clock, rectifier and to solder devices and components.
C116.4	Students will able to understand the pipe connections for the home application and industrial constructions
C116.5	Students will be able to do plan the real geometry of the shapes for industrial applications.
C116.6	Students will be able to understand the concept of joining the metal by welding.

Title:PROGRAMMING IN C LABORATORY,Subject Code:CS3271 NBA Code for the Subject :C120 ,Semester : 2 [22-23EVEN]Target :65 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C120.1	Demonstrate knowledge on C programming constructs
C120.2	Develop simple applications in C using basic constructs
C120.3	Design and implement applications using arrays and strings
C120.4	Develop and implement modular applications in C using functions
C120.5	Develop applications in C using structures and pointers
C120.6	Design applications using sequential and random access file processing

Electronics and Communication Engineering

Programme:B.E. Electronics and Communication Engineering

Course OutComes for the Academic Year : 2022-23

Title:PROBLEM SOLVING AND PYTHON PROGRAMMING,Subject Code:GE3151 NBA Code for the Subject :105 ,Semester : 1 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
105.1	To understand the basics of algorithmic problem solving
105.2	To learn to solve problems using Python conditionals and loops.
105.3	To define Python functions and use function calls to solve problems.
105.4	To use Python data structures - lists, tuples, dictionaries to represent complex data.
105.5	To learn about usage of python packages and modules
105.6	To do input/output with files in Python

Title:MATRICES AND CALCULUS,Subject Code:MA3151 NBA Code for the Subject :C102 ,Semester : 1 [22-23ODD]Target :60 Credits:4	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C102.1	Eigenvalues and eigenvectors, diagonalization of a matrix,symmetric matrices, Positive definite matrices and similar matrices.
C102.2	Understand the limit, continuity and derivative of the functions. Solve various functions and its maxima /minima using differentiation rules.
C102.3	Apply the total and partial derivatives in Taylor series expansion of functions and the extremum of functions.
C102.4	Evaluate the integrals both by using Riemann sums and by using the Fundamental theorem of Calculus. Evaluate integrals using various techniques of integration.
C102.5	Understand the concepts of double integration and determine the area using integration. Also understands the concepts of the change of order of integration and Change of variables in integrals.
C102.6	Understand the concepts of Triple integration and determine the volume using integration.

Title:ENGINEERING PHYSICS,Subject Code:PH3151 NBA Code for the Subject :C103 ,Semester : 1 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C103.1	Understand the importance of mechanics
C103.2	Express their knowledge in electromagnetic waves
C103.3	Demonstrate a strong foundational knowledge in optics and lasers
C103.4	Understand the importance of quantum physics.

C103.5	Comprehend and apply quantum mechanical principles towards the formation of energy bands
C103.6	Demonstrate a strong foundational knowledge in oscillations.

Title:ENGINEERING CHEMISTRY,Subject Code:CY3151 NBA Code for the Subject :C1O4 ,Semester : 1 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C1O4.1	To infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water
C1O4.2	To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engg and tech. applications
C1O4.3	To apply the knowledge of phase rule and composites for materials selection requirements.
C1O4.4	To recommend suitable fuel for engg. processes and applications
C1O4.5	To analyse combustion process and its calculations
C1O4.6	To recognize different forms of energy resources and apply them for suitable applications in energy sectors.

Title:PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY,Subject Code:GE3171 NBA Code for the Subject :106 ,Semester : 1 [22-23ODD]Target :80 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
106.1	To understand the problem solving approaches.
106.2	To learn the basic programming constructs in Python
106.3	To learn the programming constructs in Python like loop, function, recursion.
106.4	To practice various computing strategies for Python-based solutions to real world problems.
106.5	To use Python data structures-lists, tuples, dictionaries.
106.6	To do input/output with files in Python.

Title:ENGLISH LABORATORY,Subject Code:GE3172 NBA Code for the Subject :C101 ,Semester : 1 [22-23ODD]Target :65 Credits:1

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C101.1	To improve the communicative competence of learners by throwing light on vocabulary and basic grammar
C101.2	To improve the communicative competence of learners by throwing light on vocabulary and basic grammar
C101.3	To build on students¿ English language skills by engaging them in listening, speaking and grammar learning activities those are relevant to authentic contexts.

C101.4	C101.4 To build on students¿ English language skills by engaging them in listening, speaking and grammar learning activities those are relevant to authentic contexts.
C101.5	C101.5 To use language efficiently in expressing their opinions via various media and graphical representation.
C101.6	C101.6 Participate effectively in informal conversations; introduce themselves and their friends and express opinion in English with different types of sentences

Title:PHYSICS AND CHEMISTRY LABORATORY,Subject Code:BS3171 NBA Code for the Subject :C107 ,Semester : 1 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C107.1	gain knowledge about elasticity, modulus, oscillations and also able to calculate Young's,rigidity modulus, moment of inertia of regular and irregular bodies.
C107.2	understand the application of interference and diffraction in finding thickness of the given sample and wavelength of the source respectively
C107.3	calculate the variation of resistance with respect to temperature and also able to calculate the band gap of semiconductor
C107.4	Analyse various water quality parameters-Hardness, alkalinity and DO in water sample.
C107.5	Acquire practical skills by using instruments like conductivity meter, pH meter and potentiometer.
C107.6	Finding the strength and amount of nickel in steel.

Title:PROFESSIONAL ENGLISH-II,Subject Code:HS3252 NBA Code for the Subject :C108 ,Semester : 2 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C108.1	To compare and contrast products and ideas through technical texts in essays with appropriate grammatical usage and contextual meanings.
C108.2	emails and responses to complaints. To enhance learners¿ awareness of general rules of writing for specific audiences through professional
C108.3	To help learners understand the purpose, audience, contexts of different types of letters/essays/checklists
C108.4	To analyze problems in order to arrive at feasible solutions and communicate them orally and in the written format. To report events and the processes of technical and industrial nature
C108.5	To make use of grammatical items effectively in writing recommendations and in transcoding the graphs
C108.6	To write a winning job/internship application-cover letter and resume / SoP-Statement of purpose

Title:STATISTICS AND NUMERICAL METHODS,Subject Code:MA3251 NBA Code for the Subject :C109 ,Semester : 2 [22-23EVEN]Target :60 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C109.1	Apply the concept of testing of hypothesis for small and large samples in real life problems.
C109.2	Apply the basic concepts of classifications of design of experiments in the field of agriculture.
C109.3	Solve algebraic, transcendental equations and simultaneous equations by direct method.
C109.4	Solve simultaneous equations by iterative method and Eigen value problems.
C109.5	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.
C109.6	Gain the knowledge of various techniques and methods to solve first order ordinary differential equations with initial conditions in engineering applications.

Title:PHYSICS FOR ELECTRONICS ENGINEERING,Subject Code:PH3254 NBA Code for the Subject :C111 ,Semester : 2 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C111.1	Gives knowledge about structure of various materials and its properties
C111.2	Gives understanding about the electrical properties of materials, applications of quantum mechanics
C111.3	Gain knowledge on magnetic properties of materials and their applications
C111.4	Gives understanding of semiconductor physics from basics to applications of devices
C111.5	Gain knowledge about the optical properties of materials, optical displays and its applications
C111.6	Gives information about nanostructures, quantum confinement and nano device applications

Title:ELECTRICAL AND INSTRUMENTATION ENGINEERING,Subject Code:BE3254 NBA Code for the Subject :C112 ,Semester : 2 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C112.1	Comprehend the concepts in transformers
C112.2	Comprehend the concepts in electrical generators and motors
C112.3	Comprehend the concept of AC machines
C112.4	Explain Working principle of various measuring instruments
C112.5	Comprehend the concept of various power system
C112.6	Working of circuit breaker, Earthing CONCEPTS

Title:ENGINEERING GRAPHICS,Subject Code:GE3251 NBA Code for the Subject :C113 ,Semester : 2 [22-23EVEN]Target :65 Credits:4

At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C113.1	Student will be able to draw the various types of engineering curves.
C113.2	Student will be able to draw the projection of points, lines and plain surfaces.
C113.3	Student will be able to drawing orthographic projection of solids.
C113.4	Student will be able to draw the freehand sketch of simple objects.
C113.5	Student will be able to draw the development of solids and section of solids.
C113.6	Student will be able to draw the isometric and perspective projections of simple solids.

Title:CIRCUIT ANALYSIS,Subject Code:EC3251 NBA Code for the Subject :C114 ,Semester : 2 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C114.1	Apply the basic concepts of circuit analysis such as Kirchhoff¿s laws, mesh current and node voltage method for analysis of DC and AC circuits
C114.2	Apply suitable network theorems and analyze AC and DC circuits
C114.3	Analyze steady state response of any R, L and C circuits.
C114.4	Analyze the transient response for any RC, RL and RLC circuits
C114.5	Analysis the Frequency response of parallel and series resonance circuits.
C114.6	Analyze the coupled circuits and network topologies

Title:ENGINEERING PRACTICES LABORATORY,Subject Code:GE3271 NBA Code for the Subject :115 ,Semester : 2 [22-23EVEN]Target :75 Credits:2

At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
115.1	Students will be able to distinguish residential house wiring, fluorescent lamp wiring and stair case wiring.
115.2	Students will be able to define electrical quantities like voltage, current, energy and resistance and their measurement using CRO.
115.3	Students will be able to analyze different logic gates, clock, rectifier and to solder devices and components.
115.4	Students will able to understand the pipe connections for the home application and industrial constructions
115.5	Students will be able to do plan the real geometry of the shapes for industrial applications.
115.6	Students will be able to understand the concept of joining the metal by welding.

Title:CIRCUIT ANALYSIS LABORATORY,Subject Code:EC3271 NBA Code for the Subject :C117 ,Semester : 2 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C117.1	Realize the circuit connection and acquire the knowledge of analyzing the circuit
C117.2	Understand basic information of circuit theory
C117.3	Understand basic circuit laws of voltage and current.
C117.4	Relate the basics of circuit theorem theory and practical implementation.
C117.5	Understand and realize the concept of resonance
C117.6	Interpret the circuit and its uses in real time applications.

Title:RANDOM PROCESSES AND LINEAR ALGEBRA,Subject Code:MA3355 NBA Code for the Subject :201 ,Semester : 3 [22-23ODD]Target :60 Credits:4	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
201.1	Have a fundamental knowledge of the basic probability concepts and Get exposure and a well-founded knowledge of standard distributions which can describe real life phenomena
201.2	Acquire skills in handling situations involving more than one random Variable and functions of random variables
201.3	Understand and characterize phenomena which evolve with respect to time in probabilistic manner.
201.4	To introduce the basic notions of groups, rings, fields and vectoe space which will then be used to solve related problems.
201.5	To understand the concepts of linear transformations and diagnolization.
201.6	To apply the concept of inner product spaces in orthogonalization.

Title:C PROGRAMMING AND DATA STRUCTURES,Subject Code:CS3353 NBA Code for the Subject :C202 ,Semester : 3 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C202.1	Learn the basics of C, Decision Making and Looping Statements, Functions and Arrays concepts.
C202.2	Learn the concept of Structures, Union, Pointers and File handling in C.
C202.3	Explain the Linear data structures like List, Stack and Queue and their applications.
C202.4	Discuss the Non-Linear data structure Tree, its Representation, Types, Traversals and applications.
C202.5	Learn the concept of Hashing and its types.
C202.6	Discuss the various Sorting and Searching algorithms.

Title:ELECTRONIC DEVICES AND CIRCUITS,Subject Code:EC3353 NBA Code for the Subject :C204 ,Semester : 3 [22-23ODD]Target :65 Credits:3
At the end of this course, Student will be able to

CO-Code	Course outcome Description
C204.1	Explain the structure and working operation of basic electronic devices
C204.2	Design and analyze amplifiers.
C204.3	Determine frequency response of BJT and MOSFET amplifiers.
C204.4	Design and analyze feedback amplifiers and oscillator principles.
C204.5	Design and analyse power amplifiers
C204.6	Design and analyse of power supply circuits

Title:SIGNALS AND SYSTEMS,Subject Code:EC3354 NBA Code for the Subject :C204 ,Semester : 3 [22-23ODD]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C204.1	Analyze the basic properties of various types of continuous time and discrete time signals and systems and also determine whether the given system is linear/time invariant/causal/stable
C204.2	Apply, evaluate and analyze Fourier series expansion, Fourier transformation ans Laplace transformation for determining the frequency components of continuous time signals.
C204.3	Evaluate and analyze the characteristics of continuous time linear time invariant systems by applying Fourier and Laplace transforms.
C204.4	Analyze the properties of discrete time signals by applying the Z transform and discrete time Fourier transform.
C204.5	Evaluate the response of the given discrete time LTI systems using difference equations, impulse response and Convolution in time domain.
C204.6	Apply, Evaluate and analyze the characteristics of discrete time LTI systems using Z Transform and discrete time Fourier transform in Frequency domain

Title:DIGITAL SYSTEMS DESIGN,Subject Code:EC3352 NBA Code for the Subject :C206 ,Semester : 3 [22-23ODD]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C206.1	Use Boolean algebra and simplification procedures relevant to digital logic.
C206.2	Design various combinational digital circuits using logic gates.
C206.3	Analyse and design synchronous sequential circuits.
C206.4	Analyse and design asynchronous sequential circuits.
C206.5	Build logic gates and use programmable devices
C206.6	Use Digital Electronics in present Contemporary World

Title:CONTROL SYSTEMS,Subject Code:EC3351 NBA Code for the Subject :CO4 ,Semester : 3 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
CO4.1	To introduce the components and their representation of control systems
CO4.2	To introduce the components and their representation of control systems
CO4.3	To learn various methods for analyzing the time response, frequency response and stability of the systems
CO4.4	To learn various methods for analyzing the time response, frequency response and stability of the systems
CO4.5	To learn the various approach for the state variable analysis.
CO4.6	To learn the various approach for the state variable analysis.

Title:ELECTRONIC DEVICES AND CIRCUITS LABORATORY,Subject Code:EC3361 NBA Code for the Subject :C207 ,Semester : 3 [22-23ODD]Target :80 Credits:1.5

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C207.1	students should be able to understand the characteristics of PN Junction Diode and Zener diode & its operation as regulator
C207.2	students should be able to Design full wave rectifier with and without filter using pn junction diode
C207.3	students should be able to Design and test BJT and MOSFET amplifiers
C207.4	students should be able to Design CE and CS amplifier and analyze their frequency response
C207.5	students should be able to conduct CMRR measurement of differential amplifier
C207.6	students should be able to analyze the operation and frequency response of power amplifiers

Title:C PROGRAMMING AND DATA STRUCTURES LABORATORY,Subject Code:CS3362 NBA Code for the Subject :C208 ,Semester : 3 [22-23ODD]Target :80 Credits:1.5

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C208.1	To implement basic programs and advanced concepts like Functions, Arrays in C
C208.2	To implement Structures, Pointers and Files in C
C208.3	To implement Array and Linked list implementation of Lists, Stack, Queue and its applications in C
C208.4	To implement Tree and its traversals, Binary Search Trees in C
C208.5	To implement Searching and Sorting algorithms in C
C208.6	To implement Hash functions and Collision Resolution techniques in C

Title:ENVIRONMENTAL SCIENCES AND SUSTAINABILITY,Subject Code:GE3451 NBA Code for the Subject :215 ,Semester : 4 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
215.1	Infer the importance of environment and explain the concept of ecosystem.
215.2	Recall the various functions, different values, threats and conservation of biodiversity.
215.3	Explain the different types of pollution and propose the suitable methods to prevent the same to enhance the environment.
215.4	Discuss the different types of renewable resources, optimum usage and its importance.
215.5	Discuss the aspect of sustainability and the means of sustainability management to realize the SDG targets.
215.6	List the various environmental management systems for environmental protection and discuss the given solutions for energy to materials for sustainability.

Title:ELECTROMAGNETIC FIELDS,Subject Code:EC3452 NBA Code for the Subject :C210 ,Semester : 4 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C210.1	Display an understanding of fundamental electromagnetic laws and concepts
C210.2	Analyze field potentials due to static charges and explain how materials affect electric fields.
C210.3	Analyze field potentials due to static magnetic fields and explain how materials affect magnetic fields.
C210.4	Write Maxwell's equations in integral, differential and phasor forms and explain their physical meaning, also analyze the relation between the fields under time varying situations
C210.5	Explain electromagnetic wave propagation in lossy and in lossless media.
C210.6	Discuss the principles of propagation of uniform plane waves and also solve simple problems requiring estimation of electric and magnetic field quantities based on these concepts and laws.

Title:LINEAR INTEGRATED CIRCUITS,Subject Code:EC3451 NBA Code for the Subject :C212 ,Semester : 4 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C212.1	Analyze the basic building blocks, AC and DC characteristics of linear integrated circuits
C212.2	Design linear and nonlinear applications of OP ¿ AMPS
C212.3	Design applications using analog multiplier and PLL
C212.4	Design ADC and DAC using OP ¿ AMPS
C212.5	Generate waveforms using OP ¿ AMP Circuits
C212.6	Analyze Special function ICs

Title:DIGITAL SIGNAL PROCESSING,Subject Code:EC3492 NBA Code for the

Subject :C213 ,Semester : 4 [22-23EVEN]Target :60 Credits:4	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C213.1	Apply DFT for the analysis of Digital signals and Systems
C213.2	Design IIR and FIR filters
C213.3	Characterize the Effects of Finite Precision representation on digital Filters
C213.4	Design Multirate Filters.
C213.5	Apply Adaptive filters appropriately in communication systems.
C213.6	Study of different Digital signal Processor

Title:COMMUNICATION SYSTEMS,Subject Code:EC3491 NBA Code for the Subject :C214 ,Semester : 4 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C214.1	Gain knowledge in amplitude modulation techniques
C214.2	Understand the concepts of Random Process to the design of communication systems
C214.3	Gain knowledge in digital techniques
C214.4	Gain knowledge in sampling and quantization
C214.5	Gain knowledge in digital modulations
C214.6	Understand the importance of demodulation techniques

Title:NETWORKS AND SECURITY,Subject Code:EC3401 NBA Code for the Subject :C311 ,Semester : 4 [22-23EVEN]Target :65 Credits:4	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C311.1	Explain the Network Models, layers and functions
C311.2	Categorize and classify the routing protocols
C311.3	List the functions of the transport and application layer
C311.4	Evaluate and choose the network security mechanisms
C311.5	Discuss the hardware security attacks and countermeasures
C311.6	Implement all network models and protocols in C programming

Title:COMMUNICATION SYSTEMS LABORATORY,Subject Code:EC3461 NBA Code for the Subject :C217 ,Semester : 4 [22-23EVEN]Target :65 Credits:1.5	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C217.1	Design AM, FM & Digital Modulators for specific applications.
C217.2	Compute the sampling frequency for digital modulation.

C217.3	Simulate & validate the various functional modules of Communication system
C217.4	Demonstrate their knowledge in base band signaling schemes through implementation of digital modulation schemes.
C217.5	Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of Communication system.
C217.6	Design various pulse modulation schemes

Title:LINEAR INTEGRATED CIRCUITS LABORATORY,Subject Code:EC3462 NBA Code for the Subject :C217 ,Semester : 4 [22-23EVEN]Target :80 Credits:1.5

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C217.1	Analyze various types of feedback amplifiers
C217.2	Design Oscillators, tuned amplifiers, wave shaping circuits and multivibrators
C217.3	Design and simulate feedback amplifiers, tuned amplifiers and Oscillators using SPICE tool
C217.4	Design and simulate wave shaping circuits, multivibrators and filters using SPICE tool
C217.5	Design amplifiers, Oscillators, D-A converters using operational amplifiers
C217.6	Design filters using op-amp and perform an experiment on frequency response

Title:COMMUNICATION NETWORKS,Subject Code:EC8551 NBA Code for the Subject :305 ,Semester : 5 [22-23ODD]Target :60 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
305.1	Understand the overview of OSI model and the physical layer Functions
305.2	Evaluate the required functionality at data link layer and Network layer
305.3	Analyze various routing protocols of network layer
305.4	Understand the transport layer functions and various congestion control techniques
305.5	Analyze the QOS requirements for different types of networks
305.6	Understand different application layer protocols

Title:DIGITAL COMMUNICATION,Subject Code:EC8501 NBA Code for the Subject :C301 ,Semester : 5 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C301.1	Analyze the principles of Information theory and source coding techniques
C301.2	Evaluate and Analyze the characteristics of the various waveform coding schemes and also the measurement of parameters of those techniques

C301.3	Analyse the procedure for the design of transmitter and receiver of various base band transmission schemes
C301.4	Design of transmitter and receiver of various band pass signaling schemes
C301.5	Analyze the spectral characteristics of band pass signaling schemes and their noise performance
C301.6	Analyse the fundamental characteristics of channel coding and design of channel coders for various digital transmission techniques

Title:DISCRETE-TIME SIGNAL PROCESSING,Subject Code:EC8553 NBA Code for the Subject :C302 ,Semester : 5 [22-23ODD]Target :60 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C302.1	Apply the basic concepts of signals and systems and DFT for the analysis of digital signals and systems
C302.2	Design and realize IIR filters for the given required specifications
C302.3	Design and realize linear phase FIR filters for the given specifications using various methods
C302.4	Characterize and analyze the effects of finite precision representation on digital filters
C302.5	Explain the operations of Digital Signal on fixed and floating point Processors.
C302.6	Apply and evaluate the DSP functionalities on Processors through programming for various applications.

Title:COMPUTER ARCHITECTURE AND ORGANIZATION,Subject Code:EC8552 NBA Code for the Subject :C305 ,Semester : 5 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C305.1	Describe data representation, instruction formats and the operation of a digital computer
C305.2	Illustrate the fixed point and floating-point arithmetic for ALU operation
C305.3	Discuss about implementation schemes of control unit and pipeline performance
C305.4	Describe the concepts of various hazards in processor
C305.5	Explain the concept of various memories, interfacing and organization of multiple processors
C305.6	Discuss parallel processing technique and unconventional architectures

Title:MEDICAL ELECTRONICS,Subject Code:EC8073 NBA Code for the Subject :C305PE ,Semester : 5 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C305PE.1	Understand the medical terminology relevant with biomedical instrumentation

C305PE.2	Understand various physiological parameters and the methods of amplification, recording and also the methods of transmitting these parameters
C305PE.3	Understand the principle of operations of various assist devices used in emergency units
C305PE.4	Understand the operation of equipments used for physical medicine and the various recently developed diagnostic and therapeutic techniques in physical medicine
C305PE.5	analyze the elements of risks involved with different instruments and understand the basic electrical safety methods
C305PE.6	Understand the concepts of advanced techniques like telemedicine, insulin pump, radio pill, brain machine interface etc used in medical fields

Title:BASICS OF BIOMEDICAL INSTRUMENTATION,Subject Code:OMD551 NBA Code for the Subject :C306OE1 ,Semester : 5 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C306OE1.1	To Learn the different bio potential and its propagation
C306OE1.2	To get Familiarize the different electrode placement for various physiological recording
C306OE1.3	Students will be able design bio amplifier for various physiological recording
C306OE1.4	Students will understand various technique non electrical physiological measurements
C306OE1.5	Students will understand various Biosignal characteristics and electrode configurations
C306OE1.6	Understand the different biochemical measurements

Title:DIGITAL SIGNAL PROCESSING LABORATORY,Subject Code:EC8562 NBA Code for the Subject :C307 ,Semester : 5 [22-23ODD]Target :80 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C307.1	Analyze and carryout basic signal processing operations using MATLAB
C307.2	Performing spectral analysis using DFT / FFT Algorithms
C307.3	Design and Implement the FIR and IIR Filters using MATLAB
C307.4	Analyze the architecture of a DSP Processor
C307.5	Design and Implement the FIR and IIR Filters in DSP Processor for performing filtering operation over real-time signals
C307.6	Design a DSP system for various applications of DSP

Title:COMMUNICATION SYSTEMS LABORATORY,Subject Code:EC8561 NBA Code for the Subject :C308 ,Semester : 5 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description

C308.1	Demonstrate their knowledge in base band signaling schemes through implementation of FSK, PSK and DPSK
C308.2	Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of communication system
C308.3	Simulate & validate the various functional modules of a communication system
C308.4	Simulate & validate the various functional modules of a line coding technique
C308.5	Demonstrate their knowledge in base band signal constellation diagrams of FSK, PSK and DPSK
C308.6	Simulate end-to-end Communication Link

Title:COMMUNICATION NETWORKS LABORATORY,Subject Code:EC8563 NBA Code for the Subject :C309 ,Semester : 5 [22-23ODD]Target :80 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C309.1	Communicate between two desktop computers
C309.2	Implement the different protocols
C309.3	Program using sockets
C309.4	Implement and compare the various routing algorithms
C309.5	Use simulation tool for implementing congestion algorithm
C309.6	Analyse the performance of different networks using simulation tool.

Title:PROFESSIONALCOMMUNICATION,Subject Code:HS8581 NBA Code for the Subject :C308 ,Semester : 6 [22-23EVEN]Target :65 Credits:1

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C308.1	To enhance the learners speaking skill through various activities like group discussion, telephonic conversation, presentation skill etc.,
C308.2	To develop listening and speaking skills through communicative functions
C308.3	Enhance the Employability and Career Skills of student
C308.4	Orient the students towards grooming as a professional
C308.5	Make them Employability Graduates
C308.6	Develop their confidence and help them attend interviews successfully.

Title:MICROPROCESSORS AND MICROCONTROLLERS,Subject Code:EC8691 NBA Code for the Subject :C310 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C310.1	Able to describe the architecture and organization of 8086 microprocessor
C310.2	Able to write structured understandable programs in assembly language using 8086.

C310.3	Understand techniques for interfacing I/O devices to the microprocessor including several specific standard I/O devices
C310.4	Student able to describe the architecture, interrupt structure, Timer, counter of 8051 microcontroller
C310.5	Student will be able to design of a microcontroller based minimal system for a particular application
C310.6	Design of Memory interfacing circuits

Title:VLSI DESIGN,Subject Code:EC8095 NBA Code for the Subject :C311 ,Semester : 6 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C311.1	C311.1 Realize the concepts of digital building blocks using MOS transistor
C311.2	C311.2 Understand and analyze ideal ,non ideal IV & DC characteristics of MOS transistors. C311.3 Design combinational MOS c
C311.3	C311.3 Design combinational MOS circuits and power strategies.
C311.4	C311.4 Design and construct Sequential Circuits and Timing systems.
C311.5	C311.5 Design arithmetic building blocks and memory subsystems.
C311.6	C311.6 Apply and implement FPGA design flow and testing

Title:WIRELESS COMMUNICATION,Subject Code:EC8652 NBA Code for the Subject :C312 ,Semester : 6 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C312.1	Understand the characteristics of various Wireless Channels.
C312.2	Understand the concept of cellular architecture and evaluate grade of service
C312.3	Understand and apply various digital signaling schemes on fading channels.
C312.4	Evaluate and analyze multi path mitigation techniques.
C312.5	Design and create systems with transmit and receive diversity based MIMO systems and analyze their performance.
C312.6	Understand the concept of fading and non-fading techniques.

Title:TRANSMISSION LINES AND RF SYSTEMS,Subject Code:EC8651 NBA Code for the Subject :C314 ,Semester : 6 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C314.1	Explain the characteristics of transmission lines and its losses
C314.2	Write about the standing wave ratio and input impedance in high frequency transmission lines
C314.3	Analyze impedance matching by stubs using smith charts
C314.4	Analyze the characteristics of TE and TM waves

C314.5	Design a RF transceiver system for wireless communication
C314.6	Analyze the characteristics of RF system using Smith chart

Title:PRINCIPLES OF MANAGEMENT,Subject Code:MG8591 NBA Code for the Subject :C404 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C404.1	Demonstrate critical thinking when presented with managerial problems and express their views and opinions on managerial issues in an articulate way
C404.2	Understand the major internal features of a business system and the environment in which it operates.
C404.3	Identify and explain the importance of the management process and identify some of the key skills required for the contemporary management practice
C404.4	Understand the importance of delegation
C404.5	To implement planning, Organising, directing and controlling activities in project/career
C404.6	Understand the role budget and finance in a project

Title:PROFESSIONAL ETHICS IN ENGINEERING,Subject Code:GE8076(8) NBA Code for the Subject :C409PE4 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C409PE4.1	Understand the human values and ethics in the human excellence and behavior in the organization
C409PE4.2	Understand the characteristics of morals and engineer's conduct of behavior and practice in the workplace
C409PE4.3	Realize engineering as an experimental process to understand the various ethical implications
C409PE4.4	Analyze the responsibility of engineers to ensure the safety, health and welfare of the public
C409PE4.5	Apply ethics in dealing with the global issues, computer ethics and weapons development
C409PE4.6	Realize moral guidelines of practicing human, employee, professional rights in organizations.

Title:TECHNICAL SEMINAR,Subject Code:EC8611 NBA Code for the Subject :EC318 ,Semester : 6 [22-23EVEN]Target :65 Credits:1

At the end of this course, Student will be able to

CO-Code	Course outcome Description
EC318.1	C318.1 To improve communication skill
EC318.2	C318.2 To explore technical knowledge in new thrust areas.
EC318.3	C318.3 To recognize the advances in technology so as to engage in independent and lifelong learning

EC318.4	C318.4 To communicate their contribution, individually or as a member or leader within a diverse team and in multidisciplinary discipline.
EC318.5	C318.5 To apply the knowledge of basics to review research literature and analyze complex engineering problems
EC318.6	C318.6 To apply reasoning in design solutions to solve the need for societal, health, safety and cultural issues

Title:MICROPROCESSORS AND MICROCONTROLLERS,Subject Code:EC8681 NBA Code for the Subject :C316 ,Semester : 6 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C316.1	Able to describe the architecture and organization of 8086 microprocessor
C316.2	Able to write structured understandable programs in assembly language using 8086
C316.3	Understand techniques for interfacing I/O devices to the microprocessor including several specific standard I/O devices
C316.4	Student able to describe the architecture, interrupt structure, Timer, counter of 8051 microcontroller
C316.5	Student will be able to design of a microcontroller based minimal system for a particular application
C316.6	Design of Memory interfacing circuits

Title:VLSI DESIGN LABORATORY,Subject Code:EC8661 NBA Code for the Subject :C317 ,Semester : 6 [22-23EVEN]Target :80 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C317.1	Apply HDL code for basic as well as advanced digital integrated circuits.
C317.2	Synthesize Place and Route the digital IPs.
C317.3	Import the logic modules into FPGA Boards.
C317.4	Design different analog hardware circuits using front and back end tool
C317.5	Simulate to test the correctness of the circuit using suitable tool & Extract the layouts of Analog IC Blocks
C317.6	Developed hands on design experience with professional design (EDA) Platforms

Title:AD HOC AND WIRELESS SENSOR NETWORKS,Subject Code:EC8702 NBA Code for the Subject :404 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
404.1	Know the basics of Ad hoc networks and Wireless Sensor Networks
404.2	Apply the basic knowledge to identify the suitable routing algorithm based on the network and user requirement
404.3	Understand the architecture of wireless sensor networks and design considerations

404.4	Apply the knowledge to identify appropriate physical and MAC layer protocols
404.5	Understand the transport layer and security issues possible in Ad hoc and sensor networks.
404.6	Be familiar with the OS used in Wireless Sensor Networks and build basic modules

Title:ANTENNAS AND MICROWAVE ENGINEERING,Subject Code:EC8701 NBA Code for the Subject :C401 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C401.1	Apply the basic principles and evaluate antenna parameters and link power budgets.
C401.2	Design and assess the performance of various antennas.
C401.3	Create the antenna array structure and evaluate the performance of arrays for various applications.
C401.4	Analyse the performance of various passive and active microwave devices.
C401.5	Design a microwave system for the given specifications of any application.
C401.6	Apply the microwave design principles and analyse the performance of the microwave system.

Title:OPTICAL COMMUNICATION,Subject Code:EC8751 NBA Code for the Subject :C402 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C402.1	Understand the fundamentals of fiber optic communication systems
C402.2	Understand and Analyze various losses and distortions incurred in fiber optic communication system
C402.3	Design, create and analyze the construction of fiber optic system and also analyze the system performance
C402.4	Understand the structures of optical networks such as SDH, SONET,WDM
C402.5	Create a model of an optical communication system for simulation
C402.6	Evaluate and analyze the performance of FOC system using OptiSim software

Title:EMBEDDED AND REAL TIME SYSTEMS,Subject Code:EC8791 NBA Code for the Subject :C403 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C403.1	Understand embedded design process and design methodologies
C403.2	Understand the architecture and programming of an ARM Processor
C403.3	Analyze the issues of real time embedded systems

C403.4	Apply the system design techniques to develop software for embedded systems
C403.5	Understand the differences between the general purpose operating system and RTOS
C403.6	Create embedded systems for real time applications

Title:TRANSDUCER ENGINEERING,Subject Code:OIC751 NBA Code for the Subject :C406OE2 ,Semester : 7 [22-23ODD]Target :60 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C406OE2.1	pply mathematical knowledge and science and engineering fundamentals gained to solve problems pertaining to measurement application and Summarize the types of transducers and its applications.
C406OE2.2	Determine the static and dynamic characteristics of transducers to model them
C406OE2.3	Get exposed to different types of resistive transducers and their application areas
C406OE2.4	Acquire knowledge on variable inductance and variable capacitance transducers
C406OE2.5	Gain knowledge on variety of transducers and its need
C406OE2.6	Analyze MEMS and Nano sensors

Title:PROFESSIONAL ETHICS IN ENGINEERING,Subject Code:GE8076[8] NBA Code for the Subject :C409PE ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C409PE.1	Understand the human values and ethicsin the human excellence and behaviour in the organisation
C409PE.2	Understand the characteristics of morals and engineer's conduct of behaviour and practice in the workplace
C409PE.3	Realize engineering as an experimental process to understand the various ethical implications
C409PE.4	Analyze the responsibility of engineers to ensure the safety, health and welfare of the public
C409PE.5	Apply ethics in dealing with the global issues, computer ethics and weapons development
C409PE.6	Realize moral guidelines of practising human, employee, professional rights in organisations.

Title:EMBEDDED LABORATORY,Subject Code:EC8711 NBA Code for the Subject :C407 ,Semester : 7 [22-23ODD]Target :80 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C407.1	Write programs in ARM for a specific Application
C407.2	Interface memory and Write programs related to memory operations
C407.3	Interface A/D and D/A convertors with ARM system

C407.4	Analyze the performance of interrupt
C407.5	Write programs for interfacing keyboard, display, motor and sensor
C407.6	Formulate a mini project using embedded system

Title:ADVANCED COMMUNICATIONLABORATORY,Subject Code:EC8761 NBA Code for the Subject :C8761 ,Semester : 7 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C8761.1	Understand the working principle of optical sources, detector, fibers
C8761.2	Develop understanding of simple optical communication link
C8761.3	Understand the measurement of BER, Pulse broadening
C8761.4	Understand and capture an experimental approach to digital wireless communication
C8761.5	Understand actual communication waveforms that will be sent and received across wireless channel
C8761.6	Understand the intricacies in Microwave System design

Title:PROFESSIONAL READINESS FOR INNOVATION,EMPLOYABILITY AND ENTREPRENEURSHIP,Subject Code:HX8001 NBA Code for the Subject :HX8001 ,Semester : 7 [22-23ODD]Target :65 Credits:1

At the end of this course, Student will be able to

CO-Code	Course outcome Description
HX8001.1	sfjafjhajsf jhjksfhhskjdf
HX8001.2	fdsafsdahgfjsadfj kasfhdfajshfj
HX8001.3	hyuewtyuwery vhhsdbhfs
HX8001.4	safgbshfghsdf jewrfhjbfnsda
HX8001.5	Fbhjajhdhuhjr dfsjhgfjdgkjdf
HX8001.6	bgurebgfk ksbdvjshsfjnsdf

Title:PROJECT WORK,Subject Code:EC8811 NBA Code for the Subject :C413 ,Semester : 8 [22-23EVEN]Target :65 Credits:10

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C413.1	Apply various engineering techniques to solve any challenging practical problems
C413.2	Design and implement their own innovative ideas or research problems which may satisfy the societal and environmental needs.
C413.3	Use various modern engineering and IT tools to solve and assess societal, health, safety, legal and cultural issues
C413.4	Understand the impact of the professional engineering solutions in societal and environmental contexts and apply ethical principles and commit to professional ethics and responsibilities
C413.5	Work effectively as an individual, and as a member or leader in multidisciplinary teams with effective communication skills

C413.6	Manage projects in multidisciplinary environments and to engage in lifelong learning

Electrical and Electronics Engineering

Programme:B.E. Electrical and Electronics Engineering

Course OutComes for the Academic Year : 2022-23

Title:PROBLEM SOLVING AND PYTHON PROGRAMMING,Subject Code:GE3151 NBA Code for the Subject :105 ,Semester : 1 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
105.1	To understand the basics of algorithmic problem solving
105.2	To learn to solve problems using Python conditionals and loops.
105.3	To define Python functions and use function calls to solve problems.
105.4	To use Python data structures - lists, tuples, dictionaries to represent complex data.
105.5	To learn about usage of python packages and modules
105.6	To do input/output with files in Python

Title:MATRICES AND CALCULUS,Subject Code:MA3151 NBA Code for the Subject :C102 ,Semester : 1 [22-23ODD]Target :60 Credits:4	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C102.1	Eigenvalues and eigenvectors, diagonalization of a matrix,symmetric matrices, Positive definite matrices and similar matrices.
C102.2	Understand the limit, continuity and derivative of the functions. Solve various functions and its maxima /minima using differentiation rules.
C102.3	Apply the total and partial derivatives in Taylor series expansion of functions and the extremum of functions.
C102.4	Evaluate the integrals both by using Riemann sums and by using the Fundamental theorem of Calculus. Evaluate integrals using various techniques of integration.
C102.5	Understand the concepts of double integration and determine the area using integration. Also understands the concepts of the change of order of integration and Change of variables in integrals.
C102.6	Understand the concepts of Triple integration and determine the volume using integration.

Title:ENGINEERING PHYSICS,Subject Code:PH3151 NBA Code for the Subject :C103 ,Semester : 1 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C103.1	Understand the importance of mechanics
C103.2	Express their knowledge in electromagnetic waves
C103.3	Demonstrate a strong foundational knowledge in optics and lasers
C103.4	Understand the importance of quantum physics.

C103.5	Comprehend and apply quantum mechanical principles towards the formation of energy bands
C103.6	Demonstrate a strong foundational knowledge in oscillations.

Title:ENGINEERING CHEMISTRY,Subject Code:CY3151 NBA Code for the Subject :C1O4 ,Semester : 1 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C1O4.1	To infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water
C1O4.2	To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engg and tech. applications
C1O4.3	To apply the knowledge of phase rule and composites for materials selection requirements.
C1O4.4	To recommend suitable fuel for engg. processes and applications
C1O4.5	To analyse combustion process and its calculations
C1O4.6	To recognize different forms of energy resources and apply them for suitable applications in energy sectors.

Title:PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY,Subject Code:GE3171 NBA Code for the Subject :106 ,Semester : 1 [22-23ODD]Target :80 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
106.1	To understand the problem solving approaches.
106.2	To learn the basic programming constructs in Python
106.3	To learn the programming constructs in Python like loop, function, recursion.
106.4	To practice various computing strategies for Python-based solutions to real world problems.
106.5	To use Python data structures-lists, tuples, dictionaries.
106.6	To do input/output with files in Python.

Title:ENGLISH LABORATORY,Subject Code:GE3172 NBA Code for the Subject :C101 ,Semester : 1 [22-23ODD]Target :65 Credits:1

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C101.1	To improve the communicative competence of learners by throwing light on vocabulary and basic grammar
C101.2	To improve the communicative competence of learners by throwing light on vocabulary and basic grammar
C101.3	To build on students¿ English language skills by engaging them in listening, speaking and grammar learning activities those are relevant to authentic contexts.

C101.4	C101.4 To build on students¿ English language skills by engaging them in listening, speaking and grammar learning activities those are relevant to authentic contexts.
C101.5	C101.5 To use language efficiently in expressing their opinions via various media and graphical representation.
C101.6	C101.6 Participate effectively in informal conversations; introduce themselves and their friends and express opinion in English with different types of sentences

Title:PHYSICS AND CHEMISTRY LABORATORY,Subject Code:BS3171 NBA Code for the Subject :C107 ,Semester : 1 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C107.1	gain knowledge about elasticity, modulus, oscillations and also able to calculate Young's,rigidity modulus, moment of inertia of regular and irregular bodies.
C107.2	understand the application of interference and diffraction in finding thickness of the given sample and wavelength of the source respectively
C107.3	calculate the variation of resistance with respect to temperature and also able to calculate the band gap of semiconductor
C107.4	Analyse various water quality parameters-Hardness, alkalinity and DO in water sample.
C107.5	Acquire practical skills by using instruments like conductivity meter, pH meter and potentiometer.
C107.6	Finding the strength and amount of nickel in steel.

Title:ELECTRICAL CIRCUIT ANALYSIS,Subject Code:EE3251 NBA Code for the Subject :113 ,Semester : 2 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
113.1	Ability to Explain circuit¿s behavior using circuit laws
113.2	Compute the transient response of first order and second order systems to step and sinusoidal input
113.3	ompute the transient response of first order and second order systems to step and sinusoidal input
113.4	Ability to Compute power, line/ phase voltage and currents of the given three phase circuit
113.5	Ability to Explain the frequency response of series and parallel RLC circuits
113.6	Ability to Explain the behavior of magnetically coupled circuits

Title:BASIC CIVIL AND MECHANICAL ENGINEERING,Subject Code:BE3255 NBA Code for the Subject :114 ,Semester : 2 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
114.1	Understanding profession of Civil and Mechanical engineering.

114.2	Sumerise the planning of building, infrastructure and working of Machines. the planning of building, infrastructure and working of Machineries.
114.3	Apply the knowledge gained in respective discipline
114.4	Illustrate the ideas of Civil and Mechanical Engineering applications.
114.5	Appraise the material, Structures, machines and energy.
114.6	understand the refrigeration systems

Title:PROFESSIONAL ENGLISH-II,Subject Code:HS3252 NBA Code for the Subject :C108 ,Semester : 2 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C108.1	To compare and contrast products and ideas through technical texts in essays with appropriate grammatical usage and contextual meanings.
C108.2	emails and responses to complaints. To enhance learners¿ awareness of general rules of writing for specific audiences through professional
C108.3	To help learners understand the purpose, audience, contexts of different types of letters/essays/checklists
C108.4	To analyze problems in order to arrive at feasible solutions and communicate them orally and in the written format. To report events and the processes of technical and industrial natureTo make use of
C108.5	To make use of grammatical items effectively in writing recommendations and in transcoding the graphs
C108.6	To write a winning job/internship application-cover letter and resume / SoP-Statement of purpose

Title:PHYSICS FOR ELECTRICAL ENGINEERING,Subject Code:PH3202 NBA Code for the Subject :C111 ,Semester : 2 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C111.1	know basics of dielectric materials and insulation
C111.2	gain knowledge on the electrical and magnetic properties of materials and their applications
C111.3	understand clearly of semiconductor physics and functioning of semiconductor devices
C111.4	understand the optical properties of materials and working principles of various optical devices
C111.5	Gain knowledge on various nanotechnology
C111.6	Acquire the knowledge on carbon nano tube and applications

Title:STATISTICS AND NUMERICAL METHODS,Subject Code:MA3251 NBA Code for the Subject :C112 ,Semester : 2 [22-23EVEN]Target :60 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C112.1	Apply the concept of testing of hypothesis for small and large samples in real life problems.

C112.2	Apply the basic concepts of classifications of design of experiments in the field of agriculture.
C112.3	Solve algebraic, transcendental equations and simultaneous equations and Eigen value problems.
C112.4	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.
C112.5	Understand the knowledge of various techniques and methods for solving first order ordinary differential equations with initial conditions in engineering applications.
C112.6	Solve the ordinary differential equations with initial conditions by using certain techniques in engineering applications.

Title:ENGINEERING GRAPHICS,Subject Code:GE3251 NBA Code for the Subject :C113 ,Semester : 2 [22-23EVEN]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C113.1	to draw the various types of engineering curves
C113.2	to draw the projection of points, lines and plain surfaces
C113.3	to drawing orthographic projection of solids
C113.4	to draw the freehand sketch of simple objects
C113.5	to draw the development of solids and section of solids
C113.6	to draw the isometric and perspective projections of simple solids

Title:Tamils and Technology,Subject Code:GE3252 NBA Code for the Subject :ge3252 ,Semester : 2 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
ge3252.1	UNDERSTAND ABOUT WEAVING AND CERAMIC TECHNOLOGY
ge3252.2	UNDERSTAND ABOUT DESIGN AND CONSTRUCTION TECHNOLOGY
ge3252.3	UNDERSTAND ABOUT MANUFACTURING TECHNOLOGY
ge3252.4	UNDERSTAND ABOUT AGRICULTURE AND IRRIGATION TECHNOLOGY
ge3252.5	UNDERSTAND ABOUT SCIENTIFIC TAMIL & TAMIL COMPUTING
ge3252.6	UNDERSTAND ABOUT ANCIENT KNOWLEDGE OF OCEAN

Title:ELECTRIC CIRCUITS LABORATORY,Subject Code:EE3271 NBA Code for the Subject :115 ,Semester : 2 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
115.1	Use simulation and experimental methods to verify the fundamental electrical laws for the given DC/AC circuit
115.2	Use simulation and experimental methods to verify the various electrical theorems (Superposition, Thevenin , Norton and maximum power transfer) for the given DC/AC circuit

115.3	Analyze transient behavior of the given RL/RC/RLC circuit using simulation and experimental methods
115.4	Analyze frequency response of the given series RLC circuit using simulation and experimentation methods
115.5	Analyze frequency response of the given parallel RLC circuit using simulation and experimentation methods
115.6	Analyze the performance of the given three-phase circuit using simulation and experimental methods

Title:ENGINEERING PRACTICES LABORATORY,Subject Code:GE3271 NBA Code for the Subject :C117 ,Semester : 2 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C117.1	Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work
C117.2	Saw, plane, make joints in wood materials used in common household wood work.
C117.3	Weld various joints in steel plates using arc welding work
C117.4	Machine various simple processes like turning, drilling, tapping in parts
C117.5	Assemble simple mechanical assembly of common household equipments
C117.6	Make a tray out of metal sheet using sheet metal work.

Title:ELECTROMAGNETIC FIELDS,Subject Code:EE3301 NBA Code for the Subject :C201 ,Semester : 3 [22-23ODD]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C201.1	apply knowledge of mathematical prerequisites and explain the theorems related to vector fields
C201.2	explain the concepts of electric fields, electric potential, energy density and applications of electrostatics
C201.3	explain the concepts of magnetic fields , energy density and applications of magnetostatics
C201.4	explain the concepts of capacitance and inductance
C201.5	derive Maxwel's equation by applying Faraday's And Ampere's laws
C201.6	derive the electromagnetic wave equations and explain the concept of wave propagation using pyonting's vactor

Title:PROBABILITY AND COMPLEX FUNCTIONS,Subject Code:MA3303 NBA Code for the Subject :C201 ,Semester : 3 [22-23ODD]Target :60 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C201.1	Have a fundamental knowledge of the basic probability concepts.
C201.2	Get exposure and a well-founded knowledge of standard distributions which can describe real life phenomena

C201.3	Acquire skills in handling situations involving more than one random Variable and functions of random variables with correlation and regression.
C201.4	Analytic functions, conformal mapping and complex integration.
C201.5	Solve contour integration and Cauchy Residue theorem
C201.6	Solve the linear equations of second and higher order with constant, and variable coefficients, simultaneous first order differential equations. Apply the method of variation of parameters and underte

Title:C PROGRAMMING AND DATA STRUCTURES,Subject Code:CS3353 NBA Code for the Subject :C202 ,Semester : 3 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C202.1	To introduce the basics of C programming language.
C202.2	Apply advanced features of C in solving problems.
C202.3	Write functions to implement linear and non¿linear data structure operations.
C202.4	Suggest and use appropriate linear/non¿linear data structure operations for solving a given problem.
C202.5	Apply appropriate hash functions that result in a collision free scenario for data storage and retrieval.
C202.6	Appropriately use sort and search algorithms for a given application.

Title:ELECTRON DEVICES AND CIRCUITS,Subject Code:EC3301 NBA Code for the Subject :C204 ,Semester : 3 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C204.1	Explain the structure operation and characteristics of PN junction devices (diode,zener diode, LED and Laser diode).
C204.2	Design clipper,clamper,half wave and full wave rectifier, regulator circuits using PN junction diodes.
C204.3	Analyze the structure and characteristics of BJT,FET,MOSFET,UJT,Thyristor and IGBT.
C204.4	Analyze the performance of various configurations of BJT and MOSFET based amplifier.
C204.5	Explain the characteristics of MOS based cascade and differential amplifier. CO6: Explain the operation of vario
C204.6	Explain the operation of various feedback amplifiers and oscillators.

Title:ELECTRICAL MACHINES - I,Subject Code:EE3303 NBA Code for the Subject :C205 ,Semester : 3 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C205.1	Apply the laws governing the electromechanical energy conversion for singly and multiple excited systems.

C205.2	Explain the construction and working principle of DC machines.
C205.3	Interpret various characteristics of DC machines.
C205.4	Compute various performance parameters of the machine, by conducting suitable tests.
C205.5	Draw the equivalent circuit of transformer and predetermine the efficiency and regulation.
C205.6	Describe the working principle of auto transformer, three phase transformer with different types of connections.

Title:DIGITAL LOGIC CIRCUITS,Subject Code:EE3302 NBA Code for the Subject :EE3302 ,Semester : 3 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
EE3302.1	Explain the various number systems and compare the characteristics and operation of digital logic families. Describe the various types of number system, binary codes and examine the digital logic fami
EE3302.2	Use K-map for simplification and implementation of combinational logic circuit
EE3302.3	Design various synchronous sequential circuit.
EE3302.4	Design various asynchronous sequential circuit.
EE3302.5	Analyze the programmability logic devices.
EE3302.6	Discuss digital simulation for development of application oriented logic circuits.

Title:C PROGRAMMING AND DATA STRUCTURES LABORATORY,Subject Code:CS3362 NBA Code for the Subject :C203 ,Semester : 3 [22-23ODD]Target :65 Credits:1.5

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C203.1	Use different constructs of C and develop applications
C203.2	Apply advanced features of C in solving problems.
C203.3	Write functions to implement linear and non-linear data structure operations
C203.4	Suggest and use the appropriate linear / non-linear data structure operations for a given problem
C203.5	Apply appropriate hash functions that result in a collision free scenario for data storage and Retrieval
C203.6	Implement Sorting and searching algorithms for a given application

Title:ELECTRICAL MACHINES LABORATORY ? I,Subject Code:EE3311 NBA Code for the Subject :C208 ,Semester : 3 [22-23ODD]Target :60 Credits:1.5

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C208.1	Construct the circuit with appropriate connections for the given DC machine/transformer.

C208.2	Experimentally determine the characteristics of different types of DC machines.
C208.3	Demonstrate the speed control techniques for a DC motor for industrial applications.
C208.4	Identify suitable methods for testing of transformer and DC machines
C208.5	Predetermine the performance parameters of transformers and DC motor.
C208.6	Understand DC motor starters and 3-phase transformer connections.

Title:ELECTRONIC DEVICES AND CIRCUITS LABORATORY,Subject Code:EC3311 NBA Code for the Subject :EC3311 ,Semester : 3 [22-23ODD]Target :65 Credits:1.5

At the end of this course, Student will be able to

CO-Code	Course outcome Description
EC3311.1	To understand the Characteristics of Semiconductor diode, BJT configuration through experimentation
EC3311.2	To understand the behavior of JFET and UJT through experimentation
EC3311.3	To study and understand behavior of photo diode and photo transistor through experimentation
EC3311.4	To apply diode for rectification purpose in half wave and full wave operation
EC3311.5	To study the working operation of oscillators RC phase shift and LC filters through experimentation
EC3311.6	To apply and study the operation of FET as differential operation through experimentation

Title:ELECTRICAL MACHINES - II PCC 3 0 0 3 3,Subject Code:EE3405 NBA Code for the Subject :216 ,Semester : 4 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
216.1	Ability to understand the construction and working principle of Synchronous generator.
216.2	Ability to understand the construction and working principle of Synchronous Motor
216.3	Ability to understand the construction and working principle of Three Phase Induction Motor
216.4	Acquire knowledge about the starting and speed control of induction motors
216.5	To gain knowledge about the basic principles and working of Single phase induction motors
216.6	To gain knowledge about the basic principles and working of Special Electrical Machines.

Title:ENVIRONMENTAL SCIENCES AND SUSTAINABILITY,Subject Code:GE3451 NBA Code for the Subject :C104 ,Semester : 4 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C104.1	Infer the importance of environment and explain the concept, types, structure and function of ecosystem
C104.2	Recall the various functions, different values, levels, threats and conservation of biodiversity
C104.3	Explain the different type of pollution and propose the suitable methods to prevent the same to enhance the environment
C104.4	Discuss the types of energy resources and conservation
C104.5	Discuss the aspect of sustainability and the means of sustainability management to realize the SDG targets
C104.6	List the various environmental management systems(EMS) for environmental protection and discusses the given solutions for energy to materials for sustainability

Title:TRANSMISSION AND DISTRIBUTION PCC 3 0 0 3,Subject Code:EE3401 NBA Code for the Subject :C212 ,Semester : 4 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C212.1	Understand the structure of power system, computation of transmission line parameters for different configurations and the impact of skin and proximity effects.
C212.2	Model the transmission lines to determine the line performance and to understand the impact of Ferranti effect and corona on line performance.
C212.3	Do Mechanical design of transmission lines and grounding.
C212.4	Construct electrical equivalent representation of insulators, calculate the potential distribution and explain the methods of improving the string efficiency.
C212.5	Design the underground cables and understand the performance analysis of underground cable.
C212.6	Understand the modelling, performance analysis and modern trends in distribution system.

Title:MEASUREMENTS AND INSTRUMENTATION,Subject Code:EE3403 NBA Code for the Subject :C212 ,Semester : 4 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C212.1	Define units and standards, their conversions and describe the characteristics, error analysis and basic functional elements of measurement systems
C212.2	Describe the working of various electrical and electronic meters
C212.3	Select the suitable instrument for measuring different magnetic parameters
C212.4	Design a suitable Bridge circuit to determine the values of various resistor, inductor and capacitor

C212.5	Explain the construction and working principle of various types of storage and display devices and compare them
C212.6	Describe resistive, inductive and capacitive transducers which are used for measuring various parameters like displacement, temperature and explain the function of different blocks involved in data ac

Title:LINEAR INTEGRATED CIRCUITS PCC 3 0 0 3 3,Subject Code:EE3402 NBA Code for the Subject :C213 ,Semester : 4 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C213.1	Explain monolithic IC fabrication process
C213.2	Explain the fabrication of diodes, capacitance, resistance, FETs and PV Cell
C213.3	Analyze the characteristics and basic applications (inverting/non-inverting amplifier, summer, differentiator, integrator, V/I and I/V converter) of Op-Amp
C213.4	Explain circuit and applications of op-amp based instrumentation amplifier, log/antilog amplifier, analog multiplier /divider, active filters, comparators, waveform generators, A/D and D/A converter
C213.5	Explain Functional blocks, characteristics and applications of Timer, PLL, analog multiplier ICs.
C213.6	Explain the applications of ICs in Instrumentation amplifier, fixed and variable voltage regulator, SMPS and function generator

Title:MICROPROCESSOR AND MICROCONTROLLER,Subject Code:EE3404 NBA Code for the Subject :EE3404 ,Semester : 4 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
EE3404.1	Ability to write assembly language program for microprocessor and microcontroller.
EE3404.2	Ability to design and implement interfacing of peripheral with microprocessor and microcontroller
EE3404.3	Ability to analyze, comprehend, design and simulate microprocessor based systems used for control and monitoring
EE3404.4	Ability to analyze, comprehend, design and simulate microcontroller based systems used for control and monitoring
EE3404.5	Ability to understand and appreciate advanced architecture evolving microprocessor field
EE3404.6	Ability to write program in Microcontroller 8051

Title:ELECTRICAL MACHINES LABORATORY-II,Subject Code:EE3411 NBA Code for the Subject :218 ,Semester : 4 [22-23EVEN]Target :65 Credits:1.5

At the end of this course, Student will be able to

CO-Code	Course outcome Description
218.1	Ability to understand and analyze EMF and MMF methods
218.2	Ability to analyze the characteristics of V and Inverted V curves

218.3	Acquire hands on experience of conducting various tests on alternators and obtaining their performance indices using standard analytical as well as graphical methods.
218.4	Acquire hands on experience of conducting various tests on alternators and obtaining their performance indices using standard analytical as well as graphical methods.
218.5	Ability to acquire knowledge on separation of losses
218.6	Ability to understand the importance of synchronous motors and induction motors and to understand the starting methods.

Title:LINEAR AND DIGITAL CIRCUITS LABORATORY,Subject Code:EE3412 NBA Code for the Subject :C219 ,Semester : 4 [22-23EVEN]Target :65 Credits:1.5

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C219.1	Ability to understand and implement Boolean Functions.
C219.2	Ability to understand the importance of code conversion.
C219.3	Ability to Design and implement circuits with digital ICs like decoders, multiplexers, register.
C219.4	Ability to acquire knowledge on Application of Op-Amp.
C219.5	Ability to Design and implement counters using analog ICs like timers, VCOs and digital ICs like Flip-flops and counters.
C219.6	Ability to acquire knowledge on digital gates and Op-amp.

Title:MICROPROCESSOR AND MICROCONTROLLER LABORATORY,Subject Code:EE3413 NBA Code for the Subject :C220 ,Semester : 4 [22-23EVEN]Target :65 Credits:1.5

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C220.1	To perform simple arithmetic operations using assembly language program and study the addressing modes & instruction set of 8085 & 8051 assembly language programming.
C220.2	To develop skills in simple program writing in assembly languages diagram using 8085 microprocessor.
C220.3	To write an assembly language program to convert Analog input to Digital output and Digital input to Analog output.
C220.4	To perform interfacing experiments with µP8085 looping and calling subroutines.
C220.5	To perform interfacing experiments with µC8051. and 8051 microcontroller.
C220.6	Ability to analyze, comprehend, design and simulate microcontroller based systems used for control and monitoring

Title:POWER SYSTEM ANALYSIS,Subject Code:EE8501 NBA Code for the Subject :C301 ,Semester : 5 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description

C301.1	Explain the operation of various power system components, Draw the per unit diagram and form the Y-bus matrix for the power system
C301.2	Develop the power flow equation for power system problem and determine the power flows using various algorithms.
C301.3	Illustrate the types of faults and their effects. Calculate the fault currents for symmetrical fault condition.
C301.4	Draw the sequence network for L-G, L-L and L-L-G fault of the power system and determine the fault current incase of L-G, L-L, and L-L-G fault.
C301.5	Explain the concept of power system stability.
C301.6	Analyze the stability of single machine infinite bus system

Title:MICROPROCESSORS AND MICROCONTROLLERS,Subject Code:EE8551 NBA Code for the Subject :C302 ,Semester : 5 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C302.1	Explain about the architecture of 8085 microprocessor, pin configuration, interrupts and the timing diagram of 8085
C302.2	Develop the assembly language program using mnemonics and corresponding machine code based on architecture of 8085 microprocessor
C302.3	Define the 8051 microcontroller with its architecture, pin-outs, memory organization, interrupts and compare the programming concepts with 8085
C302.4	Illustrate the interfacing of 8085 with various peripheral devices for transmission, reception and control of data
C302.5	Make use of the data conversion technique such as ADC and DAC and to interface with 8085 processor and 8051 microcontroller
C302.6	Develop the microcontroller assembly language program for various real time applications

Title:POWER ELECTRONICS,Subject Code:EE8552 NBA Code for the Subject :C303 ,Semester : 5 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C303.1	Achieve clear understanding by the students on the characteristics of different power electronic switching devices SCR, TRIAC, GTO, BJT, MOSFET, IGBT, and IGCT along with its driver and protection snubber circuits
C303.2	Understand the operation and characteristics of different phase controlled rectifiers and its performance parameters
C303.3	Achieve Knowledge on different firing schemes for converter, understanding of working of dual converters and it characteristics and to develop application knowledge on implementing phase controlled converters
C303.4	Analysis and study of different DC-DC converters, its design, control strategies and its applications in real time.

C303.5	Acquire knowledge in design and analysis of single and three phase inverters, it control schemes, and its applications in real time
C303.6	Develop the microcontroller assembly language program for various real time applications

Title:DIGITAL SIGNAL PROCESSING,Subject Code:EE8591 NBA Code for the Subject :C304 ,Semester : 5 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C304.1	Understand the importance of Fourier transform, digital filters and DS Processors.
C304.2	Acquire knowledge on Signals and systems & their mathematical representation.
C304.3	Understand and analyze the discrete time systems.
C304.4	Analyze the transformation techniques & their computation.
C304.5	Understand the types of filters and their design for digital implementation.
C304.6	Acquire knowledge on programmability digital signal processor & quantization effects.

Title:BASICS OF BIOMEDICAL INSTRUMENTATION,Subject Code:OMD551 NBA Code for the Subject :C306 ,Semester : 5 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C306.1	To be able to Learn the different bio potential and its propagation
C306.2	To be able to Familiarize the different electrode placement for various physiological recording To be able to Familiarize the different electrode placement for various physiological recording
C306.3	To be able to Design the bio amplifier for various physiological recording
C306.4	To be able to Understand different measurement techniques for non-physiological parameters
C306.5	To be able to Familiarize the different biochemical measurements
C306.6	To be able to Recognize the importance of the different biochemical measurements.

Title:PROFESSIONAL COMMUNICATION,Subject Code:HS8581 NBA Code for the Subject :C308 ,Semester : 5 [22-23ODD]Target :65 Credits:1	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C308.1	To enhance the learners speaking skill through various activities like group discussion, telephonic conversation, presentation skill etc.,
C308.2	To develop listening and speaking skills through communicative functions
C308.3	Enhance the Employability and Career Skills of student
C308.4	Orient the students towards grooming as a professional

C308.5	Make them Employability Graduates
C308.6	Develop their confidence and help them attend interviews successfully

Title:OBJECT ORIENTED PROGRAMMING,Subject Code:CS8392 NBA Code for the Subject :CS8392 ,Semester : 5 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
CS8392.1	Learn the architecture of java Environment and understand the role of JVM and JRE
CS8392.2	To understand object oriented concepts and basic characteristics of java
CS8392.3	To know the principles of packages,inheritance and interfaces
CS8392.4	To define Exceptions and use I/O Streams
CS8392.5	To develop java applications with threads and generics classes
CS8392.6	To design and build simple graphical User Interfaces

Title:OBJECT ORIENTED PROGRAMMING LABORATORY,Subject Code:CS8383 NBA Code for the Subject :CS8383 ,Semester : 5 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
CS8383.1	Develop and implement Java programs to develop simple applications.
CS8383.2	Learn Features of Object oriented programming by developing programs using Classes,Packages and Interfaces
CS8383.3	Design and implement java programs using Exceptions,Generics.
CS8383.4	Develop java applications using multi Threading.
CS8383.5	Design and implement java programs using I/O Streams
CS8383.6	Learn to develop GUI programming and event handling using swing and awt classes.

Title:CONTROL AND INSTRUMENTATION LABORATORY,Subject Code:EE8511 NBA Code for the Subject :c307 ,Semester : 5 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
c307.1	Design and simulate the different types of controllers and compensators and analyse the stability of the given system
c307.2	Examine the stability response of Machines, Sensors and Transducers.
c307.3	Explain the concept of position control systems,synchro and analyse its characteristics.
c307.4	Identify the various parameters such as R,L and C using bridge circuits and also measure the power and energy of Electrical circuits.
c307.5	Illustrate the concept of sensors/transducers and signal conditioning elements.
c307.6	Design and simulate the characteristics,response and stability of the given system.

Title:SOLID STATE DRIVES,Subject Code:EE8601 NBA Code for the Subject :C310 ,Semester : 6 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C310.1	Illustrate the N-T characteristics of Electric drives and Develop the condition for steady state stability.
C310.2	Select a drive for a particular application based on power rating.
C310.3	Understand the different modes of operation of converter / chopper fed dc motor, enabling to solve problems on dc drives.
C310.4	Familiarize about the different control methods of induction motor drives and solve problems on induction motor drives.
C310.5	Acquire knowledge on different control methods of synchronous motor.
C310.6	Develop the design procedure of controllers for DC drives.

Title:PROTECTION AND SWITCHGEAR,Subject Code:EE8602 NBA Code for the Subject :C311 ,Semester : 6 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C311.1	Summarize the causes and effects of faults in power system and explain the necessity of protection in power system.
C311.2	Describe the operation of electromagnetic relays and draw their characteristic curves.
C311.3	List out the various faults that can occur on alternator, motor, transformer, busbar, transmission line and select the suitable protection schemes.
C311.4	Synthesize the static relays using comparators and explain numerical relays.
C311.5	Derive the expression for RRRV, critical resistance value.
C311.6	Explain the construction details, working of various types of circuit breakers.

Title:EMBEDDED SYSTEMS,Subject Code:EE8691 NBA Code for the Subject :C312 ,Semester : 6 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C312.1	Analyze the basic build process of embedded systems, structural units in embedded processor and selection of processor and memory devices depending upon the applications
C312.2	Classify the types of I/O device ports and buses and different interfaces for data transfer
C312.3	Modeling of the Embedded Product Development Life Cycle (EDLC) by using different techniques like state machine model, sequential program model and concurrent model
C312.4	Analyze about the basic concept of Real Time Operating Systems and plan to scheduling of different task and compare the features of different types of Real Time Operating System

C312.5	Apply the knowledge and concept of digital camera and ATM machine
C312.6	Apply the knowledge of programming concepts of Embedded Systems for various applications like Washing Machine automotive and Smart Card System applications

Title:DESIGN OF ELECTRICAL APPARATUS,Subject Code:EE8002 NBA Code for the Subject :C313 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C313.1	Ability to understand basics of design considerations for rotating and static electrical machines
C313.2	Ability to design of field system for its application.
C313.3	Ability to design sing and three phase transformer.
C313.4	Ability to design armature and field of DC machines.
C313.5	Ability to design stator and rotor of induction motor.
C313.6	Ability to design and analyze synchronous machines.

Title:SPECIAL ELECTRICAL MACHINES,Subject Code:EE8005 NBA Code for the Subject :C314 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C314.1	Explain the construction and operating principle of different types of stepper motor, its performance.
C314.2	Explain the digital control of stepper motor using microprocessor.
C314.3	Summarize the construction, operating principle, types of Power Controllers of Switched Reluctance Motor and its performance.
C314.4	Explain the operating principle and performance of square wave BLDC motor
C314.5	Express the working principle, performance, characteristics of Permanent Magnet Synchronous Motor.
C314.6	Explain the construction and operating principle of other special Electrical Machines.

Title:PROFESSIONAL ETHICS IN ENGINEERING,Subject Code:GE8076[8] NBA Code for the Subject :C409 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C409.1	Understanding the human values and ethics in the human excellence and behaviour in the organisation
C409.2	Apply ethics for solving moral issues
C409.3	Apply engineering as an experimental process to understand the various ethical implications
C409.4	Understanding responsibility of engineers to ensure the safety, health and welfare of the public

C409.5	Understanding the importance of ethics in dealing with the global issues, computer ethics and weapons developmentApplying moral guidelines of practicing human, employee, professional rights in organiz
C409.6	Applying moral guidelines of practicing human, employee, professional rights in organizations.

Title:MICROPROCESSORS AND MICROCONTROLLERS LABORATORY,Subject Code:EE8681 NBA Code for the Subject :316 ,Semester : 6 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
316.1	Ability to understand and apply computing platform and software for engineering problems
316.2	Ability to programming logics for code conversion
316.3	Ability to acquire knowledge on A/D and D/A
316.4	Ability to understand basics of serial communication
316.5	Ability to understand and impart knowledge in DC and AC motor interfacing
316.6	Ability to understand basics of software simulators

Title:POWER ELECTRONICS AND DRIVES LABORATORY,Subject Code:EE8661 NBA Code for the Subject :C314 ,Semester : 6 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C314.1	Ability to practice and understand converter and inverter circuits and apply software for engineering problems.
C314.2	Ability to experiment about switching characteristics various switches.
C314.3	Ability to analyze about AC to DC converter circuits.
C314.4	Ability to analyze about DC to AC circuits.
C314.5	Ability to acquire knowledge on AC to AC converters
C314.6	Ability to acquire knowledge on simulation software.

Title:MINI PROJECT,Subject Code:EE8611 NBA Code for the Subject :EE8611 ,Semester : 6 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
EE8611.1	Develop the ability to solve a specific problem right from its identification
EE8611.2	Plan the project work schedule and prepare budget for experimentation
EE8611.3	Identify and design the circuits with necessary components, simulation tools and accessories for the specific problem
EE8611.4	Demonstrate the system model and also analyze the parameters in various parts of the system using simulation tools

EE8611.5	Explain the project work orally among the team members and also in review presentation
EE8611.6	Write the project report and face viva voce examination

Title:HIGH VOLTAGE ENGINEERING,Subject Code:EE8701 NBA Code for the Subject :401 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
401.1	Ability to understand the various types of over voltages in power system and protection methods
401.2	Ability to explain the breakdown mechanisms in different types of dielectrics
401.3	Ability to understand the methods of generation of high voltages and high currents
401.4	Ability to discuss the various high voltage measurement techniques
401.5	Ability to understand High voltage testing
401.6	Ability to test power apparatus and insulation coordination

Title:POWER SYSTEM OPERATION AND CONTROL,Subject Code:EE8702 NBA Code for the Subject :C402 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C402.1	Analyze the various load characteristics with load curve and load duration curve
C402.2	Describe modeling of power-frequency dynamics and design power-frequency controller
C402.3	Explain the modeling of reactive power-voltage interaction and the control actions
C402.4	Solve economic dispatch problems and unit commitments problems in power systems
C402.5	Explain the need of computer controls to energy management
C402.6	Illustrate about SCADA and its application for real time operation and control of power systems

Title:RENEWABLE ENERGY SYSTEMS,Subject Code:EE8703 NBA Code for the Subject :C403 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C403.1	Ability to create awareness about renewable Energy Sources and technologies.
C403.2	Ability to get adequate inputs on a variety of issues in harnessing renewable Energy.
C403.3	Ability to recognize current and possible future role of renewable energy sources.

C403.4	Ability to explain the various renewable energy resources and technologies and their applications
C403.5	Ability to understand basics about Biomass energy.
C403.6	Ability to acquire knowledge about Solar energy.

Title:FIBRE OPTICS AND LASER INSTRUMENTS,Subject Code:EI8075 NBA Code for the Subject :C405 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C405.1	Understand the principle, transmission, dispersion and attenuation characteristics of optical fibers
C405.2	Apply the gained knowledge on optical fibers for its use as communication medium and as sensors.
C405.3	Understand important applications of optical fibres in production, manufacturing industrial and biomedical applications.
C405.4	Understand laser theory and laser generation system
C405.5	Apply laser theory for the selection of lasers for a specific Industrial application.
C405.6	Apply the fibre optics and laser theory in medical applications

Title:POWER SYSTEMS TRANSIENTS,Subject Code:EE8010 NBA Code for the Subject :C406 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C406.1	Able to explain the types and importance of studying the transients
C406.2	Able to map the given problem to the concerned basic transform
C406.3	Able to explain the resistance switching, capacitance switching and current chopping
C406.4	Able to explain the lightning mechanism and protection schemes
C406.5	Able to construct the Bewley's lattice diagram
C406.6	Able to explain different overvoltage mechanisms in the power system

Title:HIGH VOLTAGE DIRECT CURRENT TRANSMISSION,Subject Code:EE8017(8) NBA Code for the Subject :C410 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C410.1	Discuss the planning of DC power transmission and compare with AC power transmission
C410.2	Analyze the effect of various HVDC converters in transmission lines
C410.3	Evaluate the various types of compounding and regulation methods for power system stability
C410.4	Explain the effects of harmonics and design suitable filters for ower system control and protection

C410.5	Infer the basic physical phenomenon arising in DC insulation and dielectric stress consideration
C410.6	Interpret the modeling of HVDC Systems for digital dynamic simulation by using suitable philosophy and tools

Title:INTRODUCTION TO C PROGRAMMING,Subject Code:OCS752 NBA Code for the Subject :COCS752 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
COCS752.1	To understand simple applications using basic c syntax
COCS752.2	To Develop applications using arrays
COCS752.3	Develop applications using strings
COCS752.4	Develop applications using functions and structures Develop applications using functions and structures Develop applications using functions and structures To understand the concept of functions
COCS752.5	Develop applications using structures
COCS752.6	To Develop simple applications using basic constructs

Title:POWER SYSTEM SIMULATION LABORATORY,Subject Code:EE8711 NBA Code for the Subject :C407 ,Semester : 7 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C407.1	Ability to write MATLAB programs for computation of line parameters and performance of line
C407.2	Ability to develop algorithms and MATLAB programs for constructing bus admittance matrix
C407.3	Ability to develop mathematical formulation for load flow studies using G-S and N-R methods and solve them using MATLAB programs
C407.4	Ability to develop algorithm and transform it into programs for short circuit studies using MATLAB
C407.5	Ability to develop models for load-frequency studies and analyse using MATLAB/SIMULINK package
C407.6	Ability to write programs and solve economic dispatch problem using MATLAB

Title:RENEWABLE ENERGY SYSTEMS LABORATORY,Subject Code:EE8712 NBA Code for the Subject :C408 ,Semester : 7 [22-23ODD]Target :80 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C408.1	understand and analyze Renewable energy systems.
C408.2	train the students in Renewable Energy Sources and technologies.
C408.3	provide adequate inputs on a variety of issues in harnessing Renewable Energy.
C408.4	simulate the various Renewable energy sources.

C408.5	recognize current and possible future role of Renewable energy sources.
C408.6	understand basics of Intelligent Controllers.

Title:PROJECT WORK,Subject Code:EE8811 NBA Code for the Subject :411 ,Semester : 8 [22-23EVEN]Target :65 Credits:10	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
411.1	¿On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology.
411.2	¿To develop the ability to solve a specific problem right from its identification and literature review till the successful solution of the same.
411.3	To train the students in preparing project reports and to face reviews and viva voce examination.
411.4	To give basic knowledge in describing function analysis.
411.5	Ability to understand the the recent trends in engineering
411.6	Explain the project work orally among the team members and also in review presentation

Instrumentation and Control Engineering

Programme:B.E. Instrumentation and Control Engineering

Course OutComes for the Academic Year : 2022-23

Title:PROBLEM SOLVING AND PYTHON PROGRAMMING,Subject Code:GE3151 NBA Code for the Subject :105 ,Semester : 1 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
105.1	To understand the basics of algorithmic problem solving
105.2	To learn to solve problems using Python conditionals and loops.
105.3	To define Python functions and use function calls to solve problems.
105.4	To use Python data structures - lists, tuples, dictionaries to represent complex data.
105.5	To learn about usage of python packages and modules
105.6	To do input/output with files in Python

Title:MATRICES AND CALCULUS,Subject Code:MA3151 NBA Code for the Subject :C102 ,Semester : 1 [22-23ODD]Target :60 Credits:4	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C102.1	Eigenvalues and eigenvectors, diagonalization of a matrix,symmetric matrices, Positive definite matrices and similar matrices.
C102.2	Understand the limit, continuity and derivative of the functions. Solve various functions and its maxima /minima using differentiation rules.
C102.3	Apply the total and partial derivatives in Taylor series expansion of functions and the extremum of functions.
C102.4	Evaluate the integrals both by using Riemann sums and by using the Fundamental theorem of Calculus. Evaluate integrals using various techniques of integration.
C102.5	Understand the concepts of double integration and determine the area using integration. Also understands the concepts of the change of order of integration and Change of variables in integrals.
C102.6	Understand the concepts of Triple integration and determine the volume using integration.

Title:ENGINEERING PHYSICS,Subject Code:PH3151 NBA Code for the Subject :C103 ,Semester : 1 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C103.1	Understand the importance of mechanics
C103.2	Express their knowledge in electromagnetic waves
C103.3	Demonstrate a strong foundational knowledge in optics and lasers
C103.4	Understand the importance of quantum physics.
C103.5	Comprehend and apply quantum mechanical principles towards the formation of energy bands
C103.6	Demonstrate a strong foundational knowledge in oscillations.

Title:ENGINEERING CHEMISTRY,Subject Code:CY3151 NBA Code for the Subject :C1O4 ,Semester : 1 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C1O4.1	To infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water
C1O4.2	To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engg and tech. applications
C1O4.3	To apply the knowledge of phase rule and composites for materials selection requirements.
C1O4.4	To recommend suitable fuel for engg. processes and applications
C1O4.5	To analyse combustion process and its calculations
C1O4.6	To recognize different forms of energy resources and apply them for suitable applications in energy sectors.

Title:PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY,Subject Code:GE3171 NBA Code for the Subject :106 ,Semester : 1 [22-23ODD]Target :80 Credits:2

At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
106.1	To understand the problem solving approaches.
106.2	To learn the basic programming constructs in Python
106.3	To learn the programming constructs in Python like loop, function, recursion.
106.4	To practice various computing strategies for Python-based solutions to real world problems.
106.5	To use Python data structures-lists, tuples, dictionaries.
106.6	To do input/output with files in Python.

Title:ENGLISH LABORATORY,Subject Code:GE3172 NBA Code for the Subject :C101 ,Semester : 1 [22-23ODD]Target :65 Credits:1	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C101.1	To improve the communicative competence of learners by throwing light on vocabulary and basic grammar
C101.2	To improve the communicative competence of learners by throwing light on vocabulary and basic grammar
C101.3	To build on students¿ English language skills by engaging them in listening, speaking and grammar learning activities those are relevant to authentic contexts.
C101.4	C101.4 To build on students¿ English language skills by engaging them in listening, speaking and grammar learning activities those are relevant to authentic contexts.
C101.5	C101.5 To use language efficiently in expressing their opinions via various media and graphical representation.
C101.6	C101.6 Participate effectively in informal conversations; introduce themselves and their friends and express opinion in English with different types of sentences

Title:PHYSICS AND CHEMISTRY LABORATORY,Subject Code:BS3171 NBA Code for the Subject :C107 ,Semester : 1 [22-23ODD]Target :65 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C107.1	gain knowledge about elasticity, modulus, oscillations and also able to calculate Young's,rigidity modulus, moment of inertia of regular and irregular bodies.
C107.2	understand the application of interference and diffraction in finding thickness of the given sample and wavelength of the source respectively
C107.3	calculate the variation of resistance with respect to temperature and also able to calculate the band gap of semiconductor
C107.4	Analyse various water quality parameters-Hardness, alkalinity and DO in water sample.
C107.5	Acquire practical skills by using instruments like conductivity meter, pH meter and potentiometer.
C107.6	Finding the strength and amount of nickel in steel.

Title:ELECTRICAL CIRCUIT ANALYSIS,Subject Code:EE3251 NBA Code for the Subject :113 ,Semester : 2 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
113.1	Explain circuit¿s behavior using circuit laws
113.2	Apply mesh analysis/ nodal analysis / network theorems to determine behavior of the given DC and AC circuit
113.3	Compute the transient response of first order and second order systems to step and sinusoidal input
113.4	Compute power, line/ phase voltage and currents of the given three phase circuit
113.5	Explain the frequency response of series and parallel RLC circuits
113.6	Explain the behavior of magnetically coupled circuits

Title:PROFESSIONAL ENGLISH-II,Subject Code:HS3252 NBA Code for the Subject :C108 ,Semester : 2 [22-23EVEN]Target :65 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**

C108.1	To compare and contrast products and ideas through technical texts in essays with appropriate grammatical usage and contextual meanings
C108.2	emails and responses to complaints. To enhance learners¿ awareness of general rules of writing for specific audiences through professional
C108.3	To help learners understand the purpose, audience, contexts of different types of letters/essays/checklists
C108.4	To analyze problems in order to arrive at feasible solutions and communicate them orally and in the written format. To report events and the processes of technical and industrial nature
C108.5	To make use of grammatical items effectively in writing recommendations and in transcoding the graphs
C108.6	To write a winning job/internship application-cover letter and resume /SoP-Statement of purpose

Title:STATISTICS AND NUMERICAL METHODS,Subject Code:MA3251 NBA Code for the Subject :C109 ,Semester : 2 [22-23EVEN]Target :60 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C109.1	Apply the concept of testing of hypothesis for small and large samples in real life problems.
C109.2	Apply the basic concepts of classifications of design of experiments in the field of agriculture.
C109.3	Solve algebraic, transcendental equations and simultaneous equations by direct method.
C109.4	Solve simultaneous equations by iterative method and Eigen value problems.
C109.5	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.
C109.6	Gain the knowledge of various techniques and methods to solve first order ordinary differential equations with initial conditions in engineering applications.

Title:PHYSICS FOR INSTRUMENTATION ENGINEERING,Subject Code:PH3255 NBA Code for the Subject :C111 ,Semester : 2 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C111.1	Students gain basic knowledge about electricity magnetism and applications of vector in electricity magnetism
C111.2	Gives understanding about electrical properties of materials, quantum mechanical applications to analyze the properties and their applications
C111.3	Gives knowledge about Classification, properties and applications of Magnetic materials in memory storage devices.
C111.4	Gives understanding about semiconductor physics, charge carrier determination and functioning of semiconductor devices
C111.5	Gives complete knowledge about optical properties of materials, optical displays and applications
C111.6	Gives the basic knowledge and importance of functional nano electronic devices

Title:BASIC CIVIL AND MECHANICAL ENGINEERING,Subject Code:BE3255 NBA Code for the Subject :C112 ,Semester : 2 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C112.1	Understanding profession of Civil and Mechanical engineering.
C112.2	Summerise the planning of building, infrastructure and working of Machines.
C112.3	Apply the knowledge gained in respective discipline.
C112.4	Illustrate the ideas of Civil and Mechanical Engineering applications.
C112.5	Appraise the material, Structures, machines and energy.
C112.6	Understand the refrigeration systems

Title:ENGINEERING GRAPHICS,Subject Code:GE3251 NBA Code for the Subject :C113 ,Semester : 2 [22-23EVEN]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C113.1	Student will be able to draw the various types of engineering curves.
C113.2	Student will be able to draw the projection of points, lines and plain surfaces

C113.3	Student will be able to drawing orthographic projection of solids
C113.4	Student will be able to draw the freehand sketch of simple objects
C113.5	Student will be able to draw the development of solids and section of solids.
C113.6	Student will be able to draw the isometric and perspective projections of simple solids.

Title:ELECTRIC CIRCUITS LABORATORY,Subject Code:EE3271 NBA Code for the Subject :116 ,Semester : 2 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
116.1	Use simulation and experimental methods to verify the fundamental electrical laws for the given DC/AC circuit
116.2	Use simulation and experimental methods to verify the various electrical theorems (Superposition, Thevenin , Norton and maximum power transfer) for the given DC/AC circuit
116.3	Analyze transient behavior of the given RL/RC/RLC circuit using simulation and experimental methods
116.4	Analyze frequency response of the given series and parallel RLC circuit using simulation and experimentation methods
116.5	Analyze the performance of the given three-phase circuit using simulation and experimental methods
116.6	

Title:ENGINEERING PRACTICES LABORATORY,Subject Code:GE3271 NBA Code for the Subject :C115 ,Semester : 2 [22-23EVEN]Target :80 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C115.1	distinguish residential house wiring, fluorescent lamp wiring and stair case wiring.
C115.2	define electrical quantities like voltage, current, energy and resistance and their measurement using CRO.
C115.3	analyze different logic gates, clock, rectifier and to solder devices and components.
C115.4	understand the pipe connections for the home application and industrial constructions
C115.5	do plan the real geometry of the shapes for industrial applications.
C115.6	understand the concept of joining the metal by welding.

Title:TRANSFORMS AND DIFFERENTIAL EQUATIONS,Subject Code:MA3353 NBA Code for the Subject :C201 ,Semester : 3 [22-23ODD]Target :60 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C201.1	acquaint the students with Differential Equations which are significantly used in engineering problems.
C201.2	understand how to solve the given standard partial differential equations.
C201.3	solve differential equations using Fourier series analysis which plays a vital role in engineering applications.
C201.4	appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations.
C201.5	understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering.
C201.6	use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.

Title:ANALOG ELECTRONICS,Subject Code:EI3351 NBA Code for the Subject :C202 ,Semester : 3 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C202.1	To understand the structure, operation and applications of electronic devices.
C202.2	To familiarize of BJT,biasing,and its frequency response in various configurations CC,CE,CB.
C202.3	To familiarize of FET(JFET,MOSFET)wit its biasing and Thyristors(SCR,UJT)
C202.4	To learn the function of power(differential) amplifiers

C202.5	To understand the concepts of feedback amplifiers
C202.6	To design RC and LC tuned oscillators for a given frequency.

Title:DIGITAL SYSTEM DESIGN AND APPLICATIONS,Subject Code:EI3352 NBA Code for the Subject :C203 ,Semester : 3 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C203.1	Describe the various types of number systems, binary codes
C203.2	Use K map for simplification and implementation of combinational logic circuit.
C203.3	Explain the synchronous sequential logic circuits and produce a state transition diagram from a description of sequential logic function.
C203.4	Demonstrate the synchronous sequential circuits and describe the operation of programmable logic devices and examine the digital logic families
C203.5	Describe the VHDL programming language for logic circuits
C203.6	Produce VHDL coding for combinational logic and sequential circuits

Title:TRANSDUCERS ENGINEERING,Subject Code:EI3353 NBA Code for the Subject :C204 ,Semester : 3 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C204.1	Understand the working principles of various types of transducers
C204.2	Gain knowledge on the application areas of different sensors
C204.3	Select the right sensor/transducer for a given application
C204.4	Determine the static and dynamic characteristics of transducers using software packages
C204.5	Design simple signal conditioning circuits for the R,L and C type of sensors
C204.6	Summarize the advanced sensor technologies and sensors for specific applications

Title:LINEAR INTEGRATED CIRCUITS AND APPLICATIONS,Subject Code:EI3354 NBA Code for the Subject :C205 ,Semester : 3 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C205.1	Explain the IC fabrication process and discuss the fabrication of active and passive components
C205.2	Compute the gain and output voltage of the given Op-Amp circuits
C205.3	Explain the internal functional blocks and applications of ICs 555, 566, 565, and AD633
C205.4	Explain the operation of voltage regulator ICs namely LM78XX, LM79XX, LM317 and LM723
C205.5	Explain the operation and design of various signal conditioning circuits
C205.6	Explain the concepts of various signal conditioning circuits

Title:C PROGRAMMING AND DATA STRUCTURES,Subject Code:CS3353 NBA Code for the Subject :C206 ,Semester : 3 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C206.1	Learn the basic of c,Decision making and Looping statements, Functions and Arrays concepts.
C206.2	Learn the concept of Structures,Union,Pointers and File handling in c.
C206.3	Explain the Linear data sturctures like List,Stack and Queue and their applications.
C206.4	Disucss the Non-linear data structure Tree, its Representation,Types, Traversals and applications.
C206.5	Learn the concept of Hashing and its types.
C206.6	Disucss the various Sorting and Searching algorithms.

Title:SEMICONDUCTOR DEVICES AND CIRCUITS LABORATORY,Subject Code:EI3361 NBA Code for the Subject :C207 ,Semester : 3 [22-23ODD]Target :65 Credits:1.5	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**

C207.1	Determine the Breakdown voltage, forward and reverse resistance of PN junction diode and Zener diode and calculate the ripple factor of rectifier circuits with filter.
C207.2	Calculate the hybrid parameters of BJT under CE and CB configuration
C207.3	Obtain the frequency response of CE amplifier and CS amplifier
C207.4	Obtain the UJT and JFET parameters from the characteristics and also to calculate the gain of differential amplifier using JFET.
C207.5	Design the RC and LC tuned oscillators for a given oscillating frequency.
C207.6	Analyze the input and output performance of the given diode based circuit using simulation tools.

Title:C PROGRAMMING AND DATA STRUCTURES LABORATORY,Subject Code:CS3362 NBA Code for the Subject :C208 ,Semester : 3 [22-23ODD]Target :80 Credits:1.5

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C208.1	To implement basic programs and advanced concepts like Functions, Arrays in c.
C208.2	To implement Structures,Pointers and Files in c.
C208.3	To implement Array and Linked list implementation of Lists,Stacks, Queue and its applications in c.
C208.4	To implement Tree and its Traversals,Binary search Trees in c.
C208.5	To implement Searching and Sorting algorithms in c.
C208.6	To implement Hash Functions and collision Resolution techniques in c.

Title:EMBEDDED SYSTEMS AND IOT,Subject Code:IC3402 NBA Code for the Subject :214 ,Semester : 4 [22-23EVEN]Target :60 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
214.1	Understand the concept of embedded system and its architectural features
214.2	Develop embedded software using Embedded C and Python.
214.3	Integrate/Interface real world field devices with microcontrollers.
214.4	Utilize the power of RTOS for embedded applications.
214.5	Acquire real world signals and perform remote process monitoring utilizing the concept of IoT.
214.6	Design and implement IoT enabled embedded control strategy for a given application.

Title:ENVIRONMENTAL SCIENCES AND SUSTAINABILITY,Subject Code:GE3451 NBA Code for the Subject :215 ,Semester : 4 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
215.1	Infer the importance of environment and explain the concept of ecosystem.
215.2	Recall the various functions, different values, threats and conservation of biodiversity.
215.3	Explain the different types of pollution and propose the suitable methods to prevent the same to enhance the environment.
215.4	Discuss the different types of renewable resources, optimum usage and its importance.
215.5	Discuss the aspect of sustainability and the means of sustainability management to realize the SDG targets.
215.6	List the various environmental management systems for environmental protection and discuss the given solutions for energy to materials for sustainability.

Title:INDUSTRIAL INSTRUMENTATION,Subject Code:EI3451 NBA Code for the Subject :C210 ,Semester : 4 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C210.1	Define the measurement techniques of viscosity, humidity and moisture
C210.2	Describe the measurement of temperature and pressure
C210.3	Examine the concept of flow measurement techniques
C210.4	Explain the concept of electrical flow meters
C210.5	Classify the various techniques of level measurements

C210.6	Describe the different types of transmitters

Title:AUTOMATIC CONTROL SYSTEMS,Subject Code:IC3451 NBA Code for the Subject :C211 ,Semester : 4 [22-23EVEN]Target :60 Credits:4	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C211.1	To represent and develop systems in different forms using the knowledge gained.
C211.2	To analyses the system in time and frequency domain.
C211.3	To discuss the effect of PID controller in closed loop systems
C211.4	To construct compensator for the linear systems in frequency domain
C211.5	To analyses the stability of physical systems
C211.6	To acquire and analyses knowledge in State variable model for MIMO systems

Title:MODERN ELECTRONIC INSTRUMENTATION,Subject Code:IC3401 NBA Code for the Subject :C212 ,Semester : 4 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C212.1	To understand the principle behind measurement of Electrical/ mechanical quantities..(
C212.2	To interpret the specifications of different ADCs/DACs/ Digital interfaces.
C212.3	To gain knowledge on different types of MEMS Sensors and their merits/ demerits.
C212.4	To learn the basics of wireless instrumentation
C212.5	To analyze and design measurement system for simple applications
C212.6	To develop simple measurement solutions for the measuring given physical quantity

Title:ELECTRICAL MACHINES AND DRIVES,Subject Code:IC3452 NBA Code for the Subject :C215 ,Semester : 4 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C215.1	Ability to understand the terms associated with electrical machines
C215.2	Ability to understand basic concepts and working principle of electrical machines
C215.3	Ability to understand the performance characteristics of machines
C215.4	Ability to identify suitable machines for carrying out interdisciplinary projects.
C215.5	Ability to understand the motor operating principle and characteristics of motor
C215.6	Ability to understand the motor operating principle and characteristics of transformer

Title:DIGITAL AND LINEAR INTEGRATED CIRCUITS LABORATORY,Subject Code:EI3461 NBA Code for the Subject :C217 ,Semester : 4 [22-23EVEN]Target :65 Credits:1.5	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C217.1	Design and implement the given Boolean function using logic gates
C217.2	Design and verify the truth table of combinational logic circuits (code converters, encoders, decoders, multiplexer and demultiplexer).
C217.3	Design and implement the Counters and Shift registers
C217.4	Design and testing of Op-Amp circuits and to simulate the op-amp application circuit using simulation tools
C217.5	Design and testing of as table and monostable circuits using Timer IC NE/SE 555
C217.6	Design and testing of variable voltage regulator using IC LM317/LM723

Title:SENSORS AND SIGNAL CONDITIONING CIRCUITS LABORATORY,Subject Code:EI3462 NBA Code for the Subject :C218 ,Semester : 4 [22-23EVEN]Target :80 Credits:1.5	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C218.1	Ability to perform error analysis and uncertainty analysis
C218.2	Ability to evaluate the static and dynamic characteristics of measuring instruments.

C218.3	Ability to design and construct measurement systems using different types of resistance, capacitance and inductance transducers
C218.4	Ability to apply special transducers for measurement applications.
C218.5	Ability to interface and analyze different signal conditioning units
C218.6	Ability to present the results in oral form as well as in written form as a report and graph.

Title:INDUSTRIAL INSTRUMENTATION - II,Subject Code:EI8552 NBA Code for the Subject :C302 ,Semester : 5 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C302.1	Define the various techniques and methods of flow meter
C302.2	Describe the various methods of quantity meters
C302.3	Examine the concept of area flow meters and mass flow meters
C302.4	Explain the concept of electrical flow meters
C302.5	Classify the various techniques of level measurements
C302.6	Describe the different types of transmitters

Title:ANALYTICAL INSTRUMENTS,Subject Code:EI8551 NBA Code for the Subject :C303 ,Semester : 5 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C303.1	Infer various techniques and methods of analysis which occur in the various regions of the spectrum
C303.2	Classify the various chromatography techniques
C303.3	Compute the various sources and detectors in chromatography
C303.4	Estimate the various methods of analysis of industrial gases.
C303.5	Estimate the importance of chemical methods of analysis.
C303.6	Describe about nuclear magnetic resonance and microscopic techniques

Title:PROCESS CONTROL,Subject Code:EI8553 NBA Code for the Subject :C303 ,Semester : 5 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C303.1	Derive the Mathematical model of first order level, flow, pressure, temperature process.
C303.2	Outline various final control elements and modelling of pneumatic actuators.
C303.3	Illustrate the effect of various control actions.
C303.4	Classify the evaluation criteria and tuning techniques of controllers.
C303.5	Elaborate the model based control schemes.
C303.6	Explain the concept of multi loop control techniques.

Title:MICROPROCESSORS AND MICROCONTROLLERS,Subject Code:EE8551 NBA Code for the Subject :C305 ,Semester : 5 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C305.1	Understand the architecture, addressing modes, Instruction set of 8086 microprocessor for programming the microprocessor and also understand the operations of stacks, interrupt service routines
C305.2	Create ALP programs in assembly language using 8085
C305.3	Understand techniques for interfacing I/O devices to the microprocessor including several specific standard I/O devices
C305.4	Understand the architecture, interrupt structure, Timer, counter of 8051 microcontroller
C305.5	Create a microcontroller based minimal system for a particular application
C305.6	Design microcontroller based system design

Title:UNIT OPERATION AND CONTROL,Subject Code:EI8093 NBA Code for the Subject :C305 ,Semester : 5 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C305.1	Apply the knowledge on solids to handle the raw materials.
C305.2	Apply the knowledge on fluids to handle the raw materials.
C305.3	Select and apply relevant handling techniques to convert the solids and fluids for specific applications
C305.4	Come out with solutions for simple/complex problems in heat transfer and design the heat exchange specific applications
C305.5	Able to carry out multidisciplinary projects using heat transfer, mass transfer concepts
C305.6	Gain ability for lifelong learning of new techniques and developments in various types of unit operations in industries

Title:AIR POLLUTION AND CONTROL ENGINEERING\,Subject Code:OCE551 NBA Code for the Subject :C306 ,Semester : 5 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C306.1	Outline the basic concepts of air quality management
C306.2	Examine the characteristics of air pollutants and their effects
C306.3	Identify, formulate and solve meteorological effects
C306.4	Ability to design stacks and particulate air pollution control devices to meet applicable standards
C306.5	Ability to select control equipment
C306.6	Ability to ensure quality, control and preventive measures.

Title:MICROPROCESSORS AND MICROCONTROLLERS LABORATORY,Subject Code:EE8681 NBA Code for the Subject :C307 ,Semester : 5 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C307.1	Understand the architecture, addressing modes, Instruction set of 8086 microprocessor for programming the microprocessor and also understand the operations of stacks, interrupt service routines
C307.2	Create ALP programs in assembly language using 8085
C307.3	Understand techniques for interfacing I/O devices to the microprocessor including several specific standard I/O devices
C307.4	Understand the architecture, interrupt structure, Timer, counter of 8051 microcontroller
C307.5	Create a microcontroller based minimal system for a particular application
C307.6	Design microcontroller based system design

Title:INDUSTRIAL INSTRUMENTATION LABORATORY,Subject Code:EI8561 NBA Code for the Subject :C307 ,Semester : 5 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C307.1	Experimentally verify the process in flow
C307.2	Compute various parameters like level, pressure, temperature
C307.3	Apply the speed, torque, vibration, moisture and viscosity measurement
C307.4	Experiment and control of spectrometer
C307.5	Measure the pH, conductivity of solutions
C307.6	Analyze the ECG and pulse measurement

Title:APPLIED SOFT COMPUTING,Subject Code:EE8071 NBA Code for the Subject :314 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
314.1	Associate the concepts of architectures in neural networks.
314.2	Illustrate the concepts of neural networks for control.
314.3	Distinguish the adaptive fuzzy system and neuro-fuzzy systems.

314.4	Infer a comprehensive knowledge on fuzzy logic control and their applications.
314.5	Explain the concept of genetic algorithms.
314.6	Applying tabu search and ant colony search techniques for solving optimisation problems.

Title:DATA STRUCTURES,Subject Code:CS8391 NBA Code for the Subject :C203 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C203.1	Describe linear data structures using array and linked list
C203.2	Apply data structures like stacks, queues in linear data structure.
C203.3	Discuss non-linear data structures tree and its application.
C203.4	Apply various algorithms in graph.
C203.5	Solve searching, sorting and hashing techniques in data structures.
C203.6	Interpret sorting algorithms for a give problem.

Title:ADVANCED CONTROL SYSTEM,Subject Code:IC8651 NBA Code for the Subject :C309 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C309.1	To provide knowledge on introduction to state space representation and modeling
C309.2	To provide knowledge on design state space representation and modeling
C309.3	To provide knowledge on design state feedback control and state observer.
C309.4	State space representation of Digital/sampled data system
C309.5	To provide knowledge in phase plane analysis,To give basic knowledge in describing function analysis.
C309.6	To study the design of optimal controller and estimator including Kalman Filter

Title:LOGIC AND DISTRIBUTED CONTROL SYSTEM,Subject Code:EI8651 NBA Code for the Subject :C310 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C310.1	Know about the Programmable Logic Controller (PLC) and SCADA
C310.2	Explain about the basics of ladder logic programming
C310.3	Explain about the PLC programming using other languages
C310.4	Identify the architecture and local control unit of Distributed Control System (DCS).
C310.5	Gives the basic knowledge in the interfaces used in DCS.
C310.6	Know about the importance and applications of PLC and DCS used in automation industries.

Title:THERMAL POWER PLANT INSTRUMENTATION,Subject Code:EI8092 NBA Code for the Subject :C312 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C312.1	Describe an overview on power generation through various methods.
C312.2	Identify various measurements and controls used in power plant.
C312.3	Understand basic furnace control techniques
C312.4	Know basic boiler control techniques.
C312.5	Discriminate advanced boiler control techniques.
C312.6	Summarize the turbine control techniques.

Title:MEMS AND NANO SCIENCE,Subject Code:EE8072 NBA Code for the Subject :C313-E11 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C313-E11.1	Know about the intrinsic characteristics of MEMS and Microsystems.

C313-E11.2	Understand the operation of actuators at micro level.
C313-E11.3	Describe about the various micromachining methods like surface micromachining, bulk micromachining
C313-E11.4	Understand about the importance of polymer and optical MEMS.
C313-E11.5	Explain about the nano scale engineering.
C313-E11.6	State about patterning and preparation methods at nano scale.

Title:PRINCIPLES OF MANAGEMENT,Subject Code:MG8591[8] NBA Code for the Subject :C409 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C409.1	To understand the fundamentals of management principles and practices in the organizations.
C409.2	To know the various types of planning and decision making in the context of organizations.
C409.3	To learn the significance of organising resources, jobs and manpower for effective management.
C409.4	To understand the various motivational techniques influencing and directing the human behaviour in the organization.
C409.5	To measure the performance of organization and suggest suitable actions for improving productivity.
C409.6	To identify the various controlling techniques used by managers in the business world.

Title:DATA STRUCTURES LABORATORY,Subject Code:CS8381 NBA Code for the Subject :C207 ,Semester : 6 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C207.1	Implement the linear data structures like list and stack using arrays and linked list Implement the linear data structures like list and stack using arrays and linked list
C207.2	Implement the applications of linear data structures
C207.3	Implement the non-linear data structures tree and its traversals and applications
C207.4	Implement the non-linear data structures graph and its traversals
C207.5	Implement Sorting and Searching algorithms
C207.6	Implement various Hash Functions

Title:PROFESSIONAL COMMUNICATION,Subject Code:HS8581 NBA Code for the Subject :C308 ,Semester : 6 [22-23EVEN]Target :65 Credits:1

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C308.1	To enhance the learners speaking skill through various activities like group discussion, telephonic conversation, presentation skill etc.,
C308.2	To develop listening and speaking skills through communicative functions
C308.3	Enhance the Employability and Career Skills of student
C308.4	Orient the students towards grooming as a professional
C308.5	Make them Employability Graduates
C308.6	Develop their confidence and help them attend interviews successfully.

Title:PROCESS CONTROL LABORATORY,Subject Code:EI8661 NBA Code for the Subject :C317 ,Semester : 6 [22-23EVEN]Target :80 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C317.1	Simulate lumped / distributed parameter system and identify the model using non parametric identification methods.
C317.2	Analyze process control engineering problems and control valve characteristics.
C317.3	Apply the tuning techniques on PID controllers for solving various practical problems and to face implementation issues.

C317.4	Experiment and control of closed loop AC and DC drives.
C317.5	Experimentally verify the process control concepts on the selected process control loops like level, pressure, temperature and flow.
C317.6	Apply the complex control techniques like cascade, feed forward on three tank and four tank system and model predictive control schemes.

Title:INDUSTRIAL DATA NETWORKS,Subject Code:EI8751 NBA Code for the Subject :403 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
403.1	Infer knowledge on the basic concepts of data networks.
403.2	Define the basics concepts of internetworking and serial communications.
403.3	Describe the uses of HART and Field buses in process industries.
403.4	Recognize the importance of MODBUS, PROFIBUS and other communication protocol.
403.5	Identify the importance and applications of foundation fieldbus
403.6	Exhibit the concept of industrial Ethernet and wireless communication techniques.

Title:INTRODUCTION TO C PROGRAMMING,Subject Code:OCS752 NBA Code for the Subject :502 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
502.1	Develop algorithmic solutions to simple computational problems
502.2	Read, write, execute by hand simple C programs.
502.3	Structure simple C programs for solving problems using statements
502.4	Represent data using arrays and strings operations
502.5	Decompose a C program into functions and pointers
502.6	Represent and write program using structure and union

Title:ELECTRONICS INSTRUMENTATION,Subject Code:EI8692 NBA Code for the Subject :C310 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C310.1	Outlines the varies electronics instruments and their applications.
C310.2	Explains about the cathode ray oscilloscopes, their applications and different types of signal analyzers.
C310.3	Illustrates about virtual instrumentation, its applications
C310.4	Describe the telemetry, modulation techniques and multiplexing.
C310.5	Demonstrate the LabVIEW programming.
C310.6	Experiment to do interfaces with real time processes with aid of NI components.

Title:INSTRUMENTATION IN PETROCHEMICAL INDUSTRIES,Subject Code:EI8091 NBA Code for the Subject :C402 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C402.1	introduce the students the method of oil recovery
C402.2	make the students understand the process behavior of some of the important unit operations in petrochemical industry through mathematical model
C402.3	familirize the students to apply knowledge to select the appropriate control strategy for the selective process
C402.4	provide information about the most important derivatives obtained from petroleum products
C402.5	help the students in understanding selection and maintenance of instruments in petrochemical industry
C402.6	introduce the steps involved in oil gas production process

Title:DIGITAL IMAGE PROCESSING,Subject Code:EC8093 NBA Code for the Subject :C403 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C403.1	Understand the basics and fundamentals of digital image processing
C403.2	Understand and apply the techniques used in image enhancement
C403.3	Understand and apply the techniques used in image restoration
C403.4	Understand the basics of segmentation and feature extraction techniques
C403.5	understand the basics of compression and recognition methods
C403.6	Apply the knowledge gained in segmentation methods

Title:FIBRE OPTICS AND LASER INSTRUMENTATION,Subject Code:EI8075 NBA Code for the Subject :C404-E31 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C404-E31.1	Understand the principle, transmission, dispersion and attenuation characteristics of optical fibers
C404-E31.2	Acquire knowledge on the concepts of waves and optical devices and their applications in fibre optics
C404-E31.3	Apply the gained knowledge on optical fibers for its use as communication medium.
C404-E31.4	Gained knowledge optical fibre as a sensor which have important applications in production, manufacturing industrial and biomedical applications.
C404-E31.5	Understand laser theory and laser generation system.
C404-E31.6	Students will gain ability to apply laser theory for the selection of lasers for a specific Industrial and medical application.

Title:PROFESSIONAL ETHICS IN ENGINEERING,Subject Code:GE8076[8] NBA Code for the Subject :C411 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C411.1	Understanding the human values and ethics in the human excellence and behaviour in the organization
C411.2	Helps to understand the characteristics of morals and engineer's conduct of behaviour and practice in the workplace
C411.3	Engineering as an experimental process to understand the various ethical implications
C411.4	Responsibility of engineers to ensure the safety, health and welfare of the public
C411.5	The importance of ethics in dealing with the global issues, computer ethics and weapons development
C411.6	Moral guidelines of practicing human, employee, professional rights in organisations.

Title:INDUSTRIAL AUTOMATION LAB,Subject Code:EI8761 NBA Code for the Subject :407 ,Semester : 7 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
407.1	Ability to understand and Programming of PLC, SCADA and DCS
407.2	To impart practical skills in interfacing the various field devices with PLC
407.3	Ability to working with industrial automation system
407.4	Be able to design and implement control schemes in PLC
407.5	Ability to interface field devices with PLC & DCS
407.6	design and implement control schemes in DCS

Title:INSTRUMENTATION SYSTEM DESIGN LABORATORY,Subject Code:EI8762 NBA Code for the Subject :C408 ,Semester : 7 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C408.1	Design of instrumentation amplifiers and various filters
C408.2	Design of converters and compensation systems

C408.3	Analyze signal conditioning circuits and flowmeters.
C408.4	Design of controllers and control valves for various applications
C408.5	Design of data acquisition system and transmitter
C408.6	Inspect, installation procedures and safety regulations used in industries.

Title:FUNDAMENTALS OF NANO SCIENCE,Subject Code:GE8073 NBA Code for the Subject :C410-E64 ,Semester : 8 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C410-E64.1	To learn about the basis of nano material science and its properties
C410-E64.2	To discuss about the various preparation methods of nano materials
C410-E64.3	Infer various nano materials and its method of synthesis
C410-E64.4	Develop knowledge about various characterization techniques of nano materials
C410-E64.5	To identify the various applications of nanotechnology in computing
C410-E64.6	To identify the various applications of nanotechnology in biomedical

Title:PROJECT WORK,Subject Code:IC8811 NBA Code for the Subject :C413 ,Semester : 8 [22-23EVEN]Target :65 Credits:10

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C413.1	Experiment a specific problem right from its identification, formulation and obtaining successful solution for the same using various engineering techniques.
C413.2	Choose any challenging practical problems and find solution by formulating proper methodology.
C413.3	Prepare project reports and to face reviews and viva voce examination.
C413.4	Integrate and work in a team.
C413.5	Summarize the project and prepare the publication of papers and journals to expose to the technical world.
C413.6	Discriminate various instruments and able to control systems in automation and in emerging trends of instrumentation.

HoD/ICE

Information Technology

Programme:B.Tech Information Technology

Course OutComes for the Academic Year : 2022-23

Title:PROBLEM SOLVING AND PYTHON PROGRAMMING,Subject Code:GE3151 NBA Code for the Subject :105 ,Semester : 1 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
105.1	To understand the basics of algorithmic problem solving
105.2	To learn to solve problems using Python conditionals and loops.
105.3	To define Python functions and use function calls to solve problems.
105.4	To use Python data structures - lists, tuples, dictionaries to represent complex data.
105.5	To learn about usage of python packages and modules
105.6	To do input/output with files in Python

Title:MATRICES AND CALCULUS,Subject Code:MA3151 NBA Code for the Subject :C102 ,Semester : 1 [22-23ODD]Target :60 Credits:4	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C102.1	Eigenvalues and eigenvectors, diagonalization of a matrix,symmetric matrices, Positive definite matrices and similar matrices.
C102.2	Understand the limit, continuity and derivative of the functions. Solve various functions and its maxima /minima using differentiation rules.
C102.3	Apply the total and partial derivatives in Taylor series expansion of functions and the extremum of functions.
C102.4	Evaluate the integrals both by using Riemann sums and by using the Fundamental theorem of Calculus. Evaluate integrals using various techniques of integration.
C102.5	Understand the concepts of double integration and determine the area using integration. Also understands the concepts of the change of order of integration and Change of variables in integrals.
C102.6	Understand the concepts of Triple integration and determine the volume using integration.

Title:ENGINEERING PHYSICS,Subject Code:PH3151 NBA Code for the Subject :C103 ,Semester : 1 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C103.1	Understand the importance of mechanics
C103.2	Express their knowledge in electromagnetic waves
C103.3	Demonstrate a strong foundational knowledge in optics and lasers
C103.4	Understand the importance of quantum physics.
C103.5	Comprehend and apply quantum mechanical principles towards the formation of energy bands
C103.6	Demonstrate a strong foundational knowledge in oscillations.

Title:ENGINEERING CHEMISTRY,Subject Code:CY3151 NBA Code for the Subject :C1O4 ,Semester : 1 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C1O4.1	To infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water
C1O4.2	To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engg and tech. applications
C1O4.3	To apply the knowledge of phase rule and composites for materials selection requirements.
C1O4.4	To recommend suitable fuel for engg. processes and applications
C1O4.5	To analyse combustion process and its calculations
C1O4.6	To recognize different forms of energy resources and apply them for suitable applications in energy sectors.

Title:PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY,Subject Code:GE3171 NBA Code for the Subject :106 ,Semester : 1 [22-23ODD]Target :80 Credits:2

At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
106.1	To understand the problem solving approaches.
106.2	To learn the basic programming constructs in Python
106.3	To learn the programming constructs in Python like loop, function, recursion.

106.4	To practice various computing strategies for Python-based solutions to real world problems.
106.5	To use Python data structures-lists, tuples, dictionaries.
106.6	To do input/output with files in Python.

Title:ENGLISH LABORATORY,Subject Code:GE3172 NBA Code for the Subject :C101 ,Semester : 1 [22-23ODD]Target :65 Credits:1

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C101.1	To improve the communicative competence of learners by throwing light on vocabulary and basic grammar
C101.2	To improve the communicative competence of learners by throwing light on vocabulary and basic grammar
C101.3	To build on students¿ English language skills by engaging them in listening, speaking and grammar learning activities those are relevant to authentic contexts.
C101.4	C101.4 To build on students¿ English language skills by engaging them in listening, speaking and grammar learning activities those are relevant to authentic contexts.
C101.5	C101.5 To use language efficiently in expressing their opinions via various media and graphical representation.
C101.6	C101.6 Participate effectively in informal conversations; introduce themselves and their friends and express opinion in English with different types of sentences

Title:PHYSICS AND CHEMISTRY LABORATORY,Subject Code:BS3171 NBA Code for the Subject :C107 ,Semester : 1 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C107.1	gain knowledge about elasticity, modulus, oscillations and also able to calculate Young's,rigidity modulus, moment of inertia of regular and irregular bodies.
C107.2	understand the application of interference and diffraction in finding thickness of the given sample and wavelength of the source respectively
C107.3	calculate the variation of resistance with respect to temperature and also able to calculate the band gap of semiconductor
C107.4	Analyse various water quality parameters-Hardness, alkalinity and DO in water sample.
C107.5	Acquire practical skills by using instruments like conductivity meter, pH meter and potentiometer.

C107.6	Finding the strength and amount of nickel in steel.

Title:PROFESSIONAL ENGLISH-II,Subject Code:HS3252 NBA Code for the Subject :C108 ,Semester : 2 [22-23EVEN]Target :65 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C108.1	To compare and contrast products and ideas through technical texts in essays with appropriate grammatical usage and contextual meanings.
C108.2	emails and responses to complaints. To enhance learners¿ awareness of general rules of writing for specific audiences through professional
C108.3	To help learners understand the purpose, audience, contexts of different types of letters/essays/checklists
C108.4	To analyze problems in order to arrive at feasible solutions and communicate them orally and in the written format. To report events and the processes of technical and industrial nature
C108.5	To make use of grammatical items effectively in writing recommendations and in transcoding the graphs
C108.6	To write a winning job/internship application-cover letter and resume /SoP-Statement of purpose

Title:PHYSICS FOR INFORMATION SCIENCE,Subject Code:PH3256 NBA Code for the Subject :C111 ,Semester : 2 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C111.1	Gain knowledge on classical and quantum electron theories, and energy band structures
C111.2	Acquire knowledge on basics of semiconductor physics
C111.3	Get knowledge on magnetic properties of materials and their applications in data storage
C111.4	Have the necessary understanding on the functioning of optical materials for optoelectronics
C111.5	Understand the basics of quantum structures
C111.6	Applications and basics of quantum computing

Title:BASIC ELECTRICAL AND ELECTRONICS ENGINEERING,Subject Code:BE3251 NBA Code for the Subject :C112 ,Semester : 2 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**

C112.1	Compute Electric DC Circuit parameters for simple problems
C112.2	Compute the AC parameters for simple problems
C112.3	Explain the working principle and applications of electrical machines
C112.4	Analyze the characteristics of analog electronic devices
C112.5	Explain the basic concepts of digital electronics
C112.6	Explain the operating principles of measuring instruments

Title:STATISTICS AND NUMERICAL METHODS,Subject Code:MA3251 NBA Code for the Subject :C112 ,Semester : 2 [22-23EVEN]Target :60 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C112.1	Apply the concept of testing of hypothesis for small and large samples in real life problems.
C112.2	Apply the basic concepts of classifications of design of experiments in the field of agriculture.
C112.3	Solve algebraic, transcendental equations and simultaneous equations by direct method.
C112.4	Solve simultaneous equations by iterative method and Eigen value problems.
C112.5	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.
C112.6	Gain the knowledge of various techniques and methods to solve first order ordinary differential equations with initial conditions in engineering applications.

Title:ENGINEERING GRAPHICS,Subject Code:GE3251 NBA Code for the Subject :C113 ,Semester : 2 [22-23EVEN]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C113.1	Student will be able to draw the various types of engineering curves.
C113.2	Student will be able to draw the projection of points, lines and plain surfaces
C113.3	Student will be able to drawing orthographic projection of solids
C113.4	Student will be able to draw the freehand sketch of simple objects
C113.5	Student will be able to draw the development of solids and section of solids.
C113.6	Student will be able to draw the isometric and perspective projections of simple solids.

Title:PROGRAMMING IN C,Subject Code:CS3251 NBA Code for the Subject :C114 ,Semester : 2 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C114.1	Demonstrate knowledge on C Programming constructs
C114.2	Develop simple applications in C using basic constructs
C114.3	Design and implement applications using arrays and strings
C114.4	Develop and implement modular applications in C using functions.
C114.5	Develop applications in C using structures and pointers
C114.6	Design applications using sequential and random access file processing

Title:ENGINEERING PRACTICES LABORATORY,Subject Code:GE3271 NBA Code for the Subject :116 ,Semester : 2 [22-23EVEN]Target :65 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
116.1	Students will be able to distinguish residential house wiring, fluorescent lamp wiring and stair case wiring.
116.2	Students will be able to define electrical quantities like voltage, current, energy and resistance and their measurement using CRO.
116.3	Students will be able to analyze different logic gates, clock, rectifier and to solder devices and components.
116.4	Students will able to understand the pipe connections for the home application and industrial constructions
116.5	Students will be able to do plan the real geometry of the shapes for industrial applications.
116.6	Students will be able to understand the concept of joining the metal by welding.

Title:PROGRAMMING IN C LABORATORY,Subject Code:CS3271 NBA Code for the Subject :C116 ,Semester : 2 [22-23EVEN]Target :65 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C116.1	Demonstrate knowledge on C programming constructs.

C116.2	Develop programs in C using basic constructs.
C116.3	Develop programs in C using arrays.
C116.4	Develop applications in C using strings, pointers, functions.
C116.5	Develop applications in C using structures.
C116.6	Develop applications in C using file processing.

Title:DISCRETE MATHEMATICS BSC 3 1 0 4,Subject Code:MA3354 NBA Code for the Subject :201 ,Semester : 3 [22-23ODD]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
201.1	Have knowledge of the concepts needed to test the logic of a program
201.2	Use proof techniques to check the truthfulness of a real life situation.
201.3	Be aware of a class of functions which transforms a finite set into another finite set which relate to input and output functions in computer science and counting principles.
201.4	Use graph theory to formulate the problem and solve it.
201.5	Be exposed to concepts and properties of algebraic structure such as groups, rings and fields.
201.6	Analyse the basic knowledge gained by Lattices, Boolean algebra and apply them.

Title:DIGITAL PRINCIPLES AND COMPUTER ORGANIZATION ESC 3 0 2 5,Subject Code:CS3351 NBA Code for the Subject :C202 ,Semester : 3 [22-23ODD]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C202.1	Analyzing and designing the combinational circuits
C202.2	Analyzing and designing the sequential circuits
C202.3	Understand the basic structure and operation of a digital Computer
C202.4	Understand the design of data path unit,control unit for processor and to familiarize with different types of hazards
C202.5	Understand the concepts of various memories
C202.6	Understand the I/O interfacing

Title:FOUNDATIONS OF DATA SCIENCE PCC 3 0 0 3,Subject Code:CS3352 NBA Code for the Subject :C203 ,Semester : 3 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C203.1	Define the data science process
C203.2	Understand different types of data description for data science process
C203.3	Gain knowledge on relationships between data
C203.4	Use the Python Libraries for Data Wrangling
C203.5	Apply visualization Libraries in Python to interpret data
C203.6	Apply visualization Libraries in Python to explore data

Title:DATA STRUCTURES AND ALGORITHMS PCC 3 0 0 3,Subject Code:CD3291 NBA Code for the Subject :C204 ,Semester : 3 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C204.1	Explain abstract data types and concepts of object oriented programming
C204.2	Design and Analyze the complexity for various algorithms
C204.3	Design, implement, and analyze linear data structures, such as lists, queues, and stacks, according to the needs of different applications
C204.4	Explain and implement searching, sorting and hashing algorithms
C204.5	Design, implement, and analyse efficient tree structures for different applications
C204.6	Model problems as graph problems and implement efficient graph algorithms to solve them

Title:OBJECT ORIENTED PROGRAMMING PCC 3 0 0 3,Subject Code:CS3391 NBA Code for the Subject :C204 ,Semester : 3 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C204.1	Learn the Architecture of Java Environment and understand the role of JVM and JRE.
C204.2	To understand Object Oriented Programming concepts and basic characteristics of Java
C204.3	To know the principles of inheritance and interfaces
C204.4	To define exceptions and use I/O streams

C204.5	To develop a java application with threads and generics classes
C204.6	To design and build simple Graphical User Interfaces using Javafx

Title:DATA STRUCTURES AND ALGORITHMS LABORATORY PCC 0 0 4 4,Subject Code:CD3281 NBA Code for the Subject :C206 ,Semester : 3 [22-23ODD]Target :80 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C206.1	1mplement ADTs as Python classes
C206.2	Implement List ADT using Python arrays and Linked list for different applications Implement List ADT using Python arrays and Linked list for different applications Impl
C206.3	Design and implement linear data structures - queues and stacks, according to the needs of different applications
C206.4	Implement searching, sorting and hashing algorithms.
C206.5	Design and implement tree structures.
C206.6	Implement efficient graph algorithms to solve graph problems

Title:OBJECT ORIENTED PROGRAMMING LABORATORY PCC 0 0 3 3,Subject Code:CS3381 NBA Code for the Subject :C207 ,Semester : 3 [22-23ODD]Target :65 Credits:1.5	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C207.1	To build software development skills using java programming for real-world applications.
C207.2	Learn Features of Object oriented programming by developing programs using Classes,Packages and Interfaces.
C207.3	Design and implement java programs using Exceptions,Arrays.
C207.4	Develop java applications using multithreading,Generic Programming
C207.5	Design and implement java programs using I/O Streams
C207.6	Learn to develop GUI programming and event handling using swing and awt classes

Title:DATA SCIENCE LABORATORY PCC 0 0 4 4,Subject Code:CS3361 NBA Code for the Subject :C208 ,Semester : 3 [22-23ODD]Target :80 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**

C208.1	Make use of the python libraries for data science
C208.2	Make use of the basic Statistical and Probability measures for data science.
C208.3	Perform descriptive analytics on the benchmark data sets
C208.4	Perform correlation and regression analytics on standard data sets
C208.5	Present data using visualization packages in Python.
C208.6	Interpret data using visualization packages in Python.

Title:THEORY OF COMPUTATION,Subject Code:CS3452 NBA Code for the Subject :C210 ,Semester : 4 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C210.1	Construct automata theory using Finite Automata
C210.2	Write regular expressions for any pattern
C210.3	Design context free grammar and Pushdown Automata
C210.4	Normalize context free grammar
C210.5	Design Turing machine for computational functions
C210.6	Differentiate between decidable and undecidable problems

Title:ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING,Subject Code:CS3491 NBA Code for the Subject :C211 ,Semester : 4 [22-23EVEN]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C211.1	Implement appropriate uninformed search algorithms for problem solving
C211.2	Implement appropriate heuristics search algorithms for problem solving
C211.3	Apply reasoning under uncertainty
C211.4	Build supervised learning models
C211.5	Build ensembling and unsupervised models
C211.6	Build deep learning neural network models

Title:DATABASE MANAGEMENT SYSTEMS,Subject Code:CS3492 NBA Code for the Subject :C212 ,Semester : 4 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C212.1	Study the fundamentals of data models and to represent a database system
C212.2	Apply ER model to Relational model to perform database design effectively and to perform normalization in databases.
C212.3	Understand and analyze the fundamental concepts of transactions
C212.4	Compare and contrast various indexing strategies in different database systems
C212.5	Illustrate and construct query optimization technique in database systems
C212.6	Appraise the difference between advanced databases and traditional databases.

Title:WEB ESSENTIALS,Subject Code:IT3401 NBA Code for the Subject :C213 ,Semester : 4 [22-23EVEN]Target :65 Credits:4	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C213.1	CO 1: Apply JavaScript, HTML and CSS effectively to create interactive and dynamic websites. Apply JavaScript, HTML and CSS effectively to create interactive and dynamic websites.
C213.2	Create simple PHP scripts
C213.3	Design and deploy simple web-applications.
C213.4	Create simple database applications.
C213.5	CO 5: Handle multimedia components Handle multimedia components
C213.6	create servlets and server side programming

Title:INTRODUCTION TO OPERATING SYSTEMS,Subject Code:CS3451 NBA Code for the Subject :C214 ,Semester : 4 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C214.1	Analyze various scheduling algorithms and process synchronization.
C214.2	Explain deadlock prevention and avoidance algorithms.
C214.3	Compare and contrast various memory management schemes.
C214.4	Explain the functionality of file systems, I/O systems

C214.5	Understanding of Virtualization
C214.6	Compare iOS and Android Operating Systems.

Title:ENVIRONMENTAL SCIENCES AND SUSTAINABILITY,Subject Code:GE3451 NBA Code for the Subject :C215 ,Semester : 4 [22-23EVEN]Target :65 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C215.1	Infer the importance of environment and explain the concept, types, structure and function of ecosystem
C215.2	Recall the various functions, values, levels, threats and conservation of biodiversity
C215.3	Explain the different types of pollution and propose the suitable methods to prevent the same to enhance the environment
C215.4	Discuss the conservation of different energy sources, optimal usage and the importance
C215.5	Discuss the aspect of sustainability and the means of sustainability management to realize the sustainable development goals
C215.6	Lists the various environment management systems, protection and discuss the green solutions for energy to materials for sustainability

Title:OPERATING SYSTEMS LABORATORY,Subject Code:CS3461 NBA Code for the Subject :C217 ,Semester : 4 [22-23EVEN]Target :65 Credits:1.5	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C217.1	To install windows operating systems and Linux using VMware
C217.2	To understand the basics of Unix command and shell programming.
C217.3	To implement various CPU scheduling algorithms
C217.4	To implement Deadlock Avoidance and Deadlock Detection Algorithms
C217.5	To implement Page Replacement Algorithms and memory allocation methods
C217.6	To be familiar with File Organization and File Allocation

Title:DATABASE MANAGEMENT SYSTEMS LABORATORY,Subject Code:CS3481 NBA Code for the Subject :C217 ,Semester : 4 [22-23EVEN]Target :80 Credits:1.5
At the end of this course, Student will be able to

CO-Code	Course outcome Description
C217.1	C1234567890C1234567890
C217.2	C1234567890C1234567890
C217.3	C1234567890C1234567890
C217.4	C1234567890C1234567890
C217.5	C1234567890C1234567890
C217.6	C1234567890C1234567890

Title:MICROPROCESSORS AND MICROCONTROLLERS,Subject Code:EC8691 NBA Code for the Subject :305 ,Semester : 5 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
305.1	Able to describe the architecture and organization of 8086 microprocessor
305.2	Able to write structured understandable programs in assembly language using 8086
305.3	Understand techniques for interfacing I/O devices to the microprocessor including several specific standard I/O devices
305.4	Students able to describe the architecture, interrupt structure, Timer, Counter of 8051 microcontroller
305.5	Student will be able to design of a microcontroller based minimal system for a particular application
305.6	Design of memory interfacing circuits

Title:ALGEBRA AND NUMBER THEORY,Subject Code:MA8551 NBA Code for the Subject :C301 ,Semester : 5 [22-23ODD]Target :60 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C301.1	Apply the basic notions of groups which will then be used to solve related problems.
C301.2	Apply the basic notions rings, fields which will then be used to solve related problems.
C301.3	Demonstrate accurate and efficient use of advanced algebraic techniques.
C301.4	Understand the basic concepts in number theory
C301.5	Demonstrate their mastery by solving non-trivial problems related to the concepts, and proving simple theorems

C301.6	Apply integrated approach to number theory

Title:COMPUTER NETWORKS,Subject Code:CS8591 NBA Code for the Subject :C302 ,Semester : 5 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C302.1	Understand the protocol layering and physical level communication
C302.2	Analyze the performance of a network
C302.3	Understand the various components required to build different networks
C302.4	Learn the functions of network layer and the various routing protocols
C302.5	Familiarize the functions and protocols of the Transport layer
C302.6	Learn the protocols of the application layer

Title:WEB TECHNOLOGY,Subject Code:IT8501 NBA Code for the Subject :C304 ,Semester : 5 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C304.1	Develop simple web pages using markup languages like HTML and XHTML
C304.2	Construct dynamic web pages using DHTML and java script that is easy to navigate and use.
C304.3	Develop program on server side web pages that have to process request from client side web pages.
C304.4	Understand Serverside technologies Servlets and JSP.
C304.5	Represent web data using XML and XSLT.
C304.6	Describe various web services and how these web services interact.

Title:SOFTWARE ENGINEERING,Subject Code:CS8494 NBA Code for the Subject :C305 ,Semester : 5 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C305.1	Explain the key activities in managing the software project and different process models
C305.2	Identify the concepts of requirement engineering and analysis modeling

C305.3	Identify the systematic procedure for software design and deployment. Explain the process of architectural design and other interface design.
C305.4	Compare and contrast various testing and maintenanc
C305.5	Explain the cost estimation-LOC and FP based estimation
C305.6	Identify the the risk and RMMM plan

Title:GEOGRAPHIC INFORMATION SYSTEM,Subject Code:OCE552 NBA Code for the Subject :C305OE ,Semester : 5 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C305OE.1	Have basic idea about the fundamentals of GIS
C305OE.2	Understand the types of data models
C305OE.3	Gain knowledge on data quality and standards
C305OE.4	Get knowledge about data input and topology
C305OE.5	Understand data management functions and data output and Analysis
C305OE.6	Have basic idea about GIS applications

Title:MICROPROCESSORS AND MICROCONTROLLERS LABORATORY,Subject Code:EC8681 NBA Code for the Subject :C306 ,Semester : 5 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C306.1	Write ALP Programmes for fixed and Floating Point and Arithmetic operations
C306.2	Write ALP Programmes for string manipulations, sorting and searching using 8086
C306.3	Interface different I/Os with processor
C306.4	Generate waveforms using Microprocessors
C306.5	Execute Programs in 8051
C306.6	Explain the difference between simulator and Emulator

Title:NETWORKS LABORATORY,Subject Code:CS8581 NBA Code for the Subject :C308 ,Semester : 5 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to

CO-	Course outcome Description

Code	
C308.1	To learn and use network commands
C308.2	To learn TCP socket programming for client server model
C308.3	To learn UDP socket programming for client server model
C308.4	To implement and analyze various network protocols.
C308.5	To learn and use simulation tools to analyse the packets
C308.6	To use simulation tools to analyze the performance of various network protocol

Title:WEB TECHNOLOGY LABORATORY,Subject Code:IT8511 NBA Code for the Subject :C309 ,Semester : 5 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C309.1	Design simple web pages using markup languages like HTML and XHTML.
C309.2	Create dynamic web pages using DHTML and java script that is easy to navigate and use.
C309.3	Program server side web pages that have to process request from client side web pages.
C309.4	Create three-tier applications with server and databases.
C309.5	Represent web data using XML and develop web pages using JSP.
C309.6	Understand various web services and how these web services interact.

Title:PROFESSIONAL COMMUNICATION,Subject Code:HS8581 NBA Code for the Subject :C308 ,Semester : 6 [22-23EVEN]Target :65 Credits:1

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C308.1	To enhance the learners speaking skill through various activities like group discussion, telephonic conversation, presentation skill etc.,
C308.2	To develop listening and speaking skills through communicative functions
C308.3	Enhance the Employability and Career Skills of student
C308.4	Orient the students towards grooming as a professional
C308.5	Make them Employability Graduates
C308.6	Develop their confidence and help them attend interviews successfully.

Title:COMPUTATIONAL INTELLIGENCE,Subject Code:IT8601 NBA Code for the Subject :C310 ,Semester : 6 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C310.1	Provide a basic exposition to the goals and methods of Computational Intelligence.
C310.2	Understand the design of intelligent computational techniques.
C310.3	Apply the Intelligent techniques for problem solving.
C310.4	Apply Computational Intelligence techniques for applications which involve perception, reasoning and learning.
C310.5	Improve problem solving skills using the acquired knowledge in the areas of, reasoning, natural language understanding.
C310.6	Improve skills in computer vision, automatic programming and machine learning.

Title:OBJECT ORIENTED ANALYSIS AND DESIGN,Subject Code:CS8592 NBA Code for the Subject :C311 ,Semester : 6 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C311.1	Express software design with UML diagrams
C311.2	Design software applications using OO concepts.
C311.3	Identify various scenarios based on software requirements
C311.4	Transform UML based software design into pattern based design using design patterns
C311.5	Understand the various testing methodologies for OO software
C311.6	Implement projects using UML diagrams

Title:MOBILE COMMUNICATION,Subject Code:IT8602 NBA Code for the Subject :C311 ,Semester : 6 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C311.1	Explain the basics of mobile Computing and describe the concepts of Mac Protocols
C311.2	Explain the different types of mobile telecommunication systems

C311.3	Explain the architecture of Wireless LAN technologies
C311.4	Determine the functionality of network layer and Identify a routing protocol for a given Ad hoc networks
C311.5	Explain the functionality of Transport Layer.
C311.6	Explain the functionality of Application Layer.

Title:BIG DATA ANALYTICS,Subject Code:CS8091 NBA Code for the Subject :C313 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C313.1	Know the fundamental concepts of big data and analytics
C313.2	Explore clustering and classification tools and practices for working with big data
C313.3	Understand the association methods for working with big data
C313.4	Know the fundamental concepts of Recommendation systems
C313.5	Learn about stream computing
C313.6	Explain about NO SQL data management for big data and visualization

Title:COMPUTER GRAPHICS AND MULTIMEDIA,Subject Code:CS8092 NBA Code for the Subject :C314 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C314.1	Design two dimensional graphics and Apply two dimensional transformations
C314.2	Design three dimensional graphics and Apply three dimensional transformations.
C314.3	Apply Illumination and color models.
C314.4	Apply clipping techniques to graphics.
C314.5	Understood Different types of Multimedia File Format
C314.6	Design Basic 3d Scenes

Title:PROFESSIONAL ETHICS IN ENGINEERING,Subject Code:GE8076[8] NBA Code for the Subject :c409 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
c409.1	Describe the human values with regard to the individual life style for the society
c409.2	Explain the role of ethics to the engineering field
c409.3	Describe how engineering is applied in association with ethics based on engineering experimentation
c409.4	Explain the engineering ethics based safety, responsibilities and rights
c409.5	Discuss the global issues of professional ethics in engineering
c409.6	Experiment the professional ethics in engineering based product development

Title:MOBILE APPLICATION DEVELOPMENT LAB,Subject Code:CS8662 NBA Code for the Subject :C316 ,Semester : 6 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C316.1	Develop mobile applications using GUI and Layouts
C316.2	Develop mobile applications using Event Listener
C316.3	Develop mobile applications using databases
C316.4	Develop mobile applications using Multithreading and GPS
C316.5	Develop mobile applications using RSS feed, Internal/External Storage and e-Mail
C316.6	Analyze and discover own mobile app for simple needs

Title:OBJECT ORIENTED ANALYSIS AND DESIGN LABORATORY,Subject Code:CS8582 NBA Code for the Subject :C317 ,Semester : 6 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C317.1	Develop a Problem statement and to identify Use Cases.
C317.2	Identify Conceptual classes and develop a domain model
C317.3	Draw the UML diagrams for the given Specification.
C317.4	Identify and map basic software requirements in UML mapping
C317.5	Improve the software Quality using design patterns
C317.6	Test the Compliance of the software with SRS.

Title:MINI PROJECT,Subject Code:IT8611 NBA Code for the Subject :C318 ,Semester : 6 [22-23EVEN]Target :65 Credits:1	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C318.1	Gather and interpret technical literature to formulate a project proposal to solve challenging practical problems
C318.2	Identify SDLC model and prepare software requirements specification.
C318.3	Design the software architecture.
C318.4	Apply modern tools for implementation using best coding practices and.testing at various levels of the project.
C318.5	Document the technical report on identified topic and present the ideas with effective communication skills
C318.6	Learn the concepts of project management and to work effectively as a member in team.

Title:HOSPITAL MANAGEMENT,Subject Code:OBM752 NBA Code for the Subject :503 ,Semester : 7 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
503.1	To understand the fundamentals of hospital administration and management.
503.2	To know the market related research process
503.3	To explore various information management systems and relative supportive services.
503.4	To learn the quality and safety aspects in hospital.
503.5	To know the market related research process
503.6	To know the market related research process

Title:CRYPTOGRAPHY AND NETWORK SECURITY,Subject Code:CS8792 NBA Code for the Subject :C402 ,Semester : 7 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C402.1	To understand fundamentals of cryptography theories
C402.2	To learn the mathematics of symmetric key cryptography

C402.3	To understand symmetric key cryptography algorithms and systems
C402.4	To learn understand mathematics of asymmetric key cryptography and cryptosystems
C402.5	To understand message authentication and integrity principles
C402.6	To understand security practices and system security

Title:CLOUD COMPUTING,Subject Code:CS8791 NBA Code for the Subject :C403 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C403.1	To understand the concept of cloud computing
C403.2	To appreciate the evolution of cloud from the existing technologies
C403.3	To have knowledge on the various issues in cloud computing
C403.4	To be familiar with the lead players in cloud
C403.5	To appreciate the emergence of cloud as the next generation computing paradigm
C403.6	To be familiar with the advancements in cloud

Title:PRINCIPLES OF MANAGEMENT,Subject Code:MG8591 NBA Code for the Subject :C404 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C404.1	Demonstrate critical thinking when presented with managerial problems and express their views and opinions on managerial issues in an articulate way
C404.2	Understand the major internal features of a business system and the environment in which it operates.
C404.3	Identify and explain the importance of the management process and identify some of the key skills required for the contemporary management practice
C404.4	Understand the importance of delegation
C404.5	To implement planning, Organizing, directing and controlling activities in project/career
C404.6	Understand the role budget and finance in a project

Title:SOFTWARE PROJECT MANAGEMENT,Subject Code:IT8075 NBA Code for the Subject :C405E25 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C405E25.1	Understand Project Management principles while developing software.
C405E25.2	Gain extensive knowledge about the basic project management concepts, framework and the process models.
C405E25.3	Obtain adequate knowledge about software process models and software effort estimation techniques
C405E25.4	Estimate the risks involved in various project activities
C405E25.5	Define the checkpoints, project reporting structure, project progress and tracking mechanisms using project management principles
C405E25.6	Learn staff selection process and the issues related to people management

Title:E-COMMERCE,Subject Code:IT8005[8] NBA Code for the Subject :C407 ,Semester : 7 [22-23ODD]Target :65 Credits:10

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C407.1	Learn the E-Commerce Platform and its concepts
C407.2	Understand the Technology, infrastructure in E-Commerce
C407.3	Understand the Security and Challenges in E-Commerce
C407.4	Learn Business concepts in E-Commerce
C407.5	Learn Different Models of E-Commerce Business
C407.6	Build an Own E-Commerce using Open Source Frameworks

Title:FOSS AND CLOUD COMPUTING LABORATORY,Subject Code:IT8711 NBA Code for the Subject :C407 ,Semester : 7 [22-23ODD]Target :80 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C407.1	Configure various virtualization tools such as Virtual Box, VMware workstation
C407.2	Design and deploy a web application in a PaaS environment
C407.3	Learn how to simulate a cloud environment to implement new schedulers
C407.4	Design of File transfer between VMs
C407.5	Install and use a generic cloud environment that can be used as a private cloud

C407.6	Manipulate large data setsin a parallel environment

Title:SECURITY LABORATORY,Subject Code:IT8761 NBA Code for the Subject :C408 ,Semester : 7 [22-23ODD]Target :65 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C408.1	Develop code for classical Encryption Techniques to solve the problems.
C408.2	Build cryptosystems by applying symmetric key encryption algorithms
C408.3	Build cryptosystems by applying public key encryption algorithms
C408.4	Construct code for authentication algorithms.
C408.5	Develop a signature scheme using Digital signature standard.
C408.6	Demonstrate the network security system using open source tools

Title:PROJECT WORK,Subject Code:IT8811 NBA Code for the Subject :C411 ,Semester : 8 [22-23EVEN]Target :65 Credits:10	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C411.1	Gather, organize, summarize and interpret technical literature to formulate a project proposal by applying the various engineering techniques to solve challenging practical problems.
C411.2	Apply SDLC and project management principles to design and implement own innovative ideas or research problems.
C411.3	Select and apply modern tools and technologies for design, implementation and testing of software systems
C411.4	Find IT solutions for problems related to social and environmental issues and understand professional ethics and team management principles.
C411.5	Work effectively as an individual, and as a member in multidisciplinary teams with effective communication skills and document the technical report on identified topic and present the ideas using grap
C411.6	Define intended future work based on the technical reviews and engage in lifelong learning.

Mechanical Engineering

Programme:B.E. Mechanical Engineering

Course OutComes for the Academic Year : 2022-23

Title:PROBLEM SOLVING AND PYTHON PROGRAMMING,Subject Code:GE3151 NBA Code for the Subject :105 ,Semester : 1 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
105.1	To understand the basics of algorithmic problem solving
105.2	To learn to solve problems using Python conditionals and loops.
105.3	To define Python functions and use function calls to solve problems.
105.4	To use Python data structures - lists, tuples, dictionaries to represent complex data.
105.5	To learn about usage of python packages and modules
105.6	To do input/output with files in Python

Title:MATRICES AND CALCULUS,Subject Code:MA3151 NBA Code for the Subject :C102 ,Semester : 1 [22-23ODD]Target :60 Credits:4	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C102.1	Eigenvalues and eigenvectors, diagonalization of a matrix,symmetric matrices, Positive definite matrices and similar matrices.
C102.2	Understand the limit, continuity and derivative of the functions. Solve various functions and its maxima /minima using differentiation rules.
C102.3	Apply the total and partial derivatives in Taylor series expansion of functions and the extremum of functions.
C102.4	Evaluate the integrals both by using Riemann sums and by using the Fundamental theorem of Calculus. Evaluate integrals using various techniques of integration.
C102.5	Understand the concepts of double integration and determine the area using integration. Also understands the concepts of the change of order of integration and Change of variables in integrals.
C102.6	Understand the concepts of Triple integration and determine the volume using integration.

Title:ENGINEERING PHYSICS,Subject Code:PH3151 NBA Code for the Subject :C103 ,Semester : 1 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C103.1	Understand the importance of mechanics
C103.2	Express their knowledge in electromagnetic waves
C103.3	Demonstrate a strong foundational knowledge in optics and lasers
C103.4	Understand the importance of quantum physics.

C103.5	Comprehend and apply quantum mechanical principles towards the formation of energy bands
C103.6	Demonstrate a strong foundational knowledge in oscillations.

Title:ENGINEERING CHEMISTRY,Subject Code:CY3151 NBA Code for the Subject :C1O4 ,Semester : 1 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C1O4.1	To infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water
C1O4.2	To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engg and tech. applications
C1O4.3	To apply the knowledge of phase rule and composites for materials selection requirements.
C1O4.4	To recommend suitable fuel for engg. processes and applications
C1O4.5	To analyse combustion process and its calculations
C1O4.6	To recognize different forms of energy resources and apply them for suitable applications in energy sectors.

Title:PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY,Subject Code:GE3171 NBA Code for the Subject :106 ,Semester : 1 [22-23ODD]Target :80 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
106.1	To understand the problem solving approaches.
106.2	To learn the basic programming constructs in Python
106.3	To learn the programming constructs in Python like loop, function, recursion.
106.4	To practice various computing strategies for Python-based solutions to real world problems.
106.5	To use Python data structures-lists, tuples, dictionaries.
106.6	To do input/output with files in Python.

Title:ENGLISH LABORATORY,Subject Code:GE3172 NBA Code for the Subject :C101 ,Semester : 1 [22-23ODD]Target :65 Credits:1

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C101.1	To improve the communicative competence of learners by throwing light on vocabulary and basic grammar
C101.2	To improve the communicative competence of learners by throwing light on vocabulary and basic grammar
C101.3	To build on students¿ English language skills by engaging them in listening, speaking and grammar learning activities those are relevant to authentic contexts.

C101.4	C101.4 To build on students¿ English language skills by engaging them in listening, speaking and grammar learning activities those are relevant to authentic contexts.
C101.5	C101.5 To use language efficiently in expressing their opinions via various media and graphical representation.
C101.6	C101.6 Participate effectively in informal conversations; introduce themselves and their friends and express opinion in English with different types of sentences

Title:PHYSICS AND CHEMISTRY LABORATORY,Subject Code:BS3171 NBA Code for the Subject :C107 ,Semester : 1 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C107.1	gain knowledge about elasticity, modulus, oscillations and also able to calculate Young's,rigidity modulus, moment of inertia of regular and irregular bodies.
C107.2	understand the application of interference and diffraction in finding thickness of the given sample and wavelength of the source respectively
C107.3	calculate the variation of resistance with respect to temperature and also able to calculate the band gap of semiconductor
C107.4	Analyse various water quality parameters-Hardness, alkalinity and DO in water sample.
C107.5	Acquire practical skills by using instruments like conductivity meter, pH meter and potentiometer.
C107.6	Finding the strength and amount of nickel in steel.

Title:BASIC ELECTRICAL AND ELECTRONICS ENGINEERING,Subject Code:BE3251 NBA Code for the Subject :112 ,Semester : 2 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
112.1	Compute the DC electric circuit parameters for simple problems
112.2	Compute the AC parameters for simple problems
112.3	Explain the working principle and applications of electrical machines
112.4	Analyze the characteristics of analog electronic devices
112.5	Explain the basic concepts of digital electronics
112.6	Explain the operating principles of measuring instruments

Title:PROFESSIONAL ENGLISH-II,Subject Code:HS3252 NBA Code for the Subject :C108 ,Semester : 2 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C108.1	To compare and contrast products and ideas through technical texts in essays with appropriate grammatical usage and contextual meanings.
C108.2	To enhance learners¿ awareness of general rules of writing for specific audiences through professional emails and responses to complaints.

C108.3	To help learners understand the purpose, audience, contexts of different types of letters/essays/checklists
C108.4	To analyze problems in order to arrive at feasible solutions and communicate them orally and in the written format. To report events and the processes of technical and industrial nature
C108.5	To make use of grammatical items effectively in writing recommendations and in transcoding the graphs
C108.6	To write a winning job/internship application-cover letter and resume / SoP-Statement of purpose

Title:MATERIAL SCIENCE,Subject Code:PH3251 NBA Code for the Subject :C111 ,Semester : 2 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C111.1	To know basics of crystallography and its importance for varied materials properties Zener-Bloch oscillations
C111.2	Gain knowledge on the electrical properties of materials and their applications
C111.3	Gain knowledge on the magnetic properties of materials and their applications
C111.4	Understand clearly of semiconductor physics and functioning of semiconductor devices
C111.5	Understand the optical properties of materials and working principles of various optical devices
C111.6	Understand the importance of functional nanoelectronic devices

Title:STATISTICS AND NUMERICAL METHODS,Subject Code:MA3251 NBA Code for the Subject :C112 ,Semester : 2 [22-23EVEN]Target :60 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C112.1	Apply the concept of testing of hypothesis for small and large samples in real life problems.
C112.2	Apply the basic concepts of classifications of design of experiments in the field of agriculture.
C112.3	Solve algebraic, transcendental equations and Eigen value problems.
C112.4	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.
C112.5	Understand the knowledge of various techniques and methods for solving first order ordinary differential equations.
C112.6	Solve the ordinary differential equations with initial conditions by using certain techniques in engineering applications.

Title:ENGINEERING GRAPHICS,Subject Code:GE3251 NBA Code for the Subject :C113 ,Semester : 2 [22-23EVEN]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description

C113.1	Student will be able to draw the various types of engineering curves
C113.2	Student will be able to draw the projection of points, lines and plane surfaces
C113.3	Student will be able to drawing orthographic projection of solids
C113.4	Student will be able to draw the freehand sketch of simple objects
C113.5	Student will be able to draw the development of solids and section
C113.6	Student will be able to draw the isometric and perspective projections of simple solids.

Title:Tamils and Technology,Subject Code:GE3252 NBA Code for the Subject :C115 ,Semester : 2 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C115.1	v,h,fh,h,khk,kh,m,hmk,kh,hk,jh,jh,hj,hj,jh,hj,jh,hjjh,hj,jh,jhjh,jh
C115.2	v,h,fh,h,khk,kh,m,hmk,kh,hk,jh,jh,hj,hj,jh,hj,jh,hjjh,hj,jh,jhjh,jh
C115.3	v,h,fh,h,khk,kh,m,hmk,kh,hk,jh,jh,hj,hj,jh,hj,jh,hjjh,hj,jh,jhjh,jh
C115.4	v,h,fh,h,khk,kh,m,hmk,kh,hk,jh,jh,hj,hj,jh,hj,jh,hjjh,hj,jh,jhjh,jh
C115.5	v,h,fh,h,khk,kh,m,hmk,kh,hk,jh,jh,hj,hj,jh,hj,jh,hjjh,hj,jh,jhjh,jh
C115.6	v,h,fh,h,khk,kh,m,hmk,kh,hk,jh,jh,hj,hj,jh,hj,jh,hjjh,hj,jh,jhjh,jh

Title:BASIC ELECTRICAL ELECTRONICS ENGINEERING LABORATORY,Subject Code:BE3271 NBA Code for the Subject :209 ,Semester : 2 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
209.1	Use experimental methods to verify Ohms law
209.2	Use experimental methods to verify Kirchoffs law
209.3	Analyze Experimentally the load characterstics of DC machine
209.4	Analyze Experimentally the load characterstics of AC machine
209.5	Analyze the characterstics of basic electronic device
209.6	use DSO to measure various parameters

Title:ENGINEERING PRACTICES LABORATORY,Subject Code:GE3271 NBA Code for the Subject :C116 ,Semester : 2 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C116.1	Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work
C116.2	Saw, plane, make joints in wood materials used in common household wood work.
C116.3	Weld various joints in steel plates using arc welding work
C116.4	Machine various simple processes like turning, drilling, tapping in parts

C116.5	Assemble simple mechanical assembly of common household equipments
C116.6	Make a tray out of metal sheet using sheet metal work.

Title:TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS,Subject Code:MA3351 NBA Code for the Subject :C201 ,Semester : 3 [22-23ODD]Target :60 Credits:4	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C201.1	solve the given partial differential equations
C201.2	apply Fourier series analysis which plays a vital role in engineering applications
C201.3	apply Fourier series techniques to solve one dimensional wave, one and two dimensional heat equations
C201.4	gain the knowledge in Fourier transform techniques to solve the problems of engineering.
C201.5	formulate some of the physical problems of engineering using difference equations
C201.6	apply Z-transform techniques to solve the difference equations

Title:ENGINEERING MECHANICS,Subject Code:ME3351 NBA Code for the Subject :C202 ,Semester : 3 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C202.1	Illustrate the vector and scalar representation of forces and moments
C202.2	Analyse the rigid body in equilibrium
C202.3	Evaluate the properties of distributed forces
C202.4	Determine the friction and the effects by the laws of friction
C202.5	Perform kinematic analysis of particles
C202.6	Calculate dynamic forces exerted on a body

Title:ENGINEERINGTHERMODYNAMICS,Subject Code:ME3391 NBA Code for the Subject :C203 ,Semester : 3 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C203.1	apply the zeroth and first law of thermodynamics by formulating temperature scales and calculating the property changes in closed and open engineering systems.
C203.2	apply the second law of thermodynamics in analysing the performance of thermal devices through energy and entropy calculations.
C203.3	apply the second law of thermodynamics in evaluating the various properties of steam through steam tables and Mollier chart.
C203.4	apply the properties of pure substance in computing the macroscopic properties of ideal and real gases using gas laws and appropriate thermodynamic relations.

C203.5	apply the properties of gas mixtures in calculating the properties of gas mixtures.
C203.6	apply various thermodynamic relations to calculate property changes.

Title:FLUID MECHANICS AND MACHINERY,Subject Code:CE3391 NBA Code for the Subject :C204 ,Semester : 3 [22-23ODD]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C204.1	Apply mathematical knowledge to predict the properties and characteristics of fluid
C204.2	Analyse the boundary layer parameters
C204.3	Calculate the major and minor losses associated with pipe flow in piping networks
C204.4	Formulate the relationship among the parameters using dimensional and model analysis
C204.5	Explain the working principles and performance of turbines
C204.6	Explain the working principles and performance of pumps

Title:ENGINEERING MATERIALS AND METALLURGY,Subject Code:ME3392 NBA Code for the Subject :C205 ,Semester : 3 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C205.1	Student will be able to understand the alloys and phase diagram, Iron-Iron carbon diagram and steel classification.
C205.2	Student will be able to analyze the isothermal transformation, continuous cooling diagrams and different heat treatment processes
C205.3	Student will be able to Clarify the effect of alloying elements on ferrous and non-ferrous metals
C205.4	Student will be able to Summarize the properties and applications of non metallic materials.
C205.5	Student will be able to study about polymers and ceramics
C205.6	Student will be able to calculate the testing of mechanical properties.

Title:MANUFACTURING PROCESSES,Subject Code:ME3393 NBA Code for the Subject :C206 ,Semester : 3 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C206.1	Understand about the types of patterns and preparation of green sand moulding process.
C206.2	Understand the various special casting process and casting defects.
C206.3	Learn and apply the working principles of various metal joining processes.
C206.4	Analyze the working principles of bulk deformation of metals.
C206.5	Learn the working principles of sheet metal forming processes.

C206.6	Study and practice the working principles of plastics moulding.

Title:MANUFACTURING TECHNOLOGY LABORATORY,Subject Code:ME3382 NBA Code for the Subject :C208 ,Semester : 3 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C208.1	Demonstrate the safety precautions exercised in the mechanical workshop
C208.2	Make the work piece as per given shape and size using Lathe and calculate the corresponding machining time
C208.3	The students able to make the work piece as per given shape and size using machining process such as shaping, drilling and milling
C208.4	Join two metals using Gas metal arc welding.
C208.5	Use different moulding tools, patterns and prepare sand moulds.
C208.6	The students become make the gears using gear making machines and analyze the defects in the cast and machined components

Title:COMPUTER AIDED MACHINE DRAWING,Subject Code:ME3381 NBA Code for the Subject :C307 ,Semester : 3 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C307.1	Classify and illustrate the BIS specifications for metal joint
C307.2	Explain the basic principles behind dimensions and tolerances in an engineering drawing.
C307.3	Apply different types of tools in 2-D drafting.
C307.4	Build bearings and valves with the help of various components.
C307.5	Construct the various machine components like couplings, joints, engine parts, miscellaneous components.
C307.6	Construct the various Engine parts ¿ Piston, Connecting Rod, Cross head

Title:ENVIRONMENTAL SCIENCES AND SUSTAINABILITY,Subject Code:GE3451 NBA Code for the Subject :215 ,Semester : 4 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
215.1	Infer the importance of environment and explain the concept, types, structure and function of ecosystem
215.2	Recall the various functions, values, levels, threats and conservation of biodiversity
215.3	Explain the different types of pollution and propose the suitable methods to prevent the same to enhance the environment
215.4	Discuss of conservation different energy sources, optimal usage and the importance
215.5	Discuss the aspect of sustainability and the means of sustainability management to realize the sustainable development goals

215.6	Lists the various environment management systems, protection and discuss the green solutions for energy to materials for sustainability

Title:THEORY OF MACHINES,Subject Code:ME3491 NBA Code for the Subject :C210 ,Semester : 4 [22-23EVEN]Target :65 Credits:0

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C210.1	Discuss the basics of mechanism
C210.2	Design cam mechanisms for specified output motions
C210.3	Study the basic concepts of toothed gearing and kinematics of gear trains
C210.4	Analyze the effects of friction in machine elements
C210.5	Predict the force-motion relationship in components subjected to external forces and analyzing of standard mechanisms
C210.6	Analyse the undesirable effects of unbalances resulting from prescribed motions in mechanism and the effect of dynamics of undesirable vibrations

Title:THERMAL ENGINEERING,Subject Code:ME3451 NBA Code for the Subject :C211 ,Semester : 4 [22-23EVEN]Target :65 Credits:0

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C211.1	Apply thermodynamic concepts to different air standard cycles and solve problems
C211.2	To solve problems in steam nozzle and calculate critical pressure ratio.
C211.3	Explain the flow in steam turbines, draw velocity diagrams
C211.4	Explain the flow in Gas turbines and solve problems.
C211.5	Explain the functioning and features of IC engine, components and auxiliaries.
C211.6	Calculate the various performance parameters of IC engines

Title:HYDRALICS AND PNEUMATICS,Subject Code:ME3492 NBA Code for the Subject :C212 ,Semester : 4 [22-23EVEN]Target :65 Credits:0

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C212.1	apply the working principles of fluid power systems and hydraulic pumps.
C212.2	apply the working principles of hydraulic actuators and control components.
C212.3	design and develop hydraulic circuits and systems.
C212.4	apply the working principles of pneumatic circuits and power system and its components.
C212.5	identify various troubles shooting methods in fluid power systems.

C212.6	apply the principles of IOT in hydraulics and pneumatics for various applications.

Title:MANUFACTURING TECHNOLOGY,Subject Code:ME3493 NBA Code for the Subject :C212 ,Semester : 4 [22-23EVEN]Target :65 Credits:0	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C212.1	To study the concepts and basic mechanics of metal cutting and the factors affecting machinability
C212.2	To learn working of basic and advanced turning machines.
C212.3	To teach the basics of machine tools with reciprocating and rotating motions and abrasive finishing processes.
C212.4	To teach the basics of machine tools with reciprocating and rotating motions and abrasive finishing processes.
C212.5	To study the basic concepts of CNC of machine tools and constructional features of CNC.
C212.6	To study the basic concepts of CNC of machine tools and constructional features of CNC.

Title:STRENGTH OF MATERIALS,Subject Code:CE3491 NBA Code for the Subject :C214 ,Semester : 4 [22-23EVEN]Target :65 Credits:0	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C214.1	To understand the concepts of stress and strain in simple and compound bars.
C214.2	To understand the concepts of principal stresses and principal planes.
C214.3	To understand the load transferring mechanism in beams and stress distribution due to shearing force and bending moment.
C214.4	To apply basic equation of simple torsion in designing of shafts and helical spring
C214.5	To calculate the slope and deflection in beams using different methods.
C214.6	To analyze and design thin and thick shells for the applied internal and external pressures.

Title:STRENGTH OF MATERIALS AND FLUID MACHINERY LAB,Subject Code:CE3481 NBA Code for the Subject :C216 ,Semester : 4 [22-23EVEN]Target :75 Credits:0	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C216.1	Determine the tensile, torsion and hardness properties of metals testing
C216.2	Determine the stiffness properties of helical and carriage spring
C216.3	apply the consecration laws to determine the coefficient of discharge of a venturi meter and finding the friction factor of given pipe.
C216.4	Apply the fluid static and momentum principles to determine the metacentric height and forces due to impact of jet

C216.5	Determine the performance characteristics of turbine
C216.6	Determine the performance characteristics of pumps

Title:THERMAL ENGINEERING LABORATORY,Subject Code:ME3461 NBA Code for the Subject :C218 ,Semester : 4 [22-23EVEN]Target :80 Credits:0	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C218.1	Study the fuel properties and its performance characteristics
C218.2	Study the Performance characteristics of Engines
C218.3	Study the energy balancing in engines
C218.4	Study the performance characteristics of compressors
C218.5	Study the performance characteristics of boiler
C218.6	Study the performance characteristics of turbine

Title:THERMAL ENGINEERING- II,Subject Code:ME8595 NBA Code for the Subject :C301 ,Semester : 5 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C301.1	Apply thermodynamic concepts and solve problems in Steam Nozzles
C301.2	Explain the functioning and features of different types of Boilers and auxiliaries and calculate performance parameters
C301.3	Explain the flow in steam turbines, draw velocity diagrams for steam turbines and solve problems
C301.4	Understand the concept of Co-generation and the concept of utilizing residual heat in thermal systems like Heat pumps and Heat exchangers
C301.5	Apply thermodynamic concepts to refrigeration systems and solve problems using refrigerant table / charts
C301.6	Apply thermodynamic concepts to air conditioning systems and solve problems using psychrometric charts

Title:DESIGN OF MACHINE ELEMENTS,Subject Code:ME8593 NBA Code for the Subject :C302 ,Semester : 5 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C302.1	Explain the materials selection based on mechanical properties and fundamentals of stress analysis in the design of machine components.
C302.2	Calculate principal stresses and factor of safety for various theories of failure under different loading conditions.
C302.3	Design the shafts, keys and couplings.
C302.4	Design the permanent and temporary fasteners.
C302.5	Calculate various dimensions of energy storing elements and engine components.
C302.6	Select the various bearings according to the applications and lubrication requirements.

Title:METROLOGY AND MEASUREMENTS,Subject Code:ME8501 NBA Code for the Subject :C303 ,Semester : 5 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C303.1	Explain the various measuring instruments its errors and ways to control it.
C303.2	Explain the various linear measuring instruments with their uses and applications. Also to know the concepts of interchangeability.
C303.3	Analyse the various taper angle by angular measuring instruments with their uses and applications
C303.4	Describe the advanced measuring instruments like laser, CMM and interferometers.
C303.5	Identify the difference between straightness, flatness and roundness measurements and their applications.
C303.6	Distinguish between the various measuring instruments for power, flow and temperature measurements.

Title:DYNAMICS OF MACHINES,Subject Code:ME8594 NBA Code for the Subject :C304 ,Semester : 5 [22-23ODD]Target :65 Credits:4	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C304.1	Calculate static and dynamic forces of mechanisms
C304.2	explain the working of flywheels and punching presses.
C304.3	Calculate the balancing masses and their locations of reciprocating and rotating masses.
C304.4	Compute the frequency of free vibration.
C304.5	Compute the frequency of forced vibration and damping coefficient.
C304.6	Calculate the speed and lift of the governor and estimate the gyroscopic effect on automobiles, ships and airplanes.

Title:RENEWABLE ENERGY SOURCES,Subject Code:ORO551 NBA Code for the Subject :C305-OE19 ,Semester : 5 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C305-OE19.1	Understanding the physics of solar radiation
C305-OE19.2	Understanding the solar radiation and its environmental impact to power.
C305-OE19.3	Understanding the solar energy collectors and methodologies of storing solar energy.
C305-OE19.4	Understanding the solar pv methodologies of storing solar energy.
C305-OE19.5	Knowledge in wind energy and biomass with its economic aspects.

C305-OE19.6	Knowledge in capturing and applying other forms of energy sources like wave,Tidal,OTEC and geothermal energies

Title:INTERNAL COMBUSTION ENGINES,Subject Code:OAT552 NBA Code for the Subject :C305-OE9 ,Semester : 5 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C305-OE9.1	Analyse air standard cycles and construction and working principles of IC engines
C305-OE9.2	Understand stages of combustion in S.I engines , combustion chambers,ignition system and S.I knocking
C305-OE9.3	Construction and working principles of diesel engines and types of injection system,types of injection nozzles
C305-OE9.4	Perceive the stages of combustion process,types of injection, combustion chambers in C.I engines
C305-OE9.5	Study of lubricants properties, Types of lubricants and cooling systems for IC engines
C305-OE9.6	Have exposure with modern concepts like CRDI,HCCI,GDI and Hybrid technology

Title:KINEMATICS AND DYNAMICS LABORATORY,Subject Code:ME8511 NBA Code for the Subject :C306 ,Semester : 5 [22-23ODD]Target :80 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C306.1	appraise the principles in mechanisms used for speed control and stability control.
C306.2	describe the force motion relationship in components subjected to external forces.
C306.3	explain the working of flywheels and punching processes.
C306.4	describe the balancing of rotating and reciprocating masses.
C306.5	appraise the effect of free vibrations.
C306.6	explain the effect of forced vibrations.

Title:THERMAL ENGINEERING LABORATORY,Subject Code:ME8512 NBA Code for the Subject :C307 ,Semester : 5 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C307.1	conduct tests on heat conduction apparatus and evaluate thermal conductivity of materials.
C307.2	conduct tests on natural and forced convective heat transfer apparatus and evaluate heat transfer coefficient.
C307.3	conduct tests on radiative heat transfer apparatus and evaluate Stefan Boltzmann constant and emissivity.
C307.4	conduct tests to evaluate the performance of parallel/counter flow heat exchanger apparatus and reciprocating air compressor.

C307.5	conduct tests to evaluate the performance of refrigeration and air conditioning test rigs
C307.6	Conduct performance test on Internal combustion engines,steam boilers and steam turbine and determine fuel properties

Title:METROLOGY AND MEASUREMENTS LABORATORY,Subject Code:ME8513 NBA Code for the Subject :C308 ,Semester : 5 [22-23ODD]Target :80 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C308.1	calibrate and use most of the linear measurement tools.
C308.2	understand Gear inspection and profile measurements.
C308.3	measure the profile of screw threads and check the flatness of surfaces.
C308.4	use the comparators and gauges for quality inspection.
C308.5	understand the measurement of force and torque using sensor.
C308.6	analyse and measure surface roughness of machined surface.

Title:HEAT AND MASS TRANSFER,Subject Code:ME8693 NBA Code for the Subject :311 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
311.1	Students will be able to understand the mechanism of steady state conduction in Cartesian and polar coordinates
311.2	Students will be able to evaluate transient heat conduction for lumped analysis, semi-infinite and finite surfaces
311.3	Students will be able to understand both free and forced convective heat transfer on plates, cylinder and sphere
311.4	Students will be able to analyze the heat transfer concepts in phase changing process and able to design and evaluate the performance of heat exchangers
311.5	Students will be able to understand and evaluate the radiation heat transfer in various applications
311.6	Students will be able to apply mass diffusion concepts in several applications

Title:DESIGN OF TRANSMISSION SYSTEMS,Subject Code:ME8651 NBA Code for the Subject :C309 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C309.1	Understand the basic concepts of transmission systems.
C309.2	Able to design flexible transmission components used in Engine and machines.
C309.3	Able to design spur gears and Helical gears used in Engine and machines.
C309.4	Able to design Bevel gears and worm gears used in Engine and machines.

C309.5	Understand the function of a gear box and its components and able to design gear boxes.
C309.6	Able to design cam, clutches and brakes for transmission system.

Title:COMPUTER AIDED DESIGN AND MANUFACTURING,Subject Code:ME8691 NBA Code for the Subject :C310 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C310.1	Describe the product life cycle and design process and the role of CAD/ CAM in it.
C310.2	Distinguish the various geometric modeling concepts and techniques in CAD.
C310.3	Choose the appropriate CAD standards in neutral file format and transfer.
C310.4	Formulate the G codes and M codes for Milling and Turning CNC part programming.
C310.5	Identify the group technology concepts and the coding schemes in it.
C310.6	Describe the formation of FMS and perform quantitative analysis in it.

Title:FINITE ELEMENT ANALYSIS,Subject Code:ME8692 NBA Code for the Subject :C312 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C312.1	understand the principles and concepts of Finite Element Methods.
C312.2	implement the Finite Element Methods for simple 1-D problems such as Solid Mechanics, Heat Transfer and Vibration.
C312.3	appraise the second order 2-D equations involving Scalar Variable Functions.
C312.4	describe the application of field problems such as Thermal, Torsion and Higher Order Elements.
C312.5	exposure the 2-D Vector Variable Problems, Plane Stress, Plane Strain and Axi-Symmetric Elements.
C312.6	learn the Isoparametric Elements for 1-D and 2-D Problems and Solution techniques to Dynamic Problems.

Title:HYDRAULICS AND PNEUMATICS,Subject Code:ME8694 NBA Code for the Subject :C313 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C313.1	Explain the fluid power and operation of different types of pumps
C313.2	Summarize the features and functions of hydraulic motors,actuators and flow control valves
C313.3	Explain the different types of hydraulic circuits and systems
C313.4	Explain the working of different pneumatic circuits and systems

C313.5	Summarize the various trouble shooting methods and application of hydraulic and pneumatic sytems
C313.6	Design of hydraulic and pneumatic circuits for various applications

Title:PRINCIPLES OF MANAGEMENT,Subject Code:MG8591[8] NBA Code for the Subject :C410 ,Semester : 6 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C410.1	To understand the fundamentals of management principles and practices in the organizations.
C410.2	To know the various types of planning and decision making in the context of organizations.
C410.3	To learn the significance of organizing resources, jobs and manpower for effective management.
C410.4	To understand the various motivational techniques influencing and directing the human behaviour in the organization.
C410.5	To measure the performance of organization and suggest suitable actions for improving productivity.
C410.6	To identify the various controlling techniques used by managers in the business world.

Title:CAD/CAM LABORATORY,Subject Code:ME8681 NBA Code for the Subject :C315 ,Semester : 6 [22-23EVEN]Target :80 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C315.1	Build a 3-D model using parametric relations.
C315.2	Duplicate a 3-D assembly model using 2-D drawing.
C315.3	Create various 3-D assembly models and convert them into orthographic views.
C315.4	Study the features of CNC Machine Tool and expose students to modern control systems (Fanuc, Siemens etc.,).
C315.5	Apply Computer Aided Manufacturing Techniques in the areas of machining process.
C315.6	Apply the programming concepts in Computer Aided Part Programming.

Title:DESIGN AND FABRICATION PROJECT,Subject Code:ME8682 NBA Code for the Subject :C316 ,Semester : 6 [22-23EVEN]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C316.1	design the machine elements.
C316.2	design the mechanical product.
C316.3	fabricate the machine elements
C316.4	fabricate the mechanical product.
C316.5	demonstrate the working model of the machine elements.

C316.6	demonstrate the working model of the mechanical product.

Title:PROFESSIONAL COMMUNICATION,Subject Code:HS8581 NBA Code for the Subject :CS308 ,Semester : 6 [22-23EVEN]Target :65 Credits:1

At the end of this course, Student will be able to

CO-Code	Course outcome Description
CS308.1	To enhance the learners speaking skill through various activities like group discussion, telephonic conversation, presentation skill etc.,
CS308.2	To develop listening and speaking skills through communicative functions
CS308.3	Enhance the Employability and Career Skills of student
CS308.4	Orient the students towards grooming as a professional
CS308.5	Make them Employability Graduates
CS308.6	Develop their confidence and help them attend interviews successfully

Title:POWER PLANT ENGINEERING,Subject Code:ME8792 NBA Code for the Subject :401 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
401.1	Analyse thermodynamic cycles in coal based thermal power plant
401.2	Analyse thermodynamic cycles in air, diesel and dual cycles
401.3	Perceive different stages in nuclear power plants
401.4	Interpret the necessity on the role of renewable energy based power plants
401.5	Have exposure with energy and economic issues associated with power plants
401.6	Study pollutant formation and their controlling measures from power plants

Title:PROCESS PLANNING AND COST ESTIMATION,Subject Code:ME8793 NBA Code for the Subject :C402 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C402.1	select the process, equipment and tools for various industrial products.
C402.2	prepare process planning activity chart.
C402.3	explain the concept of cost estimation.
C402.4	compute the job order cost for different type of shop floor.
C402.5	calculate the machining time for various machining operations - Lathe, Drilling & Boring
C402.6	calculate the machining time for various machining operations - Milling, Shaping, Planning & Grinding

Title:MECHATRONICS,Subject Code:ME8791 NBA Code for the Subject :C403 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C403.1	Discuss the interdisciplinary applications of electronics, electrical and computer system for the control of mechanical, electronic system and sensor technology.
C403.2	Outline appropriate sensors and actuators for an engineering application.
C403.3	Discuss the architecture, pin diagram and addressing modes of microprocessor and microcontroller
C403.4	Discuss programmable peripheral interface, Architecture of 8255 and various device interfacing
C403.5	Explain the architecture, programming and application of PLC to problems and challenges in the areas of mechatronic engineering
C403.6	Discuss various actuators and mechatronic system using the knowledge and acquired through the course and also from the given case studies

Title:ROBOTICS,Subject Code:ME8099 NBA Code for the Subject :C405 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C405.1	Explain the concepts of industrial robots, classification, specifications and coordinate systems. Also summarize the need and application of robots in different sectors.
C405.2	Illustrate the different types of robot drive systems as well as robot end effectors.
C405.3	Apply the different sensors and image processing techniques in robotics to improve the ability of robots.
C405.4	Develop robotic programs for different tasks
C405.5	Familiarize with the kinematics motions of robot.
C405.6	Examine the implementation of robots in various industrial sectors and interpolate the economic analysis of robots.

Title:RENEWABLE SOURCES OF ENERGY,Subject Code:ME8072 NBA Code for the Subject :C405-E7 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C405-E7.1	Discuss the importance and Economics of renewable Energy
C405-E7.2	The students will acquire the knowledge of power generation from Solar thermal Energy
C405-E7.3	The students will acquire the knowledge of power generation from Solar PV Energy
C405-E7.4	The students will acquire the knowledge of method of power generation from Wind Energy
C405-E7.5	The students will acquire the knowledge of method of power generation from Bio Energy

C405-E7.6	The students will acquire the knowledge of Tidal energy, Wave Energy, OTEC, Hydro energy, Geothermal Energy, Fuel Cells and Hybrid Systems.

Title:LEAN SIX SIGMA,Subject Code:OMF751 NBA Code for the Subject :C406 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C406.1	Understand the history of evolution and fundamental terminologies used in lean manufacturing and six sigma.
C406.2	Evaluate the perfect implementation of lean six sigma by using various novel tools and techniques.
C406.3	Design six sigma methodologies like FMEA and CAP.
C406.4	Understand the importance of QFD in quality management.
C406.5	Analyze various challenges faced during the effective implementation of six sigma in an organization.
C406.6	Understand the vitality of continuous improvement in lean manufacturing systems.

Title:PRODUCTION PLANNING AND CONTROL,Subject Code:IE8693[8] NBA Code for the Subject :C411 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C411.1	Distinguish the role of design and Break even analysis in Production process.
C411.2	Apply the various techniques of work study and method study.
C411.3	Explain the role of balancing in product and process planning.
C411.4	Relate the basic scheduling problems in production planning.
C411.5	Identify the role of Inventory control in an industry.
C411.6	Distinguish the application of MRP II and ERP.

Title:TOTAL QUALITY MANAGEMENT,Subject Code:GE8077 NBA Code for the Subject :c403 ,Semester : 7 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
c403.1	Student will be able to describe the principles of quality management and to explain how these principles can be applied within quality management system
c403.2	Student will be able to identify the key aspects of the quality improvement cycle and to select and use appropriate tools and techniques for controlling, improving and measuring quality.
c403.3	Student will be to apprise the organizational, communication and team wrok requirements for effective quality management
c403.4	Student will be able to describe the strategic issues in quality management, including current issues and developments, and to devise and evaluate quality improvement plans

c403.5	Student will be able to describe the use of old and new quality management tools.
c403.6	Student will be able to apply the tools and techniques of quality management to manufacturing and services process

Title:SIMULATION AND ANALYSIS LABORATORY ,Subject Code:ME8711 NBA Code for the Subject :C407 ,Semester : 7 [22-23ODD]Target :80 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C407.1	Demonstrate the use of FEA tool to find the deflection in beams, plates and trusses
C407.2	Illustrate the need for Axi-symmetric components
C407.3	Compare the various types of heat transfer analysis on plates
C407.4	Differentiate the modal and vibration analysis
C407.5	Perform harmonic and transient analysis of simple systems
C407.6	Describe the use of Matlab and multi body dynamic software in design

Title:MECHATRONICS LABORATORY,Subject Code:ME8781 NBA Code for the Subject :C408 ,Semester : 7 [22-23ODD]Target :65 Credits:2

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C408.1	Identify the basic elements and techniques of mechatronic devices.
C408.2	Explain the working of sensors and actuators for various application.
C408.3	Write programs and execute the same for microprocessor and microcontroller.
C408.4	Design and execute ladder diagrams for PLC and elctropneumatic applications.
C408.5	Able to design and simulate pneumatic and hydraulic circuits using AUTOMATION STUDIO software.
C408.6	Able to understand the working of servo motor, stepper motor and PID controller .

Title:TECHNICAL SEMINAR,Subject Code:ME8712 NBA Code for the Subject :C409 ,Semester : 7 [22-23ODD]Target :80 Credits:1

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C409.1	Apply the theoretical concepts to practical case studies
C409.2	Create an application platform for practical problems
C409.3	Prepare themselves for competitive exams
C409.4	Convert their projects into patents
C409.5	Prepare themselves to become an entrepreneur
C409.6	Manage their time for online MCQ exams

Title:PRINCIPLES OF MANAGEMENT,Subject Code:MG8591 NBA Code for the

Subject :C410 ,Semester : 8 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C410.1	To understand the fundamentals of management principles and practices in the organizations.
C410.2	To know the various types of planning and decision making in the context of organizations.
C410.3	To learn the significance of organizing resources, jobs and manpower for effective management.
C410.4	To understand the various motivational techniques influencing and directing the human behaviour in the organization.
C410.5	To measure the performance of organization and suggest suitable actions for improving productivity.
C410.6	To identify the various controlling techniques used by managers in the business world.

Title:PRODUCTION PLANNING AND CONTROL,Subject Code:IE8693 NBA Code for the Subject :C411 ,Semester : 8 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C411.1	distinguish the role of design and Break Even Analysis in Production process.
C411.2	apply the various techniques of work study and method study.
C411.3	explain the role of balancing in product and process planning.
C411.4	relate the basic scheduling problems in production planning.
C411.5	identify the role of Inventory control in an industry.
C411.6	distinguish the application of MRP II and ERP.

Title:PROJECT WORK,Subject Code:ME8811 NBA Code for the Subject :C412 ,Semester : 8 [22-23EVEN]Target :65 Credits:10	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C412.1	Identify a problem and create a feasible solution
C412.2	Analyze and evaluate various literature and identify suitable problem solving technique/process/methodology
C412.3	Carry out their project work (Experiment/Analysis/Observation/Case-study)
C412.4	Present project work in review meetings
C412.5	Create a project report that confirms to regulatory guidelines
C412.6	Publish thei project work in conference and refereed journals

Master of Business Administration

Programme:

Course OutComes for the Academic Year : 2022-23

Title:BUSINESS ETHICS,Subject Code:BA4211 NBA Code for the Subject :c211 ,Semester : 2 [22-23EVEN]Target :60 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
c211.1	The learners can handle issues of business ethics and offer solutions ethical perspectives
c211.2	The learners are able to apply the basic concepts of Indian ethos and value systems at work.
c211.3	The learners can handle issues of business ethics and offer solutions in ethical perspectives
c211.4	The learners are professionally efficient and skilful in value systems and culture
c211.5	The learners are capable in ethically manage business towards well being of the society.
c211.6	The learners can be socially effective in undertaking business responsibilities.

Title:PROJECT MANAGEMENT ,Subject Code:BA4026 NBA Code for the Subject :301 ,Semester : 3 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
301.1	understand the roles and responsibilities of a project manager
301.2	plan and budget projects
301.3	schedule and allocate resources to projects
301.4	manage project organization
301.5	control and complete projects
301.6	know about the report preparation and documentation

Title:QUALITY MANAGEMENT,Subject Code:BA4022 NBA Code for the Subject :c409 ,Semester : 3 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
c409.1	Understanding the evolution of Quality management
c409.2	Understanding of quality philosophies and practices
c409.3	Ability to apply statistical process control to enhance quality
c409.4	Ability to apply quality tools to enhance organization's quality performance
c409.5	Awareness of quality management systems
c409.6	Awareness of quality six sigma systems

Communication Systems

Programme:

Course OutComes for the Academic Year : 2022-23

Title:IOT FOR SMART SYSTEMS,Subject Code:ET4251 NBA Code for the Subject :C303 ,Semester : 3 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C303.1	Analyze the concepts of IoT and its present developments
C303.2	Compare and contrast different platforms and infrastructures available for IoT
C303.3	Explain different protocols and communication technologies used in IoT
C303.4	Building IoT using RasperryPi and Arduino
C303.5	Analyze the big data analytic and programming of IoT
C303.6	Implement IoT solutions for smart applications

Title:SOFTWARE DEFINED RADIOS,Subject Code:CU4005 NBA Code for the Subject :C406 ,Semester : 3 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C406.1	Demonstrate advanced knowledge in the evolving paradigm of Software defined radio and technologies for its implementation.
C406.2	Analyse complex problems critically in the domains of Radio frequency implementation issues
C406.3	Apply multirate signal processing in SDR
C406.4	Implement Smart antenna techniques for better spectrum exploitation for conducting research.
C406.5	Apply appropriate techniques for the development of scientific and technological knowledge in designing software defined radios.
C406.6	Analyze design issues of software defined radios connected in network

Programme:

Course OutComes for the Academic Year : 2022-23

Title:IOT FOR SMART SYSTEMS,Subject Code:ET4251 NBA Code for the Subject :C303 ,Semester : 3 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C303.1	Analyze the concepts of IoT and its present developments
C303.2	Compare and contrast different platforms and infrastructures available for IoT
C303.3	Explain different protocols and communication technologies used in IoT
C303.4	Building IoT using RasperryPi and Arduino
C303.5	Analyze the big data analytic and programming of IoT
C303.6	Implement IoT solutions for smart applications

Title:SOFTWARE DEFINED RADIOS,Subject Code:CU4005 NBA Code for the Subject :C406 ,Semester : 3 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C406.1	Demonstrate advanced knowledge in the evolving paradigm of Software defined radio and technologies for its implementation.
C406.2	Analyse complex problems critically in the domains of Radio frequency implementation issues
C406.3	Apply multirate signal processing in SDR
C406.4	Implement Smart antenna techniques for better spectrum exploitation for conducting research.
C406.5	Apply appropriate techniques for the development of scientific and technological knowledge in designing software defined radios.
C406.6	Analyze design issues of software defined radios connected in network

M.E Computer Science Engineering

Programme:M.E. Computer Science and Engineering

Course OutComes for the Academic Year : 2022-23

Title:RESEARCH METHODOLOGY AND IPR,Subject Code:RM4151 NBA Code for the Subject :102 ,Semester : 1 [22-23ODD]Target :65 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
102.1	Ability to formulate research problem
102.2	Ability to carry out research analysis
102.3	Ability to follow research ethics
102.4	Ability to understand that today¿s world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity
102.5	Ability to understand about IPR and filing patents in R & D
102.6	Study of new developments in IPR.

Title:ADVANCED DATA STRUCTURES AND ALGORITHMS,Subject Code:CP4151 NBA Code for the Subject :103 ,Semester : 1 [22-23ODD]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
103.1	Analyze the complexity algorithms and build efficient algorithms.
103.2	Choose and use appropriate hierarchical data structures to solve problems.
103.3	Design algorithms using graph structure to solve real-life problems.
103.4	Understand algorithm design techniques.
103.5	Apply suitable design strategy for problem solving.
103.6	Understand NP completeness of algorithms.

Title:ADVANCED DATA STRUCTURES AND ALGORITHMS LABORATORY,Subject Code:CP4161 NBA Code for the Subject :108 ,Semester : 1 [22-23ODD]Target :80 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
108.1	Design and implement basic and advanced data structures extensively
108.2	Design algorithms using graph structures
108.3	Design and develop efficient algorithms with minimum complexity using design techniques
108.4	Develop programs using various algorithms
108.5	Choose appropriate data structures and algorithms, understand the ADTlibraries and use it to design algorithms for a specific problem

108.6	Understand the applications of data structures and use appropriate data structures for specific applications.

Title:DATABASE PRACTICES,Subject Code:CP4152 NBA Code for the Subject :C104 ,Semester : 1 [22-23ODD]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C104.1	To understand the fundamental elements of Relational Database Management systems.
C104.2	Convert the ER-model to relational tables, populate relational databases and formulate SQL queries on data.
C104.3	Be able to apply methods and techniques for distributed query processing
C104.4	Understand and write well-formed XML documents
C104.5	Use the data control, definition, and manipulation languages of the NoSQL databases and use the Big data storage systems
C104.6	Design and Implement secure database systems.

Title:NETWORK TECHNOLOGIES,Subject Code:CP4153 NBA Code for the Subject :C105 ,Semester : 1 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C105.1	Explain the basic concepts of networks
C105.2	Explain various technologies in the wireless domain
C105.3	Explain 4G modile data networks
C105.4	Explain the concepts of 5G cellular networks
C105.5	Implement network concepts using Software defined networks
C105.6	Virtualize network functionalities in a virtual machine

Title:PRINCIPLES OF PROGRAMMING LANGUAGES,Subject Code:CP4154 NBA Code for the Subject :C106 ,Semester : 1 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C106.1	Describe syntax and semantics of programming languages
C106.2	Explain data, data types, and basic statements of programming languages
C106.3	Design and implement subprogram constructs
C106.4	Apply object-oriented, concurrency, and event handling programming constructs
C106.5	Develop programs in Scheme, ML, and Prolog
C106.6	Understand and adopt new programming language

Title:APPLIED PROBABILITY AND STATISTICS FOR COMPUTER SCIENCE ENGINEERS,Subject Code:MA4151 NBA Code for the Subject :CP 101 ,Semester : 1 [22-23ODD]Target :60 Credits:4

At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
CP 101.1	TO ENCOURAGE STUDENTS TO DEVELOP A WORKING KNOWLEDGE OF THE CENTRAL IDEAS OF LINEAR ALGEBRA.
CP 101.2	2. COMPUTE PROBABILITY FOR SIMPLE AND COMPOUND EVENTS. DEFINE DISCRETE AND CONTINUOUS RANDOM VARIABLES AND TO COMPUTE THE EXPECTED VALUES AND MOMENT GENERATING FUNCTIONS OF DISCRETE AND CONTINUOUS VAR
CP 101.3	EXPLAIN VARIOUS DISTRIBUTIONS OF DISCRETE AND CONTINUOUS RANDOM VARIABLES.
CP 101.4	EXPLAIN THE JOINT DISTRIBUTION, MARGINAL DISTRIBUTION AND TO COMPUTE THE CORRELATION AND THE EQUATION OF LINES OF REGRESSION, TO DESCRIBE THE TRANSFORMATION OF TWO DIMENSIONAL RANDOM VARIABLES.
CP 101.5	DEFINE NULL AND ALTERNATE HYPOTHESIS AND APPLY THE CONCEPT OF TESTING OF HYPOTHESIS FOR SMALL AND LARGE SAMPLES IN REAL LIFE PROBLEMS.
CP 101.6	PERFORM EXPLORATORY ANALYSIS OF MULTIVARIATE DATA , SUCH AS MULTIVARIATE NORMAL DENSITY, CALCULATING DESCRIPTIVE STATISTICS, TESTING FFOR MULTIVARIATE NORMALIITY.

Title:ADVANCED SOFTWARE ENGINEERING,Subject Code:SE4151 NBA Code for the Subject :C11 ,Semester : 2 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C11.1	Identify appropriate process models based on the Project requirements.
C11.2	Understand the importance of having a good Software Architecture.
C11.3	Understand the five important dimensions of dependability, namely, availability, reliability, safety, security, and resilience.
C11.4	:Understand the basic notions of a web service, web service standards, and service-oriented architecture.
C11.5	Be familiar with various levels of Software testing
C11.6	Understand the concepts of configuration management in software and mobile app.

Title:MACHINE LEARNING,Subject Code:CP4252 NBA Code for the Subject :C110 ,Semester : 2 [22-23EVEN]Target :65 Credits:4	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C110.1	Understand and outline problems for each type of machine learning
C110.2	Design a Decision tree and Random forest for an application
C110.3	Implement Probabilistic Discriminating and Generative algorithms for an application and analyze the results.
C110.4	Use a tool to implement typical Clustering algorithms for different types of applications.
C110.5	Design and implement an HMM for a Sequence Model type of application

C110.6	Identify applications suitable for different types of machine learning with suitable justification

Title:INTERNET OF THINGS,Subject Code:CP4291 NBA Code for the Subject :CP4291 ,Semester : 2 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
CP4291.1	Understand the Architectural Overview of IoT
CP4291.2	Understand the IoT Reference Architecture
CP4291.3	Understand the Real World Design Constraints
CP4291.4	Understand the various IoT levels
CP4291.5	understand the basics of cloud architecture
CP4291.6	Gain experience in Arduino Uno, Raspberry PI and experiment simple IoT application on it

Title:MULTICORE ARCHITECTURE AND PROGRAMMING,Subject Code:CP4292 NBA Code for the Subject :CP4292 ,Semester : 2 [22-23EVEN]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
CP4292.1	Describe multicore architectures and identify their characteristics and challenges.
CP4292.2	Describe Cache coherence, Performance Issues and Parallel program design.
CP4292.3	Identify the issues in programming Parallel Processors.
CP4292.4	Write programs using OpenMP and MPI.
CP4292.5	Design parallel programming solutions to common problems.
CP4292.6	Compare and contrast programming for serial processors and programming for parallel processors.

Title:BIG DATA ANALYTICS,Subject Code:DS4015 NBA Code for the Subject :204 ,Semester : 3 [22-23ODD]Target :60 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
204.1	Understand the basics of big data analytics
204.2	Ability to use Hadoop, Map Reduce Frame work
204.3	Ability to identify the areas for applying big data analytics for increasing the business outcome
204.4	Gain Knowledge on R Language
204.5	Contextually Integrate and correlate large amount of information to gain faster insights.
204.6	Gain Knowledge on different search methods and visualization

Title:SECURITY PRACTICES,Subject Code:CP4391 NBA Code for the Subject :C201 ,Semester : 3 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C201.1	Understand the core fundamentals of system security
C201.2	Apply the security concepts to wired and wireless networks
C201.3	Implement and Manage the security essentials in IT Sector
C201.4	Explain the concepts of Cyber Security and Cyber forensics
C201.5	Be aware of Privacy and Storage security Issues
C201.6	Be Aware OF Top 10 Web Application Security Risks

Title:MOBILE APPLICATION DEVELOPMENT,Subject Code:MP4292 NBA Code for the Subject :MP4292 ,Semester : 3 [22-23ODD]Target :65 Credits:4

At the end of this course, Student will be able to

CO-Code	Course outcome Description
MP4292.1	Identify various concepts of mobile programming that make it unique from programming for other platforms
MP4292.2	Create, test and debug Android application by setting up Android development
MP4292.3	Demonstrate methods in storing, sharing and retrieving data in Android applications
MP4292.4	Utilize rapid prototyping techniques to design and develop sophisticated mobile interfaces
MP4292.5	Create interactive applications in android using databases with multiple activities
MP4292.6	audio, video and notifications and deploy them in marketplace

Title:MOBILE AND PERVASIVE COMPUTING,Subject Code:CP4094 NBA Code for the Subject :cp4094 ,Semester : 3 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
cp4094.1	Design a basic architecture for a pervasive computing environment
cp4094.2	Design and allocate the resources on 3G-4G wireless networks
cp4094.3	Analyze the role of sensors in wireless networks
cp4094.4	workout the routing in mesh networks
cp4094.5	Deploy the location and context information for application development
cp4094.6	Develop mobile computing applications based on paradigm of context aware computing and wearable computing

Power Electronic Drives

Programme:

Course OutComes for the Academic Year : 2022-23

Title:RESEARCH METHODOLOGY AND IPR,Subject Code:RM4151 NBA Code for the Subject :105 ,Semester : 1 [22-23ODD]Target :65 Credits:2	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
105.1	Ability to design the research processes and Ability to design the research questions to collect data.
105.2	Ability to collect research data using questionnaires, instruments and sampling methods. Ability to explore and display the data.
105.3	Ability to analysis the research data and to prepare reports and/or presentations.
105.4	Ability to explain the basic concepts, developments and the authoritative bodies of IPR.
105.5	Ability to explain the basic concepts, significance, preparation of filing applications and agreements of patents.
105.6	----------

Title:ANALYSIS OF ELECTRICAL DRIVES,Subject Code:PX4201 NBA Code for the Subject :110 ,Semester : 2 [22-23EVEN]Target :60 Credits:4	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
110.1	Ability to acquire and apply knowledge of mathematics and converter/ machine dynamics in Electrical engineering.
110.2	Ability to formulate, design, simulate power supplies for generic load and for machine loads.
110.3	Ability to analyze, comprehend, design and simulate direct current motor based adjustable speed drives.
110.4	Ability to analyze, comprehend, design and simulate induction motor based adjustable speed drives.
110.5	Ability to design a closed loop motor drive system with controllers for the current and speed control operations.
110.6	Ability to design a closed loop motor drive system with controllers forinduction and synchronous motors

Title:MODERN RECTIFIERS AND RESONANT CONVERTERS,Subject Code:PX4006 NBA Code for the Subject :C119 ,Semester : 2 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C119.1	understand the standards for supply current harmonics and its significance
C119.2	design power factor correction rectifiers for UPS applications
C119.3	analyze and design the resonant converters

C119.4	derive the state space model of basic and derived DC-DC converters
C119.5	design an appropriate controller for PWM rectifiers
C119.6	design an appropriate controller for PWM rectifiers

Title:POWER ELECTRONICS AND DRIVES LABORATORY,Subject Code:PX4211 NBA Code for the Subject :C116 ,Semester : 2 [22-23EVEN]Target :65 Credits:1.5

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C116.1	Ability to construct the simulation circuit for the closed loop control of drive systems
C116.2	Ability to formulate, design the speed controller for DC motor-based drive system.
C116.3	Ability to formulate, design the speed controller for DC motor-based drive system.
C116.4	Ability to formulate, design the speed controller for AC motor-based drive system.
C116.5	Ability to design the control algorithm for the control of an electrical drive using Micro controller and Digital signal processor.
C116.6	Ability to formulate, design the speed controller for stepper motor drive system.

Title:DESIGN LABORATORY FOR POWER ELECTRONICS SYSTEMS,Subject Code:PX4212 NBA Code for the Subject :PX4212 ,Semester : 2 [22-23EVEN]Target :80 Credits:1.5

At the end of this course, Student will be able to

CO-Code	Course outcome Description
PX4212.1	independently carryout research and development work in power converters
PX4212.2	demonstrate a degree of mastery over the design and fabrication of switching regulators.
PX4212.3	apply conceptual basis required for design and testing of various power converters
PX4212.4	interact with industry to take up problem of societal importance as miniproject designed
PX4212.5	to compare different possible solution to the same practical problem.
PX4212.6	to simulate non-isolated and isolated power converters for various applications

Title:ENERGY CONSERVATION AND MANAGEMENT IN DOMESTIC SECTORS,Subject Code:OME432 NBA Code for the Subject :203 ,Semester : 3 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
203.1	Understanding technical aspects of energy conservation scenario.
203.2	Knowing energy audit in any type of domestic buildings and suggesting the conservation measures

203.3	Performing building load estimates and designing the energy efficient landscape system
203.4	Gaining knowledge to utilize an appliance/device sustainably
203.5	Understanding the status and current technological advancement in energy storage field.
203.6	Understanding the status and current technological advancement in energy storage field.

Title:WIND ENERGY CONVERSION SYSTEM,Subject Code:PX4013 NBA Code for the Subject :PX4013 ,Semester : 3 [22-23ODD]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
PX4013.1	To learn about the basic concepts of wind energy conversion system
PX4013.2	To learn the design and control principles of Wind turbine.
PX4013.3	To understand the concepts of fixed speed wind energy conversion systems.
PX4013.4	To understand the concepts of Variable speed wind energy conversion systems.
PX4013.5	To analyze the grid integration issues.
PX4013.6	To study the power system modelling issues.

Thermal Engineering

Programme:

Course OutComes for the Academic Year : 2022-23

Title:ADVANCED NUMERICAL METHODS,Subject Code:MA4154 NBA Code for the Subject :C101 ,Semester : 1 [22-23ODD]Target :65 Credits:4	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C101.1	To study various numerical techniques to solve linear algebraic and transcendental equations.
C101.2	To study various numerical techniques to solve non- linear algebraic and transcendental equations.
C101.3	To compare ordinary differential equations by finite difference and collocation methods.
C101.4	To establish finite difference methods to solve Parabolic and hyperbolic equations.
C101.5	To establish finite difference method to solve elliptic partial differential equations. To establish finite difference method to solve elliptic partial differential equations. To establish finite diff
C101.6	To provide basic knowledge in finite elements method in solving partial differential. equations.

Title:INSTRUMENTATION FOR THERMAL,Subject Code:TE4201 NBA Code for the Subject :C109 ,Semester : 2 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C109.1	Infer the role of uncertainty analysis in measuring instruments
C109.2	Select the appropriate temperature sensors based on specific applications
C109.3	Identify the suitable sensors for pressure and volume measurements
C109.4	Evaluate thermos physical properties of media
C109.5	Appraise the advantages of data acquisition systems
C109.6	

Title:COMPUTATIONAL FLUID DYNAMICS,Subject Code:IC4291 NBA Code for the Subject :C110 ,Semester : 2 [22-23EVEN]Target :65 Credits:3	
At the end of this course, Student will be able to	
CO-Code	**Course outcome Description**
C110.1	Analyse the governing equations and boundary conditions.
C110.2	Analyse various discretization techniques for both steady diffusion problems.
C110.3	Analyse various discretization techniques for both unsteady diffusion problems.
C110.4	Analyse the various convection-diffusion problems by Finite-Volume method

C110.5	Analyse the flow processes by using different pressure bound algorithms.
C110.6	Select and use the different turbulence models according to the type of flows.

Title:ADVANCED ENERGY STORAGE TECHNOLOGIES,Subject Code:EY4091 NBA Code for the Subject :C117 ,Semester : 2 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C117.1	Identify the energy storage technologies for suitable applications.
C117.2	Analyze the energy storage systems using TRNSYS
C117.3	Summarize the concepts and types of batteries
C117.4	Examine the principle of operation of Hydrogen storage systems
C117.5	Examine the principle of operation of Biogas storage systems
C117.6	Explain the working of super capacitor, Flywheel and compressed energy storage systems

Title:ADVANCED POWER PLANT ENGINEERING,Subject Code:TE4091 NBA Code for the Subject :C401 ,Semester : 2 [22-23EVEN]Target :65 Credits:3

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C401.1	Explain the coal based thermal power plants.
C401.2	Distinguish the role of Air standard cycles and Layout of Diesel, Gas Turbine and Combined cycle power plants.
C401.3	Describe the working of Nuclear power plants and safety measures involved in it.
C401.4	Explain the need of Hydro electric power plants.
C401.5	Explain the need of renewable sources of energy.
C401.6	Appraise the impact of energy crises on society and its judicious use.

Title:TECHNICAL SEMINAR ? I,Subject Code:TE4212 NBA Code for the Subject :C117 ,Semester : 2 [22-23EVEN]Target :65 Credits:1

At the end of this course, Student will be able to

CO-Code	Course outcome Description
C117.1	Identify and choose appropriate topic of relevance.
C117.2	To assimilate literature on technical articles of specified topic and develop comprehension.
C117.3	Prepare technical report.
C117.4	Design, develop and deliver presentation on specified technical topic
C117.5	Develop the skill of drawing technical solui
C117.6	Learn the methodology of publishing technical papers