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DATE : 02.02.2024

Course Outcomes (COs) for all Programmes

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DEPARTMENT : SCIENCE AND HUMANITIES(R22)

Course Outcomes(COs) :B.Tech I YEAR – I and II Semesters

Computer Science and Engineering

Academic Year : 2022 -2023

I Year – I Semester

Subject Code	Course Name	COs	Outcomes
MA101BS	**Matrices And Calculus**	**CO1**	Students are able to do the matrix representation of a set of linear equations and analyse the solution of the system of equations.
		CO2	Students are able to find the Eigenvalues and Eigen vectors and reduce the quadratic form to canonical form using orthogonal transformations.
		CO3	Students are able to do the applications on the mean value theorems and evaluate the improper integrals using Beta and Gamma functions.
		CO4	Students are trained to find the extreme values of functions of two variables with/ without constraints.
		CO5	Students are able to evaluate the multiple integrals and apply the concept to find areas, volumes.

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Subject Code	Course Name	COs	Outcomes
CH102BS	Engineering Chemistry	CO1	Students are able to understand the basic properties of water and its usage in domestic and industrial purposes.
		CO2	Students acquired the basic knowledge of electrochemical procedures related to corrosion and its control.
		CO3	Students learned the fundamentals and general properties of polymers and other engineering materials.
		CO4	Students imbibe the basic concepts of petroleum and its products and predict potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs.
		CO5	Students are able to acquire required knowledge about engineering materials like cement, smart materials and Lubricants.

Subject Code	Course Name	COs	Outcomes
CS103ES	Programming for Problem Solving	CO1	Students are trained to write algorithms and to draw flowcharts for solving problems.
		CO2	Students are able to use arrays, pointers, strings and structures to write C programs
		CO3	Students learned the syntax and semantics of the C programming language
		CO4	Students are able to decompose a problem into functions and to develop modular reusable code.
		CO5	Students are trained to search and sort problems.

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Subject Code	Course Name	COs	Outcomes
EE104ES	Basic Electrical Engineering	CO1	Students are able to understand and analyze basic Electrical circuits.
		CO2	Students are able to understand Single & Three phase AC circuits.
		CO3	Students studied the construction and working principle of Transformers.
		CO4	Students studied the construction and working principle of different type of DC Machines and AC Machines.
		CO5	Students gained the knowledge of various electrical installations and the concept of power, power factor and its improvement.

Subject Code	Course Name	COs	Outcomes
ME105ES	Computer Aided Engineering Graphics	CO1	Students are able to apply computer aided drafting tools to create 2D and 3D objects.
		CO2	Students are able to sketch conics and different types of solids.
		CO3	Students are able to appreciate the need of Sectional views of solids and Development of surfaces of solids.
		CO4	Students are able to read and interpret engineering drawings□.
		CO5	Students are enabled to do the Conversion of orthographic projection into isometric view and vice versa manually and by using computer aided drafting.

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Subject Code	Course Name	COs	Outcomes
CS106ES	**Elements of Computer Science & Engineering**	CO1	Students learned the working principles of functional units of a basic computer.
		CO2	Students are able to understand program development, the use of data structures and algorithms in problem Solving.
		CO3	Students learned about need and types of operating system, database systems.
		CO4	Students are enabled to understand the significance of networks, internet, WWW and cyber security.
		CO5	Students are able to understand Autonomous systems, the application of artificial intelligence.

Subject Code	Course Name	COs	Outcomes
CH107BS	**Engineering Chemistry Laboratory**	CO1	Students are able to estimate the hardness of water to check its suitability for drinking purpose.
		CO2	Students are able to perform estimations of acids and bases using conductometry, potentiometry and pH metry methods.
		CO3	Students will learn to prepare polymers such as Bakelite and nylon-6 in the laboratory.
		CO4	Students are able to determine the parameters of rate of corrosion of mild steel in various conditions.
		CO5	Students will learn skills related to the lubricant properties such as saponification value, surface tension and viscosity of oils.

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Subject Code	Course Name	COs	Outcomes
CS108ES	Programming for Problem Solving Laboratory	CO1	Students are able to formulate the algorithms for simple problems and translate given algorithms to a working and correct program.
		CO2	Students are able to correct syntax errors as reported by the compilers and identify and correct logical errors encountered during execution.
		CO3	Students are able to represent and manipulate data with arrays, strings and structures.
		CO4	Students are able to use pointers of different types.
		CO5	Students are able to create, read and write to and from simple text and binary files and modularize the code with functions so that they can be reused.

Subject Code	Course Name	COs	Outcomes
EE109ES	Basic Electrical Engineering Laboratory	CO1	To measure the electrical parameters for different types of DC and AC circuits using conventional and theorems approach.
		CO2	Students are able to understand the response of different types of Electrical circuits for different excitations.
		CO3	Students are able to determine the performance of DC Shunt Machine.
		CO4	Students are able to determine the performance of Three phase induction motors.
		CO5	Students are able to understand basic characteristics of Transformers and its calculations.

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I Year – II Semester

Subject Code	Course Name	COs	Outcomes
PH202BS	**Applied Physics**	CO1	Students are able to understand the basic principles of quantum physics and band theory of solids.
		CO2	Students are able to understand the underlying mechanism involved in construction and working principles of various semiconductor devices.
		CO3	Students are able to explore the fundamental properties of dielectric, magnetic materials and energy for their applications
		CO4	Students are able to identify the importance of nanoscale, quantum confinement and various fabrications techniques.
		CO5	Students are able to understand various aspects of Lasers and Optical fiber and their applications in diverse fields.

Subject Code	Course Name	COs	Outcomes
EN204HS	**English for Skill Enhancement**	CO1	Students are trained to develop study skills and communication skills in various professional situations.
		CO2	Students are able to understand the importance of vocabulary and sentence structures and choose appropriate vocabulary and sentence structures for their oral and written communication.
		CO3	Students are able to demonstrate their understanding of the rules of functional grammar.
		CO4	Students are trained to develop comprehension skills from the known and unknown passages and take an active part in drafting paragraphs, letters, essays, abstracts, précis and reports in various contexts.
		CO5	Students are able to acquire basic proficiency in reading and writing modules of English.

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Subject Code	Course Name	COs	Outcomes
EC205ES	Electronic Devices and Circuits	CO1	Students are able to understand the characteristics of Diodes
		CO2	Students acquired the knowledge on applications of Diodes.
		CO3	Students learned the principle of operations and different types of configuration of Bipolar Junction Transistors(BJT)
		CO4	Students learned the principle of operations and different types of configuration of JFET.
		CO5	Students acquired the knowledge about the role of special purpose devices and their applications.

Subject Code	Course Name	COs	Outcomes
MA201BS	Ordinary Differential Equations and Vector Calculus	CO1	Students learned to identify whether the given differential equation of first order is exact or not□.
		CO2	Students are able to solve higher differential equation and apply the concept of differential equation to real world problems.
		CO3	Students are enabled to solve ordinary differential equations using Laplace transforms techniques.
		CO4	Students are able to understand the physical quantities involved in engineering field related to vector valued functions.
		CO5	Students learned the basic properties of vector valued functions and their applications to line, surface and volume integrals

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Subject Code	Course Name	COs	Outcomes
*MC210	Environmental Science	CO1	Students are able to understand the importance of ecological balance for sustainable development.
		CO2	Students are able to understand the impacts of developmental activities and mitigation measures.
		CO3	Students are able to understand the environmental policies and regulations
		CO4	Students will be evaluate technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development
		CO5	Students will be develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development

Subject Code	Course Name	COs	Outcomes
CS206ES	Python Programming Laboratory	CO1	Students are able to install and run the Python interpreter and learn control structures.
		CO2	Students are able to develop the application specific codes using python.
		CO3	Students are able to understand Strings, Lists, Tuples and Dictionaries in Python
		CO4	Students are able to verify programs using modular approach, file I/O, Python standard library.
		CO5	Students are able to implement Digital Systems using Python.

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Subject Code	Course Name	COs	Outcomes
PH207BS	**Applied Physics Laboratory**	CO1	Students gain the knowledge on the determination of the Planck's constant using Photo electric effect and identify the material whether it is n-type or p-type by Hall experiment.
		CO2	Students are able to appreciate quantum physics in semiconductor devices and optoelectronics.
		CO3	Students gain the knowledge of applications of dielectric constant.
		CO4	Students are able to understand the variation of magnetic field and behavior of hysteresis curve.
		CO5	Students are able to carry out data analysis.

Subject Code	Course Name	COs	Outcomes
EN208HS	**English Language and Communication Skills Laboratory**	CO1	Students are enabled to develop their listening skills so that they may appreciate the role in the LSRW skills approach to language and improve their pronunciation.
		CO2	Students are able to understand the nuances of English language through audio- visual experience and group Activities.
		CO3	Students are able to neutralise their accent for intelligibility.
		CO4	Students are trained to use language appropriately for public speaking, group discussions and interviews□.
		CO5	Students are able to speak with clarity and confidence which in turn enhances their employability skills.

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Subject Code	Course Name	COs	Outcomes
ME203ES	Engineering Workshop	CO1	Students are provided with hands on experience about use of different engineering materials, tools, equipments and processes those are common in the engineering field.
		CO2	Students are enabled to study and practice on machine tools and their operations.
		CO3	Made students to practice on manufacturing components using workshop trades including carpentry and fitting.
		CO4	Students are able to apply basic electrical engineering knowledge for house wiring.
		CO5	Students are able to produce welding and joining processes.

Subject Code	Course Name	COs	Outcomes
CS209ES	IT Workshop	CO1	Students learn to perform Hardware troubleshooting.
		CO2	Students are able to understand Hardware components and inter dependencies.
		CO3	Students learn to safeguard computer systems from viruses/worms□.
		CO4	Students are able to do Document/ Presentation preparation.
		CO5	Students are able to perform calculations using spreadsheets.

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DEPARTMENT : COMPUTER SCIENCE AND ENGINEERING (CSE)(R22)

Course Outcomes(COs) :B.Tech II YEAR – I Semester

Academic Year : 2022 -2023

Subject Code	Course Name	COs	Outcomes
CS301PC	Digital Electronics	CO1	Students learn the fundamental concepts of digital system design and common forms of number representations and their conversions
		CO2	Students are enabled to implement and design logical operations using combinational logic circuits and sequential logic circuits.
		CO3	Students are able to understand the working of logic families and logic gates
		CO4	Students learn to design and implement Combinational and Sequential logic circuits
		CO5	Students are able to implement the given logical problems using programmable logic devices.

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Subject Code	Course Name	COs	Outcomes
CS302PC	Data Structures	CO1	Students are able to select the data structures that efficiently model the information in a problem.
		CO2	Students are able to assess efficiency trade-offs among different data structure implementations or combinations.
		CO3	Students are enabled to implement and know the application of algorithms for sorting and pattern matching.
		CO4	Students are able to design programs using a variety of data structures, including hash tables, binary and general tree structures, search trees,
		CO5	Students are able to understand Autonomous systems, the application of artificial intelligence.

Subject Code	Course Name	COs	Outcomes
CS303PC	Computer Oriented Statistical Methods	CO1	Students are able to apply the concepts of probability and distributions to case studies.
		CO2	Students are able to formulate and solve problems involving random variables and apply statistical methods for analyzing experimental data
		CO3	Students are able to learn continuous probability distributions and sampling distributions
		CO4	Students are able to apply concept of estimation and testing of hypothesis to case studies
		CO5	Students are able to learn stochastic process and Markov chains

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Subject Code	Course Name	COs	Outcomes
CS304PC	Computer organization and architecture	CO1	Students are able to understand the basics of instruction sets and their impact on processor design.
		CO2	Students are able to demonstrate an understanding of the design of the functional units of a digital computer system.
		CO3	Students are able to evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory.
		CO4	Students are able to design a pipeline for consistent execution of instructions with minimum hazards.
		CO5	Students are enabled to recognize and manipulate representations of numbers stored in digital computers

Subject Code	Course Name	COs	Outcomes
CS305PC	Object Oriented Programmi -ng Through JAVA	CO1	Students are able to demonstrate the behavior of programs involving the basic programming constructs like control structures, constructors, string handling and garbage collection.
		CO2	Students are able to demonstrate the implementation of inheritance (multilevel, hierarchical and multiple) by using extend and implement keywords
		CO3	Students are able to use multithreading concepts to develop inter process communication.
		CO4	Students are able to understand the process of graphical user interface design and implementation using AWT or swings
		CO5	Students are enabled to develop applets that interact abundantly with the client environment and deploy on the server

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Subject Code	Course Name	COs	Outcomes
CS306PC	Data Structures Lab	CO1	Students are able to develop the programs for linked list, stack and queues
		CO2	Students are able to implement programs for graph traversal techniques
		CO3	Students are able to implement programs for various sorting techniques
		CO4	Students are able to implement programs for various searching techniques
		CO5	Students learn to implement programs for various tree traversal and graph traversal methods

Subject Code	Course Name	COs	Outcomes
CS308PC	Data Visualization- R Programming/ POWER BI	CO1	Students are able to understand how to import data into Tableau.
		CO2	Students are able to understand Tableau concepts of Dimensions and Measures.
		CO3	Students are able to develop Programs and understand how to map Visual Layouts and Graphical Properties.
		CO4	Students are able to create a Dashboard that links multiple visualizations.
		CO5	Students learn to use graphical user interfaces to create Frames for providing solutions to real world problems.

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Subject Code	Course Name	COs	Outcomes
*MC309	Gender sensitization lab	CO1	Students are able to develop students' sensibility with regard to issues of gender in contemporary India.
		CO2	Students are able to provide a critical perspective on the socialization of men and women
		CO3	Students are able to introduce students to information about some key biological aspects of genders.
		CO4	Students are able to expose the students to debates on the politics and economics of work.
		CO5	Students learn to help students reflect critically on gender violence and to expose students to more egalitarian interactions between men and women

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II YEAR – II SEMESTER

Subject Code	Course Name	COs	Outcomes
CS401PC	Discrete Mathematics	CO1	Students are able to understand and construct precise mathematical proofs
		CO2	Students are able to apply logic and set theory to formulate precise statements
		CO3	Students are able to analyze and solve counting problems on finite and discrete structures
		CO4	Students are able to describe and manipulate sequences
		CO5	Students learn to apply graph theory in solving computing problems

Subject Code	Course Name	COs	Outcomes
SM402MS	Business Economical and Financial Analysis	CO1	Students understand the various Forms of Business and the impact of economic variables on the Business.
		CO2	Students are able to understand the Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt.
		CO3	Students are able to study the firm's financial position by analysing the Financial Statements of a company.
		CO4	Students are able to study the financial statements of a company like journal, ledger, preparation of trial balance, accounts.
		CO5	Students are able to understand various financial analysis.

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Subject Code	Course Name	COs	Outcomes
CS403PC	OPERATING SYSTEMS	CO1	Students are able to control access to a computer and the files that may be shared
		CO2	Students are able to demonstrate the knowledge of the components of computers and their respective roles in computing
		CO3	Students are able to recognize and resolve user problems with standard operating environments
		CO4	Students are able to gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively
		CO5	Students learn to understand various file system interface and operations

Subject Code	Course Name	COs	Outcomes
CS404PC	DATABASE MANAGEMENT SYSTEMS	CO1	Students are able to gain knowledge of fundamentals of DBMS, database design and normal form
		CO2	Students are able to understand the basics of relational model, relational algebra and calculus
		CO3	Students are able to master the basics of SQL for retrieval and management of data
		CO4	Students are able to understand basics of transaction processing and concurrency control.
		CO5	Students learn to learn familiarity with database storage structures and access techniques

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Subject Code	Course Name	COs	Outcomes
CS405PC	SOFTWARE ENGINEERING	CO1	Students are able to translate end-user requirements into system and software requirements, using e.g. UML
		CO2	Students are able to structure the requirements in a Software Requirements Document (SRD)
		CO3	Students are able to Identify and apply appropriate software architectures and patterns to carry out high level design of a system
		CO4	Students are able to critically compare alternative choices
		CO5	Students will have experience and/or awareness of testing problems and will be able to develop a simple testing report

Subject Code	Course Name	COs	Outcomes
CS406PC	OPERATING SYSTEMS LAB	CO1	Students are able to simulate a program for various cpu scheduling algorithm
		CO2	Students are able to simulate bankers algorithm for dead lock avoidance and prevention
		CO3	Students are able to implement various system call functions and inter process communication mechanisms
		CO4	Students are able to simulate memory management techniques
		CO5	Students are able to simulate page replacement policies

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Subject Code	Course Name	COs	Outcomes
CS407PC	DATABASE MANAGEMENT SYSTEMS LAB	CO1	Students are able to implement the concept design with ER and relational model
		CO2	Students are able to design database schema for a given application and apply normalization
		CO3	Students are able to acquire skills in using SQL commands
		CO4	Students are able to develop solutions for database applications using procedures, cursors and triggers
		CO5	Students learn to design a data base for a given real time problem.

Subject Code	Course Name	COs	Outcomes
*MC410	CONSTITUTION OF INDIA	CO1	Students are able to discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
		CO2	Students are able to discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India.
		CO3	Students are able to discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru
		CO4	Students are able to discuss the passage of the Hindu Code Bill of 1956.
		CO5	Students are able to study the fundamental rights of equality

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Subject Code	Course Name	COs	Outcomes
CS409PC	**NODE JS/ REACT JS/ DJANGO**	CO1	Students are able to build a custom website with HTML, CSS, and Bootstrap and little Java Script
		CO2	Students are able to demonstrate advanced features of JavaScript and learn about JDBC
		CO3	Students are able to develop Server – side implementation using Java technologies like
		CO4	Students are able to develop the server – side implementation using Node JS.
		CO5	Students are able to design a Single Page Application using React.

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DEPARTMENT OF SCIENCE & HUMANITIES

COURSE OUTCOMES (CO'S) OF B.Tech I YEAR I & II SEMESTERS

BRANCH : ECE

ACADEMIC YEAR:2022-2023

I YEAR -I SEMESTER

Subject Code	Course Name	COs	Outcomes
MA101BS	**Matrices And Calculus**	CO1	Students are able to do the matrix representation of a set of linear equations and analyse the solution of the system of equations.
		CO2	Students are able to find the Eigenvalues and Eigen vectors and reduce the quadratic form to canonical form using orthogonal transformations.
		CO3	Students are able to do the applications on the mean value theorems and evaluate the improper integrals using Beta and Gamma functions.
		CO4	Students are trained to find the extreme values of functions of two variables with/ without constraints.
		CO5	Students are able to evaluate the multiple integrals and apply the concept to find areas, volumes.

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Subject Code	Course Name	COs	Outcomes
PH102BS	Applied Physics	CO1	Students are able to understand the basic principles of quantum physics and band theory of solids.
		CO2	Students are able to understand the underlying mechanism involved in construction and working principles of various semiconductor devices.
		CO3	Students are able to explore the fundamental properties of dielectric, magnetic materials and energy for their applications
		CO4	Students are able to identify the importance of nanoscale, quantum confinement and various fabrications techniques.
		CO5	Students are able to understand various aspects of Lasers and Optical fiber and their applications in diverse fields.

Subject Code	Course Name	COs	Outcomes
EC103ES	C Programming for Engineers	CO1	Students are able to learn the fundamentals of computers and draw flowcharts for solving arithmetic and logical problems.
		CO2	Students are trained to develop modular reusable code by understanding concepts of functions.
		CO3	Students learned the syntax and semantics of C Programming Language.
		CO4	Students learn to formulate algorithms and programs using arrays, pointers, strings and structures.
		CO5	Students are able to write a programs using Searching and sorting algorithms□.

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Subject Code	Course Name	COs	Outcomes
ME104ES	Engineering Workshop	CO1	Students are provided with hands on experience about use of different engineering materials, tools, equipments and processes those are common in the engineering field.
		CO2	Students are enabled to study and practice on machine tools and their operations.
		CO3	Made students to practice on manufacturing components using workshop trades including carpentry and fitting.
		CO4	Students are able to apply basic electrical engineering knowledge for house wiring.
		CO5	Students are able to produce welding and joining processes.

Subject Code	Course Name	COs	Outcomes
EN105HS	English for Skill Enhancement	CO1	Students are trained to develop study skills and communication skills in various professional situations.
		CO2	Students are able to understand the importance of vocabulary and sentence structures and choose appropriate vocabulary and sentence structures for their oral and written communication.
		CO3	Students are able to demonstrate their understanding of the rules of functional grammar.
		CO4	Students are trained to develop comprehension skills from the known and unknown passages and take an active part in drafting paragraphs, letters, essays, abstracts, précis and reports in various contexts.
		CO5	Students are able to acquire basic proficiency in reading and writing modules of English.

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Subject Code	Course Name	COs	Outcomes
EC106ES	Elements of Electronics and Communication Engineering	CO1	Students are able to identify the different components used for electronics applications.
		CO2	Students are enabled to identify the different passive and active components.
		CO3	Students are able to study the CRO and measure the frequency and phase of given signal.
		CO4	Students are trained to measure different parameters using various measuring instruments.
		CO5	Students are able to distinguish various signal used for analog and digital communications☐.

Subject Code	Course Name	COs	Outcomes
PH107BS	Applied Physics Laboratory	CO1	Students gain the knowledge on the determination of the Planck's constant using Photo electric effect and identify the material whether it is n-type or p-type by Hall experiment.
		CO2	Students are able to appreciate quantum physics in semiconductor devices and optoelectronics.
		CO3	Students gain the knowledge of applications of dielectric constant.
		CO4	Students are able to understand the variation of magnetic field and behaviour of hysteresis curve.
		CO5	Students are able to carry out data analysis.

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Subject Code	Course Name	COs	Outcomes
EC108ES	C Programming for Engineers Laboratory	CO1	Students are able to formulate the algorithms for simple problems and translate given algorithms to a working and correct program.
		CO2	Students are able to correct syntax errors as reported by the compilers and identify and correct logical errors encountered during execution.
		CO3	Students are able to represent and manipulate data with arrays, strings and structures.
		CO4	Students are able to use pointers of different types.
		CO5	Students are able to create, read and write to and from simple text and binary files and modularize the code with functions so that they can be reused.

Subject Code	Course Name	COs	Outcomes
EN109HS	English Language and Communication Skills Laboratory	CO1	Students are enabled to develop their listening skills so that they may appreciate the role in the LSRW skills approach to language and improve their pronunciation.
		CO2	Students are able to understand the nuances of English language through audio- visual experience and group Activities.
		CO3	Students are able to neutralise their accent for intelligibility.
		CO4	Students are trained to use language appropriately for public speaking, group discussions and interviews□.
		CO5	Students are able to speak with clarity and confidence which in turn enhances their employability skills.

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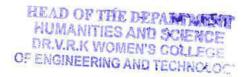Affiliated to Jawaharlal Nehru Technological University Hyderabad
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I YEAR -II SEMESTER

Subject Code	Course Name	COs	Outcomes
MA201BS	**Ordinary Differential Equations and Vector Calculus**	CO1	Students learned to identify whether the given differential equation of first order is exact or not□.
		CO2	Students are able to solve higher differential equation and apply the concept of differential equation to real world problems.
		CO3	Students are enabled to solve ordinary differential equations using Laplace transforms techniques.
		CO4	Students are able to understand the physical quantities involved in engineering field related to vector valued functions.
		CO5	Students learned the basic properties of vector valued functions and their applications to line, surface and volume integrals

Subject Code	Course Name	COs	Outcomes
CH202BS	**Engineering Chemistry**	CO1	Students are able to understand the basic properties of water and its usage in domestic and industrial purposes.
		CO2	Students acquired the basic knowledge of electrochemical procedures related to corrosion and its control.
		CO3	Students learned the fundamentals and general properties of polymers and other engineering materials.
		CO4	Students imbibe the basic concepts of petroleum and its products and predict potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs.
		CO5	Students are able to acquire required knowledge about engineering materials like cement, smart materials and Lubricants.
Subject Code	Course Name	COs	Outcomes

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ME203ES	**Computer Aided Engineering Graphics**	**CO1**	Students are able to apply computer aided drafting tools to create 2D and 3D objects.
		CO2	Students are able to sketch conics and different types of solids.
		CO3	Students are able to appreciate the need of Sectional views of solids and Development of surfaces of solids.
		CO4	Students are able to read and interpret engineering drawings☐.
		CO5	Students are enabled to do the Conversion of orthographic projection into isometric view and vice versa manually and by using computer aided drafting.

Subject Code	Course Name	COs	Outcomes
EE204ES	**Basic Electrical Engineering**	**CO1**	Students are able to understand and analyze basic Electrical circuits.
		CO2	Students are able to understand Single & Three phase AC circuits.
		CO3	Students studied the construction and working principle of Transformers.
		CO4	Students studied the construction and working principle of different type of DC Machines and AC Machines.
		CO5	Students gained the knowledge of various electrical installations and the concept of power, power factor and its improvement.

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Subject Code	Course Name	COs	Outcomes
EC205ES	Electronic Devices and Circuits	CO1	Students are able to understand the characteristics of Diodes
		CO2	Students acquired the knowledge on applications of Diodes.
		CO3	Students learned the principle of operations and different types of configuration of Bipolar Junction Transistors(BJT)
		CO4	Students learned the principle of operations and different types of configuration of JFET.
		CO5	Students acquired the knowledge about the role of special purpose devices and their applications.

Subject Code	Course Name	COs	Outcomes
CS206ES	Applied Python Programming Laboratory	CO1	Students are able to install and run the Python interpreter and learn control structures.
		CO2	Students are able to develop the application specific codes using python.
		CO3	Students are able to understand Strings, Lists, Tuples and Dictionaries in Python
		CO4	Students are able to verify programs using modular approach, file I/O, Python standard library.
		CO5	Students are able to implement Digital Systems using Python.

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Subject Code	Course Name	COs	Outcomes
CH207BS	Engineering Chemistry Laboratory	CO1	Students are able to estimate the hardness of water to check its suitability for drinking purpose.
		CO2	Students are able to perform estimations of acids and bases using conductometry, potentiometry and pH metry methods.
		CO3	Students will learn to prepare polymers such as Bakelite and nylon-6 in the laboratory.
		CO4	Students are able to determine the parameters of rate of corrosion of mild steel in various conditions.
		CO5	Students will learn skills related to the lubricant properties such as saponification value, surface tension and viscosity of oils.

Subject Code	Course Name	COs	Outcomes
EE208ES	Basic Electrical Engineering Laboratory	CO1	To measure the electrical parameters for different types of DC and AC circuits using conventional and theorems approach.
		CO2	Students are able to understand the response of different types of Electrical circuits for different excitations.
		CO3	Students are able to determine the performance of DC Shunt Machine.
		CO4	Students are able to determine the performance of Three phase induction motors.
		CO5	Students are able to understand basic characteristics of Transformers and its calculations.

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Subject Code	Course Name	COs	Outcomes
EC209ES	**Electronic Devices and Circuits Laboratory**	**CO1**	Students are able to learn the PN junction diode characteristics in forward bias and reverse bias.
		CO2	Students acquire the knowledge of various semiconductor devices and their use in real life.
		CO3	Students are able to design aspects of biasing and keep them in active region of the device for functional circuits.
		CO4	Students are able to study the switching characteristics of a transistor.
		CO5	Students are able to acquire the knowledge about the role of special purpose devices and their applications.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE OUTCOMES (CO'S) OF B.Tech II YEAR I & II SEMESTERS

ACADEMIC YEAR:2022-2023

II YEAR -I SEMESTER

Subject Code	Course Name	COs	Outcomes
MA301BS	**NUMERICAL METHODS AND COMPLEX VARIABLES**	CO1	Students will able to express any periodic function in terms of sine and cosine and find the root of a given polynomial and transcendental equations
		CO2	Students are able to estimate the value for the given data using interpolation
		CO3	Students are able to find the numerical solutions for a given first order ODE's
		CO4	Students are able to analyze the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorems
		CO5	Students are able to Taylor's and Laurent's series expansions in complex function

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Subject Code	Course Name	COs	Outcomes
EC302PC	ANALOG CIRCUITS	CO1	Students are able to design the amplifiers with various biasing techniques.
		CO2	Students are able to learn the concepts of high frequency analysis of transistors
		CO3	Students are able to design single stage amplifiers using BJT and FET.
		CO4	Students are able to design multistage amplifiers and understand the concepts of High Frequency Analysis of BJT.
		CO5	Students are able to utilize the concepts of negative feedback to improve the stability of amplifiers and positive feedback to sustained oscillations.

Subject Code	Course Name	COs	Outcomes
EC303PC	NETWORK ANALYSIS AND SYNTHESIS	CO1	Students are able to learn network analysis by applying network topologies
		CO2	Students are able to gain the knowledge on basic RLC circuits behaviour.
		CO3	Students are able to analyse the Steady state and transient analysis of RLC Circuits
		CO4	Students are able to understand about characterizon of two port network parameters.
		CO5	Students will analyse the design aspect of various filters and attenuators

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Subject Code	Course Name	COs	Outcomes
EC304PC	DIGITAL LOGIC DESIGN	CO1	Students are able to acquire the knowledge on numerical information in different forms and Boolean Algebra theorems.
		CO2	Students are able to learn basic techniques for the design of digital circuits and fundamental concepts used in the design of digital systems.
		CO3	Students are able to define Postulates of Boolean algebra and to minimize combinational functions, and design the combinational circuits
		CO4	Students are able to design and analyse sequential circuits for various cyclic functions.
		CO5	Students will characterize logic families and analyze them for the purpose of AC and DC parameters.

Subject Code	Course Name	COs	Outcomes
EC305PC	SIGNALS AND SYSTEMS	CO1	Students are able to Characterize various signals, systems and their time and frequency domain analysis, using transform techniques.
		CO2	Students are able to identify the conditions for transmission of signals through systems and conditions for physical realization of systems.
		CO3	Students are able to understand Laplace and Z-transforms their properties for analysis of signals and systems.
		CO4	Students are able to use sampling theorem for baseband and band pass signals for various types of sampling and for different duty cycles.
		CO5	Students are able to apply the correlation and PSD functions for various applications.

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Subject Code	Course Name	COs	Outcomes
EC306PC	ANALOG CIRCUITS LABORATORY	CO1	Students will able to design amplifiers with required Q point and analyse amplifier characteristics
		CO2	Students are able to calculate h-parameters from the Characteristics through I/O characteristics of CE,CB,CC amplifiers
		CO3	Students are able to examine the effect multistage amplification on frequency response
		CO4	Students are able to characterize LTI systems driven by stationary random process by using ACFs and PSDs.
		CO5	Students are able to understand the concepts of Noise and Information theory in Communication systems

Subject Code	Course Name	COs	Outcomes
EC307PC	DIGITAL LOGIC DESIGN LABORATORY	CO1	Students will able to acquire the knowledge on numerical information in different forms and Boolean Algebra theorems.
		CO2	Students are able to define Postulates of Boolean algebra
		CO3	Students are able to minimize combinational functions, and design the combinational circuits
		CO4	Students are able to design and analyze sequential circuits for various cyclic functions
		CO5	Students are able to characterize logic families and analyze them for the purpose of AC and DC parameters.

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Subject Code	Course Name	COs	Outcomes
EC308PC	BASIC SIMULATION LABORATORY	CO1	Students will able to generate, analyze and perform various operations on Signals/Sequences both in time and Frequency domain
		CO2	Students are able to analyze and Characterize Continuous and Discrete Time Systems both in Time and Frequency domain along with the concept of Sampling
		CO3	Students are able to generate different Random Signals and capable to analyze their Characteristics
		CO4	Students are able to verify sampling theorem
		CO5	Students are able to apply the Concepts of Deterministic and Random Signals for Noise removal Applications and on other Real Time Signals

Subject Code	Course Name	COs	Outcomes
MC309	CONSTITUTION OF INDIA	CO1	Students will able to discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
		CO2	Students are able to discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India
		CO3	Students are able to discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru
		CO4	Students are able to discuss the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution
		CO5	Students are able to discuss the passage of the Hindu Code Bill of 1956.

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IIYEAR-IISEMESTER

Subject Code	Course Name	COs	Outcomes
EC401PC	PROBABILITY THEORY AND STOCHASTIC PROCESSES	CO1	Students will understand the concepts of probability through sets, experiments, sample spaces
		CO2	Students are able to perform operations on single and multiple Random variables.
		CO3	Students are able to determine the Spectral and temporal characteristics of Random Signals
		CO4	Students are able to characterize LTI systems driven by stationary random process by using ACFs and PSDs.
		CO5	Students are able to understand the concepts of Noise and Information theory in Communication systems

Subject Code	Course Name	COs	Outcomes
EC402PC	ELECTROMAGNETIC FIELDS AND TRANSMISSION LINES	CO1	Students will able to acquire the knowledge of Basic Laws, Concept sand proofs related to Electrostatic Fields and Magneto static Fields.
		CO2	Students are able to Characterize the static and time-varying fields, establish the corresponding sets of Maxwell's Equations and Boundary Conditions
		CO3	Students are able to analyze the Wave Equations and classify conductors, dielectrics
		CO4	Students are able to evaluate the UPW Characteristics for several practical media of int
		CO5	Students are able to analyze the Design aspect of transmission line parameters and configurations.

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Subject Code	Course Name	COs		Outcomes
EC403PC	ANALOG AND DIGITAL COMMUNICATIONS	CO1		Students will to develop ability to analyze system requirements of Analog and digital communication systems.
		CO2		Students are able develop ability to analyze system requirements of Analog and digital communication systems. able to design and analyze various Analog and Digital Modulation and Demodulation techniques
		CO3		Students are able to model the noise present in continuous wave Modulation techniques
		CO4		Students are able to acquire the vortical knowledge of each block in AM, FM transmitters and receivers.
		CO5		Students are able to understand the concepts of baseband transmissions.

Subject Code	Course Name	COs		Outcomes
EC404PC	LINEAR AND DIGITAL IC APPLICATIONS	CO1		Students will understand the basic building blocks of linear integrated circuits
		CO2		Students will have a thorough understanding of operational amplifiers with linear integrated circuits
		CO3		Students are able to attain the knowledge of functional diagrams and design applications of IC555 and IC565
		CO4		Students are able to acquire the knowledge and design the Data converters
		CO5		Students are able to choose the proper digital integrated circuits by knowing their characteristics.

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Subject Code	Course Name	COs	Outcomes
EC405PC	ELECTRONIC CIRCUIT ANALYSIS	CO1	Students will design the power amplifiers
		CO2	Students will design the tuned amplifiers and analyse is frequency response
		CO3	Students are able to design Multivibrators and sweep circuits for various applications.
		CO4	Students are able to understand features and methods of Time base generators
		CO5	Students are able to utilize the concepts of synchronization, frequency division and sampling gates.

Subject Code	Course Name	COs	Outcomes
EC406PC	ANALOG AND DIGITAL COMMUNICATIONS LABARATORY	CO1	Students will design and implement various Analog modulation and demodulation Techniques and observe the time and frequency domain characteristics
		CO2	Students will design and understand spectrum analysis of AM and FM
		CO3	Students are able to design and implement various Pulse modulation and demodulation Techniques and observe the time and frequency domain characteristics
		CO4	Students are able to apply different types of Sampling with various Sampling rates and duty Cycles
		CO5	Students are able to design and implement various Digital modulation and demodulation Techniques and observe the waveforms of these modulated Signals practically

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Subject Code	Course Name	COs	Outcomes
EC407PC	LINEAR AND DIGITAL IC APPLICATIONS LABORATORY	CO1	Students will design and implementation of various analog circuits using 741 ICs
		CO2	Students will design and implementation of various Multivibrators using 555 timer.
		CO3	Students will understand to design code converters and verify truth tables
		CO4	Students are able to design and implement various circuits using digital ICs
		CO5	Students are able to design and implement ADC, DAC and voltage regulators.

Subject Code	Course Name	COs	Outcomes
EC408PC	ELECTRONIC CIRCUIT ANALYSIS LABARATORY	CO1	Students will design power amplifiers and find its efficiency
		CO2	Students will design tuned amplifiers and find its Q-factor
		CO3	Students will design various multivibrators and sweep circuits. Understand the necessity of linearity
		CO4	Students are able to design sampling gates and understanding the concepts of frequency division
		CO5	Students will understand to prove practically Schmitt Trigger generates square wave

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Subject Code	Course Name	COs	Outcomes
MC410	GENDER SENSITIZATION LAB	CO1	Students will develop a better understanding of important issues related to gender in contemporary India.
		CO2	Students will be sensitized to basic dimensions of the biolo, sociological, psychological and legal aspects of gender.
		CO3	Students will attain a finer grasp of how gender discrimination works in our society and how to counter it
		CO4	Students will acquire insight into the gendered division of labour and its relation to politics and economics
		CO5	Students will develop a sense of appreciation of women in all walks of life. Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence

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DEPARTMENT : SCIENCE AND HUMANITIES(R22)

Course Outcomes(COs) :B.Tech I YEAR – I and II Semesters

BRANCH : EEE

Academic Year : 2022 -2023

Subject Code	Course Name	COs	Outcomes
MA101BS	**Matrices And Calculus**	CO1	Students are able to do the matrix representation of a set of linear equations and analyse the solution of the system of equations.
		CO2	Students are able to find the Eigenvalues and Eigen vectors and reduce the quadratic form to canonical form using orthogonal transformations.
		CO3	Students are able to do the applications on the mean value theorems and evaluate the improper integrals using Beta and Gamma functions.
		CO4	Students are trained to find the extreme values of functions of two variables with/ without constraints.
		CO5	Students are able to evaluate the multiple integrals and apply the concept to find areas, volumes.

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Subject Code	Course Name	COs	Outcomes
CH102BS	Engineering Chemistry	CO1	Students are able to understand the basic properties of water and its usage in domestic and industrial purposes.
		CO2	Students acquired the basic knowledge of electrochemical procedures related to corrosion and its control.
		CO3	Students learned the fundamentals and general properties of polymers and other engineering materials.
		CO4	Students imbibe the basic concepts of petroleum and its products and predict potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs.
		CO5	Students are able to acquire required knowledge about engineering materials like cement, smart materials and Lubricants.

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Subject Code	Course Name	COs	Outcomes
EE103ES	C Programming and Data Structures	CO1	Students understand the various steps in Program development and explore the basic concepts in C Programming Language.
		CO2	Students learn to develop modular and readable C Programs.
		CO3	Students understand the basic concepts such as Abstract Data Types, Linear and Non-Linear Data structures.
		CO4	Students learn to apply data structures such as stacks, queues in problem solving.
		CO5	Students are able to understand and analyze various searching and sorting algorithms.

Subject Code	Course Name	COs	Outcomes
EE105ES	Electrical Circuit Analysis – I	CO1	Students gained the knowledge in circuits and to understand the fundamentals of derived circuit laws.
		CO2	Students are able to understand network analysis, techniques using mesh and node analysis.
		CO3	Students are able to evaluate steady state and transient behavior of circuits for DC and AC excitations.
		CO4	Students are able to understand Theorems and concepts of coupled circuits.
		CO5	Students are able to analyze electric circuits using network theorems and concepts of coupled circuits.

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Subject Code	Course Name	COs	Outcomes
ME105ES	**Computer Aided Engineering Graphics**	CO1	Students are able to apply computer aided drafting tools to create 2D and 3D objects.
		CO2	Students are able to sketch conics and different types of solids.
		CO3	Students are able to appreciate the need of Sectional views of solids and Development of surfaces of solids.
		CO4	Students are able to read and interpret engineering drawings.
		CO5	Students are enabled to do the Conversion of orthographic projection into isometric view and vice versa manually and by using computer aided drafting.

Subject Code	Course Name	COs	Outcomes
EE106ES	**Elements of Electrical and Electronics Engineering**	CO1	Students are able to measure the electrical parameters for different types of DC and AC circuits using conventional and theorems approach.
		CO2	Students are made to study the transient response of various R, L and C circuits using different excitations.
		CO3	Students are able to determine the performance of different types of DC machines and Transformers.
		CO4	Students are able to verify the basic Electrical circuits through different experiments.
		CO5	Students are able to analyse the transient responses of R, L and C circuits for different input conditions.

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Subject Code	Course Name	COs	Outcomes
EE108ES	C Programming and Data Structures Laboratory	CO1	Students are able to develop modular and readable C Programs.
		CO2	Students are able to solve problems using strings, functions.
		CO3	Students learned to handle data in files.
		CO4	Students learned to implement stacks, queues using arrays, linked lists.
		CO5	Students are able to understand and analyze various searching and sorting algorithms.

Subject Code	Course Name	COs	Outcomes
CH107BS	Engineering Chemistry Laboratory	CO1	Students are able to estimate the hardness of water to check its suitability for drinking purpose.
		CO2	Students are able to perform estimations of acids and bases using conductometry, potentiometry and pH metry methods.
		CO3	Students will learn to prepare polymers such as Bakelite and nylon-6 in the laboratory.
		CO4	Students are able to determine the parameters of rate of corrosion of mild steel in various conditions.
		CO5	Students will learn skills related to the lubricant properties such as saponification value, surface tension and viscosity of oils.

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I Year – II Semester

Subject Code	Course Name	COs	Outcomes
MA201BS	Ordinary Differential Equations and Vector Calculus	CO1	Students learned to identify whether the given differential equation of first order is exact or not .
		CO2	Students are able to solve higher differential equation and apply the concept of differential equation to real world problems.
		CO3	Students are enabled to solve ordinary differential equations using Laplace transforms techniques.
		CO4	Students are able to understand the physical quantities involved in engineering field related to vector valued functions.
		CO5	Students learned the basic properties of vector valued functions and their applications to line, surface and volume integrals

Subject Code	Course Name	COs	Outcomes
PH202BS	Applied Physics	CO1	Students are able to understand the basic principles of quantum physics and band theory of solids.
		CO2	Students are able to understand the underlying mechanism involved in construction and working principles of various semiconductor devices.
		CO3	Students are able to explore the fundamental properties of dielectric, magnetic materials and energy for their applications
		CO4	Students are able to identify the importance of nanoscale, quantum confinement and various fabrications techniques.
		CO5	Students are able to understand various aspects of Lasers and Optical fiber and their applications in diverse fields.

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Subject Code	Course Name	COs	Outcomes
ME203ES	**Engineering Workshop**	CO1	Students are provided with hands on experience about use of different engineering materials, tools, equipments and processes those are common in the engineering field.
		CO2	Students are enabled to study and practice on machine tools and their operations.
		CO3	Made students to practice on manufacturing components using workshop trades including carpentry and fitting.
		CO4	Students are able to apply basic electrical engineering knowledge for house wiring.
		CO5	Students are able to produce welding and joining processes.

Subject Code	Course Name	COs	Outcomes
EN208HS	**English Language and Communication Skills Laboratory**	CO1	Students are enabled to develop their listening skills so that they may appreciate the role in the LSRW skills approach to language and improve their pronunciation.
		CO2	Students are able to understand the nuances of English language through audio- visual experience and group Activities.
		CO3	Students are able to neutralise their accent for intelligibility.
		CO4	Students are trained to use language appropriately for public speaking, group discussions and interviews .
		CO5	Students are able to speak with clarity and confidence which in turn enhances their employability skills.

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Subject Code	Course Name	COs	Outcomes
EE205ES	**Electrical Circuit Analysis - II**	CO1	Students observe the response of various R, L and C circuits for different excitations.
		CO2	Students are able to examine the behavior of circuit using laplace transform and transformation of single port network.
		CO3	Students are able to examine the behavior of circuit using two single port network.
		CO4	Students are able to examine the behavior of circuits using Fourier.
		CO5	Students are able to obtain two port network parameters and applications and design of various filters.

Subject Code	Course Name	COs	Outcomes
EE206ES	**Applied Python Programming Laboratory**	CO1	Students are able to install and run the Python interpreter and learn control structures.
		CO2	Students are able to develop the application specific codes using python.
		CO3	Students are able to understand Strings, Lists, Tuples and Dictionaries in Python
		CO4	Students are able to verify programs using modular approach, file I/O, Python standard library.
		CO5	Students are able to implement Digital Systems using Python.

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Subject Code	Course Name	COs	Outcomes
PH207BS	Applied Physics Laboratory	CO1	Students gain the knowledge on the determination of the Planck's constant using Photo electric effect and identify the material whether it is n-type or p-type by Hall experiment.
		CO2	Students are able to appreciate quantum physics in semiconductor devices and optoelectronics.
		CO3	Students gain the knowledge of applications of dielectric constant.
		CO4	Students are able to understand the variation of magnetic field and behavior of hysteresis curve.
		CO5	Students are able to carry out data analysis.

Subject Code	Course Name	COs	Outcomes
EN208HS	English Language and Communication Skills Laboratory	CO1	Students are enabled to develop their listening skills so that they may appreciate the role in the LSRW skills approach to language and improve their pronunciation.
		CO2	Students are able to understand the nuances of English language through audio- visual experience and group Activities.
		CO3	Students are able to neutralise their accent for intelligibility.
		CO4	Students are trained to use language appropriately for public speaking, group discussions and interviews .
		CO5	Students are able to speak with clarity and confidence which in turn enhances their employability skills.

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Subject Code	Course Name	COs	Outcomes
EE209ES	Electrical Circuit Analysis Laboratory	CO1	Students are able to design electrical systems and analyse them by applying various Network Theorems.
		CO2	Students are able to measure three phase Active and Reactive power.
		CO3	Students are able to understand the locus diagrams and concept of resonance.
		CO4	Students are able to analyze complex DC and AC linear circuits Apply concepts of electrical circuits across engineering.
		CO5	Students are enabled to evaluate response of a given network by using theorems.

Subject Code	Course Name	COs	Outcomes
*MC210	Environmental Science	CO1	Students are able to understand the importance of ecological balance for sustainable development.
		CO2	Students are able to understand the impacts of developmental activities and mitigation measures.
		CO3	Students are able to understand the environmental policies and regulations
		CO4	Students will be evaluate technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development
		CO5	Students will be develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development

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DEPARTMENT : ELECTRICAL AND ELECTRONICS ENGINEERING(R22)

Course Outcomes(COs) :B.Tech II YEAR – I Semester

Academic Year : 2022 -2023

Subject Code	Course Name	COs	Outcomes
MA301BS	**Numerical Methods and Complex variables**	CO1	Students are able to express any periodic function in terms of sine and cosine and find the root of a given polynomial and transcendental equations.
		CO2	Students are able to estimate the value for the given data using interpolation
		CO3	Students are able to find the numerical solutions for a given first order ODE's.
		CO4	Students are able to analyze the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorems.
		CO5	Students are able to Taylor's and Laurent's series expansions in complex function

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Subject Code	Course Name	COs	Outcomes
EE302PC	Electrical Machines-I	CO1	Students are able to study and understand different types of DC machines and their performance evaluation through various testing methods.
		CO2	Students are enabled to understand the operation of single and ploy-phase Transformers
		CO3	Students are able to identify different parts of a DC machines & understand their operation
		CO4	Students are able to carry out different excitation, starting, speed control methods and testing of DC machines
		CO5	Students are able to analyze single & three phase transformers and their performance through testing.

Subject Code	Course Name	COs	Outcomes
EE304PC	Analog Electronic Circuits	CO1	Students learn the characteristics, utilization of various components.
		CO2	Students are able to understand the biasing techniques.
		CO3	Students learn to design and analyze various rectifiers, small signal amplifier circuits
		CO4	Students learn to design sinusoidal and non-sinusoidal oscillators.
		CO5	Students learn the designs of OP-AMP based circuits with linear integratedcircuits.

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Subject Code	Course Name	COs	Outcomes
EE303PC	Power System-I	CO1	Students are able to understand the power generation through conventional and non-conventional sources
		CO2	Students are able to illustrate the economic aspects of power generation and tariff methods.
		CO3	Students are able to understand the operation of conventional and renewable electrical power generating stations.
		CO4	Students are able to evaluate the power tariff methods and Economics associated with power generation
		CO5	Students are enabled to analyze the operations of AIS & GIS, Insulators and Distribution systems

Subject Code	Course Name	COs	Outcomes
EE305PC	Electro Magnetic Fields	CO1	Students are introduced to the concepts of electric field and magnetic field.
		CO2	Students learn the applications of electric and magnetic fields in the development of the theory for power transmission linesand electrical machines.
		CO3	Students are able to understand the basic laws of electromagnetism and their applications.
		CO4	Students are enabled to analyze time varying electric and magnetic fields.
		CO5	Students are able to understand the propagation of EM waves.

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Subject Code	Course Name	COs	Outcomes
EE306PC	Electrical Machines Laboratory-I	CO1	Students are exposed to the operation of DC Generators.
		CO2	Students gained the knowledge in the operation of various types of DC Motors.
		CO3	Students learned to start and control the Different DC Machines.
		CO4	Students are able to assess the performance of different machines using different testing methods.
		CO5	Students are able to evaluate the performance of different Transformers using different testing methods.

Subject Code	Course Name	COs	Outcomes
EE308PC	Electrical Simulation tools Laboratory	CO1	Students are able to understand basic block sets of different simulation platform used in electrical/electronic circuit design.
		CO2	Students are able to understand use and coding in different software tools used in electrical/ electronic circuit Design.
		CO3	Students develop the knowledge of software packages to model and program electrical and electronics Systems.
		CO4	Students learn to model different electrical and electronic systems and analyze the results
		CO5	Students learn to articulate importance of software packages used for simulation in laboratory experimentation by analyzing the simulation results.

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Subject Code	Course Name	COs	Outcomes
EE307PC	**Analog Electronic Circuits Laboratory**	CO1	Students learn the characteristics, utilization of various components.
		CO2	Students are able to understand the biasing techniques.
		CO3	Students learn to design and analyze various rectifiers, small signal amplifier circuits
		CO4	Students learn to design sinusoidal and non-sinusoidal oscillators.
		CO5	Students learn the designs of OP-AMP based circuits with linear integrated circuits.

Subject Code	Course Name	COs	Outcomes
*MC309	**Gender Sensitization Laboratory**	CO1	Students will have developed a better understanding of important issues related to gender in contemporary India.
		CO2	Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
		CO3	Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
		CO4	Students will acquire insight into the gendered division of labor and its relation to politics and economics.
		CO5	Students will develop a sense of appreciation of women in all walks of life

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II Year – II Semester

Subject Code	Course Name	COs	Outcomes
EE401PC	Solid Mechanics & Hydraulic Machines	CO1	Students are enabled to identify an appropriate structural system and work comfortably with basic engineering mechanics and types of loading & support conditions that act on structural systems.
		CO2	Students are able to understand the meaning of centers of gravity, centroids, moments of Inertia and rigid body dynamics.
		CO3	Students are able to solve problems dealing with forces, beam and cable problems and understand distributed force systems.
		CO4	Students are able to solve friction problems and determine moments of Inertia and centroid of practical shapes.
		CO5	Students are enabled to apply knowledge of mechanics in addressing problems in hydraulic machinery and its principles that will be utilized in Hydropower development and for other practical usages.

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Subject Code	Course Name	COs	Outcomes
EE402PC	Measurements and Instrumentation	CO1	Students are introduced to the basic principles of all measuring instruments.
		CO2	Students are enabled to deal with the measurement of voltage, current, Power factor, power, energy and magnetic measurements.
		CO3	Students are able to understand different types of measuring instruments, their construction, operation and characteristics and identify the instruments suitable for typical measurements.
		CO4	Students are able to apply the knowledge about transducers and instrument transformers to use them effectively
		CO5	Students are able to apply the knowledge of smart and digital metering for industrial applications.

Subject Code	Course Name	COs	Outcomes
EE403PC	Electrical Machines–II	CO1	Students learn the detailed analysis of poly-phase induction motors & Alternators.
		CO2	Students are able to understand operation, construction and types of single-phase motors and their applications in household appliances and control systems.
		CO3	Students are enabled to understand the concepts of rotating magnetic fields
		CO4	Students learn to examine the operation of ac machines.
		CO5	Students learn to analyze the performance characteristics of ac machines.

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Subject Code	Course Name	COs	Outcomes
EE404PC	Digital Electronics	CO1	Students learn the fundamental concepts of digital system design and common forms of number representations and their conversions.
		CO2	Students are enabled to implement and design logical operations using combinational logic circuits and sequential logic circuits.
		CO3	Students are able to understand the working of logic families and logic gates
		CO4	Students learn to design and implement Combinational and Sequential logic circuits
		CO5	Students are able to implement the given logical problems using programmable logic devices.

Subject Code	Course Name	COs	Outcomes
EE406PC	Digital Electronics Laboratory	CO1	Students learn the basic techniques for the design of digital circuits and number conversion systems.
		CO2	Students learn to implement simple logical operations using combinational logic circuits.
		CO3	Students are able to understand the working of logic families and logic gates.
		CO4	Students learn to design and implement Combinational and Sequential logic circuits.
		CO5	Students are able to analyze different types of semiconductor memories.

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Subject Code	Course Name	COs	Outcomes
EE405PC	Power System-II	CO1	Students study the performance of transmission lines and travelling waves.
		CO2	Students are able to understand the concept of voltage control, compensation methods and per unit representation of power systems.
		CO3	Students learn to analyze transmission line performance and Apply load compensation techniques to control reactive power.
		CO4	Students are able to understand the application of per unit quantities in power systems.
		CO5	Students learn to design over voltage protection, insulation coordination and determine the fault currents for symmetrical and unbalanced faults.

Subject Code	Course Name	COs	Outcomes
EE407PC	Measurements and Instrumentation Laboratory	CO1	Students learn to calibrate Watt, Energy and PF Meter and determination of three phase active & reactive powers
		CO2	Students are able to determine unknown inductance, resistance, capacitance by performing experiments on D.C Bridges & A. C Bridges.
		CO3	Students learn to choose and test any measuring instruments
		CO4	Students are able to find the accuracy of any instrument by performing experiments.
		CO5	Students are able to calculate the various parameters using different types of measuring instruments.

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Subject Code	Course Name	COs	Outcomes
EE408PC	Electrical Machines Laboratory-II	CO1	Students are able to understand the operation of Induction, Synchronous machines and Transformers.
		CO2	Students study the performance analysis of Induction and Synchronous Machines through various testing methods.
		CO3	Students are able to assess the performance of different types of AC machines using different testing methods.
		CO4	Students learn to analyze the suitability of AC machines and Transformers for real word applications.
		CO5	Students are able to design the machine models based on the application requirements.

Subject Code	Course Name	COs	Outcomes
*MC410	Constitution of India	CO1	Students will be able to understand the premises informing the twin themes of liberty and freedom from a civil rights perspective.
		CO2	Students will be able to discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
		CO3	Students are able to discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India.
		CO4	Students will be able to discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution
		CO5	Students will be able to address the growth of Indian opinion regarding modern Indian intellectuals' constitutional role and entitlement to civil and economic rights as well as the emergence of nationhood in the early years of Indian nationalism

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DEPARTMENT : SCIENCE AND HUMANITIES(R22)

Course Outcomes(COs) :B.Tech I YEAR – I and II Semesters

Artificial Intelligence and Data Sciences

Academic Year : 2022 -2023

I Year – I Semester

Subject Code	Course Name	COs	Outcomes
MA101BS	**Matrices And Calculus**	CO1	Students are able to do the matrix representation of a set of linear equations and analyse the solution of the system of equations.
		CO2	Students are able to find the Eigenvalues and Eigen vectors and reduce the quadratic form to canonical form using orthogonal transformations.
		CO3	Students are able to do the applications on the mean value theorems and evaluate the improper integrals using Beta and Gamma functions.
		CO4	Students are trained to find the extreme values of functions of two variables with/ without constraints.
		CO5	Students are able to evaluate the multiple integrals and apply the concept to find areas, volumes.

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Subject Code	Course Name	COs	Outcomes
CS103ES	Programming for Problem Solving	CO1	Students are trained to write algorithms and to draw flowcharts for solving problems.
		CO2	Students are able to use arrays, pointers, strings and structures to write C programs
		CO3	Students learned the syntax and semantics of the C programming language
		CO4	Students are able to decompose a problem into functions and to develop modular reusable code.
		CO5	Students are trained to search and sort problems.

Subject Code	Course Name	COs	Outcomes
PH202BS	Applied Physics	CO1	Students are able to understand the basic principles of quantum physics and band theory of solids.
		CO2	Students are able to understand the underlying mechanism involved in construction and working principles of various semiconductor devices.
		CO3	Students are able to explore the fundamental properties of dielectric, magnetic materials and energy for their applications
		CO4	Students are able to identify the importance of nanoscale, quantum confinement and various fabrications techniques.
		CO5	Students are able to understand various aspects of Lasers and Optical fiber and their applications in diverse fields.

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Subject Code	Course Name	COs	Outcomes
EN204HS	English for Skill Enhancement	CO1	Students are trained to develop study skills and communication skills in various professional situations.
		CO2	Students are able to understand the importance of vocabulary and sentence structures and choose appropriate vocabulary and sentence structures for their oral and written communication.
		CO3	Students are able to demonstrate their understanding of the rules of functional grammar.
		CO4	Students are trained to develop comprehension skills from the known and unknown passages and take an active part in drafting paragraphs, letters, essays, abstracts, précis and reports in various contexts.
		CO5	Students are able to acquire basic proficiency in reading and writing modules of English.

Subject Code	Course Name	COs	Outcomes
CS106ES	Elements of Computer Science & Engineering	CO1	Students learned the working principles of functional units of a basic computer.
		CO2	Students are able to understand program development, the use of data structures and algorithms in problem Solving.
		CO3	Students learned about need and types of operating system, database systems.
		CO4	Students are enabled to understand the significance of networks, internet, WWW and cyber security.
		CO5	Students are able to understand Autonomous systems, the application of artificial intelligence.

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Subject Code	Course Name	COs	Outcomes
CS108ES	Programming for Problem Solving Laboratory	CO1	Students are able to formulate the algorithms for simple problems and translate given algorithms to a working and correct program.
		CO2	Students are able to correct syntax errors as reported by the compilers and identify and correct logical errors encountered during execution.
		CO3	Students are able to represent and manipulate data with arrays, strings and structures.
		CO4	Students are able to use pointers of different types.
		CO5	Students are able to create, read and write to and from simple text and binary files and modularize the code with functions so that they can be reused.

Subject Code	Course Name	COs	Outcomes
PH207BS	Applied Physics Laboratory	CO1	Students gain the knowledge on the determination of the Planck's constant using Photo electric effect and identify the material whether it is n-type or p-type by Hall experiment.
		CO2	Students are able to appreciate quantum physics in semiconductor devices and optoelectronics.
		CO3	Students gain the knowledge of applications of dielectric constant.
		CO4	Students are able to understand the variation of magnetic field and behavior of hysteresis curve.
		CO5	Students are able to carry out data analysis.

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Subject Code	Course Name	COs	Outcomes
EN208HS	English Language and Communication Skills Laboratory	CO1	Students are enabled to develop their listening skills so that they may appreciate the role in the LSRW skills approach to language and improve their pronunciation.
		CO2	Students are able to understand the nuances of English language through audio- visual experience and group Activities.
		CO3	Students are able to neutralise their accent for intelligibility.
		CO4	Students are trained to use language appropriately for public speaking, group discussions and interviews□.
		CO5	Students are able to speak with clarity and confidence which in turn enhances their employability skills.

Subject Code	Course Name	COs	Outcomes
*MC210	Environmental Science	CO1	Students are able to understand the importance of ecological balance for sustainable development.
		CO2	Students are able to understand the impacts of developmental activities and mitigation measures.
		CO3	Students are able to understand the environmental policies and regulations
		CO4	Students will be evaluate technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development
		CO5	Students will be develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development

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Subject Code	Course Name	COs	Outcomes
ME203ES	**Engineering Workshop**	**CO1**	Students are provided with hands on experience about use of different engineering materials, tools, equipments and processes those are common in the engineering field.
		CO2	Students are enabled to study and practice on machine tools and their operations.
		CO3	Made students to practice on manufacturing components using workshop trades including carpentry and fitting.
		CO4	Students are able to apply basic electrical engineering knowledge for house wiring.
		CO5	Students are able to produce welding and joining processes.

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I Year – II Semester

Subject Code	Course Name	COs	Outcomes
MA201BS	Ordinary Differential Equations and Vector Calculus	CO1	Students learned to identify whether the given differential equation of first order is exact or not□.
		CO2	Students are able to solve higher differential equation and apply the concept of differential equation to real world problems.
		CO3	Students are enabled to solve ordinary differential equations using Laplace transforms techniques.
		CO4	Students are able to understand the physical quantities involved in engineering field related to vector valued functions.
		CO5	Students learned the basic properties of vector valued functions and their applications to line, surface and volume integrals

Subject Code	Course Name	COs	Outcomes
CH102BS	Engineering Chemistry	CO1	Students are able to understand the basic properties of water and its usage in domestic and industrial purposes.
		CO2	Students acquired the basic knowledge of electrochemical procedures related to corrosion and its control.
		CO3	Students learned the fundamentals and general properties of polymers and other engineering materials.
		CO4	Students imbibe the basic concepts of petroleum and its products and predict potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs.
		CO5	Students are able to acquire required knowledge about engineering materials like cement, smart materials and Lubricants.

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Subject Code	Course Name	COs	Outcomes
EE104ES	**Basic Electrical Engineering**	CO1	Students are able to understand and analyze basic Electrical circuits.
		CO2	Students are able to understand Single & Three phase AC circuits.
		CO3	Students studied the construction and working principle of Transformers.
		CO4	Students studied the construction and working principle of different type of DC Machines and AC Machines.
		CO5	Students gained the knowledge of various electrical installations and the concept of power, power factor and its improvement.

Subject Code	Course Name	COs	Outcomes
ME105ES	**Computer Aided Engineering Graphics**	CO1	Students are able to apply computer aided drafting tools to create 2D and 3D objects.
		CO2	Students are able to sketch conics and different types of solids.
		CO3	Students are able to appreciate the need of Sectional views of solids and Development of surfaces of solids.
		CO4	Students are able to read and interpret engineering drawings□.
		CO5	Students are enabled to do the Conversion of orthographic projection into isometric view and vice versa manually and by using computer aided drafting.

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Subject Code	Course Name	COs	Outcomes
EC205ES	Electronic Devices and Circuits	CO1	Students are able to understand the characteristics of Diodes
		CO2	Students acquired the knowledge on applications of Diodes.
		CO3	Students learned the principle of operations and different types of configuration of Bipolar Junction Transistors(BJT)
		CO4	Students learned the principle of operations and different types of configuration of JFET.
		CO5	Students acquired the knowledge about the role of special purpose devices and their applications.

Subject Code	Course Name	COs	Outcomes
CH107BS	Engineering Chemistry Laboratory	CO1	Students are able to estimate the hardness of water to check its suitability for drinking purpose.
		CO2	Students are able to perform estimations of acids and bases using conductometry, potentiometry and pH metry methods.
		CO3	Students will learn to prepare polymers such as Bakelite and nylon-6 in the laboratory.
		CO4	Students are able to determine the parameters of rate of corrosion of mild steel in various conditions.
		CO5	Students will learn skills related to the lubricant properties such as saponification value, surface tension and viscosity of oils.

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Subject Code	Course Name	COs	Outcomes
EE109ES	Basic Electrical Engineering Laboratory	CO1	To measure the electrical parameters for different types of DC and AC circuits using conventional and theorems approach.
		CO2	Students are able to understand the response of different types of Electrical circuits for different excitations.
		CO3	Students are able to determine the performance of DC Shunt Machine.
		CO4	Students are able to determine the performance of Three phase induction motors.
		CO5	Students are able to understand basic characteristics of Transformers and its calculations.

Subject Code	Course Name	COs	Outcomes
CS206ES	Python Programming Laboratory	CO1	Students are able to install and run the Python interpreter and learn control structures.
		CO2	Students are able to develop the application specific codes using python.
		CO3	Students are able to understand Strings, Lists, Tuples and Dictionaries in Python
		CO4	Students are able to verify programs using modular approach, file I/O, Python standard library.
		CO5	Students are able to implement Digital Systems using Python.

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Subject Code	Course Name	COs	Outcomes
CS209ES	**IT Workshop**	CO1	Students learn to perform Hardware troubleshooting.
		CO2	Students are able to understand Hardware components and inter dependencies.
		CO3	Students learn to safeguard computer systems from viruses/worms□.
		CO4	Students are able to do Document/ Presentation preparation.
		CO5	Students are able to perform calculations using spreadsheets.

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DEPARTMENT : ARTIFICIAL INTELLIGENCE AND DATA SCIENCES(CSE)(R22)

Course Outcomes(COs) :B.Tech II YEAR – I Semester

Academic Year : 2022 -2023

Subject Code	Course Name	COs	Outcomes
AD301PC	Mathematical and Statistical Foundations	CO1	Students are able to understand the Number Theory basic concepts useful for cryptography etc
		CO2	Students are able to apply the number theory concepts to cryptography domain
		CO3	Students are able to apply the concepts of probability and distributions to some case studies
		CO4	Students learn to correlate the material of one unit to the material in other units
		CO5	Students are able to resolve the potential misconceptions and hazards in each topic of study

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Subject Code	Course Name	COs	Outcomes
AD302PC	Digital Electronics	CO1	Students learn the fundamental concepts of digital system design and common forms of number representations and their conversions
		CO2	Students are enabled to implement and design logical operations using combinational logic circuits and sequential logic circuits.
		CO3	Students are able to understand the working of logic families and logic gates
		CO4	Students learn to design and implement Combinational and Sequential logic circuits
		CO5	Students are able to implement the given logical problems using programmable logic devices.

Subject Code	Course Name	COs	Outcomes
AD303PC	Data Structures	CO1	Students are able to select the data structures that efficiently model the information in a problem.
		CO2	Students are able to assess efficiency trade-offs among different data structure implementations or combinations.
		CO3	Students are enabled to implement and know the application of algorithms for sorting and pattern matching.
		CO4	Students are able to design programs using a variety of data structures, including hash tables, binary and general tree structures, search trees,
		CO5	Students are able to understand Autonomous systems, the application of artificial intelligence.

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Subject Code	Course Name	COs	Outcomes
AD304PC	Object Oriented Programm i-ng Through JAVA	CO1	Students are able to demonstrate the behavior of programs involving the basic programming constructs like control structures, constructors, string handling and garbage collection.
		CO2	Students are able to demonstrate the implementation of inheritance (multilevel, hierarchical and multiple) by using extend and implement keywords
		CO3	Students are able to use multithreading concepts to develop inter process communication.
		CO4	Students are able to understand the process of graphical user interface design and implementation using AWT or swings
		CO5	Students are enabled to develop applets that interact abundantly with the client environment and deploy on the server

Subject Code	Course Name	COs	Outcomes
AD305PC	Computer Organization and Architecture	CO1	Students are able to understand the basics of instruction sets and their impact on processor design.
		CO2	Students learn to demonstrate an understanding of the design of the functional units of a digital computer system.
		CO3	Students are able to evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory.
		CO4	Students are enabled to design a pipeline for consistent execution of instructions with minimum hazards.
		CO5	Students are able to recognize and manipulate representations of numbers stored in digital computers.

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Subject Code	Course Name	COs	Outcomes
AD306PC	**Digital Electronics Laboratory**	CO1	Students learn the basic techniques for the design of digital circuits and number conversion systems.
		CO2	Students learn to implement simple logical operations using combinational logic circuits.
		CO3	Students are able to understand the working of logic families and logic gates.
		CO4	Students learn to design and implement Combinational and Sequential logic circuits.
		CO5	Students are able to analyze different types of semiconductor memories.

Subject Code	Course Name	COs	Outcomes
AD307PC	**Introduction to Data Structures Lab**	CO1	Students are able to develop C programs for computing and real-life applications using basic elements like control statements, arrays, functions, pointers and strings, and data structures like stacks, queues and linked lists.
		CO2	Students are able to Implement searching and sorting algorithms
		CO3	Students learn the various concepts of C programming language
		CO4	Students are able to understand searching and sorting algorithms.
		CO5	Students are able to understand the data structures such as stacks and queues.

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Subject Code	Course Name	COs	Outcomes
AD308PC	Java Programming Lab	CO1	Students are able to understand Java collection framework.
		CO2	Students are able to write the programs for solving real world problems using Java OOP principles.
		CO3	Students are enabled to write programs using Exceptional Handling approach.
		CO4	Students are able to write multithreaded applications
		CO5	Students are able to write GUI programs using swing controls in Java.

Subject Code	Course Name	COs	Outcomes
AD309PC	Data visualization- R Programming/ Power BI	CO1	Understand How to import data into Tableau
		CO2	Understand Tableau concepts of Dimensions and Measures.
		CO3	Develop Programs and understand how to map Visual Layouts and Graphical Properties
		CO4	Create a Dashboard that links multiple visualizations
		CO5	Use graphical user interfaces to create Frames for providing solutions to real world problems.

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Subject Code	Course Name	COs	Outcomes
*MC310	**Constitution of India**	CO1	Students will be able to understand the premises informing the twin themes of liberty and freedom from a civil rights perspective.
		CO2	Students will be able to discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
		CO3	Students are able to discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India.
		CO4	Students will be able to discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution
		CO5	Students will be able to address the growth of Indian opinion regarding modern Indian intellectuals' constitutional role and entitlement to civil and economic rights as well as the emergence of nationhood in the early years of Indian nationalism

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II YEAR – II SEMESTER

Subject Code	Course Name	COs	Outcomes
AD401PC	Discrete Mathematics	CO1	Students are able to understand and construct precise mathematical proofs
		CO2	Students are able to apply logic and set theory to formulate precise statements
		CO3	Students are able to analyze and solve counting problems on finite and discrete structures
		CO4	Students are able to describe and manipulate sequences
		CO5	Students learn to apply graph theory in solving computing problems

Subject Code	Course Name	COs	Outcomes
AD402PC	Introduction to Artificial Intelligence	CO1	Students are able to apply AI techniques to solve problems of game playing, theorem proving, and machine learning.
		CO2	Students are able to learn different knowledge representation techniques
		CO3	Students are able to understand the concepts of state space representation, exhaustive search, heuristic search together with the time and space complexities.
		CO4	Students are able to comprehend the applications of Probabilistic Reasoning and Bayesian Networks
		CO5	Students are enabled to analyze Supervised Learning Vs. Learning Decision Trees.

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Subject Code	Course Name	COs	Outcomes
AD403PC	Database Management Systems	CO1	Students are able to gain knowledge of fundamentals of DBMS, database design and normal form
		CO2	Students are able to understand the basics of relational model, relational algebra and calculus
		CO3	Students are able to master the basics of SQL for retrieval and management of data
		CO4	Students are able to understand basics of transaction processing and concurrency control.
		CO5	Students learn to learn familiarity with database storage structures and access techniques

Subject Code	Course Name	COs	Outcomes
AD404PC	Operating systems	CO1	Students are able to control access to a computer and the files that may be shared
		CO2	Students are able to demonstrate the knowledge of the components of computers and their respective roles in computing
		CO3	Students are able to recognize and resolve user problems with standard operating environments
		CO4	Students are able to gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively.
		CO5	Students learn to understand various file system interface and operations

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Subject Code	Course Name	COs	Outcomes
AD405PC	Software Engineering	CO1	Students are able to translate end-user requirements into system and software requirements, using e.g. UML
		CO2	Students are able to structure the requirements in a Software Requirements Document (SRD)
		CO3	Students are able to Identify and apply appropriate software architectures and patterns to carry out high level design of a system
		CO4	Students are able to critically compare alternative choices
		CO5	Students will have experience and/or awareness of testing problems and will be able to develop a simple testing report

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Subject Code	Course Name	COs	Outcomes
AD406PC	Operating Systems Lab	CO1	Students are able to simulate a program for various cpu scheduling algorithm
		CO2	Students are able to simulate bankers algorithm for dead lock avoidance and prevention
		CO3	Students are able to implement various system call functions and inter process communication mechanisms
		CO4	Students are able to simulate memory management techniques
		CO5	Students are able to simulate page replacement policies

Subject Code	Course Name	COs	Outcomes
AD407PC	Database Management Systems Lab	CO1	Students are able to implement the concept design with ER and relational model
		CO2	Students are able to design database schema for a given application and apply normalization
		CO3	Students are able to acquire skills in using SQL commands
		CO4	Students are able to develop solutions for database applications using procedures, cursors and triggers
		CO5	Students learn to design a data base for a given real time problem.

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Subject Code	Course Name	COs	Outcomes
AD409PC	NODE JS/ REACT JS/ DJANGO	CO1	Students are able to build a custom website with HTML, CSS, and Bootstrap and little Java Script
		CO2	Students are able to demonstrate advanced features of JavaScript and learn about JDBC
		CO3	Students are able to develop Server – side implementation using Java technologies like
		CO4	Students are able to develop the server – side implementation using Node JS.
		CO5	Students are able to design a Single Page Application using React.

Subject Code	Course Name	COs	Outcomes
*MC410	Gender sensitization lab	CO1	Students are able to develop students' sensibility with regard to issues of gender in contemporary India.
		CO2	Students are able to provide a critical perspective on the socialization of men and women
		CO3	Students are able to introduce students to information about some key biological aspects of genders.
		CO4	Students are able to expose the students to debates on the politics and economics of work.
		CO5	Students learn to help students reflect critically on gender violence and to expose students to more egalitarian interactions between men and women

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COURSE OUTCOME'S (CO's): M.Tech I YEAR I AND II SEMESTERS

ACADEMIC YEAR: 2022-2023

I YEAR: I SEMESTER

Subject Code	Course Name	CO's	Outcomes
	Mathematical Foundations of Computer Science	CO1	Ability to understand and construct precise mathematical proofs.
		CO2	Ability to use logic and set theory to formulate precise statements.
		CO3	Ability to analyze and solve counting problems on finite and discrete structures.
		CO4	Ability to describe and manipulate sequences.
		CO5	Ability to apply graph theory in solving computing problems.

Subject Code	Course Name	CO's	Outcomes
	Advanced Data Structures	CO1	Understand Heap Structures, hashing and collisions
		CO2	Understand search structures like OBST, AVL Trees, Red-Black Trees and Splay Trees.
		CO3	Ability to select the data structures that efficiently model the information in a problem
		CO4	Ability to understand how the choice of data structures impact the performance of programs
		CO5	Design programs using a variety of data structures, including hash tables, search structures and digital search structures

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COURSE OUTCOME'S (CO's): M.Tech I YEAR I AND II SEMESTERS

ACADEMIC YEAR: 2022-2023

I YEAR: I SEMESTER

Subject Code	Course Name	CO's	Outcomes
	Mathematical Foundations of Computer Science	CO1	Ability to understand and construct precise mathematical proofs.
		CO2	Ability to use logic and set theory to formulate precise statements.
		CO3	Ability to analyze and solve counting problems on finite and discrete structures.
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		CO5	Ability to apply graph theory in solving computing problems.

Subject Code	Course Name	CO's	Outcomes
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Subject Code	Course Name	CO's	Outcomes
		CO1	Understand importance of PL/SQL basics
		CO2	Understand language fundamentals and control structures
	Database Programming with PL/SQL	CO3	Understand packages
		CO4	Implement functions and procedures using PL/SQL
		CO5	Understand the importance of triggers in database

Subject Code	Course Name	CO's	Outcomes
		CO1	Implement deep learning algorithms
		CO2	understand neural networks and traverse the layers of data
	Deep Learning	CO3	Learn topics such as convolutional neural networks, recurrent neural networks, training deep networks and high-level interfaces
		CO4	Understand applications of Deep Learning to Computer Vision
		CO5	Understand and analyze Applications of Deep Learning to NLP

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Subject Code	Course Name	CO's	Outcomes
	Natural Language Processing	CO1	Show sensitivity to linguistic phenomena and an ability to model them with formal grammars.
		CO2	Understand and carry out proper experimental methodology for training and evaluating empirical NLP systems
		CO3	Able to manipulate probabilities, construct statistical models over strings and trees, and estimate parameters using supervised and unsupervised training methods.
		CO4	Able to design, implement, and analyze NLP algorithms Able to design different language modeling Techniques.
		CO5	Able to design different language modeling Techniques.

Subject Code	Course Name	CO's	Outcomes
	APPLIED CRYPTOGRAPHY	CO1	Understand the various cryptographic protocols
		CO2	Understand Cryptographic Techniques
		CO3	Analyze key length and algorithm types and modes
		CO4	Illustrate different public key algorithms in cryptosystems
		CO5	Understand special algorithms for protocols and usage in the real world

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Subject Code	Course Name	CO's	Outcomes
	Software Quality Engineering	CO1	Understand software quality and its perspectives
		CO2	Understand software quality assurance and its process
		CO3	Analyze defect prevention and defect reduction in software quality assurance
		CO4	Illustrate software quality engineering activities and its process
		CO5	Understand Checklist based testing and its limitations

DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING			
Course Outcomes (CO's): M.Tech I Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	Advanced Data Structures Lab	CO1	Ability to select the data structures that efficiently model the information in a problem.
		CO2	Ability to assess efficiency trade-offs among different data structure implementations or combinations.
		CO3	Implement and know the application of algorithms for sorting and pattern matching.
		CO4	Design programs using a variety of data structures, including hash tables, binary and general tree structures, search trees, tries, heaps, graphs, and B-trees.
		CO5	Able to implement all the functions of a dictionary using hashing

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Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	Research Methodology & IPR	CO1	Understand research problem formulation.
		CO2	Analyze research related information. Follow research ethics
		CO3	Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity.
		CO4	Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasis the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular.
		CO5	Understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about, economic growth and social benefits.

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I YEAR: II SEMESTER

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Course Outcomes (CO's): M.Tech I Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	Advanced Algorithms	CO1	Understand various sorting algorithms
		CO2	Understand Edmond's Blossom algorithm to compute augmenting path.
		CO3	Analyze the complexity/performance of different algorithms.
		CO4	Determine the appropriate data structure for solving a particular set of problems.
		CO5	Categorize the different problems in various classes according to their complexity.

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Course Outcomes (CO's): M.Tech I Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	Advanced Computer Architecture	CO1	Understand the concepts and principles of parallel and advanced computer architectures.
		CO2	Understand shared memory organizations
		CO3	Computational models and Computer Architectures.
		CO4	Concepts of parallel computer models.
		CO5	Scalable Architectures, Pipelining, Superscalar processors

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Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	Enterprise Cloud Concepts	CO1	Understand importance of cloud architecture
		CO2	Understand Cloud-Enabling Technology
		CO3	Illustrating the fundamental concepts of cloud security.
		CO4	Analyze various cloud computing mechanisms
		CO5	Understanding the architecture and working of cloud computing.

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Course Outcomes (CO's): M.Tech I Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	Advanced Computer Networks	CO1	Understand the basics of wireless and mobile networking
		CO2	Understand multimedia networking.
		CO3	Understanding of holistic approach to computer networking
		CO4	Ability to understand the computer network protocols and their applications
		CO5	Ability to design simulation concepts related to packet forwarding in networks.

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Subject Code	Course Name	CO's	Outcomes
	Edge Analytics	CO1	Understand the concepts of Edge Analytics, both in theory and in practical application.
		CO2	Demonstrate a comprehensive understanding of different tools used at edge analytics.
		CO3	Formulate, Design and Implement the solutions for real world edge analytics.
		CO4	Understand Cloud Service providers
		CO5	Designing a Smart Doorbell with Visual Recognition setting up the environment

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Course Outcomes (CO's): M.Tech I Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	Bioinformatics	CO1	Understand the Central Dogma & XML (Bio XML) for Bioinformatics
		CO2	Analyze Perl (Bioperl) for Bioinformatics
		CO3	Illustrate Databases technology, architecture and its interfaces
		CO4	Understand Sequence Alignment Algorithms.
		CO5	Understand Phylogenetic Analysis

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Academic Year: 2018 - 2019			
Subject Code	**Course Name**	**CO's**	**Outcomes**
	Nature Inspired Computing	CO1	Understand the Models of Life and Intelligence
		CO2	Familiar with Genetic algorithm and its applications.
		CO3	Compare different Ant Colony Optimization algorithmic models.
		CO4	Compare different Artificial Bee Colony Optimization algorithmic models.
		CO5	Illustrate Particle swam optimization algorithm with an example.

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Course Outcomes (CO's): M.Tech I Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	**Course Name**	**CO's**	**Outcomes**
	Robotic Process Automation	CO1	Understand Robotic Process Automation & Bot Creation
		CO2	Describe RPA, where it can be applied and how it's implemented
		CO3	Identify and understand Web Control Room and Client Introduction
		CO4	Understand how to handle various devices and the workload
		CO5	Understand Bot creators, Web recorders and task editors

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DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING			
Course Outcomes (CO's): M.Tech I Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	Advanced Algorithms Lab	CO1	Able to analyze the performance of algorithms
		CO2	Perform multiplication of long integers using divide and conquer method
		CO3	Implement a solution for the knapsack problem using the Greedy method
		CO4	Implement Gaussian elimination method
		CO5	Implement Harspool algorithm

DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING			
Course Outcomes (CO's): M.Tech I Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	Professional Elective - III Lab (ENTERPRISE CLOUD CONCEPTS LAB)	CO1	Understand importance of cloud architecture
		CO2	Illustrating the fundamental concepts of cloud security
		CO3	Analyze various cloud computing mechanisms
		CO4	Understanding the architecture and working of cloud computing.
		CO5	Understand Hadoop single node cluster and run simple applications like word count.

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Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
		CO1	Understand the selection of Projects
		CO2	Learn to collect data
		CO3	Learn to analyze the data
		CO4	Learn to implement the project
	Mini Project with Seminar	CO5	understand the tools for testing

II YEAR: I SEMESTER

DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING			
Course Outcomes (CO's): M.Tech II Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
		CO1	Understand relevant legislation and codes of ethics.
		CO2	Understand Cyber Crime Scene Analysis
	Digital Forensics	CO3	Computer forensics and digital detective and various processes, policies and procedures.
		CO4	E-discovery, guidelines and standards, E-evidence, tools and environment.
		CO5	Email and web forensics and network forensics.

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Course Outcomes (CO's): M.Tech II Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	High Performance Computing	CO1	Understanding the concepts in grid computing
		CO2	Ability to set up cluster and run parallel applications
		CO3	Understand Job and Resource Management Systems
		CO4	Ability to understand the cluster projects and cluster OS
		CO5	Understanding the concepts of pervasive computing & quantum computing.

DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING			
Course Outcomes (CO's): M.Tech II Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	Quantum Computing	CO1	Understand Essential Linear Algebra
		CO2	Understand basics of quantum computing
		CO3	Understand physical implementation of Qubit
		CO4	Understand Quantum algorithms and their implementation
		CO5	Understand The Impact of Quantum Computing on Cryptography

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Course Outcomes (CO's): M.Tech II Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	IPR	CO1	Understand types of Intellectual Property
		CO2	Analyze trademarks and its functionality
		CO3	Illustrate law of copy rights and law of patents
		CO4	Understand Trade Secrets
		CO5	Understand new development of intellectual property

DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING			
Course Outcomes (CO's): M.Tech II Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	FAULT TOLERANCE SYSTEMS	CO1	Understand Fault Tolerant Computing
		CO2	Become familiar with general and state of the art techniques used in design and analysis of fault tolerant digital systems.
		CO3	Be familiar with making system fault tolerant, modeling and testing
		CO4	benchmarking to evaluate and compare systems.
		CO5	Understand Information Redundancy and Error Correcting Codes

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Course Outcomes (CO's): M.Tech II Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	INTRUSION DETECTION SYSTEMS	CO1	Possess a fundamental knowledge of Cyber Security.
		CO2	Understand what vulnerability is and how to address most common vulnerabilities.
		CO3	Know basic and fundamental risk management principles as it relates to Cyber Security and Mobile Computing.
		CO4	Have the knowledge needed to practice safer computing and safeguard your information using Digital Forensics.
		CO5	Understand basic technical controls in use today, such as firewalls and Intrusion Detection systems. Understand legal perspectives of Cyber Crimes and Cyber Security

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Course Outcomes (CO's): M.Tech II Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	OPTIMIZATION TECHNIQUES	CO1	explain the need of optimization of engineering systems.
		CO2	understand optimization of electrical and electronics engineering problems.
		CO3	apply classical optimization techniques, linear programming, simplex algorithm, transportation problem.
		CO4	apply unconstrained optimization and constrained non-linear programming and dynamic programming.
		CO5	Formulate optimization problems.

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Course Outcomes (CO's): M.Tech II Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	GRAPH ANALYTICS	CO1	Understand Large-scale Graph and its Characteristics
		CO2	Analyze Breadth-First Search Algorithm
		CO3	Illustrate Recent Advances in Scalable Network Generation
		CO4	Understand Multicore Algorithms for Graph Connectivity Problems
		CO5	Understand Cloud-Based Approach to Big Graphs

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Subject Code Course Name	COs	Outcomes
Dissertation Work Review - II	CO1	Apply the concepts of probability and distributions to some case studies.
	CO2	Correlate the material of one unit to the material in other units.
	CO3	Resolve the potential misconceptions and hazards in each topic of study
	CO4	Understand the Estimation & Tests of Hypotheses.
	CO5	Understand the Stochastic Processes and Markov Chains

II YEAR: II SEMESTER

Subject Code Course Name	COs	Outcomes
Dissertation Work Review - III	CO1	Ability to understand and construct precise mathematical proofs
	CO2	Ability to use logic and set theory to formulate precise statements
	CO3	Ability to analyze and solve counting problems on finite and discrete structures
	CO4	Ability to describe and manipulate sequences
	CO5	Ability to apply graph theory in solving computing problems

Subject Code Course Name	COs	Outcomes
Dissertation Viva-Voce	CO1	understand the various Forms of Business and the impact of economic variables on the Business.
	CO2	Understand Demand and Supply Analysis.
	CO3	understand the Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt.
	CO4	Understand Financial Accounting concepts and Conventions
	CO5	understand the firm's financial position by analysing the Financial Statements of a Company.

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DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING

COURSE OUTCOME'S (CO's): B.Tech I YEAR I AND II SEMESTERS

ACADEMIC YEAR: 2018 – 2019/2019 – 2020/2020 – 2021/2021 – 2022

I YEAR: I SEMESTER

Subject Code	Course Name	CO's	Outcomes
MA101BS	**Mathematics - I**	CO1	Write the matrix representation of a set of linear equations and to analyse the solution of the system of equations
		CO2	Find the Eigen values and Eigen vectors
		CO3	Reduce the quadratic form to canonical form using orthogonal transformations.
		CO4	Analyse the nature of sequence and series. Solve the applications on the mean value theorems.
		CO5	Evaluate the improper integrals using Beta and Gamma functions. Find the extreme values of functions of two variables with/ without constraints.

Subject Code	Course Name	CO's	Outcomes
CH102BS	**Chemistry**	CO1	The knowledge of atomic, molecular and electronic changes, band theory related to conductivity.
		CO2	The required principles and concepts of electrochemistry, corrosion and in understanding the problem of water and its treatments.
		CO3	The required skills to get clear concepts on basic spectroscopy and application to medical and other fields.
		CO4	The knowledge of configurational and conformational analysis of molecules and reaction mechanisms.
		CO5	The knowledge of Spectroscopic techniques and applications

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Subject Code	Course Name	CO's	Outcomes
EE103ES	Basic Electrical Engineering	CO1	To analyze and solve electrical circuits using network laws and theorems.
		CO2	To understand and analyze basic Electric and Magnetic circuits
		CO3	To study the working principles of Electrical Machines
		CO4	To introduce components of Low Voltage Electrical Installations
		CO5	To understand the types of Batteries and Important Characteristics for Batteries.

Subject Code	Course Name	CO's	Outcomes
ME105ES	Engineering Workshop	CO1	Study and practice on machine tools and their operations.
		CO2	Practice on manufacturing of components using workshop trades including pluming, fitting, carpentry, foundry, house wiring and welding.
		CO3	Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling.
		CO4	Explains the construction, function, use and application of different working tools, equipment and machines.
		CO5	Apply basic electrical engineering knowledge for house wiring practice.

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Subject Code	Course Name	CO's	Outcomes
EN105HS	English	CO1	Use English Language effectively in spoken and written forms.
		CO2	Comprehend the given texts and respond appropriately.
		CO3	Communicate confidently in various contexts and different cultures.
		CO4	Acquire basic proficiency in English including reading and listening comprehension,
		CO5	Acquire basic proficiency in English for writing and speaking skills.

Subject Code	Course Name	CO's	Outcomes
CH106BS	Engineering Chemistry Lab	CO1	Determination of parameters like hardness and chloride content in water.
		CO2	Estimation of rate constant of a reaction from concentration – time relationships.
		CO3	Determination of physical properties like adsorption and viscosity.
		CO4	Calculation of Rf values of some organic molecules by TLC technique.
		CO5	Understand the Spectroscopic techniques and applications for important organic compounds.

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Subject Code	Course Name	CO's	Outcomes
EN107HS	English Language and Communication Skills Lab	CO1	Better understanding of nuances of English language through audio- visual experience and group activities
		CO2	Neutralization of accent for intelligibility
		CO3	Speaking skills with clarity and confidence which in turn enhances their employability skills
		CO4	Able to spoken English and neutralize their mother tongue influence
		CO5	able to use language appropriately for public speaking and interviews

Subject Code	Course Name	CO's	Outcomes
EE108ES	Basic Electrical Engineering Lab	CO1	Get an exposure to basic electrical laws.
		CO2	Understand the response of different types of electrical circuits to different excitations.
		CO3	Understand the measurement, calculation and relation between the basic electrical parameters.
		CO4	Understand the basic characteristics of transformers and electrical machines.
		CO5	Understand No-Load Characteristics of a Three-phase Alternator

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I YEAR: II SEMESTER

Subject Code	Course Name	CO's	Outcomes
MA201BS	Mathematics - II	CO1	Identify whether the given differential equation of first order is exact or not
		CO2	Solve higher differential equation and apply the concept of differential equation to real world Problems.
		CO3	Evaluate the multiple integrals and apply the concept to find areas, volumes, centre of mass and Gravity for cubes, sphere and rectangular parallelopiped.
		CO4	Evaluate the line, surface and volume integrals and converting them from one to another.
		CO5	Knowledge in Vector Integration

Subject Code	Course Name	CO's	Outcomes
AP202BS	Applied Physics	CO1	The student would be able to learn the fundamental concepts on Quantum behaviour of matter in its micro state.
		CO2	The knowledge of fundamentals of Semiconductor physics, Optoelectronics, Lasers and fibre Optics enable the students to apply to various systems like communications, solar cell, photo cells and so on.
		CO3	Knowledge in Optoelectronics
		CO4	Design, characterization and study of properties of material help the students to prepare new materials for various engineering applications.
		CO5	The course also helps the students to be exposed to the phenomena of electromagnetism and also to have exposure on magnetic materials and dielectric materials

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Subject Code	Course Name	CO's	Outcomes
CS203ES	Programming for Problem Solving	CO1	To write algorithms and to draw flowcharts for solving problems.
		CO2	To convert the algorithms/flowcharts to C programs.
		CO3	To code and test a given logic in C programming language.
		CO4	To decompose a problem into functions and to develop modular reusable code.
		CO5	To use arrays, pointers, strings and structures to write C programs. Searching and sorting problems.

Subject Code	Course Name	CO's	Outcomes
ME204ES	Engineering Graphics	CO1	Preparing working drawings to communicate the ideas and information.
		CO2	Read, understand and interpret engineering drawings
		CO3	Development of Surfaces of Right Regular Solids, Prism, Cylinder, Pyramid and Cone,
		CO4	Understand the Principles of Isometric Projection.
		CO5	Knowledge to CAD Software Package Commands

Subject Code	Course Name	CO's	Outcomes
AP205BS	Applied Physics Lab	CO1	Understand the V-I Characteristics of solar cell
		CO2	determine magnetic field along the axis of a current carrying coil.
		CO3	determine Hall co-efficient of a given semiconductor
		CO4	determine the bending losses of Optical fibres.
		CO5	determine the Quality factor of LCR Circuit.

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Subject Code	Course Name	CO's	Outcomes
CS206ES	Programming for Problem Solving Lab	CO1	formulate the algorithms for simple problems
		CO2	translate given algorithms to a working and correct program.
		CO3	correct syntax errors as reported by the compilers. Identify and correct logical errors encountered during execution.
		CO4	represent and manipulate data with arrays, strings and structures and use pointers of different types
		CO5	☐create, read and write to and from simple text and binary files and modularize the code with functions so that they can be reused

Subject Code	Course Name	CO's	Outcomes
MC209ES	Environmental Science	CO1	understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development
		CO2	Classify Living and Non-Living resources
		CO3	Define Biodiversity and Biotic Resources
		CO4	Understand the Environmental Pollution and Control Technologies
		CO5	Understand Environmental Policy, Legislation & EIA

II YEAR: I SEMESTER

Subject Code	Course Name	CO's	Outcomes
CS301ES	Analog and Digital Electronics	CO1	Know the characteristics of various components.
		CO2	Understand the utilization of components.
		CO3	Design and analyze small signal amplifier circuits.
		CO4	Learn Postulates of Boolean algebra and to minimize combinational functions.
		CO5	Design and analyze combinational and sequential circuits. Know about the logic families and realization of logic gates

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Subject Code	Course Name	CO's	Outcomes
CS302ES	Data Structures	CO1	Ability to select the data structures that efficiently model the information in a problem.
		CO2	Ability to assess efficiency trade-offs among different data structure implementations or combinations.
		CO3	Implement and know the application of algorithms for sorting and pattern matching.
		CO4	Design programs using a variety of data structures, including hash tables, binary and general tree structures, search trees, tries, heaps, graphs, and AVL-trees.
		CO5	Understand the Pattern matching algorithms.

Subject Code	Course Name	CO's	Outcomes
MA303BS	Computer Oriented Statistical Methods	CO1	Apply the concepts of probability and distributions to some case studies.
		CO2	Correlate the material of one unit to the material in other units.
		CO3	Resolve the potential misconceptions and hazards in each topic of study
		CO4	Understand the Estimation & Tests of Hypotheses.
		CO5	Understand the Stochastic Processes and Markov Chains

Subject Code	Course Name	CO's	Outcomes
CS304PC	Computer Organization and Architecture	CO1	Understand the basics of instructions sets and their impact on processor design.
		CO2	Demonstrate an understanding of the design of the functional units of a digital computer system.
		CO3	Evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory.
		CO4	Design a pipeline for consistent execution of instructions with minimum hazards.
		CO5	Recognize and manipulate representations of numbers stored in digital computers□.

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Subject Code	Course Name	CO's	Outcomes
CS305PC	Object Oriented Programming using C++	CO1	Able to develop programs with reusability
		CO2	Develop programs for file handling
		CO3	Handle exceptions in programming
		CO4	Develop applications for a range of problems using object-oriented programming techniques
		CO5	Develop applications using Virtual Functions and Polymorphism

Subject Code	Course Name	CO's	Outcomes
CS306ES	Analog and Digital Electronics Lab	CO1	Know the characteristics of various components.
		CO2	Understand the utilization of components.
		CO3	Design and analyze small signal amplifier circuits.
		CO4	Postulates of Boolean algebra and to minimize combinational functions.
		CO5	Design and analyze combinational and sequential circuits. Known about the logic families and realization of logic gates

Subject Code	Course Name	CO's	Outcomes
CS307PC	Data Structures Lab	CO1	to develop C programs for computing and real-life applications using basic elements like control statements, arrays, functions, pointers, strings.
		CO2	create data structures using stacks, queues and linked lists.
		CO3	Able to implement the tree traversal methods.
		CO4	Ability to Implement searching and sorting algorithms
		CO5	Able to implement the graph traversal methods.

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Subject Code Course Name	COs	Outcomes
CS308PC: IT WORKSHOP LAB	CO1	To know the components of PC Hardware,
	CO2	To assemble the PC
	CO3	install the software
	CO4	able to work on Internet & World Wide Web
	CO5	able to work on Productivity tools including Word, Excel, Power Point and Publisher.

Subject Code	Course Name	CO's	Outcomes
CS309PC	C++ Programming Lab	CO1	Able to declare Struct. Initialize and display contents of member variables
		CO2	Able to declare a class. Declare pointer to class. Initialize and display the contents of the class member
		CO3	Able to illustrate the concepts of console I/O operations
		CO4	Able to create multilevel inheritance
		CO5	able to develop applications for a range of problems using object-oriented programming techniques.

Subject Code	Course Name	CO's	Outcomes
MC309	Gender Sensitization Lab	CO1	Able to better understanding of important issues related to gender in contemporary India.
		CO2	Able to sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
		CO3	Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
		CO4	Students will acquire insight into the gendered division of labour and its relation to politics and economics. Men and women students and professionals will be better equipped to work and live together as equals.

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		CO5	Able to develop a sense of appreciation of women in all walks of life.

II YEAR: II SEMESTER

Subject Code	Course Name	CO's	Outcomes
CS401PC	Discrete Mathematics	CO1	Ability to understand and construct precise mathematical proofs
		CO2	Ability to use logic and set theory to formulate precise statements
		CO3	□ Ability to analyze and solve counting problems on finite and discrete structures
		CO4	Ability to describe and manipulate sequences
		CO5	Ability to apply graph theory in solving computing problems

Subject Code	Course Name	CO's	Outcomes
SM402MS	Business Economics & Financial Analysis	CO1	understand the various Forms of Business and the impact of economic variables on the Business.
		CO2	Understand Demand and Supply Analysis.
		CO3	understand the Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt.
		CO4	Understand Financial Accounting concepts and Conventions
		CO5	understand the firm's financial position by analysing the Financial Statements of a Company.

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Subject Code	Course Name	CO's	Outcomes
CS403PC	Operating Systems	CO1	Will be able to control access to a computer and the files that may be shared.
		CO2	Demonstrate the knowledge of the components of computer and their respective roles in computing.
		CO3	Ability to recognize and resolve user problems with standard operating environments.
		CO4	Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively.
		CO5	Understand File System Interface and Operations

Subject Code	Course Name	CO's	Outcomes
CS404PC	Database Management Systems	CO1	Gain knowledge of fundamentals of DBMS, database design and normal forms.
		CO2	Understand the Relational Model:
		CO3	Master the basics of SQL for retrieval and management of data.
		CO4	Be acquainted with the basics of transaction processing and concurrency control.
		CO5	Familiarity with database storage structures and access techniques

Subject Code	Course Name	CO's	Outcomes
CS405PC	Java Programming	CO1	Able to solve real world problems using OOP techniques.
		CO2	☐ Able to understand the use of abstract classes.
		CO3	Able to solve problems using java collection framework and I/o classes.
		CO4	Able to develop multithreaded applications with synchronization.
		CO5	Able to develop applets for web applications. Able to design GUI based applications

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Subject Code	Course Name	CO's	Outcomes
CS406PC	Operating Systems Lab	CO1	Simulate and implement operating system concepts of scheduling
		CO2	Simulate and implement operating system concepts of deadlock management.
		CO3	Simulate and implement operating system concepts of file management and memory management.
		CO4	Simulate and implement operating system concepts of memory management.
		CO5	Able to implement C programs using Unix system calls

Subject Code	Course Name	CO's	Outcomes
CS407PC	Database Management Systems Lab	CO1	Design database schema for a given application and apply normalization
		CO2	Acquire skills in using SQL commands for data definition and data manipulation.
		CO3	Develop solutions for database applications using procedures.
		CO4	Develop solutions for database applications using cursors.
		CO5	Develop solutions for database applications using triggers

Subject Code	Course Name	CO's	Outcomes
CS408PC	Java Programming Lab	CO1	Able to write programs for solving real world problems using java collection frame work.
		CO2	Able to write programs using abstract classes.
		CO3	Able to write multithreaded programs.
		CO4	Able to write GUI programs using swing controls in Java
		CO5	Able to implement sorting algorithms.

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Subject Code	Course Name	CO's	Outcomes
MC409	Constitution of India	CO1	Understand constitution law and constitutionalism
		CO2	Understand Scheme of the fundamental rights
		CO3	Understand the Directive Principles of State Policy – Its importance and implementation
		CO4	Understand Parliamentary Form of Government in India – The constitution powers and status of the President of India
		CO5	Understand The historical perspectives of the constitutional amendments in India

III YEAR I SEMESTER

Subject Code	Course Name	CO's	Outcomes
CS501PC	Formal Languages & Automata Theory	CO1	Able to understand the concept of abstract machines and their power to recognize the languages.
		CO2	Able to employ finite state machines for modeling and solving computing problems.
		CO3	Able to design context free grammars for formal languages.
		CO4	Able to distinguish between decidability and undecidability.
		CO5	Able to gain proficiency with mathematical tools and formal methods.

Subject Code	Course Name	CO's	Outcomes
CS502PC	Software Engineering	CO1	Ability to understand the software engineering process.
		CO2	Ability to translate end-user requirements into system and software requirements, using e.g. UML, and structure the requirements in a Software Requirements Document (SRD).
		CO3	Identify and apply appropriate software architectures and patterns to carry out high level design of a system and be able to critically compare alternative choices.
		CO4	Will have experience and/or awareness of testing problems and will be able to develop a simple testing report
		CO5	Ability to check the software quality.

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Subject Code	Course Name	CO's	Outcomes
CS503PC	Computer Networks	CO1	Gain the knowledge of the basic computer network technology.
		CO2	Gain the knowledge of the functions of each layer in the OSI and TCP/IP reference model.
		CO3	Obtain the skills of subnetting and routing mechanisms.
		CO4	Familiarity with the essential protocols of computer networks, and how they can be applied in network design and implementation.
		CO5	Understand the communication between machines in a network and the protocols of the various layers.

Subject Code	Course Name	CO's	Outcomes
CS504PC	Web Technologies	CO1	gain knowledge of client-side scripting, validation of forms and AJAX programming
		CO2	understand server-side scripting with PHP language
		CO3	understand what is XML and how to parse and use XML Data with Java
		CO4	To introduce Server-side programming with Java Servlets and JSP
		CO5	Able to write Client-side Scripting.

Subject Code Course Name	COs	Outcomes
CS515PE Principles of Programming Languages	CO1	Acquire the skills for expressing syntax and semantics in formal notation
	CO2	Identify and apply a suitable programming paradigm for a given computing application
	CO3	Understand concurrency.
	CO4	Gain knowledge of and able to compare the features of various programming languages
	CO5	Understand Scripting Language

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Subject Code Course Name	COs	Outcomes
CS524PE **Distributed** **Databases**	CO1	Understand theoretical and practical aspects of distributed database systems.
	CO2	Understand Query processing and decomposition
	CO3	understand basic principles and implementation techniques of distributed database systems.
	CO4	Study and identify various issues related to the development of distributed database system.
	CO5	Understand the design aspects of object-oriented database system and related development.

Subject Code	Course Name	CO's	Outcomes
CS505PC	**Software Engineering Lab**	CO1	Ability to translate end-user requirements into system and software requirements.
		CO2	Ability to generate a high-level design of the system from the software requirements.
		CO3	Ability to Develop test cases for unit testing and integration testing.
		CO4	Ability to Develop test cases for various white box and black box testing techniques.
		CO5	Will have experience and/or awareness of testing problems and will be able to develop a simple testing report.

Subject Code	Course Name	CO's	Outcomes
CS506PC	**Computer Networks & Web Technologies Lab**	CO1	Implement data link layer farming methods.
		CO2	Analyze error detection and error correction codes.
		CO3	Implement and analyze routing and congestion issues in network design.
		CO4	Implement Encoding and Decoding techniques used in presentation layer.
		CO5	To be able to work with different network tools.

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Subject Code	Course Name	CO's	Outcomes
EN508HS	Advanced Communication Skills Lab	CO1	Able to improve the students' fluency in English, through a well-developed vocabulary
		CO2	able to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.
		CO3	Able to transferring information from non-verbal to verbal texts and vice-versa.
		CO4	Able to write project/research reports/technical reports.
		CO5	Able to communicate their ideas relevantly and coherently in writing.

Subject Code	Course Name	CO's	Outcomes
MC510	Intellectual Property Rights	CO1	Able to understand the Intellectual property
		CO2	Understand the trade marks.
		CO3	Understand the law of copy rights.
		CO4	Understand the trade secrets.
		CO5	Able to develop new Intellectual property.

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III YEAR II SEMESTER

Subject Code	Course Name	CO's	Outcomes
CS601PC	Machine Learning	CO1	Understand the concepts of computational intelligence like machine learning.
		CO2	Ability to get the skill to apply machine learning techniques to address the real time problems in different areas.
		CO3	Understand the Neural Networks and its usage in machine learning application.
		CO4	Understand Genetic Algorithms.
		CO5	Understand combining Inductive and Analytical Learning.

Subject Code	Course Name	CO's	Outcomes
CS602PC	Compiler Design	CO1	Demonstrate the ability to design a compiler given a set of language features.
		CO2	Demonstrate the the knowledge of patterns, tokens & regular expressions for lexical analysis.
		CO3	Acquire skills in using lex tool & yacc tool for devleoping a scanner and parser.
		CO4	Design and implement LL and LR parsers.
		CO5	Design algorithms to do code optimization in order to improve the performance of a program in terms of space and time complexity. Design algorithms to generate machine code.

Subject Code	Course Name	CO's	Outcomes
CS603PC	Design and Analysis of Algorithms	CO1	Ability to analyze the performance of algorithms.
		CO2	Ability to choose appropriate data structures and algorithm design methods for a specified Application.
		CO3	Ability to understand how the choice of data structures and the algorithm design methods impact the performance of programs
		CO4	Understand the Greedy method.
		CO5	Understand Branch and Bound.

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Subject Code Course Name	COs	Outcomes
CS615PE **Software Testing Methodologies**	CO1	Understand the necessity of testing
	CO2	Understand Transaction Flow Testing
	CO3	Understand testing process, criteria, strategies, and methodologies
	CO4	Understand Logic Based Testing.
	CO5	Able to develop skills in software test automation and management using latest tools.

Subject Code Course Name	COs	Outcomes
CS602OE: **CYBER LAWS AND ETHICS (Open Elective – I)**	CO1	Understand the concepts of Computer Security
	CO2	Understand the concepts of security policy requirements
	CO3	understand different policies process management
	CO4	understand the importance of professional practice, Law and Ethics in their personal lives and professional careers.
	CO5	learn the rights and responsibilities as an employee, team member and a global citizen

Subject Code	Course Name	CO's	Outcomes
CS604PC	**Machine Learning Lab**	CO1	understand complexity of Machine Learning algorithms and their limitations.
		CO2	understand modern notions in data analysis-oriented computing.
		CO3	be capable of confidently applying common Machine Learning algorithms in practice and implementing their own.
		CO4	Be capable of performing experiments in Machine Learning using real-world data.
		CO5	Implement k-nearest neighbours classification using python.

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Subject Code	Course Name	CO's	Outcomes
CS605PC	Compiler Design Lab	CO1	Design and develop interactive and dynamic web applications using HTML, CSS, JavaScript and XML
		CO2	Apply client-server principles to develop scalable and enterprise web applications.
		CO3	Ability to design, develop, and implement a compiler for any language.
		CO4	Able to use lex and yacc tools for developing a scanner and a parser.
		CO5	Able to design and implement LL and LR parsers.

Subject Code Course Name	COs	Outcomes
MC609 Environmental Science	CO1	Able to understand Ecosystems
	CO2	Able to understand Classification of Resources
	CO3	Understand Environmental Pollution and Control Technologies
	CO4	Understand Environmental Policy, Legislation & EIA
	CO5	understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development

IV YEAR I SEMESTER

Subject Code	Course Name	CO's	Outcomes
CS703PC	Cryptography & Network Security Lab	CO1	Able to perform encryption and decryption using Ceaser cipher, Substitution cipher and Hill Cipher
		CO2	Able to implement the DES algorithm logic
		CO3	Able to write the RC4 logic in Java Using Java cryptography
		CO4	Able to Implement the Diffie-Hellman Key Exchange mechanism using HTML and JavaScript
		CO5	Able to calculate the message digest of a text using the MD5 algorithm in JAVA

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Subject Code	Course Name	CO's	Outcomes
CS702PC	Data Mining	CO1	Ability to understand the types of the data to be mined and present a general classification of tasks and primitives to integrate a data mining system.
		CO2	Apply preprocessing methods for any given raw data. Extract interesting patterns from large amounts of data.
		CO3	Discover the role played by data mining in various fields.
		CO4	Choose and employ suitable data mining algorithms to build analytical applications
		CO5	Evaluate the accuracy of supervised and unsupervised models and algorithms.

Subject Code	Course Name	CO's	Outcomes
CS714PE	Cloud Computing	CO1	Understand the concepts of cloud computing.
		CO2	Understand Network Connectivity in Cloud Computing
		CO3	Ability to understand various service delivery models of a cloud computing architecture.
		CO4	Ability to understand the ways in which the cloud can be programmed and deployed.
		CO5	Understanding cloud service providers

Subject Code	Course Name	CO's	Outcomes
CS722PE	Real Time Systems	CO1	Able describe how a real-time operating system kernel is implemented.
		CO2	Able explain how tasks are managed.
		CO3	Explain how the real-time operating system implements time management.
		CO4	Discuss how tasks can communicate using semaphores, mailboxes, and queues.
		CO5	Be able to implement a real-time system on an embedded processor. Be able to work with real time operating systems like RT Linux, Vx Works, MicroC /OSII, Tiny Os

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Subject Code Course Name	COs	Outcomes
MN700OE **Health & Safety in Mines (Open Elective-II)**	CO1	understand the terminology of health and safety
	CO2	undertand the preventive measures of accidents
	CO3	System engineering approach to safety, techniques used in safety analysis
	CO4	Understand Risk management
	CO5	Development of safety consciousness, publicity and propaganda for safety

Subject Code Course Name	COs	Outcomes
CS703PC **Cryptography & Network Security Lab**	CO1	Able to perform encryption and decryption using Ceaser cipher, Substitution cipher and Hill Cipher
	CO2	Able to implement the DES algorithm logic
	CO3	Able to write the RC4 logic in Java Using Java cryptography
	CO4	Able to Implement the Diffie-Hellman Key Exchange mechanism using HTML and JavaScript
	CO5	Able to calculate the message digest of a text using the MD5 algorithm in JAVA

Subject Code Course Name	COs	Outcomes
CS704PC **Industrial Oriented Mini Project/ Summer Internship**	CO1	Students will be able to practice acquired knowledge within the chosen area of technology for project development.
	CO2	Identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach.
	CO3	Reproduce, improve and refine technical aspects for engineering projects.
	CO4	Work as an individual or in a team in development of technical projects.
	CO5	Communicate and report effectively project related activities and findings

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Subject Code Course Name	COs	Outcomes
CS705PC Seminar	CO1	Establish motivation for any topic of interest and develop a thought process for technical presentation.
	CO2	Organize a detailed literature survey and build a document with respect to technical publications.
	CO3	Analysis and comprehension of proof-of-concept and related data
	CO4	Effective presentation and improve soft skills.
	CO5	Make use of new and recent technology (e.g. Latex) for creating technical reports

Subject Code Course Name	COs	Outcomes
CS706PC Project Stage - I	CO1	Demonstrate a sound technical knowledge of their selected project topic.
	CO2	Undertake problem identification, formulation and solution.
	CO3	Design engineering solutions to complex problems utilising a systems approach
	CO4	Conduct an engineering project
	CO5	Communicate with engineers and the community at large in written an oral forms

IV YEAR II SEMESTER

Subject Code Course Name	COs	Outcomes
SM801MS Organizational Behaviour	CO1	Understand the Organizational Behaviour.
	CO2	Understand conceptual framework and the theories underlying Organizational Behaviour.
	CO3	Understand strategies to improve the follow of communication
	CO4	Understand Job design and Goal setting for High performance
	CO5	Know the Activities and skills of Great leaders.

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Subject Code	Course Name	CO's	Outcomes
CS815PE	Cyber Forensics	CO1	Understand Cybercrime and Types
		CO2	Understand Forensic duplication and Forensic Duplication Tool Requirements
		CO3	understand the usage of computers in forensic
		CO4	Understand how to use various forensic tools for a wide variety of investigations.
		CO5	It gives an opportunity to students to continue their zeal in research in computer forensics

Subject Code Course Name	COs	Outcomes
MT8020E Total Quality Management	CO1	Understand the concepts of TQM
	CO2	Understand the role of marketting and sales.
	CO3	Organizing the TQM
	CO4	Measuaring the quality cost
	CO5	Know the ISO standard services

Subject Code Course Name	COs	Outcomes
CS802PC Project Stage - II	CO1	Demonstrate a sound technical knowledge of their selected project topic.
	CO2	Undertake problem identification, formulation and solution.
	CO3	Design engineering solutions to complex problems utilizing a systems approach.
	CO4	Communicate with engineers and the community at large in written an oral forms
	CO5	Conduct an engineering project

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DEPARTMENT: ELECTRONICS AND COMMUNICATION ENGINEERING(R18)

COURSE OUTCOME'S (CO's): B.Tech I YEAR I AND II SEMESTERS

ACADEMIC YEAR: 2018 – 2019/2019 – 2020/2020 – 2021/2021 – 2022

I YEAR: I SEMESTER

Subject Code	Course Name	CO's	Outcomes
MA101BS	Mathematics - I	CO1	Write the matrix representation of a set of linear equations and to analyse the solution of the system of equations
		CO2	Find the Eigen values and Eigen vectors
		CO3	Reduce the quadratic form to canonical form using orthogonal transformations.
		CO4	Analyse the nature of sequence and series. Solve the applications on the mean value theorems.
		CO5	Evaluate the improper integrals using Beta and Gamma functions. Find the extreme values of functions of two variables with/ without constraints.

Subject Code	Course Name	CO's	Outcomes
CH102BS	Chemistry	CO1	The knowledge of atomic, molecular and electronic changes, band theory related to conductivity.
		CO2	The required principles and concepts of electrochemistry, corrosion and in understanding the problem of water and its treatments.
		CO3	The required skills to get clear concepts on basic spectroscopy and application to medical and other fields.
		CO4	The knowledge of configurational and conformational analysis of molecules and reaction mechanisms.
		CO5	The knowledge of Spectroscopic techniques and applications

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Subject Code	Course Name	CO's	Outcomes
EE103ES	Basic Electrical Engineering	CO1	To analyze and solve electrical circuits using network laws and theorems.
		CO2	To understand and analyze basic Electric and Magnetic circuits
		CO3	To study the working principles of Electrical Machines
		CO4	To introduce components of Low Voltage Electrical Installations
		CO5	To understand the types of Batteries and Important Characteristics for Batteries.

Subject Code	Course Name	CO's	Outcomes
ME105ES	Engineering Workshop	CO1	Study and practice on machine tools and their operations.
		CO2	Practice on manufacturing of components using workshop trades including pluming, fitting, carpentry, foundry, house wiring and welding.
		CO3	Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling.
		CO4	Explains the construction, function, use and application of different working tools, equipment and machines.
		CO5	Apply basic electrical engineering knowledge for house wiring practice.

Subject Code	Course Name	CO's	Outcomes
EN105HS	English	CO1	Use English Language effectively in spoken and written forms.
		CO2	Comprehend the given texts and respond appropriately.
		CO3	Communicate confidently in various contexts and different cultures.
		CO4	Acquire basic proficiency in English including reading and listening comprehension,
		CO5	Acquire basic proficiency in English for writing and speaking skills.

Subject Code	Course Name	CO's	Outcomes
CH106BS	Engineering Chemistry Lab	CO1	Determination of parameters like hardness and chloride content in water.
		CO2	Estimation of rate constant of a reaction from concentration – time relationships.
		CO3	Determination of physical properties like adsorption and viscosity.
		CO4	Calculation of Rf values of some organic molecules by TLC technique.
		CO5	Understand the Spectroscopic techniques and applications for important organic compounds.

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Subject Code	Course Name	CO's	Outcomes
EN107HS	English Language and Communication Skills Lab	CO1	Better understanding of nuances of English language through audio- visual experience and group activities
		CO2	Neutralization of accent for intelligibility
		CO3	Speaking skills with clarity and confidence which in turn enhances their employability skills
		CO4	Able to spoken English and neutralize their mother tongue influence
		CO5	able to use language appropriately for public speaking and interviews

Subject Code	Course Name	CO's	Outcomes
EE108ES	Basic Electrical Engineering Lab	CO1	Get an exposure to basic electrical laws.
		CO2	Understand the response of different types of electrical circuits to different excitations.
		CO3	Understand the measurement, calculation and relation between the basic electrical parameters.
		CO4	Understand the basic characteristics of transformers and electrical machines.
		CO5	Understand No-Load Characteristics of a Three-phase Alternator

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I YEAR: II SEMESTER

Subject Code	Course Name	CO's	Outcomes
MA201BS	Mathematics - II	CO1	Identify whether the given differential equation of first order is exact or not
		CO2	Solve higher differential equation and apply the concept of differential equation to real world Problems.
		CO3	Evaluate the multiple integrals and apply the concept to find areas, volumes, centre of mass and Gravity for cubes, sphere and rectangular parallelopiped.
		CO4	Evaluate the line, surface and volume integrals and converting them from one to another.
		CO5	Knowledge in Vector Integration

Subject Code	Course Name	CO's	Outcomes
AP202BS	Applied Physics	CO1	The student would be able to learn the fundamental concepts on Quantum behaviour of matter in its micro state.
		CO2	The knowledge of fundamentals of Semiconductor physics, Optoelectronics, Lasers and fibre Optics enable the students to apply to various systems like communications, solar cell, photo cells and so on.
		CO3	Knowledge in Optoelectronics
		CO4	Design, characterization and study of properties of material help the students to prepare new materials for various engineering applications.
		CO5	The course also helps the students to be exposed to the phenomena of electromagnetism and also to have exposure on magnetic materials and dielectric materials

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Subject Code	Course Name	CO's	Outcomes
CS203ES	Programming for Problem Solving	CO1	To write algorithms and to draw flowcharts for solving problems.
		CO2	To convert the algorithms/flowcharts to C programs.
		CO3	To code and test a given logic in C programming language.
		CO4	To decompose a problem into functions and to develop modular reusable code.
		CO5	To use arrays, pointers, strings and structures to write C programs. Searching and sorting problems.

Subject Code	Course Name	CO's	Outcomes
ME204ES	Engineering Graphics	CO1	Preparing working drawings to communicate the ideas and information.
		CO2	Read, understand and interpret engineering drawings
		CO3	Development of Surfaces of Right Regular Solids, Prism, Cylinder, Pyramid and Cone,
		CO4	Understand the Principles of Isometric Projection.
		CO5	Knowledge to CAD Software Package Commands

Subject Code	Course Name	CO's	Outcomes
AP205BS	Applied Physics Lab	CO1	Understand the V-I Characteristics of solar cell
		CO2	determine magnetic field along the axis of a current carrying coil.
		CO3	determine Hall co-efficient of a given semiconductor
		CO4	determine the bending losses of Optical fibres.□
		CO5	determine the Quality factor of LCR Circuit.

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Subject Code	Course Name	CO's	Outcomes
CS206ES	Programming for Problem Solving Lab	CO1	formulate the algorithms for simple problems
		CO2	translate given algorithms to a working and correct program.
		CO3	correct syntax errors as reported by the compilers. Identify and correct logical errors encountered during execution.
		CO4	represent and manipulate data with arrays, strings and structures and use pointers of different types
		CO5	□create, read and write to and from simple text and binary files and modularize the code with functions so that they can be reused

Subject Code	Course Name	CO's	Outcomes
MC209ES	Environmental Science	CO1	understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development
		CO2	Classify Living and Non-Living resources
		CO3	Define Biodiversity and Biotic Resources
		CO4	Understand the Environmental Pollution and Control Technologies
		CO5	Understand Environmental Policy, Legislation & EIA

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE OUTCOMES (CO'S) OF B.Tech II YEAR I & II SEMESTERS

ACADEMIC YEAR: 2018-2019/2019-2020/2020-2021/2021-2022

II YEAR- I SEMESTER

Subject code	Course Name	COS	YEAR 2-- SEMESTER 1
EC301PC	ELECTRON ICDEVICES AND CIRCUITS	CO1	Know the characteristics of various components.
		CO2	Understand the utilization of components.
		CO3	Understand the biasing techniques
		CO4	Design and analyze small signal amplifier circuits.
		CO5	To understand the concepts of simulation by using Spice tool

Subject code	Course Name	COs	Course Outcomes
EC302PC	NETWORK ANALYSIS AND TRANSMISSI ONLINES	CO1	Gain the knowledge on basic RLC circuits behavior.
		CO2	Analyze the Steady state and transient analysis of RLC Circuits.
		CO3	Know the characteristics of two port network parameters.
		CO4	Compare circuit matrices of linear graphs and describe magnetic circuits
		CO5	Analyze the transmission line parameters and configurations.

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Subject code	Course Name	COs	Course Outcomes
EC303PC	DIGITAL SYSTEM DESIGN	CO1	Understand the numerical information in different forms and Boolean Algebra theorems
		CO2	Postulates of Boolean algebra and to minimize combinational functions
		CO3	Design and analyze combinational and sequential circuits
		CO4	Illustrate reduction of logical expressions using Boolean algebra and k-map.
		CO5	Known about the logic families and realization of logic gates.

Subject code	Course Name	COs	Course Outcomes
EC304PC	SIGNALS AND SYSTEMS	CO1	Differentiate various signal functions.
		CO2	Represent any arbitrary signal in time and frequency domain.
		CO3	Understand the characteristics of linear time invariant systems.
		CO4	Analyze the signals with different transform technique
		CO5	Analyze discrete time signals and systems by using appropriate mathematical Tools

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Subject code	Course Name	COs	Course Outcomes
EC305ES	PROBABILITY THEORY AND STOCHASTIC PROCESSES	CO1	Understand the concepts of Random Process and its Characteristics.
		CO2	Understand the response of linear time Invariant system for a Random Processes.
		CO3	Determine the Spectral and temporal characteristics of Random Signals.
		CO4	Understand the concepts of Noise in Communication systems.
		CO5	Create mathematical models for practical design problems and determine theoretical solutions to the created models.

Subject code	Course Name	COs	Course Outcomes
EC306ES	ELECTRONIC DEVICES AND CIRCUITS LAB	CO 1	Understand the diode and transistor characteristics, Input and output Characteristics of a BJT,
		CO 2	Verify the rectifier circuits using diodes and implement them using hardware.
		CO 3	Design various amplifiers like CE, CC, common source amplifiers and implement them using hardware and also observe their frequency responses
		CO 4	Remember the concepts of unipolar junction transistor and observe its Characteristics
		CO 5	Understand the construction, operation and characteristics of JFET andMOSFET, which can be used in the design of amplifiers.

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Subject code	Course Name	COs	Course Outcomes
EC307PC	DIGITAL SYSTEM DESIGN LAB	CO1	Knowledge and use of hardware description language (VHDL) for system modeling and simulation. Describe and explain the operation of fundamental digital gates
		CO2	Student should able to Realizeof Boolean Expressions using Gates, logic gates using universal gates
		CO3	Generation of clock using NAND / NOR gates
		CO4	4 – bit Adder / Subtractor , 4 – bit gray to Binary and Binary to Gray Converter.
		CO5	Student should able to Realize a sequence detector-a finite state machine

Subject code	Course Name	COs	Course Outcomes
EC308ES	BASIC SIMULATION LAB	CO1	Analyze various types basic operations on matrices,of signals and sequencessuch as Addition, Multiplication, ScalingShifting, Folding, Computation of Energy and Average Power
		CO2	Apply convolution and correlation operations on different signals. Auto Correlation and Cross Correlation for Signals and Sequences,
		CO3	Verification of Linearity and Time Invariance Properties of a given Continuous/Discrete System
		CO4	Computation of Unit sample, Unit step and Sinusoidal responses of the given LTIsystem
		CO5	Verify the Sampling theorem. Waveform Synthesis using Laplace Transform

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Subject code	Course Name	COs	Course Outcomes
MC309	CONSTITUTION OF INDIA	CO1	To realize the significance of constitution of India to students from all walks of life and help them to understand the basic concepts of Indian constitution.
		CO2	To identify the importance of fundamental rights as well as fundamental duties
		CO3	To understand the functioning of Union, State and Local Governments in Indian federal system.
		CO4	To learn procedure and effects of emergency, composition and activities of election commission and amendment procedure.
		CO5	To learn procedure and effects of emergency, composition and activities of election commission and amendment procedure.

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IIYEAR- II SEMESTER

Subject code	Course Name	COs	Course Outcomes
MA401BS	LAPLACE TRANSFORMS, NUMERICAL METHODS AND COMPLEX VARIABLES	CO1	Use the Laplace transforms techniques for solving ODE's
		CO2	Find the root of a given equation.
		CO3	Estimate the value for the given data using interpolation
		CO4	Find the numerical solutions for a given ODE's
		CO5	Analyze the complex function with reference to their analyticity, integration using Cauchy's

Subject code	Course Name	COs	Course Outcomes
EC402ES	ELECTROMAGNETIC FIELDS AND WAVES	CO1	Get the knowledge of Basic Laws, Concepts and proofs related to ElectrostaticFields and Magnetostatic Fields
		CO2	Distinguish between the static and time-varying fields
		CO3	Analyze the Wave Equations for good conductors, good dielectrics
		CO4	To analyze completely the rectangular waveguides, their mode characteristics
		CO5	Apply Maxwell's equations to solutions of problems relating to transmissionlines

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Subject code	Course Name	COs	Course Outcomes
EC403PC	ANALOG AND DIGITAL COMMUNICATIONS	CO1	Analyze and design of various continuous wave and angle modulation anddemodulation techniques
		CO2	Understand the effect of noise present in continuous wave and anglemodulation techniques
		CO3	Attain the knowledge about AM , FM Transmitters and Receivers
		CO4	Analyze and design the various Pulse Modulation Techniques.
		CO5	Understand the concepts of Digital Modulation Techniques and Basebandtransmission

Subject code	Course Name	COs	Course Outcomes
EC404PC	LINEAR IC APPLICATIONS	CO1	A thorough understanding of operational amplifiers with linear integratedcircuits.
		CO2	Attain the knowledge of functional diagrams and applications of IC 555 and IC565
		CO3	Acquire the knowledge about the Data converters
		CO4	Classify various active filter configurations based on frequency response and construct using 741 OpAmp.
		CO5	Analyze and design non linear applications like multiplier, comparator and etc,using Op-Amp.

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Subject code	Course Name	COs	Course Outcomes
EC406PC	ANALOG AND DIGITAL COMMUNICATIONS LAB	CO1	Demonstrate generation and detection of analog and digital modulationtechniques.
		CO2	Explain sampling, PCM, delta modulation, adaptive delta modulation andsuperheterodyne receiver.
		CO3	Demonstrate generation and detection of analog and digital modulation techniques.Frequency Division Multiplexing & De multiplexing
		CO4	Pulse Amplitude Modulation & Demodulation
		CO5	Pulse Width Modulation & Demodulation

Subject code	Course Name	COs	Course Outcomes
EC407PC	IC APPLICATIONS Lab	CO1	Design and analyse the various linear applications of op-am, Inverting and Non- Inverting Amplifiers using Op Amps,Adder and Subtractor using Op
		CO2	Design and analyse the various op-amp Integrator Circuit using IC 741.Differentiator Circuit using Op Amp..
		CO3	Design and analyse filter circuits using op-amp Active filter Applications-LPF,HPF (First Order)
		CO4	IC 741 waveform Generators-Sine, Square wave and Triangular Waves
		CO5	Multivibrators using IC555 timer

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Subject code	Course Name	COs	Course Outcomes
EC408PC	ELECTRONIC CIRCUIT ANALYSIS LAB	CO1	Comprehend the fundaments of multistage amplifiers, feedback, power amplifiers and oscillator circuits
		CO2	Analyze the circuit design process and simulate the common base, commonemitter and common collector amplifier circuits
		CO3	Analyze the circuit design process and simulate the RC Phase shift OscillatorCircuit Hartley and Colpitt's Oscillators Circuit
		CO4	Acquaint with the design and simulate the RC coupled and Cascade amplifiercircuits
		CO5	Design a Monostable Multivibrator

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Subjectcode	Course Name	COs	Course Outcomes
MC409HS	Gender Sensitization Lab	CO1	To provide an integrated and interdisciplinary approach to understand the social and cultural construction of gender that shapes the experiences of women and men in society
		CO2	Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature, and film.
		CO3	Students will attain a finer grasp of how gender discrimination works in our society and how to counter it. Students will acquire insight into the gendered division of labour and its relation to politics and economics.
		CO4	Men and women students and professionals will be better equipped to work and live together as equals.
		CO5	Students will develop a sense of appreciation of women in all walks of life. Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE OUTCOMES (CO'S) OF B.Tech IIII YEAR I & II SEMESTERS

ACADEMIC YEAR: 2018-2019/2019-2020/2020-2021/2021-2022

IIII YEAR- I SEMESTER

Subject Code	Course Name	COs	Course Outcomes
EC501PC	MICROPROCESSORS AND MICROCONTROLLERS	CO1	Understands the internal architecture, organization and assembly language programming 8086 processors.
		CO2	Understands the internal architecture, organization and assembly languageprogramming of8051/controllers
		CO3	Understands the interfacing techniques to 8086 and 8051 based systems
		CO4	Understands the internal architecture of ARM processors
		CO5	Design electrical circuitry to the Microprocessor I/O ports in order to interface the processor to external devices

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Subject Code	Course Name	COs	Course Outcomes
EC502PC	DATA COMMUNICATIONS AND NETWORKS	CO1	Know the Categories and functions of various Data communication Networks
		CO2	Design and analyze various error detection techniques.
		CO3	Demonstrate the mechanism of routing the data in network layer
		CO4	Know the significance of various Flow control and Congestion controlMechanisms
		CO5	Know the Functioning of various Application layer Protocols.

Subject	Course Name	COs	Course Outcomes
EC503PC	CONTROL SYSTEMS	CO1	Understand the modeling of linear-time-invariant systems using transfer function and state space representations.
		CO2	Understand the concept of stability and its assessment for linear-time invariantsystems.
		CO3	Design simple feedback controllers.
		CO4	Employ time domain analysis to predict and diagnose transient performanceparameters of the system for standard input functions.
		CO5	Formulate different types of analysis in frequency domain to explain the nature of stability of the system

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Subject code	Course Name	COs	Course Outcomes
SM504MS	BUSINESS ECONOMICS AND FINANCIAL ANALYSIS	CO1	The students will understand the various Forms of Business and the impact of economic variables on the Business
		CO2	The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt
		CO3	The Students can study the firm's financial position by analyzing the Financial Statements of Company.
		CO4	Build up decision making skill under uncertain business climate
		CO5	To interpret the basics of financial accounting and relevance of accounting principles

Subject code	Course Name	COs	Course Outcomes
EC513PE	ELECTRONIC MEASUREMENTS AND INSTRUMENTATION	CO1	Measure electrical parameters with different meters and understand the basic definition of measuring parameters
		CO2	Use various types of signal generators, signal analyzers for generating
		CO3	Operate an Oscilloscope to measure various signals.
		CO4	Measure various physical parameters by appropriately selecting the transducers
		CO5	Apply the complete knowledge of various electronics instruments

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Subject code	Course Name	COs	Course Outcomes
EC505PC	MICROPROCESSORS AND MICROCONTROLLERS LAB	CO1	Identify relevant information to supplement to the Microprocessor and Microcontroller course. Arithmetic, Logical, String Operations on 16 Bit and 32-Bit Data.Bit level Logical Operations, Rotate, Shift, Swap and Branch
		CO2	Set up programming strategies and select proper mnemonics and run their program on the training boards.
		CO3	Practice different types of programming Assembly Language Programs to Perform Arithmetic (Both Signed and Unsigned) 16 Bit Data Operations, Logical Operations (Byte and Bit Level Operations), Rotate, Shift, Swap and Branch Instructions Time delay Generation Using Timers of 8051. Serial Communication from / to 8051 to / from I/O devices
		CO4	Develop testing and experimental procedures on Program Using Interrupts to Generate Square Wave 10 KHZ Frequency on P2.1 Using Timer 0 8051 in 8 bit Auto reload Mode and Connect a 1 HZ Pulse to INT1 pin and Display on
		CO5	Prepare Interfacing I/O Devices to 8051, 7 Segment Display to 8051. Matrix Keypad to 8051, Sequence Generator Using Serial Interface in 8051.8 bit ADC Interface to 8051.Triangular Wave Generator through DAC interfaces to 8051.

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Subject code	Course Name	COs	Course Outcomes
EC501PC	MICROPROCESS ORS AND MICROCONTRO LLERS	CO1	Understands the internal architecture, organization and assembly language programming 8086 processors.
		CO2	Understands the internal architecture, organization and assembly language programming of8051/controllers
		CO3	Understands the interfacing techniques to 8086 and 8051 based systems
		CO4	Understands the internal architecture of ARM processors
		CO5	Design electrical circuitry to the Microprocessor I/O ports in order to interface the processor to external devices

Subject Code	Course Name	COs	Course Outcomes
EC506PC	DATA COMMUNICATI ONS AND NETWORKS LAB	CO1	Student will be able to understand network communication using the layered concept, Open System Interconnect (OSI) and the Internet Model.
		CO2	Student will be able to understand the Experiments may be Conducted using Network Simulation software like NS-2, NSG-2.1and Wire SHARK/equivalent software.
		CO3	TCL Script to create two nodes and links between node transmit data between nodes , the performance of various LAN Topologies, the performance of Drop
		CO4	Student will understand the working principles of LAN and the concepts behind physical and logical addressing, subnetting and supernetting.
		CO5	Student shall understand Evaluate the performance of TCP, New Reno and Vegas performance of AODV and DSR routing protocols ,performance of

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Subject code	Course Name	COs	Course Outcomes
EN508HS	ADVANCED COMMUNICATION SKILLS LAB	CO1	Acquire vocabulary and use it contextually
		CO2	Listen and speak effectively
		CO3	Develop proficiency in academic reading and writing
		CO4	Increase possibilities of job prospects
		CO5	Communicate confidently in formal and informal contexts

Subject code	Course Name	Cos	Course Outcomes
MC510	Intellectual Property Rights-	CO1	Distinguish and Explain various forms of IPRs
		CO2	Identify criteria's to fit one's own intellectual work in particular form of IPRs
		CO3	Apply statutory provisions to protect particular form of IPRs.
		CO4	Identify procedure to protect different forms of IPRs national and international level
		CO5	Understand about new developments of intellectual property

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IIII YEAR- I SEMESTER

Subject code	Course Name	COs	Course Outcomes
EC601PC	ANTENNAS AND WAVE PROPAGATION	CO1	establish the radiation patterns of VHF, UHF and Microwave antennas and also antenna arrays.
		CO2	Specify the requirements for microwave measurements
		CO3	Classify the different wave propagation mechanisms
		CO4	To identify the antenna array requirements, to determine the characteristics of ULAs
		CO5	To understand the concepts and set-up requirements for microwave measurements

Subject code	Course Name	COs	Course Outcomes
EC602PC	DIGITAL SIGNAL PROCESSING	CO1	Known the evolution of cellular and mobile communication system.
		CO2	The student will be able to understand Co-Channel and Non-Co-Channel interferences.
		CO3	Understand impairments due to multipath fading channel and how to overcome the different
		CO4	Familiar with cell coverage for signal and traffic, diversity, techniques, frequency management
		CO5	Know the difference between cellular and Adhoc Networks

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Subject code	Course Name	COs	Course Outcomes
EC603PC	VLSI DESIGN	CO1	The students understand the significance of Management in their Profession
		CO2	Understand the management concepts
		CO3	Analyze the concepts of management
		CO4	Development of managerial skills for engineers
		CO5	Applications of concepts in practical aspects

Subject code	Course Name	COs	Course Outcomes
EC602PC	DIGITAL SIGNAL PROCESSING	CO1	Known the evolution of cellular and mobile communication system.
		CO2	The student will be able to understand Co-Channel and Non-Co-Channel interferences.
		CO3	Understand impairments due to multipath fading channel and how to overcome the different
		CO4	Familiar with cell coverage for signal and traffic, diversity, techniques, frequency management
		CO5	Know the difference between cellular and Adhoc Networks

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Subject code	Course Name	COs	Course Outcomes
EC611PE	OBJECT ORIENTED PROGRAMMING THROUGH JAVA	CO1	Develop Applications for Range of Problems Using Object-Oriented Programming Techniques
		CO2	Design Simple Graphical User Interface Applications.
		CO3	Introduces The Principles Of Inheritance And Polymorphism;
		CO4	Introduces The Implementation Of Package
		CO5	Introduces The Design Of Graphical User Interface Using Applets And Swings.

Subject code	Course Name	COs	Course Outcomes
EC612PE	MOBILE COMMUNICATIONS AND NETWORKS	CO1	Known the evolution of cellular and mobile communication system.
		CO2	Able to understand Co-Channel and Non-Co-Channel interferences
		CO3	Understand impairments due to multipath fading channel and how to overcome the different fading effects.
		CO4	Familiar with cell coverage for signal and traffic, diversity, techniques, frequency management, Channel assignment and types of handoff.
		CO5	Know the difference between cellular and Adhoc Networks and design goals of MAC Layer protocol.

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Subject code	Course Name	COs	Course Outcomes
EC613PE	EMBEDDED SYSTEM DESIGN	CO1	Able to get overview of Design Principles of Embedded System.
		CO2	To understand the selection procedure of Processors in the embedded domain.
		CO3	Design Procedure for Embedded Firmware. 3. To visualize the role of Real time Operati
		CO4	To visualize the role of Real time Operating Systems in Embedded Systems.
		CO5	To evaluate the Correlation between task synchronization and latency issues

Subject code	Course Name	COs	Course Outcomes
EC604PC	DIGITAL SIGNAL PROCESSING LAB	CO1	Develop and Implement DSP algorithms in software using a computer language such as C with TMS320C6713 floating point Processor
		CO2	Generation of Sinusoidal Waveform / Signal based on Recursive Difference Equations
		CO3	Obtain Fourier series coefficients by formula and using FET and compare for half sine wave.
		CO4	Analyze and Observe Magnitude and phase characteristics
		CO5	Generation of Narrow Band Signal through Filtering

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Subject code	Course Name	COs	Course Outcomes
EC605PC	e-CAD LAB	CO1	Design entry and simulation of combinational &sequential circuits and functional verification
		CO2	Synthesis, p&r and post p&r simulation for combinational and sequential circuits.
		CO3	Implementation of the combinational &sequential circuits on FPGA hardware
		CO4	Write verilog and VHDL code for different circuits and understanding design styles.
		CO5	Write Verilog and VHDL code for FSM.

Subject code	Course Name	COs	Course Outcomes
	SCRIPTING LANGUAGES LAB	CO1	Ability to understand the differences between Scripting languages and programming languages
		CO2	Able to gain some fluency programming in Ruby, Perl, TCL able to Write a Ruby script
		CO3	Write a Ruby script to accept a filename from the user print the extension of that
		CO4	Write a TCL script that multiplies the numbers from 1 to 10
EC606PC		CO5	Write a Ruby script to print the elements of given array

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Subject code	Course Name	COs	Course Outcomes
MC609	ENVIRONMENTAL SCIENCE	CO1	Based on this course, the Engineering graduate will understand /evaluate / develop technologies
		CO2	Appreciate the ethical, cross-cultural, and historical context of environmental issues
		CO3	Reflect critically about their roles and identities as citizens, consumers and environmental actors
		CO4	Appreciate that one can apply systems concepts and methodologies
		CO5	Appreciate key concepts from economic, political, and social analysis

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE OUTCOMES (CO'S) OF B.Tech IV YEAR I & II SEMESTERS

ACADEMIC YEAR: 2018-2019/2019-2020/2020-2021/2021-2022

IV YEAR- I SEMESTER

Subject code	Course Name	COs	Course Outcomes
EC701PC	MICROWAVE AND OPTICAL COMMUNICATIONS	CO1	Known power generation at microwave frequencies and derive the performance characteristics.
		CO2	realize the need for solid state microwave sources and understand the principles of solid state devices
		CO3	distinguish between the different types of waveguide and ferrite components, and select proper components for engineering applications
		CO4	understand the utility of S-parameters in microwave component design and learn the measurement procedure of various micro wave parameters
		CO5	Understand the mechanism of light propagation through OpticalFibers.

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Subject code	Course Name	COs	Course Outcomes
EC713PE	DIGITAL IMAGE PROCESSING	CO1	Explore the fundamental relations between pixels and utility of 2-D transforms in image processer.
		CO2	Understand the enhancement, segmentation and restoration processes on an image.
		CO3	Implement the various Morphological operations on an image
		CO4	Understand the need of compression and evaluation of basic compression algorithms.
		CO5	Describe object detection and recognition techniques

Subject code	Course Name	COs	Course Outcomes
EC711PE	ARTIFICIAL NEURAL NETWORKS	CO1	Understand the similarity of Biological networks and Neural networks
		CO2	Perform the training of neural networks using various learning rules.
		CO3	Understanding the concepts of forward and backward propagations.
		CO4	To explore the Neuro dynamic models for various problems.
		CO5	Understand and Construct the Hopfield models.

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Subject code	Course Name	COs	Course Outcomes
EC712PE	SCRIPTING LANGUAGE	CO1	Know about basics of linux and linux networking
		CO2	use linux environment and write programs for automation
		CO3	Understand the concepts of scripting language
		CO4	Able to differentiate scripting and non scripting languages
		CO5	Able to create and run scripts using PERL/TCI/PYTHON

Subject code	Course Name	COs	Course Outcomes
SM702MS	PROFESSIONAL PRACTICE,LAW &ETHICS	CO1	The students will understand the importance of professional practice, Law and Ethics in their personal lives and professional careers
		CO2	The students will learn the rights and responsibilities as an employee, team member and a global
		CO3	Understanding basic purpose of profession, professional ethics and various moral and social issues
		CO4	Acquiring knowledge of various roles of Enbgineer In applying ethical principles at various professional levels
		CO5	Acquire knowledge of Law relating to intellectual property

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Subject code	Course Name	COs	Course Outcomes
EC703PC	MICROWAVE AND OPTICAL COMMUNICATI ONS LAB	CO1	Verify characteristics of Reflex Klystron
		CO2	Estimate the power measurements of RF Components such as directional couplers
		CO3	Analyze various parameters of Waveguide Components.
		CO4	Demonstrate characteristics of various optical sources.
		CO5	Measure data Rate, Numerical Aperture and Losses in Optical Link.

Subject code	Course Name	COs	Course Outcomes
EC704PC	Industrial Oriented Mini Project/ Summer Internship	CO1	Students will be able to practice acquired knowledge within the chosen area
		CO2	Identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach.
		CO3	Reproduce, improve and refine technical aspects for engineering projects.
		CO4	Work as an individual or in a team in development of technical projects.
		CO5	Communicate and report effectively project related activities and findings

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Subject code	Course Name	COs	Course Outcomes
EC705PC	Seminar	CO1	Establish motivation for any topic of interest and develop a thought process for technical presentation.
		CO2	Organize a detailed literature survey and build a document with respect to technical publications
		CO3	Analysis and comprehension of proof-of-concept and related data
		CO4	Effective presentation and improve soft skills
		CO5	Make use of new and recent technology (e.g. Latex) for creating technical Reports

Subject code	Course Name	COs	Course Outcomes
EC706PC	Project Stage – I	CO1	Demonstrate a sound technical knowledge of their selected project topic.
		CO2	Undertake problem identification, formulation and solution.
		CO3	Design engineering solutions to complex problems utilising a systems approach.
		CO4	Conduct an engineering project

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		CO5	Communicate with engineers and the community at large in written an oral Forms

IV YEAR II SEMESTER

Subject code	Course Name	COs	Course Outcomes
EC811PE	SATELLITE COMMUNICATIONS	CO1	Understand basic concepts and frequency allocations for satellite communication, orbital
		CO2	Envision the satellite sub systems and design satellite links for specified C/N.
		CO3	Understand the various multiple access techniques for satellite communication systems and
		CO4	Define orbital mechanics and launch methodologies
		CO5	Known the concepts of LEO, GEO Stationary Satellite Systems and satellite Navigation

Subject code	Course Name	COs	Course Outcomes
EC812PE	RADAR SYSTEMS	CO1	Able to explore the concepts of radar and its frequency bands.
		CO2	Able to Derive the complete radar range equation.
		CO3	Understand the need and functioning of CW, FM-CW and MTI radars
		CO4	Students will know various Tracking methods.
		CO5	Derive the matched filter response characteristics for radar receivers.

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Subject code	Course Name	COs	Course Outcomes
EC813PE	WIRELESS SENSOR NETWORKS	CO1	To acquire the knowledge about various architectures and applications of Sensor Networks
		CO2	Analyze and compare various architectures of Wireless Sensor Networks
		CO3	Understand Design issues and challenges in wireless sensor networks
		CO4	Analyze and compare various data gathering and data dissemination methods.
		CO5	Design, Simulate and Compare the performance of various routing and MAC protocol

Subject code	Course Name	COs	Course Outcomes
EC821PE	SYSTEM ON CHIP ARCHITECTURE	CO1	Able to understand SOC Architectural features.
		CO2	To acquire the knowledge on processor selection criteria and limitations
		CO3	To acquires the knowledge of memory architectures on SOC.

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		CO4	Able to gain the knowledge of customization using case studies.
		CO5	To understands the interconnection strategies and their customization on SOC.

Subject code	Course Name	COs	Course Outcomes
EC822PE	TEST AND TESTABILITY	**CO1**	Able to understand the need for testing
		CO2	To acquire the knowledge of fundamental concepts in fault and fault diagnosis
		CO3	Able to test pattern generation using LFSR and CA
		CO4	Design for testability rules and techniques for combinational circuits
		CO5	Understand introduction of scan architectures

Subject code	Course Name	COs	Course Outcomes
EC823PE	LOW POWER VLSI DESIGN	**CO1**	Understand the need of Low power circuit design.
		CO2	Attain the knowledge of architectural approaches
		CO3	Analyze and design Low-Voltage Low-Power combinational circuits.
		CO4	Known the design of Low-Voltage Low-Power Memories
		CO5	Summarize the power optimization and trade-off techniques in digital circuits.

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Subject code	Course Name	COs	Course Outcomes
		CO1	Explain quality standards and need for standardization
		CO2	Implement quality measurement systems in various applications
	TOTAL QUALITY MANAGEMENT	CO3	Prepare and use control charts for SQC
		CO4	Implement six sigma approach for various industrial applications
		CO5	Explain standards for total quality management

Subject code	Course Name	COs	Course Outcomes
		CO1	Demonstrate a sound technical knowledge of their selected project topic.
		CO2	Undertake problem identification, formulation and solution.
CS802PC	PROJECT STAGE - 2	CO3	Design engineering solutions to complex problems utilizing a systems approach.
		CO4	Conduct an engineering project
		CO5	Communicate with engineers and the community at large in written an oral forms

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DEPARTMENT: ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE OUTCOME'S (CO's): B.Tech I YEAR I AND II SEMESTERS

ACADEMIC YEAR: 2018 – 2019/2019 – 2020/2020 – 2021/2021 – 2022

I YEAR: I SEMESTER

Subject Code	Course Name	CO's	Outcomes
MA101BS	Mathematics - I	CO1	Write the matrix representation of a set of linear equations and to analyse the solution of the system of equations
		CO2	Find the Eigen values and Eigen vectors
		CO3	Reduce the quadratic form to canonical form using orthogonal transformations.
		CO4	Analyse the nature of sequence and series. Solve the applications on the mean value theorems.
		CO5	Evaluate the improper integrals using Beta and Gamma functions. Find the extreme values of functions of two variables with/ without constraints.

Subject Code	Course Name	CO's	Outcomes
CH102BS	Chemistry	CO1	The knowledge of atomic, molecular and electronic changes, band theory related to conductivity.
		CO2	The required principles and concepts of electrochemistry, corrosion and in understanding the problem of water and its treatments.
		CO3	The required skills to get clear concepts on basic spectroscopy and application to medical and other fields.
		CO4	The knowledge of configurational and conformational analysis of molecules and reaction mechanisms.
		CO5	The knowledge of Spectroscopic techniques and applications

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Subject Code	Course Name	CO's	Outcomes
EE103ES	Basic Electrical Engineering	CO1	To analyze and solve electrical circuits using network laws and theorems.
		CO2	To understand and analyze basic Electric and Magnetic circuits
		CO3	To study the working principles of Electrical Machines
		CO4	To introduce components of Low Voltage Electrical Installations
		CO5	To understand the types of Batteries and Important Characteristics for Batteries.

Subject Code	Course Name	CO's	Outcomes
ME105ES	Engineering Workshop	CO1	Study and practice on machine tools and their operations.
		CO2	Practice on manufacturing of components using workshop trades including pluming, fitting, carpentry, foundry, house wiring and welding.
		CO3	Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling.
		CO4	Explains the construction, function, use and application of different working tools, equipment and machines.
		CO5	Apply basic electrical engineering knowledge for house wiring practice.

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Subject Code	Course Name	CO's	Outcomes
EN105HS	English	CO1	Use English Language effectively in spoken and written forms.
		CO2	Comprehend the given texts and respond appropriately.
		CO3	Communicate confidently in various contexts and different cultures.
		CO4	Acquire basic proficiency in English including reading and listening comprehension,
		CO5	Acquire basic proficiency in English for writing and speaking skills.

Subject Code	Course Name	CO's	Outcomes
CH106BS	Engineering Chemistry Lab	CO1	Determination of parameters like hardness and chloride content in water.
		CO2	Estimation of rate constant of a reaction from concentration – time relationships.
		CO3	Determination of physical properties like adsorption and viscosity.
		CO4	Calculation of Rf values of some organic molecules by TLC technique.
		CO5	Understand the Spectroscopic techniques and applications for important organic compounds.

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Subject Code	Course Name	CO's	Outcomes
EN107HS	English Language and Communication Skills Lab	CO1	Better understanding of nuances of English language through audio- visual experience and group activities
		CO2	Neutralization of accent for intelligibility
		CO3	Speaking skills with clarity and confidence which in turn enhances their employability skills
		CO4	Able to spoken English and neutralize their mother tongue influence
		CO5	able to use language appropriately for public speaking and interviews

Subject Code	Course Name	CO's	Outcomes
EE108ES	Basic Electrical Engineering Lab	CO1	Get an exposure to basic electrical laws.
		CO2	Understand the response of different types of electrical circuits to different excitations.
		CO3	Understand the measurement, calculation and relation between the basic electrical parameters.
		CO4	Understand the basic characteristics of transformers and electrical machines.
		CO5	Understand No-Load Characteristics of a Three-phase Alternator

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I YEAR: II SEMESTER

Subject Code	Course Name	CO's	Outcomes
MA201BS	Mathematics - II	CO1	Identify whether the given differential equation of first order is exact or not
		CO2	Solve higher differential equation and apply the concept of differential equation to real world Problems.
		CO3	Evaluate the multiple integrals and apply the concept to find areas, volumes, centre of mass and Gravity for cubes, sphere and rectangular parallelopiped.
		CO4	Evaluate the line, surface and volume integrals and converting them from one to another.
		CO5	Knowledge in Vector Integration

Subject Code	Course Name	CO's	Outcomes
AP202BS	Applied Physics	CO1	The student would be able to learn the fundamental concepts on Quantum behaviour of matter in its micro state.
		CO2	The knowledge of fundamentals of Semiconductor physics, Optoelectronics, Lasers and fibre Optics enable the students to apply to various systems like communications, solar cell, photo cells and so on.
		CO3	Knowledge in Optoelectronics
		CO4	Design, characterization and study of properties of material help the students to prepare new materials for various engineering applications.
		CO5	The course also helps the students to be exposed to the phenomena of electromagnetism and also to have exposure on magnetic materials and dielectric materials

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Subject Code	Course Name	CO's	Outcomes
CS203ES	Programming for Problem Solving	CO1	To write algorithms and to draw flowcharts for solving problems.
		CO2	To convert the algorithms/flowcharts to C programs.
		CO3	To code and test a given logic in C programming language.
		CO4	To decompose a problem into functions and to develop modular reusable code.
		CO5	To use arrays, pointers, strings and structures to write C programs. Searching and sorting problems.

Subject Code	Course Name	CO's	Outcomes
ME204ES	Engineering Graphics	CO1	Preparing working drawings to communicate the ideas and information.
		CO2	Read, understand and interpret engineering drawings
		CO3	Development of Surfaces of Right Regular Solids, Prism, Cylinder, Pyramid and Cone,
		CO4	Understand the Principles of Isometric Projection.
		CO5	Knowledge to CAD Software Package Commands

Subject Code	Course Name	CO's	Outcomes
AP205BS	Applied Physics Lab	CO1	Understand the V-I Characteristics of solar cell
		CO2	determine magnetic field along the axis of a current carrying coil.
		CO3	determine Hall co-efficient of a given semiconductor
		CO4	determine the bending losses of Optical fibres.□
		CO5	determine the Quality factor of LCR Circuit.

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Subject Code	Course Name	CO's	Outcomes
CS206ES	Programming for Problem Solving Lab	CO1	formulate the algorithms for simple problems
		CO2	translate given algorithms to a working and correct program.
		CO3	correct syntax errors as reported by the compilers. Identify and correct logical errors encountered during execution.
		CO4	represent and manipulate data with arrays, strings and structures and use pointers of different types
		CO5	☐create, read and write to and from simple text and binary files and modularize the code with functions so that they can be reused

Subject Code	Course Name	CO's	Outcomes
MC209ES	Environmental Science	CO1	understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development
		CO2	Classify Living and Non-Living resources
		CO3	Define Biodiversity and Biotic Resources
		CO4	Understand the Environmental Pollution and Control Technologies
		CO5	Understand Environmental Policy, Legislation & EIA

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE OUTCOMES FOR II YEAR TO IV YEAR (R18)

Academic Year – 2018-2019/2019-2020/2020-2021/2021-2022

Subject Code	Course Name	COs	Outcomes
EE301ES	**Engineering Mechanics**	CO1	Students are able to determine resultant of forces acting on a body and analyse equilibrium of a body subjected to a system of forces.
		CO2	Students can solve the problem of bodies subjected to friction.
		CO3	Students are able to find the location of centroid and calculate moment of inertia of a given section
		CO4	Students are able to Understand the kinetics and kinematics of a body undergoing rectilinear, curvilinear, rotatory motion and rigid body motion.
		CO5	To solve problems using work energy equations for translation, fixed axis rotation and plane motion and solve problems of vibration.

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Subject Code	Course Name	COs	Outcomes
EE302PC	Electrical Circuit Analysis	CO1	Apply network theorems for the analysis of electrical circuits.
		CO2	Obtain the transient and steady-state response of electrical circuits
		CO3	Analyze circuits in the sinusoidal steady-state (single-phase and three-phase).
		CO4	Analyze the Laplace transform to circuits
		CO5	Analyze two port circuit behaviour.

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Subject Code	Course Name	COs	Outcomes
EE303PC	**Analog Electronics**	CO1	Know the characteristics, utilization of various components.
		CO2	Understand the biasing techniques
		CO3	Design and analyze various rectifiers, small signal amplifier circuits
		CO4	Design sinusoidal and non-sinusoidal oscillators.
		CO5	A thorough understanding, functioning of OP-AMP, design OP-AMP based circuits with linear

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Subject Code	Course Name	COs	Outcomes
EE304PC	**Electrical Machines - I**	CO1	Students are able to identify different parts of a DC machine & understand its operation
		CO2	Students can carry out different testing methods to predetermine the efficiency of DC machines
		CO3	Students understand different excitation and starting methods of DC machines.
		CO4	Students are able to undestand and control the voltage and speed of a DC machines
		CO5	Analyze single phase and three phase transformers circuits

Subject Code	Course Name	COs	Outcomes
EE305PC	**Electromagnetic Fields**	CO1	Understand the basic mathematical concepts related to electromagnetic vector fields. .
		CO2	Apply the principles of electrostatics to the solutions of problems relating to electric field and electric potential, boundary conditions and electric energy density
		CO3	Apply the principles of magneto statics to the solutions of problems relating to magnetic field and magnetic potential, boundary conditions and magnetic energy density.
		CO4	Understand the concepts related to Faraday's law, induced emf and Maxwell's equations.
		CO5	Apply Maxwell's equations to solutions of problems relating to transmission lines and uniform plane wave propagation.

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Subject Code	Course Name	COs	Outcomes
EE306PC	Electrical Machines Lab - I	CO1	Acquire knowledge about the working of DC machines as generators and motors and start and control the Different DC Machines.
		CO2	Assess the performance of different machines using different testing methods
		CO3	Identify different conditions required to be satisfied for self – excitation of DC Generators
		CO4	Separate iron losses of DC machines into different components
		CO5	Analyze single phase and three phase transformer circuits

Subject Code	Course Name	COs	Outcomes
EE307PC	Analog Electronics Lab	CO1	Know the characteristics, utilization of various components.
		CO2	Understand the biasing techniques
		CO3	Design and analyze various rectifiers, small signal amplifier circuits.
		CO4	Design sinusoidal and non-sinusoidal oscillators.
		CO5	A thorough understanding, functioning of OP-AMP, design OP-AMP based circuits with linear

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Subject Code	Course Name	COs	Outcomes
EE308PC	Electrical Circuits Lab	CO1	Student should be able to analyze complex DC and AC linear circuits
		CO2	Student should be able to Evaluate response in a given network by using theorems
		CO3	Apply concepts of electrical circuits across engineering
		CO4	Student should be able to measure active and reactive powers for star and delta connected balanced loads
		CO5	Student should be able to express given Electrical Circuit in terms of A, B, C, D and Z, Y Parameter Model and Solve the circuits.

Subject Code	Course Name	COs	Outcomes
MC309	Gender Sensitization Lab	CO1	Students will have developed a better understanding of important issues related to gender in contemporary India.
		CO2	Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
		CO3	Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
		CO4	Students will acquire insight into the gendered division of labour and its relation to politics and economics.
		CO5	Men and women students and professionals will be better equipped to work and live together as Year 2 equals.

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II YEAR – II SEMESTER

Subject Code	Course Name	COs	Outcomes
MA401BS	Laplace Transforms, Numerical Methods and Complex Variables	CO1	Analyze the Laplace transforms techniques for solving ODE's
		CO2	Evaluate the root of a given equation. Estimate the value for the given data using interpolation.
		CO3	Students are able to find the numerical solutions for a given ODE'
		CO4	Analyze the complex function with reference to their analyticity, integration using Cauchy's Integral and residue theorems
		CO5	Students are able to understand Taylor's and Laurent's series expansions of complex Function

Subject Code	Course Name	COs	Outcomes
EE402PC	Electrical Machines - II	CO1	Understand the concepts of rotating magnetic fields.
		CO2	Understand the operation of ac machines.
		CO3	Analyze performance characteristics of AC machines.
		CO4	To understand operation, construction and types of single phase motors and their applications in house hold appliances and control systems.
		CO5	Analyze the concept of regulation and its calculations and special machines.

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Subject Code	Course Name	COs	Outcomes
EE403PC	Digital Electronics	CO1	Understand working of logic families and logic gates.
		CO2	Design and implement Combinational and Sequential logic circuits.
		CO3	Understand the process of Analog to Digital conversion and Digital to Analog conversion.
		CO4	Students will be able to use PLDs to implement the given logical problem.
		CO5	To implement synchronous state machines using flip-flops

Subject Code	Course Name	COs	Outcomes
EE405PC	Control Systems	CO1	Categorize different types of system and identify a set of algebraic equations to represent and model a complicated system into a more simplified form.
		CO2	Characterize any system in Laplace domain to illustrate different specification of the system using transfer function concept.
		CO3	Interpret different physical and mechanical systems in terms of electrical system to construct equivalent electrical models for analysis.
		CO4	Employ time domain analysis to predict and diagnose transient performance parameters of the system for standard input functions.
		CO5	Formulate different types of analysis in frequency domain to explain the nature of stability of the system.

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Subject Code	Course Name	COs	Outcomes
EE404PC	Power Systems - I	CO1	Understand the concepts of power systems.
		CO2	Understand the operation of conventional generating stations and renewable sources of electrical power
		CO3	Evaluate the power tariff methods.
		CO4	Determine the electrical circuit parameters of transmission lines
		CO5	Understand the layout of substation and underground cables and corona.

Subject Code	Course Name	COs	Outcomes
EE406PC	Digital Electronics Lab	CO1	Understand working of logic families and logic gates.
		CO2	Design and implement Combinational and Sequential logic circuits.
		CO3	Understand the process of Analog to Digital conversion and Digital to Analog conversion
		CO4	Be able to use PLDs to implement the given logical problem
		CO5	To implement synchronous state machines using flip flops.

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Subject Code	Course Name	COs	Outcomes
EE407PC	Electrical Machines Lab - II	CO1	Assess the performance of different machines using different testing methods
		CO2	To convert the Phase from three phase to two phase and vice versa
		CO3	Compensate the changes in terminal voltages of synchronous generator after estimating the change by different methods
		CO4	Control the active and reactive power flows in synchronous machines
		CO5	Start different machines and control the speed and power factor.

Subject Code	Course Name	COs	Outcomes
EE408PC	Control Systems Lab	CO1	To improve the system performance by selecting a suitable controller and/or a compensator for a specific application
		CO2	Apply various time domain and frequency domain techniques to assess the system performance
		CO3	Apply various control strategies to different applications(example: Power systems, electrical drives etc)
		CO4	Test system controllability and observability using state space representation and applications of state space representation to various systems
		CO5	To design various controllers and compensators to improve system performance.

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Subject Code	Course Name	COs	Outcomes
MC409	**Constitution of India**	CO1	To realize the significance of constitution of India to students from all walks of life and help them to understand the basic concepts of Indian constitution.
		CO2	To identify the importance of fundamental rights as well as fundamental duties
		CO3	To understand the functioning of Union, State and Local Governments in Indian federal system.
		CO4	To learn procedure and effects of emergency, composition and activities of election commission and amendment procedure.
		CO5	To learn procedure and effects of emergency, composition and activities of election commission and amendment procedure.

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III YEAR – I SEMESTER

Subject Code	Course Name	COs	Outcomes
EE501PE	Power Electronics	CO1	Students ability to Understand the differences between signal level and power level devices and types of components & its characteristics.
		CO2	Analyze the controlled rectifier circuits of single phase and three phase for different loads.
		CO3	Analyze the operation of DC-DC choppers and its types
		CO4	Analyze the operation of voltage source inverters of single phase and three phase for different loads
		CO5	Analyze the AC-AC controlled circuits of single phase and three phase for different loads and principle of cyclo converter.

Subject Code	Course Name	COs	Outcomes
EE502PE	Power System – II	CO1	Analyze transmission line performance.
		CO2	Apply load compensation techniques to control reactive power
		CO3	Understand the application of per unit quantities.
		CO4	Design over voltage protection and insulation coordination
		CO5	Determine the fault currents for symmetrical and unbalanced faults

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Subject Code	Course Name	COs	Outcomes
EE503PE	Measurement and Instrumentation	CO1	Identify various types of electronic instrument suitable for specific measurement and Classify various errors present in measuring instruments.
		CO2	Understand construction, working principle and types of oscilloscopes.
		CO3	Comprehend different types of signal generators and analyzers, their construction and operation
		CO4	Describe the working principle, selection criteria and applications of various transducers used in measurement systems.
		CO5	Identify various types of electronic instrument suitable for specific measurement. And Classify various errors present in measuring instruments.

Subject Code	Course Name	COs	Outcomes
EE512PE	High Voltage Engineering	CO1	Understand the basic physics related to various breakdown processes in solid, liquid and gaseous insulating materials.
		CO2	Knowledge of generation and measurement of DC.
		CO3	Knowledge of tests on HV equipment and on insulating materials
		CO4	Knowledge of how over-voltages arise in a power system
		CO5	Understanding high voltage testing methods

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Subject Code	Course Name	COs	Outcomes
SM504MS	**Businesss Economics and Financial Analysis**	CO1	The students will understand the various Forms of Business and the impact of economic variables on the Business.
		CO2	The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt
		CO3	To Acquire knowledge on pricing strategies for the products
		CO4	The Students can study the firm's financial position by analysing the Financial Statements of a Company.
		CO5	Familiarize with Finical Analysis through ratios.

Subject Code	Course Name	COs	Outcomes
EE505PC	**Power System Simulation Lab**	CO1	Perform various transmission line calculations
		CO2	Understand Different circuits time constants
		CO3	Analyze the experimental data and draw the conclusions.
		CO4	To analyze the data using software tools
		CO5	To understand the high frequency transitions.

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Subject Code	Course Name	COs	Outcomes
EE506PC	Power Electronics Lab	CO1	Students must be able to correlate theoretical and practical analysis of AC-AC, DC-AC converters, AC and DC drives
		CO2	Analyze the characteristics of MOSFET, IGBT, SCR and SCR firing CKTs,
		CO3	Able to understand these commutation techniques.
		CO4	Able to understand about series and parallel inverters.
		CO5	Able to understand about converter fed to AC and DC drives.

Subject Code	Course Name	COs	Outcomes
EE507PC	Measurement and Instrumentation Lab	CO1	The student is able to choose instruments
		CO2	The student is able to test any instrument
		CO3	Find the accuracy of any instrument by performing experiment
		CO4	Calibrate PMMC instrument using D.C potentiometer
		CO5	Students will be determined ratio and phase angle errors of current and potential transformer

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Subject Code	Course Name	COs	Outcomes
EN508HS	Advanced Communication Skills Lab	CO1	Acquire vocabulary and use it contextually
		CO2	Listen and speak effectively, confidently in formal and informal contexts
		CO3	Develop proficiency in academic reading and writing
		CO4	Increase possibilities of job prospects
		CO5	Communicate confidently in formal and informal contexts.

Subject Code	Course Name	COs	Outcomes
MC510	Intellectual Property Rights	CO1	Distinguish and Explain various forms of IPRs
		CO2	Identify criteria's to fit one's own intellectual work in particular form of IPRs
		CO3	Apply statutory provisions to protect particular form of IPRs.
		CO4	Identify procedure to protect different forms of IPRs national and international level
		CO5	Develop skill of making search using modern tools and techniques.

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III YEAR – II SEMESTER

Subject Code	Course Name	COs	Outcomes
EE613PE	Wind and Solar Energy Systems	CO1	To study the physics of wind power and energy
		CO2	To understand the principle of operation of wind generators
		CO3	To know the solar power resources
		CO4	To analyze the solar photo-voltaic cell
		CO5	To discuss the solar thermal power generation

Subject Code	Course Name	COs	Outcomes
ME800OE	Non Conventional Sources of Energy	CO1	Identify renewable energy sources and their utilization.
		CO2	Understand the basic concepts of solar radiation and analyze the working of solar and thermal systems
		CO3	Understand principles of energy conversion from alternate sources including wind, geothermal, ocean, biomass, biogas and hydrogen
		CO4	Understand the concepts and applications of fuel cells, thermoelectric convertor and MHD generator
		CO5	Identify methods of energy storage for specific applications

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Subject Code	Course Name	COs	Outcomes
EE601PC	Signals and Systems	CO1	Differentiate various signal functions.
		CO2	Represent any arbitrary signal in time and frequency domain.
		CO3	Understand the characteristics of linear time invariant systems.
		CO4	Analyze the signals with different transform technique
		CO5	Analyze discrete time signals and systems by using appropriate mathematical tools

Subject Code	Course Name	COs	Outcomes
EE602PC	Microprocessors and Microcontrollers	CO1	Understands the internal architecture, organization and assembly language programming of 8086 processors
		CO2	Understands the internal architecture, organization and assembly language programming of 8051 microcontrollers
		CO3	Understands the interfacing techniques to 8086 and 8051 based systems
		CO4	Understands the internal architecture of ARM processors and basic concepts of advanced ARM Processors.
		CO5	Design electrical circuitry to the Microprocessor I/O ports in order to interface the processor to external devices.

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Subject Code	Course Name	COs	Outcomes
EE603PC	Power System Protection	CO1	Compare and contrast electromagnetic, static and microprocessor-based relays
		CO2	Apply technology to protect power system components.
		CO3	Select relay settings of over current and distance relays.
		CO4	Analyze quenching mechanisms used in air, oil and vacuum circuit breakers
		CO5	To understand the phenomenon of over voltages and its characteristics and neutral grounding for overall protection.

Subject Code	Course Name	COs	Outcomes
EE604PC	Power System Operation and Control	CO1	To know the importance of frequency control
		CO2	Understand operation and control of power systems.
		CO3	Analyze various functions of Energy Management System (EMS) functions.
		CO4	Analyze whether the machine is in stable or unstable position.
		CO5	Understand power system deregulation and restructuring

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Subject Code	Course Name	COs	Outcomes
EE605PC	Power System Lab	CO1	Perform various load flow techniques
		CO2	Understand Different protection method
		CO3	Analyze the experimental data and draw the conclusions.
		CO4	Perform various load flow techniques
		CO5	Students will be able to find sequence impedance of three phase synchronous machine and transformer.

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Subject Code	Course Name	COs	Outcomes
EE606PC	**Microprocessors and Microcontrollers Lab**	**CO1**	Identify relevant information to supplement to the Microprocessor and Microcontroller course. Arithmetic, Logical, String Operations on 16 Bit and 32-Bit Data Bit level Logical Operations, Rotate, Shift, Swap and Branch Operations
		CO2	Set up programming strategies and select proper mnemonics and run their program on the training boards.
		CO3	Practice different types of programming Assembly Language Programs to Perform Arithmetic (Both Signed and Unsigned) 16 Bit Data Operations, Logical Operations (Byte and Bit Level Operations), Rotate, Shift, Swap and Branch Instructions Time delay Generation using Timers of 8051. Serial Communication from/to 8051 to/from I/O devices
		CO4	Develop testing and experimental procedures on Program Using Interrupts to Generate Square Wave 10 KHZ Frequency on P2.1 Using Timer 0 8051 in 8 bit Auto reload Mode and Connect a 1 HZ Pulse to INT1 pin and Display on Port 0. Assume Crystal Frequency as 11.0592 MHZ
		CO5	Prepare Interfacing I/O Devices to 8051, 7 Segment Display to 8051. Matrix Keypad to 8051, Sequence Generator Using Serial Interface in 8051.8 bit ADC Interface to 8051.Triangular Wave Generator through DAC interfaces to 8051.

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Subject Code	Course Name	COs	Outcomes
EE607PC	Signals and Systems lab	CO1	Understand the concepts of continuous time and discrete time systems.
		CO2	Analyze systems in complex frequency domain.
		CO3	Understand sampling theorem and its implications
		CO4	Understand the concepts of continuous time and discrete time systems.
		CO5	To analyze sampling principles and various transform techniques.

Subject Code	Course Name	COs	Outcomes
	Cyber Security	CO1	To familiarize various types of cyber-attacks and cyber-crimes
		CO2	To give an overview of the cyber laws
		CO3	To study the defensive techniques against these attacks
		CO4	To study cybersecurity challenges and implications.
		CO5	To know about Cyber Security.

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IV YEAR – I SEMESTER

Subject Code	Course Name	COs	Outcomes
SM701MS	Fundamentals of Management for Engineers	CO1	The students understand the significance of Management in their Profession. The various Management Functions like Planning, Organizing, Staffing, Leading, Motivation and Control aspects are learnt in this course. The students can explore the Management Practices in their domain area.
		CO2	Understand the management concepts
		CO3	Analyze the concepts of management
		CO4	Development of managerial skills for engineers
		CO5	Applications of concepts in practical aspects

Subject Code	Course Name	COs	Outcomes
EE711PE	Electrical and Hybrid Vehicles	CO1	Understand the models to describe hybrid vehicles and their performance.
		CO2	Understand the different possible ways of energy storage.
		CO3	Understand the different strategies related to energy storage systems.
		CO4	To understand the fundamentals concepts, principles, analysis and design of hybrid and electric vehicles.
		CO5	Students will be able to know the various aspects of hybrid and electric drive train.

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Subject Code	Course Name	COs	Outcomes
EE721PE	**HVDC Transmission**	CO1	Compare EHV AC and HVDC system and to describe various types of DC links
		CO2	Analyze Graetz circuit for rectifier and inverter mode of operation
		CO3	Describe various methods for the control of HVDC systems and to perform power flow analysis
		CO4	To study AC/DC systems
		CO5	Describe various protection methods for HVDC systems and classify Harmonics and design

Subject Code	Course Name	COs	Outcomes
MN700OE	**Health and Safety in Mines**	CO1	Students are able to understand the basics of health and safety in mines
		CO2	Evaluate the concept of health and safety in underground
		CO3	Understand the techniques, system engineering approach and the generic approach to safety in mining operations.
		CO4	Understand the concept of safety
		CO5	Gain the knowledge and be able to understand the importance of health and safety including the role of safety risk assessment in the mining industry

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Subject Code	Course Name	COs	Outcomes
EE701PC	Electrical and Electronics Design Lab	CO1	Get practical knowledge related to electrical
		CO2	Fabricate basic electrical circuit elements/networks
		CO3	Trouble shoot the electrical circuits
		CO4	Design filter circuit for application
		CO5	Get hardware skills such as soldering, winding etc.

Subject Code	Course Name	COs	Outcomes
EE702PC	Industrial Oriented Mini Project / Summer Internship	CO1	Students will be able to practice acquired knowledge within the chosen area of technology for project development.
		CO2	Identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach.
		CO3	Reproduce, improve and refine technical aspects for engineering projects.
		CO4	Work as an individual or in a team in development of technical projects.
		CO5	Communicate and report effectively project related activities and findings

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Subject Code	Course Name	COs	Outcomes
EE703PC	Seminar	CO1	Establish motivation for any topic of interest and develop a thought process for technical presentation.
		CO2	Organize a detailed literature survey and build a document with respect to technical publications.
		CO3	Analysis and comprehension of proof-of-concept and related data
		CO4	Effective presentation and improve soft skills.
		CO5	Make use of new and recent technology (e.g. Latex) for creating technical reports

Subject Code	Course Name	COs	Outcomes
EE704PC	Project Stage - I	CO1	Demonstrate a sound technical knowledge of their selected project topic.
		CO2	Undertake problem identification, formulation and solution.
		CO3	Design engineering solutions to complex problems utilising a systems approach
		CO4	Conduct an engineering project
		CO5	Communicate with engineers and the community at large in written an oral forms

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IV YEAR – II SEMESTER

Subject Code	Course Name	COs	Outcomes
EE811PE	Power Quality and FACTS	CO1	The student will be able to Know the severity of power quality problems in distribution system and Understand the concept of voltage sag transformation from up-stream (higher voltages) to down-stream (lower voltage).
		CO2	knowledge of FACTS Concept and general system considerations and Series/shunt reactive compensation at mid point & its comparison.
		CO3	Understand the control circuits of Shunt Controllers SVC & STATCOM for various functions viz. Transient stability Enhancement, voltage instability prevention and power oscillation damping
		CO4	Understand the Power and control circuits of Series Controllers GCSC, TSSC and TCSC
		CO5	Knowledge of the Unified Power Flow Controller including its circuit arrangement, Operation and control.

Subject Code	Course Name	COs	Outcomes
EE822PE	Electrical Distribution Systems	CO1	To distinguish between transmission and distribution systems and feeder analysis.
		CO2	To understand Substation installation and to analyze the power loss in Substation and Voltage drop.
		CO3	Design protection of distribution systems. Coordination of Protective devices.
		CO4	To understand the importance of compensation and pf improvement
		CO5	To understand the importance of protection of voltage control and pf improvement

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Subject Code	Course Name	COs	Outcomes
ME800OE	**Non Conventional Sources of Energy**	CO1	Identify renewable energy sources and their utilization.
		CO2	Understand the basic concepts of solar radiation and analyze the working of solar and thermal systems
		CO3	Understand principles of energy conversion from alternate sources including wind, geothermal, ocean, biomass, biogas and hydrogen
		CO4	Understand the concepts and applications of fuel cells, thermoelectric convertor and MHD generator
		CO5	Identify methods of energy storage for specific applications

Subject Code	Course Name	COs	Outcomes
EE704PC	**Project Stage – II**	CO1	Demonstrate a sound technical knowledge of their selected project topic.
		CO2	Undertake problem identification, formulation and solution.
		CO3	Design engineering solutions to complex problems utilizing a systems approach.
		CO4	Communicate with engineers and the community at large in written an oral forms
		CO5	Conduct an engineering project

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DEPARTMENT: ARTIFICIAL INTELLIGENCE AND DATA SCIENCES

COURSE OUTCOME'S (CO's): B.Tech I YEAR I AND II SEMESTERS

ACADEMIC YEAR: 2018 – 2019/2019 – 2020/2020 – 2021/2021 – 2022

I YEAR: I SEMESTER

Subject Code	Course Name	CO's	Outcomes
MA101BS	**Mathematics - I**	CO1	Write the matrix representation of a set of linear equations and to analyse the solution of the system of equations
		CO2	Find the Eigen values and Eigen vectors
		CO3	Reduce the quadratic form to canonical form using orthogonal transformations.
		CO4	Analyse the nature of sequence and series. Solve the applications on the mean value theorems.
		CO5	Evaluate the improper integrals using Beta and Gamma functions. Find the extreme values of functions of two variables with/ without constraints.

Subject Code	Course Name	CO's	Outcomes
CH102BS	**Chemistry**	CO1	The knowledge of atomic, molecular and electronic changes, band theory related to conductivity.
		CO2	The required principles and concepts of electrochemistry, corrosion and in understanding the problem of water and its treatments.
		CO3	The required skills to get clear concepts on basic spectroscopy and application to medical and other fields.
		CO4	The knowledge of configurational and conformational analysis of molecules and reaction mechanisms.
		CO5	The knowledge of Spectroscopic techniques and applications

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Subject Code	Course Name	CO's	Outcomes
EE103ES	Basic Electrical Engineering	CO1	To analyze and solve electrical circuits using network laws and theorems.
		CO2	To understand and analyze basic Electric and Magnetic circuits
		CO3	To study the working principles of Electrical Machines
		CO4	To introduce components of Low Voltage Electrical Installations
		CO5	To understand the types of Batteries and Important Characteristics for Batteries.

Subject Code	Course Name	CO's	Outcomes
ME105ES	Engineering Workshop	CO1	Study and practice on machine tools and their operations.
		CO2	Practice on manufacturing of components using workshop trades including pluming, fitting, carpentry, foundry, house wiring and welding.
		CO3	Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling.
		CO4	Explains the construction, function, use and application of different working tools, equipment and machines.
		CO5	Apply basic electrical engineering knowledge for house wiring practice.

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Subject Code	Course Name	CO's	Outcomes
EN105HS	English	CO1	Use English Language effectively in spoken and written forms.
		CO2	Comprehend the given texts and respond appropriately.
		CO3	Communicate confidently in various contexts and different cultures.
		CO4	Acquire basic proficiency in English including reading and listening comprehension,
		CO5	Acquire basic proficiency in English for writing and speaking skills.

Subject Code	Course Name	CO's	Outcomes
CH106BS	Engineering Chemistry Lab	CO1	Determination of parameters like hardness and chloride content in water.
		CO2	Estimation of rate constant of a reaction from concentration – time relationships.
		CO3	Determination of physical properties like adsorption and viscosity.
		CO4	Calculation of Rf values of some organic molecules by TLC technique.
		CO5	Understand the Spectroscopic techniques and applications for important organic compounds.

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Subject Code	Course Name	CO's	Outcomes
EN107HS	English Language and Communication Skills Lab	CO1	Better understanding of nuances of English language through audio- visual experience and group activities
		CO2	Neutralization of accent for intelligibility
		CO3	Speaking skills with clarity and confidence which in turn enhances their employability skills
		CO4	Able to spoken English and neutralize their mother tongue influence
		CO5	able to use language appropriately for public speaking and interviews

Subject Code	Course Name	CO's	Outcomes
EE108ES	Basic Electrical Engineering Lab	CO1	Get an exposure to basic electrical laws.
		CO2	Understand the response of different types of electrical circuits to different excitations.
		CO3	Understand the measurement, calculation and relation between the basic electrical parameters.
		CO4	Understand the basic characteristics of transformers and electrical machines.
		CO5	Understand No-Load Characteristics of a Three-phase Alternator

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I YEAR: II SEMESTER

Subject Code	Course Name	CO's	Outcomes
MA201BS	Mathematics - II	CO1	Identify whether the given differential equation of first order is exact or not
		CO2	Solve higher differential equation and apply the concept of differential equation to real world Problems.
		CO3	Evaluate the multiple integrals and apply the concept to find areas, volumes, centre of mass and Gravity for cubes, sphere and rectangular parallelopiped.
		CO4	Evaluate the line, surface and volume integrals and converting them from one to another.
		CO5	Knowledge in Vector Integration

Subject Code	Course Name	CO's	Outcomes
AP202BS	Applied Physics	CO1	The student would be able to learn the fundamental concepts on Quantum behaviour of matter in its micro state.
		CO2	The knowledge of fundamentals of Semiconductor physics, Optoelectronics, Lasers and fibre Optics enable the students to apply to various systems like communications, solar cell, photo cells and so on.
		CO3	Knowledge in Optoelectronics ,
		CO4	Design, characterization and study of properties of material help the students to prepare new materials for various engineering applications.
		CO5	The course also helps the students to be exposed to the phenomena of electromagnetism and also to have exposure on magnetic materials and dielectric materials

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Subject Code	Course Name	CO's	Outcomes
CS203ES	Programming for Problem Solving	CO1	To write algorithms and to draw flowcharts for solving problems.
		CO2	To convert the algorithms/flowcharts to C programs.
		CO3	To code and test a given logic in C programming language.
		CO4	To decompose a problem into functions and to develop modular reusable code.
		CO5	To use arrays, pointers, strings and structures to write C programs. Searching and sorting problems.

Subject Code	Course Name	CO's	Outcomes
ME204ES	Engineering Graphics	CO1	Preparing working drawings to communicate the ideas and information.
		CO2	Read, understand and interpret engineering drawings
		CO3	Development of Surfaces of Right Regular Solids, Prism, Cylinder, Pyramid and Cone,
		CO4	Understand the Principles of Isometric Projection.
		CO5	Knowledge to CAD Software Package Commands

Subject Code	Course Name	CO's	Outcomes
AP205BS	Applied Physics Lab	CO1	Understand the V-I Characteristics of solar cell
		CO2	determine magnetic field along the axis of a current carrying coil.
		CO3	determine Hall co-efficient of a given semiconductor
		CO4	determine the bending losses of Optical fibres.
		CO5	determine the Quality factor of LCR Circuit.

Subject Code	Course Name	CO's	Outcomes
CS206ES	**Programming for Problem Solving Lab**	CO1	formulate the algorithms for simple problems
		CO2	translate given algorithms to a working and correct program.
		CO3	correct syntax errors as reported by the compilers. Identify and correct logical errors encountered during execution.
		CO4	represent and manipulate data with arrays, strings and structures and use pointers of different types
		CO5	□create, read and write to and from simple text and binary files and modularize the code with functions so that they can be reused

Subject Code	Course Name	CO's	Outcomes
MC209ES	**Environmental Science**	CO1	understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development
		CO2	Classify Living and Non-Living resources
		CO3	Define Biodiversity and Biotic Resources
		CO4	Understand the Environmental Pollution and Control Technologies
		CO5	Understand Environmental Policy, Legislation & EIA

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DEPARTMENT: ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

COURSE OUTCOME'S (CO's): B.Tech.

ACADEMIC YEAR: 2018-2019/2019-2020/2020-2021/2021-2022

II YEAR: I SEMESTER

Subject Code	Course Name	CO's	Outcomes
CS310PC	Discrete Mathematics	CO1	Ability to understand and construct precise mathematical proofs
		CO2	Ability to use logic and set theory to formulate precise statements
		CO3	⬚ Ability to analyze and solve counting problems on finite and discrete structures
		CO4	Ability to describe and manipulate sequences
		CO5	Ability to apply graph theory in solving computing problems

Subject Code	Course Name	CO's	Outcomes
CS302PC	Data Structures	CO1	Ability to select the data structures that efficiently model the information in a problem.
		CO2	Ability to assess efficiency trade-offs among different data structure implementations or combinations.
		CO3	Implement and know the application of algorithms for sorting and pattern matching.
		CO4	Design programs using a variety of data structures, including hash tables, binary and general tree structures, search trees, tries, heaps, graphs, and AVL-trees.
		CO5	Understand the Pattern matching algorithms.

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Subject Code	Course Name	CO's	Outcomes
CS304PC	Computer Organization and Architecture	CO1	Understand the basics of instructions sets and their impact on processor design.
		CO2	Demonstrate an understanding of the design of the functional units of a digital computer system.
		CO3	Evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory.
		CO4	Design a pipeline for consistent execution of instructions with minimum hazards.
		CO5	Recognize and manipulate representations of numbers stored in digital computers

Subject Code	Course Name	CO's	Outcomes
CS313PC	Operating Systems	CO1	Will be able to control access to a computer and the files that may be shared.
		CO2	Demonstrate the knowledge of the components of computer and their respective roles in computing.
		CO3	Ability to recognize and resolve user problems with standard operating environments.
		CO4	Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively.
		CO5	Understand File System Interface and Operations

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Subject Code	Course Name	CO's	Outcomes
CS311PC	Python Programming	CO1	Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
		CO2	Demonstrate proficiency in handling Strings and File Systems.
		CO3	Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.
		CO4	Interpret the concepts of Object-Oriented Programming as used in Python.
		CO5	Implement exemplary applications related to Network Programming, Web Services and Databases in Python.

Subject Code	Course Name	CO's	Outcomes
SM306MS	Business Economics & Financial Analysis	CO1	understand the various Forms of Business and the impact of economic variables on the Business.
		CO2	The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt.
		CO3	The Students can study the firm's financial position by analysing the Financial Statements of a Company.
		CO4	Understand Production, Cost, Market Structures & Pricing
		CO5	Understand Financial Analysis through Ratios.

Subject Code	Course Name	CO's	Outcomes
CS307PC	Data Structures Lab	CO1	to develop C programs for computing and real-life applications using basic elements like control statements, arrays, functions, pointers, strings.
		CO2	create data structures using stacks, queues and linked lists.
		CO3	Able to implement the tree traversal methods.
		CO4	Ability to Implement searching and sorting algorithms
		CO5	Able to implement the graph traversal methods.

Subject Code	Course Name	CO's	Outcomes
CS314PC	Operating Systems Lab	CO1	Simulate and implement operating system concepts of scheduling
		CO2	Simulate and implement operating system concepts of deadlock management.
		CO3	Simulate and implement operating system concepts of file management and memory management.
		CO4	Simulate and implement operating system concepts of memory management.
		CO5	Able to implement C programs using Unix system calls

Subject Code	Course Name	CO's	Outcomes
CS312PC	Python Programming Lab	CO1	able to understand the basic concepts scripting and the contributions of scripting language
		CO2	Ability to explore python especially the object-oriented concepts, and the built in objects of Python.
		CO3	Ability to create practical and contemporary applications such as TCP/IP network programming,
		CO4	Ability to create practical and contemporary applications such as Web applications.
		CO5	Ability to create practical and contemporary applications such as discrete event simulations.

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Subject Code	Course Name	CO's	Outcomes
MC309	Gender Sensitization Lab	CO1	Able to better understanding of important issues related to gender in contemporary India.
		CO2	Able to sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
		CO3	Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
		CO4	Students will acquire insight into the gendered division of labour and its relation to politics and economics. Men and women students and professionals will be better equipped to work and live together as equals.
		CO5	Able to develop a sense of appreciation of women in all walks of life.

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II YEAR: II SEMESTER

Subject Code	Course Name	CO's	Outcomes
MA413BS	Mathematical and Statistical Foundations	CO1	Apply the number theory concepts to cryptography domain
		CO2	Apply the concepts of probability and distributions to some case studies
		CO3	Correlate the material of one unit to the material in other units
		CO4	Resolve the potential misconceptions and hazards in each topic of study.
		CO5	Understand Stochastic Processes and Markov Chains.

Subject Code	Course Name	CO's	Outcomes
CS424PC	Automata Theory and Compiler Design	CO1	Able to employ finite state machines for modeling and solving computing problems.
		CO2	Able to design context free grammars for formal languages.
		CO3	Able to distinguish between decidability and undecidability.
		CO4	Demonstrate the knowledge of patterns, tokens & regular expressions for lexical analysis.
		CO5	Acquire skills in using lex tool and design LR parsers

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Subject Code	Course Name	CO's	Outcomes
CS404PC	Database Management Systems	CO1	Gain knowledge of fundamentals of DBMS, database design and normal forms.
		CO2	Understand the Relational Model:
		CO3	Master the basics of SQL for retrieval and management of data.
		CO4	Be acquainted with the basics of transaction processing and concurrency control.
		CO5	Familiarity with database storage structures and access techniques

Subject Code	Course Name	CO's	Outcomes
CS420PC	Introduction to Artificial Intelligence	CO1	Learn the distinction between optimal reasoning Vs human like reasoning and formulate an efficient problem space for a problem expressed in natural language. Also select a search algorithm for a problem and estimate its time and space complexities.
		CO2	Apply AI techniques to solve problems of game playing, theorem proving, and machine learning.
		CO3	Learn different knowledge representation techniques.
		CO4	Understand the concepts of state space representation, exhaustive search, heuristic search together with the time and space complexities.
		CO5	Comprehend the applications of Probabilistic Reasoning and Bayesian Networks. Analyze Supervised Learning Vs. Learning Decision Trees

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Subject Code	Course Name	CO's	Outcomes
CS412PC	Object Oriented Programming using Java	CO1	Able to solve real world problems using OOP techniques.
		CO2	Able to understand the use of abstract classes.
		CO3	Able to solve problems using java collection framework and I/o classes.
		CO4	Able to develop multithreaded applications with synchronization.
		CO5	Able to develop applets for web applications. Able to design GUI based applications

Subject Code	Course Name	CO's	Outcomes
CS407PC	Database Management Systems Lab	CO1	Design database schema for a given application and apply normalization
		CO2	Acquire skills in using SQL commands for data definition and data manipulation.
		CO3	Develop solutions for database applications using procedures.
		CO4	Develop solutions for database applications using cursors.
		CO5	Develop solutions for database applications using triggers

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Subject Code	Course Name	CO's	Outcomes
CS408PC	Java Programming Lab	CO1	Able to write java compiler and eclipse platform.
		CO2	Able to write programs for solving real world problems using java collection frame work.
		CO3	Able to write programs using abstract classes.
		CO4	Able to write multithreaded programs.
		CO5	Able to write GUI programs using swing controls in Java.

Subject Code	Course Name	CO's	Outcomes
CS421PC	Artificial Intelligence Lab	CO1	Able to implement simple facts and Queries
		CO2	Able to solve 8 Puzzle problems
		CO3	Apply basic principles of AI in solutions that require problem solving, knowledge representation, and learning.
		CO4	Possess the skill for representing knowledge using the appropriate technique
		CO5	Possess the ability to apply AI techniques to solve problems of Game Playing

Subject Code	Course Name	CO's	Outcomes
MC409	CONSTITUTION OF INDIA	CO1	Understand constitution law and constitutionalism
		CO2	Understand Scheme of the fundamental rights
		CO3	Understand the Directive Principles of State Policy – Its importance and implementation
		CO4	Understand Parliamentary Form of Government in India – The constitution powers and status of the President of India
		CO5	Understand The historical perspectives of the constitutional amendments in India

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II1 YEAR: I SEMESTER

Subject Code	Course Name	CO's	Outcomes
		CO1	Understand the concepts of computational intelligence like machine learning.
		CO2	Ability to get the skill to apply machine learning techniques to address the real time problems in different areas.
	Machine Learning	CO3	Understand the Neural Networks and its usage in machine learning application.
		CO4	Understand Genetic Algorithms.
		CO5	Understand combining Inductive and Analytical Learning.

Subject Code	Course Name	CO's	Outcomes
		CO1	Ability to analyze the performance of algorithms.
		CO2	Ability to choose appropriate data structures and algorithm design methods for a specified Application.
	Design and Analysis of Algorithms	CO3	Ability to understand how the choice of data structures and the algorithm design methods impact the performance of programs
		CO4	Understand the Greedy method.
		CO5	Understand Branch and Bound.

Subject Code	Course Name	CO's	Outcomes
		CO1	Ability to explain the foundations, definitions, and challenges of Big Data
		CO2	Understand various Analytical tools.
	Big Data Technologies	CO3	Ability to program using HADOOP and Map reduce, NOSQL
		CO4	Understand Mobile Analytics and tools.
		CO5	Ability to understand the importance of Big Data in Social Media and Mining.

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Subject Code	Course Name	CO's	Outcomes
	Software Engineering	CO1	Ability to understand the software engineering process.
		CO2	Ability to translate end-user requirements into system and software requirements, using e.g. UML, and structure the requirements in a Software Requirements Document (SRD).
		CO3	Identify and apply appropriate software architectures and patterns to carry out high level design of a system and be able to critically compare alternative choices.
		CO4	Will have experience and/or awareness of testing problems and will be able to develop a simple testing report
		CO5	Ability to check the software quality.

Subject Code	Course Name	CO's	Outcomes
	Pattern Recognition	CO1	Understand the theory, benefits, inadequacies and possible applications of various machine learning and pattern recognition algorithms
		CO2	Identify and employ suitable machine learning techniques in classification
		CO3	Identify and employ suitable machine learning techniques in pattern recognition,
		CO4	Identify and employ suitable machine learning techniques in clustering
		CO5	Identify and employ suitable machine learning techniques in decision problems.

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Subject Code	Course Name	CO's	Outcomes
	Computer Vision and Robotics	CO1	Implement fundamental image processing techniques required for computer vision.
		CO2	Implement boundary tracking techniques.
		CO3	Apply chain codes and other region descriptors, Hough Transform for line, circle, and ellipse detections.
		CO4	Apply 3D vision techniques and Implement motion related techniques.
		CO5	Develop applications using computer vision techniques.

Subject Code	Course Name	CO's	Outcomes
	Information Retrieval Systems	CO1	understand the data/file structures
		CO2	Ability to apply IR principles to locate relevant information large collections of data
		CO3	Ability to design different document clustering algorithms
		CO4	Implement retrieval systems for web search tasks.
		CO5	Design an Information Retrieval System for web search tasks.

Subject Code	Course Name	CO's	Outcomes
	Software Testing Methodologies	CO1	Understand the necessity of testing
		CO2	Understand Transaction Flow Testing
		CO3	Understand testing process, criteria, strategies, and methodologies
		CO4	Understand Logic Based Testing.
		CO5	Able to develop skills in software test automation and management using latest tools.

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Subject Code	Course Name	CO's	Outcomes
	DATA WAREHOUSING AND BUSINESS INTELLIGENCE	CO1	Understand architecture of data warehouse and OLAP operations.
		CO2	Understand Fundamental concepts of BI and Analytics
		CO3	Application of BI Key Performance indicators
		CO4	Design of Dashboards, Implementation of Web Analytics
		CO5	Understand Utilization of Advanced BI Tools and their Implementation. Implementation of BI Techniques and BI Ethics.

Subject Code	Course Name	CO's	Outcomes
	Big Data Technologies Lab	CO1	knowledge of Big data Analytics principles and techniques
		CO2	Use Excel as an Analytical tool and visualization tool.
		CO3	Ability to program using HADOOP and Map reduce.
		CO4	Ability to perform data analytics using ML in R.
		CO5	Use cassandra to perform social media analytics.

Subject Code	Course Name	CO's	Outcomes
	Advanced Communication Skills Lab	CO1	Able to improve the students' fluency in English, through a well-developed vocabulary
		CO2	able to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.
		CO3	Able to transferring information from non-verbal to verbal texts and vice-versa.
		CO4	Able to write project/research reports/technical reports.
		CO5	Able to communicate their ideas relevantly and coherently in writing.

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Subject Code	Course Name	CO's	Outcomes
	Intellectual Property Rights	CO1	Able to understand the Intellectual property
		CO2	Understand the trade marks.
		CO3	Understand the law of copy rights.
		CO4	Understand the trade secrets.
		CO5	Able to develop new Intellectual property.

III YEAR II SEMESTER

Subject Code	Course Name	CO's	Outcomes
	KNOWLEDGE REPRESENTATION AND REASONING	CO1	Analyze and design knowledge-based systems intended for computer implementation.
		CO2	Acquire theoretical knowledge about principles for logic-based representation and reasoning.
		CO3	Ability to understand knowledge-engineering process
		CO4	Ability to implement production systems, frames, inheritance systems and approaches
		CO5	handle uncertain or incomplete knowledge.

Subject Code	Course Name	CO's	Outcomes
	Data Analytics	CO1	Understand the impact of data analytics for business decisions and strategy
		CO2	Carry out data analysis/statistical analysis
		CO3	To carry out standard data visualization and formal inference procedures
		CO4	Design Data Architecture
		CO5	Understand various Data Sources

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Subject Code	Course Name	CO's	Outcomes
	Computer Networks	CO1	Gain the knowledge of the basic computer network technology.
		CO2	Gain the knowledge of the functions of each layer in the OSI and TCP/IP reference model.
		CO3	Obtain the skills of subnetting and routing mechanisms.
		CO4	Familiarity with the essential protocols of computer networks, and how they can be applied in network design and implementation.
		CO5	Understand the communication between machines in a network and the protocols of the various layers.

Subject Code	Course Name	CO's	Outcomes
	Data Analytics Lab	CO1	Understand linear regression and logistic regression.
		CO2	Understand the functionality of different classifiers.
		CO3	Implement visualization techniques using different graphs.
		CO4	Apply descriptive and predictive analytics for different types of data.
		CO5	understand the various search methods and visualization techniques.

Subject Code	Course Name	CO's	Outcomes
	COMPUTER NETWORKS LAB	CO1	Implement data link layer farming methods.
		CO2	Analyze error detection and error correction codes.
		CO3	Implement and analyze routing and congestion issues in network design.
		CO4	Implement Encoding and Decoding techniques used in presentation layer
		CO5	To be able to work with different network tools

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Subject Code	Course Name	CO's	Outcomes
	Environmental Science	CO1	Able to understand Ecosystems
		CO2	Able to understand Classification of Resources
		CO3	Understand Environmental Pollution and Control Technologies
		CO4	Understand Environmental Policy, Legislation & EIA
		CO5	understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development

IV YEAR I SEMESTER

Subject Code	Course Name	CO's	Outcomes
	Deep Learning	CO1	Understand the concepts of Deep Learning
		CO2	Implement deep learning algorithms, understand neural networks and traverse the layers of data
		CO3	Learn topics such as convolutional neural networks, recurrent neural networks, training deep networks and high-level interfaces
		CO4	Understand applications of Deep Learning to Computer Vision
		CO5	Understand and analyze Applications of Deep Learning to NLP

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Subject Code	Course Name	CO's	Outcomes
	DATA WRANGLING AND DATA VISUALIZATION	CO1	Perform data wrangling
		CO2	Explain principles of visual perception
		CO3	Apply core skills for visual analysis
		CO4	Apply visualization techniques for various data analysis tasks
		CO5	Evaluate visualization techniques

Subject Code	Course Name	CO's	Outcomes
	Internet of Things	CO1	Interpret the impact and challenges posed by IoT networks leading to new architectural models.
		CO2	Compare and contrast the deployment of smart objects and the technologies to connect them to network.
		CO3	Appraise the role of IoT protocols for efficient network communication.
		CO4	Elaborate the need for Data Analytics and Security in IoT.
		CO5	Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry.

Subject Code	Course Name	CO's	Outcomes
	Web Technologies	CO1	gain knowledge of client-side scripting, validation of forms and AJAX programming
		CO2	understand server-side scripting with PHP language
		CO3	understand what is XML and how to parse and use XML Data with Java
		CO4	To introduce Server-side programming with Java Servlets and JSP
		CO5	Able to write Client-side Scripting.

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Subject Code	Course Name	CO's	Outcomes
	Natural Language Processing	CO1	Show sensitivity to linguistic phenomena and an ability to model them with formal grammars.
		CO2	Understand and carry out proper experimental methodology for training and evaluating empirical NLP systems
		CO3	Able to manipulate probabilities, construct statistical models over strings and trees, and estimate parameters using supervised and unsupervised training methods.
		CO4	Able to design, implement, and analyze NLP algorithms
		CO5	Able to design different language modeling Techniques.

Subject Code	Course Name	CO's	Outcomes
	Mobile Application Development	CO1	understanding of the fundamentals of Android operating systems.
		CO2	Understand Android software development tools.
		CO3	ability to debug programs running on mobile devices.
		CO4	Student will be able to develop Android user interfaces
		CO5	Student will be able to develop, deploy and maintain the Android Applications.

Subject Code	Course Name	CO's	Outcomes
	Data Mining	CO1	Ability to understand the types of the data to be mined and present a general classification of tasks and primitives to integrate a data mining system.
		CO2	Apply preprocessing methods for any given raw data. Extract interesting patterns from large amounts of data.
		CO3	Discover the role played by data mining in various fields.
		CO4	Choose and employ suitable data mining algorithms to build analytical applications
		CO5	Evaluate the accuracy of supervised and unsupervised models and algorithms.

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Subject Code	Course Name	CO's	Outcomes
	Industrial Oriented Mini Project/ Summer Internship	CO1	Students will be able to practice acquired knowledge within the chosen
		CO2	area of technology for project development.
		CO3	Identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach.
		CO4	Reproduce, improve and refine technical aspects for engineering projects.
		CO5	Work as an individual or in a team in development of technical projects.

Subject Code	Course Name	CO's	Outcomes
	Seminar	CO1	Establish motivation for any topic of interest and develop a thought process for technical presentation.
		CO2	Organize a detailed literature survey and build a document with respect to technical publications.
		CO3	Analysis and comprehension of proof-of-concept and related data
		CO4	Effective presentation and improve soft skills.
		CO5	Make use of new and recent technology (e.g. Latex) for creating technical reports

Subject Code	Course Name	CO's	Outcomes
	Project Stage - I	CO1	Demonstrate a sound technical knowledge of their selected project topic.
		CO2	Undertake problem identification, formulation and solution.
		CO3	Design engineering solutions to complex problems utilising a systems approach
		CO4	Conduct an engineering project
		CO5	Communicate with engineers and the community at large in written an oral forms

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IV YEAR II SEMESTER

Subject Code Course Name	COs	Outcomes
	CO1	Understand the Organizational Behaviour.
	CO2	Understand conceptual framework and the theories underlying Organizational Behaviour.
Organizational Behaviour	CO3	Understand strategies to improve the follow of communication
	CO4	Understand Job design and Goal setting for High performance
	CO5	Know the Activities and skills of Great leaders.

Subject Code	Course Name	CO's	Outcomes
		CO1	Understand the concepts of cognitive science.
		CO2	Understand what cognitive computing is, and how it differs from traditional approaches.
	Cognitive Computing	CO3	Plan and use the primary tools associated with cognitive computing.
		CO4	Plan and execute a project that leverages cognitive computing.
		CO5	Understand and develop the business implications of cognitive computing.

Subject Code	Course Name	CO's	Outcomes
		CO1	Demonstrate a sound technical knowledge of their selected project topic.
		CO2	Undertake problem identification, formulation and solution.
	Project Stage - II	CO3	Design engineering solutions to complex problems utilizing a systems approach.
		CO4	Communicate with engineers and the community at large in written an oral forms
		CO5	Conduct an engineering project

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DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING

COURSE OUTCOME'S (CO's): M.Tech I YEAR I AND II SEMESTERS

ACADEMIC YEAR: 2022-2023

I YEAR: I SEMESTER

Subject Code	Course Name	CO's	Outcomes
	Mathematical Foundations of Computer Science	CO1	Ability to understand and construct precise mathematical proofs.
		CO2	Ability to use logic and set theory to formulate precise statements.
		CO3	Ability to analyze and solve counting problems on finite and discrete structures.
		CO4	Ability to describe and manipulate sequences.
		CO5	Ability to apply graph theory in solving computing problems.

Subject Code	Course Name	CO's	Outcomes
	Advanced Data Structures	CO1	Understand Heap Structures, hashing and collisions
		CO2	Understand search structures like OBST, AVL Trees, Red-Black Trees and Splay Trees.
		CO3	Ability to select the data structures that efficiently model the information in a problem
		CO4	Ability to understand how the choice of data structures impact the performance of programs
		CO5	Design programs using a variety of data structures, including hash tables, search structures and digital search structures

Subject Code	Course Name	CO's	Outcomes
	Database Programming with PL/SQL	CO1	Understand importance of PL/SQL basics
		CO2	Understand language fundamentals and control structures
		CO3	Understand packages
		CO4	Implement functions and procedures using PL/SQL
		CO5	Understand the importance of triggers in database

Subject Code	Course Name	CO's	Outcomes
	Deep Learning	CO1	Implement deep learning algorithms
		CO2	understand neural networks and traverse the layers of data
		CO3	Learn topics such as convolutional neural networks, recurrent neural networks, training deep networks and high-level interfaces
		CO4	Understand applications of Deep Learning to Computer Vision
		CO5	Understand and analyze Applications of Deep Learning to NLP

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Subject Code	Course Name	CO's	Outcomes
		CO1	Show sensitivity to linguistic phenomena and an ability to model them with formal grammars.
		CO2	Understand and carry out proper experimental methodology for training and evaluating empirical NLP systems
	Natural Language Processing	CO3	Able to manipulate probabilities, construct statistical models over strings and trees, and estimate parameters using supervised and unsupervised training methods.
		CO4	Able to design, implement, and analyze NLP algorithms Able to design different language modeling Techniques.
		CO5	Able to design different language modeling Techniques.

Subject Code	Course Name	CO's	Outcomes
		CO1	Understand the various cryptographic protocols
		CO2	Understand Cryptographic Techniques
	APPLIED CRYPTOGRAPHY	CO3	Analyze key length and algorithm types and modes
		CO4	Illustrate different public key algorithms in cryptosystems
		CO5	Understand special algorithms for protocols and usage in the real world

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Subject Code	Course Name	CO's	Outcomes
	Software Quality Engineering	CO1	Understand software quality and its perspectives
		CO2	Understand software quality assurance and its process
		CO3	Analyze defect prevention and defect reduction in software quality assurance
		CO4	Illustrate software quality engineering activities and its process
		CO5	Understand Checklist based testing and its limitations

DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING			
Course Outcomes (CO's): M.Tech I Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	**Course Name**	**CO's**	**Outcomes**
	Advanced Data Structures Lab	CO1	Ability to select the data structures that efficiently model the information in a problem.
		CO2	Ability to assess efficiency trade-offs among different data structure implementations or combinations.
		CO3	Implement and know the application of algorithms for sorting and pattern matching.
		CO4	Design programs using a variety of data structures, including hash tables, binary and general tree structures, search trees, tries, heaps, graphs, and B-trees.
		CO5	Able to implement all the functions of a dictionary using hashing

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Course Outcomes (CO's): M.Tech I Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	Research Methodology & IPR	CO1	Understand research problem formulation.
		CO2	Analyze research related information. Follow research ethics
		CO3	Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity.
		CO4	Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasis the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular.
		CO5	Understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about, economic growth and social benefits.

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I YEAR: II SEMESTER

DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING			
Course Outcomes (CO's): M.Tech I Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	Advanced Algorithms	CO1	Understand various sorting algorithms
		CO2	Understand Edmond's Blossom algorithm to compute augmenting path.
		CO3	Analyze the complexity/performance of different algorithms.
		CO4	Determine the appropriate data structure for solving a particular set of problems.
		CO5	Categorize the different problems in various classes according to their complexity.

DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING			
Course Outcomes (CO's): M.Tech I Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	Advanced Computer Architecture	CO1	Understand the concepts and principles of parallel and advanced computer architectures.
		CO2	Understand shared memory organizations
		CO3	Computational models and Computer Architectures.
		CO4	Concepts of parallel computer models.
		CO5	Scalable Architectures, Pipelining, Superscalar processors

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DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING			
Course Outcomes (CO's): M.Tech I Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	**Course Name**	**CO's**	**Outcomes**
	Enterprise Cloud Concepts	CO1	Understand importance of cloud architecture
		CO2	Understand Cloud-Enabling Technology
		CO3	Illustrating the fundamental concepts of cloud security.
		CO4	Analyze various cloud computing mechanisms
		CO5	Understanding the architecture and working of cloud computing.

DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING			
Course Outcomes (CO's): M.Tech I Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	**Course Name**	**CO's**	**Outcomes**
	Advanced Computer Networks	CO1	Understand the basics of wireless and mobile networking
		CO2	Understand multimedia networking.
		CO3	Understanding of holistic approach to computer networking
		CO4	Ability to understand the computer network protocols and their applications
		CO5	Ability to design simulation concepts related to packet forwarding in networks.

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DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING			
Course Outcomes (CO's): M.Tech I Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	**Course Name**	**CO's**	**Outcomes**
	Edge Analytics	CO1	Understand the concepts of Edge Analytics, both in theory and in practical application.
		CO2	Demonstrate a comprehensive understanding of different tools used at edge analytics.
		CO3	Formulate, Design and Implement the solutions for real world edge analytics.
		CO4	Understand Cloud Service providers
		CO5	Designing a Smart Doorbell with Visual Recognition setting up the environment

DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING			
Course Outcomes (CO's): M.Tech I Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	**Course Name**	**CO's**	**Outcomes**
	Bioinformatics	CO1	Understand the Central Dogma & XML (Bio XML) for Bioinformatics
		CO2	Analyze Perl (Bioperl) for Bioinformatics
		CO3	Illustrate Databases technology, architecture and its interfaces
		CO4	Understand Sequence Alignment Algorithms.
		CO5	Understand Phylogenetic Analysis

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Academic Year: 2018 - 2019			
Subject Code	**Course Name**	**CO's**	**Outcomes**
	Nature Inspired Computing	CO1	Understand the Models of Life and Intelligence
		CO2	Familiar with Genetic algorithm and its applications.
		CO3	Compare different Ant Colony Optimization algorithmic models.
		CO4	Compare different Artificial Bee Colony Optimization algorithmic models.
		CO5	Illustrate Particle swam optimization algorithm with an example.

DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING			
Course Outcomes (CO's): M.Tech I Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	**Course Name**	**CO's**	**Outcomes**
	Robotic Process Automation	CO1	Understand Robotic Process Automation & Bot Creation
		CO2	Describe RPA, where it can be applied and how it's implemented
		CO3	Identify and understand Web Control Room and Client Introduction
		CO4	Understand how to handle various devices and the workload
		CO5	Understand Bot creators, Web recorders and task editors

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Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	Advanced Algorithms Lab	CO1	Able to analyze the performance of algorithms
		CO2	Perform multiplication of long integers using divide and conquer method
		CO3	Implement a solution for the knapsack problem using the Greedy method
		CO4	Implement Gaussian elimination method
		CO5	Implement Harspool algorithm

DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING			
Course Outcomes (CO's): M.Tech I Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	Professional Elective - III Lab (ENTERPRISE CLOUD CONCEPTS LAB)	CO1	Understand importance of cloud architecture
		CO2	Illustrating the fundamental concepts of cloud security
		CO3	Analyze various cloud computing mechanisms
		CO4	Understanding the architecture and working of cloud computing.
		CO5	Understand Hadoop single node cluster and run simple applications like word count.

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Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	Mini Project with Seminar	CO1	Understand the selection of Projects
		CO2	Learn to collect data
		CO3	Learn to analyze the data
		CO4	Learn to implement the project
		CO5	understand the tools for testing

II YEAR: I SEMESTER

DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING			
Course Outcomes (CO's): M.Tech II Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	Digital Forensics	CO1	Understand relevant legislation and codes of ethics.
		CO2	Understand Cyber Crime Scene Analysis
		CO3	Computer forensics and digital detective and various processes, policies and procedures.
		CO4	E-discovery, guidelines and standards, E-evidence, tools and environment.
		CO5	Email and web forensics and network forensics.

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Course Outcomes (CO's): M.Tech II Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	**Course Name**	**CO's**	**Outcomes**
	High Performance Computing	CO1	Understanding the concepts in grid computing
		CO2	Ability to set up cluster and run parallel applications
		CO3	Understand Job and Resource Management Systems
		CO4	Ability to understand the cluster projects and cluster OS
		CO5	Understanding the concepts of pervasive computing & quantum computing.

DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING			
Course Outcomes (CO's): M.Tech II Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	**Course Name**	**CO's**	**Outcomes**
	Quantum Computing	CO1	Understand Essential Linear Algebra
		CO2	Understand basics of quantum computing
		CO3	Understand physical implementation of Qubit
		CO4	Understand Quantum algorithms and their implementation
		CO5	Understand The Impact of Quantum Computing on Cryptography

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Course Outcomes (CO's): M.Tech II Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	IPR	CO1	Understand types of Intellectual Property
		CO2	Analyze trademarks and its functionality
		CO3	Illustrate law of copy rights and law of patents
		CO4	Understand Trade Secrets
		CO5	Understand new development of intellectual property

DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING			
Course Outcomes (CO's): M.Tech II Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	FAULT TOLERANCE SYSTEMS	CO1	Understand Fault Tolerant Computing
		CO2	Become familiar with general and state of the art techniques used in design and analysis of fault tolerant digital systems.
		CO3	Be familiar with making system fault tolerant, modeling and testing
		CO4	benchmarking to evaluate and compare systems.
		CO5	Understand Information Redundancy and Error Correcting Codes

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Course Outcomes (CO's): M.Tech II Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	INTRUSION DETECTION SYSTEMS	CO1	Possess a fundamental knowledge of Cyber Security.
		CO2	Understand what vulnerability is and how to address most common vulnerabilities.
		CO3	Know basic and fundamental risk management principles as it relates to Cyber Security and Mobile Computing.
		CO4	Have the knowledge needed to practice safer computing and safeguard your information using Digital Forensics.
		CO5	Understand basic technical controls in use today, such as firewalls and Intrusion Detection systems. Understand legal perspectives of Cyber Crimes and Cyber Security

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Course Outcomes (CO's): M.Tech II Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	OPTIMIZATION TECHNIQUES	CO1	explain the need of optimization of engineering systems.
		CO2	understand optimization of electrical and electronics engineering problems.
		CO3	apply classical optimization techniques, linear programming, simplex algorithm, transportation problem.
		CO4	apply unconstrained optimization and constrained non-linear programming and dynamic programming.
		CO5	Formulate optimization problems.

DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING			
Course Outcomes (CO's): M.Tech II Year – I and II Semesters			
Academic Year: 2018 - 2019			
Subject Code	Course Name	CO's	Outcomes
	GRAPH ANALYTICS	CO1	Understand Large-scale Graph and its Characteristics
		CO2	Analyze Breadth-First Search Algorithm
		CO3	Illustrate Recent Advances in Scalable Network Generation
		CO4	Understand Multicore Algorithms for Graph Connectivity Problems
		CO5	Understand Cloud-Based Approach to Big Graphs

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Subject Code Course Name	COs	Outcomes
Dissertation Work Review - II	CO1	Apply the concepts of probability and distributions to some case studies.
	CO2	Correlate the material of one unit to the material in other units.
	CO3	Resolve the potential misconceptions and hazards in each topic of study
	CO4	Understand the Estimation & Tests of Hypotheses.
	CO5	Understand the Stochastic Processes and Markov Chains

II YEAR: II SEMESTER

Subject Code Course Name	COs	Outcomes
Dissertation Work Review - III	CO1	Ability to understand and construct precise mathematical proofs
	CO2	Ability to use logic and set theory to formulate precise statements
	CO3	Ability to analyze and solve counting problems on finite and discrete structures
	CO4	Ability to describe and manipulate sequences
	CO5	Ability to apply graph theory in solving computing problems

Subject Code Course Name	COs	Outcomes
Dissertation Viva-Voce	CO1	understand the various Forms of Business and the impact of economic variables on the Business.
	CO2	Understand Demand and Supply Analysis.
	CO3	understand the Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt.
	CO4	Understand Financial Accounting concepts and Conventions
	CO5	understand the firm's financial position by analysing the Financial Statements of a Company.