



DR. V.R.K WOMEN'S COLLEGE OF ENGINEERING AND TECHNOLOGY

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Affiliated to Jawaharlal Nehru Technological University Hyderabad
Aziznagar (V), Moinsabad (M), R.R. Dist. 500 075 - T.S.
Contact No. 7893044962 / 08413235962
Website : www.drvrkwomenscollege.com

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 Programming 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	DATABA SE MANAG EMENT SYSTEM S 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	CONSTIT UTION 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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HEAD OF THE DEPARTMENT
ARTIFICIAL INTELLIGENCE AND DATA SCIENCE



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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



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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
	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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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 emphasize 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.

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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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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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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

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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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Course Outcomes (CO's): M.Tech I Year – I and II Semesters			
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 swarm 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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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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Course Outcomes (CO's): M.Tech I Year – I and II Semesters			
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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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.



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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 plumbing, 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 R _f 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.
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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	<input type="checkbox"/> 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 framing 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 deveoping 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 Caesar 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 marketing and sales.
	CO3	Organizing the TQM
	CO4	Measuring 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 and oral forms
	CO5	Conduct an engineering project



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**DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING
COURSE OUTCOME'S (CO's): M.,Tech
ACADEMIC YEAR: 2021 – 2022/2022 - 2023
I YEAR: I SEMESTER**

COURSE & CODE	CO'S	COURSE 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.

COURSE & CODE	CO'S	COURSE OUTCOMES
Advanced Data Structures	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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COURSE & CODE	CO'S	COURSE OUTCOMES
Machine Learning	CO1	Understand Machine Learning concepts
	CO2	Differentiate Supervised and Unsupervised Learning
	CO3	Extract features that can be used for a particular machine learning approach in various IOT applications.
	CO4	To compare and contrast pros and cons of various machine learning techniques and to get an insight of when to apply a particular machine learning approach.
	CO5	To mathematically analyse various machine learning approaches and paradigms.

COURSE & CODE	CO'S	COURSE OUTCOMES
Network Security	CO1	To understand network security and cryptography
	CO2	To understand basics of security and issues related to it.
	CO3	Understanding of biometric techniques available and how they are used in today's world
	CO4	Security issues in web and how to tackle them.
	CO5	Learn mechanisms for transport and network security

COURSE & CODE	CO'S	COURSE OUTCOMES
Data Mining	CO1	understand data mining concepts.
	CO2	learn about various data preprocessing techniques.
	CO3	learn about data warehousing
	CO4	Understand Classification and Prediction
	CO5	learn about various data mining functionalities such as association rule mining, clustering, classification and outlier analysis.



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COURSE & CODE	CO'S	COURSE 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

COURSE & CODE	CO'S	COURSE OUTCOMES
Machine Learning Lab	CO1	Understand Machine learning principles and Techniques
	CO2	Understand complexity of Machine Learning algorithms and their limitations;
	CO3	Understand modern notions in data analysis-oriented computing;
	CO4	Be capable of confidently applying common Machine Learning algorithms in practice and implementing their own;
	CO5	Be capable of performing experiments in Machine Learning using real-world data



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COURSE & CODE	CO'S	COURSE 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	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.

I YEAR: II SEMESTER

COURSE & CODE	CO'S	COURSE 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 & CODE	CO'S	COURSE 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

COURSE & CODE	CO'S	COURSE OUTCOMES
Data Science	CO1	Understand the basic concepts and technologies of data science.
	CO2	Explain how data is collected, managed and stored for data science;
	CO3	Understand the key concepts in data science, including their real-world applications and the toolkit used by data scientists
	CO4	Implement data collection and management scripts using MongoDB
	CO5	Understand Data Analysis and Visualization

COURSE & CODE	CO'S	COURSE OUTCOMES
Cyber Security	CO1	understand the concepts of Cyber Security
	CO2	learn about cyber crimes and how they are planned
	CO3	learn the vulnerabilities of mobile and wireless devices.
	CO4	Undrstand computer Forensics
	CO5	learn about the crimes in mobile and wireless devices.



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COURSE & CODE	CO'S	COURSE 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

COURSE & CODE	CO'S	COURSE OUTCOMES
Data Science Lab	CO1	Understand the concepts and formulate the algorithms for simple problems
	CO2	translate given algorithms to a working and correct program.
	CO3	understand learn about a Big Data – R Programming, way of solving problems
	CO4	formulate the tools for data exploration, data analysis, and data visualization
	CO5	write programs in Scala to solve problems.

COURSE & CODE	CO'S	COURSE 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



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Subject Code Course Name	COs	Outcomes
Digital Forensics	CO1	Understand the concepts of Digital Forensics Science
	CO2	Understand relevant legislation and codes of ethics
	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.

Subject Code Course Name	COs	Outcomes
Energy from Waste	CO1	Understand energy from waste
	CO2	Understand Biomass Pyrolysis: Pyrolysis
	CO3	Understand Biomass Gasification:
	CO4	Understand Biomass Combustion
	CO5	Understand Biogas: Properties of biogas

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



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II YEAR: I 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.