Dr. Samuel George Institute of Engineering & Technology

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College Code : 35

UG(B.TECH)– (COMPUTER SCIENCE AND ENGINEERING)-R20		
COURSE OUTCOMES FOR FIRST YEAR FIRST SEMESTER		
Course Title With Code	**CO's**	**After Completion of the course, the student will be able to**
Communicative English (R201102)	CO-1	To understand social or transactional dialogues spoken by native speakers of English and identify the context, topic, and pieces of specific information.
	CO-2	To ask and answer general questions on familiar topics and introduce oneself/others.
	CO-3	To employ suitable strategies for skimming and scanning to get the general idea of a text and locate specific information.
	CO-4	To recognize paragraph structure and be able to match beginnings/endings/headings with paragraphs.
	CO-5	To form sentences using proper grammatical structures and correct word forms.
Mathematics - I (Calculus And Differential Equations) (R201101)	CO-1	To utilize mean value theorems to real life problems.
	CO-2	To solve the differential equations related to various engineering fields.
	CO-3	To familiarize with functions of several variables which is useful in optimization.
	CO-4	To apply double integration techniques in evaluating areas bounded by region.
	CO-5	To students will also learn important tools of calculus in higher dimensions. Students will become familiar with 2- dimensional and 3-dimensional coordinate systems.
Applied Physics (R201117)	CO-1	To Explain the need of coherent sources and the conditions for sustained interference Analyze the differences between interference and diffraction with applications.
	CO-2	To Explain various types of emission of radiation, role of laser in engineering applications Apply the fiber optic concepts in various fields.
	CO-3	To Describe the dual nature of matter, wave functions. Identifying the role of classical and quantum free electron theory in the study of electrical conductivity.
	CO-4	To Explain the concept of dielectric constant and polarization in dielectric materials. Interpret Lorentz field and Claussius-Mosotti relation in dielectrics.
	CO-5	To Outline the properties of charge carriers in semiconductors conductors, super conductors, Meissner's effect, BCS theory & Josephson effect in superconductors.
	CO-1	To write algorithms and to draw flowcharts for solving problems.

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Course Title With Code	CO's	
Programming for Problem Solving Using C (R201110)	CO-2	To convert flowcharts/algorithms to C Programs, compile and debug programs.
	CO-3	To use different operators, data types and write programs that use two-way/ multi-way selection.
	CO-4	To select the best loop construct for a given problem.
	CO-5	To design and implement programs to analyze the different pointer applications. To decompose a problem into functions and to develop modular reusable code. To apply File I/O operations.
Computer Engineering Workshop (R201118)	CO-1	Assemble and disassemble components of a PC.
	CO-2	Construct a fully functional virtual machine, Summarize various Linux operating system commands.
	CO-3	Recognize characters & extract text from scanned images, Create audio files and podcasts.
	CO-4	To have knowledge on Networking commands, Productivity tools like developing Web pages by using HTML tags to develop own home page.
	CO-5	To have knowledge on Office Tools such as Microsoft Word, Power Point, Excel.Demonstation and practive on LaTeX and produce professional pdf documents
English Communication Skills Laboratory (R201106)	CO-1	To understand the syntactical and grammatical intricacy.
	CO-2	To use right structure for right context and meaning.
	CO-3	To read and comprehend the content in English well.
	CO-4	To write well for his/her professional requiremen.t
	CO-5	To short audio texts and identifying the context and specific pieces of information to answer a series of questions in speaking.
Applied Physics Lab (R201119)	CO-1	To gain practical experience in conducting experiments.
	CO-2	To development in skills in analyzing experiments.
	CO-3	To enhance their problem solving skills.
	CO-4	To utilize various components and equipment in physics practicals.
	CO-5	To impart knowledge on a wide range of electric and magnetic phenomena and their scientific applications.
Programming for Problem Solving using C Lab (R201113)	CO-1	To Gains Knowledge on various concepts of a C language.
	CO-2	Able to draw flowcharts and write algorithms.
	CO-3	Able design and development of C problem solving skills.
	CO-4	Able to design and develop modular programming skills.
	CO-5	Able to trace and debug a program.
COURSE OUTCOMES FOR FIRST YEAR SECOND SEMESTER		
Course Title With Code	**CO's**	**After Completion of the course, the student will be able to**

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Mathematics-II (Linear Algebra And Numerical Methods) (R201201)	CO-1	To develop the use of matrix algebra techniques that is needed by engineers for practical applications.
	CO-2	To solve system of linear algebraic equations using Gauss elimination, Gauss Jordan, Gauss Seidel .Evaluate the approximate roots of polynomial and transcendental equations by different algorithms.
	CO-3	To apply Newton's forward & backward interpolation and Lagrange's formulae for equal and unequal intervals.
	CO-4	To apply numerical integral techniques to different Engineering problems.
	CO-5	To apply different algorithms for approximating the solutions of ordinary differential equations with initial conditions to its analytical computations.
Applied Chemistry (R201215)	CO-1	At the end of this unit, the students will be able to Analyze the different types of composite plastic materials and interpret the mechanism of conduction in conducting polymers.
	CO-2	At the end of this unit, the students will be able to Utilize the theory of construction of electrodes, batteries and fuel cells in redesigning new engineering products and categorize the reasons for corrosion and study methods to control corrosion.
	CO-3	At the end of this unit, the students will be able to Synthesize nanomaterials for modern advances of engineering technology. Summarize the preparation of semiconductors; analyze the applications of liquid crystals and superconductors.
	CO-4	At the end of this unit, the students will be able to Analyze the principles of different analytical instruments and their applications. Design models for energy by different natural sources.
	CO-5	At the end of this unit, the students will be able to Obtain the knowledge of computational chemistry and molecular machines.
Computer Organization (R201216)	CO-1	Demonstrate and understanding of the design of the functional units of a digital computer system.
	CO-2	Relate Postulates of Boolean algebra and minimize combinational functions.
	CO-3	Recognize and manipulate representations of numbers stored in digital computers.
	CO-4	Build the logic families and realization of logic gates.
	CO-5	Design and analyze combinational and sequential circuits.
Python Programming (R201225)	CO-1	To develop essential programming skills in computer programming concepts like data types, containers.
	CO-2	To apply the basics of programming in the Python language
	CO-3	To apply the basics of programming in the Python language
	CO-4	To solve coding tasks related conditional execution, loops
	CO-5	To solve coding tasks related to the fundamental notions and techniques used in object –oriented programming

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Data Structures (R201218)	CO-1	To summarize the properties, interfaces, and behaviors of basic abstract data types.
	CO-2	To discuss the computational efficiency of the principal algorithms for sorting & searching.
	CO-3	To use arrays, records, linked structures, stacks, queues, trees, and Graphs in writing programs.
	CO-4	To demonstrate different methods for traversing trees
	CO-5	To analyze problems and write program solutions using data structures like linked lists and binary tree.
Applied Chemistry Lab (R201239)	CO-1	To demonstrate the volumetric analysis experiments introduce.
	CO-2	To understand the EDTA titrations, redox titrations with different indicators.
	CO-3	To expose a few instrumental methods of chemical analysis.
	CO-4	To understand the different methods of chemical analysis and use of some commonly employed instruments. They thus acquire some experimental skills
	CO-5	To Understand the application of fundamental principles of chemistry to real-world problems, including stoicheometry, chemical kinetics, thermodynamics, and equilibrium.
Python Programming Lab (R201250)	CO-1	Develop essential programming skills in computer programming concepts like data types, containers.
	CO-2	To Apply the basics of programming in the Python language.
	CO-3	To Solve coding tasks related conditional execution, loops.
	CO-4	To Solve coding tasks related to the fundamental notions and techniques used in object- oriented programming.
	CO-5	To use various applications using python.
Data Structures Lab (R201241)	CO-1	To Use basic data structures such as arrays and linked list.
	CO-2	Programs to demonstrate fundamental algorithmic problems of Tree Traversals.
	CO-3	Programs to demonstrate fundamental algorithmic problems of Graph traversals.
	CO-4	Programs to demonstrate fundamental algorithmic problems of shortest paths.
	CO-5	To Use various searching and sorting algorithms.
Environment Studies (R201228)	CO-1	To Overall understanding of the natural resources.
	CO-2	Basic understanding of the ecosystem and its diversity.
	CO-3	Acquaintance on various environmental challenges induced due to unplanned anthropogenic activities.
	CO-4	An understanding of the environmental impact of developmental activities.
	CO-5	Awareness on the social issues, environmental legislation and global treaties.
COURSE OUTCOMES FOR SECOND YEAR FIRST SEMESTER		

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Course Title With Code	CO's	After Completion of the course, the student will be able to
Mathematics III (R2021011)	CO-1	Interpret the physical meaning of different operators such as gradient, curl and divergence.
	CO-2	Estimate the work done against a field, circulation and flux using vector calculus.
	CO-3	Apply the Laplace transform for solving differential equations. Find or compute the Fourier series of periodic signals.
	CO-4	Know and be able to apply integral expressions for the forwards and inverse Fourier transform to a range of non-periodic waveforms.
	CO-5	Identify solution methods for partial differential equations that model physical processes.
Object Oriented Programming through C++ (R2021051)	CO-1	Classify object oriented programming and procedural programming.
	CO-2	Apply C++ features such as composition of objects, operator overloads, dynamic memory allocation, inheritance and polymorphism, file I/O, exception handling.
	CO-3	Build C++ classes using appropriate encapsulation and design principles.
	CO-4	Apply object oriented or non-object oriented techniques to solve bigger computing problems.
	CO-5	To Able to design the applications of C++.
Operating Systems (R2021052)	CO-1	Describe various generations of Operating System and functions of Operating System.
	CO-2	Describe the concept of program, process and thread and analyze various CPU Scheduling Algorithms and compare their performance.
	CO-3	Solve Inter Process Communication problems using Mathematical Equations by various methods.
	CO-4	Compare various Memory Management Schemes especially paging and Segmentation in Operating System and apply various Page Replacement Techniques.
	CO-5	Outline File Systems in Operating System like UNIX/Linux and Windows.
Software Engineering (R2021053)	CO-1	Ability to transform an Object-Oriented Design into high quality, executable code.
	CO-2	Skills to design, implement, and execute test cases at the Unit and Integration level.
	CO-3	Compare conventional and agile software methods.
	CO-4	Ability to transform an Object-Oriented Design into high quality, executable code.
	CO-5	To The Golden Rules, User Interface Analysis and Design, Interface Analysis, Interface Design Steps.
	CO-1	Demonstrate skills in solving mathematical problems.

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Course	CO	Description
Mathematical Foundations of Computer Science (R2021054)	CO-2	Comprehend mathematical principles and logic.
	CO-3	Demonstrate knowledge of mathematical modeling and proficiency in using mathematical software.
	CO-4	Manipulate and analyze data numerically and/or graphically using appropriate Software.
	CO-5	Communicate effectively mathematical ideas/results verbally or in writing.
Object Oriented Programming through C++ Lab (R2021055)	CO-1	Demonstrate procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects.
	CO-2	Understand dynamic memory management techniques using pointers, constructors, destructors, etc.
	CO-3	Demonstrate the concept of function overloading, operator overloading, virtual functions and polymorphism, inheritance.
	CO-4	Apply the various OOPs concepts with the help of programs.
	CO-5	To Learn about Templates, Exception Handling.
Operating Systems Lab (R2021056)	CO-1	To use Unix utilities and perform basic shell control of the utilities.
	CO-2	To use the Unix file system and file access control.
	CO-3	To use of an operating system to develop software.
	CO-4	Students will be able to use Linux environment efficiently.
	CO-5	Solve problems using bash for shell scripting.
Software Engineering Lab (R2021057)	CO-1	By the end of this lab the student is able to elicit, analyze and specify software requirements through a productive working relationship with various stakeholders of the project.
	CO-2	To prepare SRS document, design document, test cases and software configuration management and risk management related document.
	CO-3	To develop function oriented and object oriented software design using tools like rational rose.
	CO-4	To use modern engineering tools necessary for software project management, estimations, time management and software reuse.
	CO-5	To generate test cases for software testing.
Skill oriented Course - I Applications of Python-NumPy (R2021058)	CO-1	Explain how data is collected, managed and stored for processing.
	CO-2	Understand the workings of various numerical techniques, different descriptive measures of Statistics, correlation and regression to solve the engineering problems.
	CO-3	Understand how to apply some linear algebra operations to n-dimensional arrays.
	CO-4	Use NumPy perform common data wrangling and computational tasks in Python.
	CO-5	To acquire programming skills in Python package NumPy and perform mathematical and statistical operations.
	CO-1	Understand historical background of the constitution making and its importance

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Constitution of India (R2021010)		for building a democratic India.
	CO-2	Understand the functioning of three wings of the government ie., executive, legislative and judiciary.
	CO-3	Understand the value of the fundamental rights and duties for becoming good citizen of India.
	CO-4	Analyze the decentralization of power between central, state and local self-government.
	CO-5	Apply the knowledge in strengthening of the constitutional institutions like CAG, Election Commission and UPSC for sustaining democracy.

COURSE OUTCOMES FOR SECOND YEAR SECOND SEMESTER

Course Title With Code	CO's	After Completion of the course, the student will be able to
Probability and Statistics (R2022051)	CO-1	Classify the concepts of data science and its importance.
	CO-2	Interpret the association of characteristics and through correlation and regression tools.
	CO-3	Make use of the concepts of probability and their applications.
	CO-4	Apply discrete and continuous probability distributions.
	CO-5	Design the components of a classical hypothesis test.Infer the statistical inferential methods based on small and large sampling tests.
Database Management Systems (R2022052)	CO-1	Describe a relational database and object-oriented database.
	CO-2	Create, maintain and manipulate a relational database using SQL.
	CO-3	Describe ER model and normalization for database design.
	CO-4	Examine issues in data storage and query processing and can formulate appropriate solutions.
	CO-5	Outline the role and issues in management of data such as efficiency, privacy, security, ethical responsibility, and strategic advantage.
Formal Languages and Automata Theory (R2022053)	CO-1	Classify machines by their power to recognize languages.
	CO-2	Summarize language classes & grammars relationship among them with the help of Chomsky hierarchy.
	CO-3	Employ finite state machines to solve problems in computing.
	CO-4	Illustrate deterministic and non-deterministic machines.
	CO-5	Quote the hierarchy of problems arising in the computer science.
Java Programming (R2022054)	CO-1	Able to realize the concept of Object Oriented Programming & Java Programming Constructs.
	CO-2	Able to describe the basic concepts of Java such as operators, classes, objects, inheritance, packages, Enumeration and various keywords.
	CO-3	Apply the concept of exception handling and Input/ Output operations.
	CO-4	Able to design the applications of Java & Java applet.

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	CO-5	Able to Analyze & Design the concept of Event Handling and Abstract Window Toolkit.
Managerial Economics and Financial Accountancy (R2022055)	CO-1	The Learner is equipped with the knowledge of estimating the Demand and demand elasticities for a product.
	CO-2	The knowledge of understanding of the Input-Output-Cost relationships and estimation of the least cost combination of inputs.
	CO-3	The pupil is also ready to understand the nature of different markets and Price Output determination under various market conditions and also to have the knowledge of different Business Units.
	CO-4	The Learner is able to prepare Financial Statements and the usage of various Accounting tools for Analysis.
	CO-5	The Learner can able to evaluate various investment project proposals with the help of capital budgeting techniques for decision making.
Database Management Systems Lab (R2022056)	CO-1	To Utilize SQL to execute queries for creating database and performing data manipulation operations.
	CO-2	To Examine integrity constraints to build efficient databases.
	CO-3	To Apply Queries using Advanced Concepts of SQL.
	CO-4	To Build PL/SQL programs including stored procedures, functions, cursors and triggers.
	CO-5	To Gain hands-on experience in designing and implementing relational database systems using SQL, including database creation, manipulation, querying, and optimization.
R Programming Lab (R2022057)	CO-1	Access online resources for R and import new function packages into the R workspace.
	CO-2	Import, review, manipulate and summarize data-sets in R
	CO-3	Explore data-sets to create testable hypotheses and identify appropriate statistical tests.
	CO-4	Perform appropriate statistical tests using R.
	CO-5	Create and edit visualizations with R.
Java Programming Lab (R2022058)	CO-1	To Evaluate default value of all primitive data type, Operations, Expressions, Control- flow, Strings.
	CO-2	To Determine Class, Objects, Methods, Inheritance, Exception, Runtime Polymorphism, User defined Exception handling mechanism.
	CO-3	To Illustrating simple inheritance, multi-level inheritance, Exception handling mechanism.
	CO-4	To Construct Threads, Event Handling, implement packages, developing applets.
	CO-5	To Develop proficiency in object-oriented programming concepts using Java, including classes,objects, inheritance, polymorphism, encapsulation, and abstraction.
Skill Oriented	CO-1	Use Pandas to create and manipulate data structures like Series and

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Course - II Applications of Python-Pandas (R2022059)		DataFrames.
	CO-2	Work with arrays, queries, and dataframes.
	CO-3	Query DataFrame structures for cleaning and processing and manipulating files.
	CO-4	Understand best practices for creating basic charts.
	CO-5	Understand about Pandas Time Series.

COURSE OUTCOMES FOR THIRD YEAR FIRST SEMESTER		
Course Title With Code	CO's	After Completion of the course, the student will be able to
Computer Networks (R2031051)	CO-1	Demonstrate different network models for networking links OSI, TCP/IP, B-ISDN, N-BISDN and get knowledge about various communication techniques, methods and protocol standards.
	CO-2	Discuss different transmission media and different switching networks.
	CO-3	Analyze data link layer services, functions and protocols like HDLC and PPP.
	CO-4	Compare and Classify medium access control protocols like ALOHA, CSMA, CSMA/CD, CSMA/CA, Polling, Token passing, FDMA, TDMA, CDMA protocols.
	CO-5	Determine application layer services and client server protocols working with the client server paradigms like WWW, HTTP, FTP, e-mail and SNMP etc.
Design and Analysis of Algorithms (R2031052)	CO-1	Analyze the performance of a given algorithm, denote its time complexity using the asymptotic notation for recursive and non-recursive algorithms.
	CO-2	List and describe various algorithmic approaches and Solve problems using divide and conquer &greedy Method.
	CO-3	Synthesize efficient algorithms dynamic programming approaches to solve in common engineering design situations.
	CO-4	Organize important algorithmic design paradigms and methods of analysis: backtracking, branch and bound algorithmic approaches.
	CO-5	Demonstrate NP- Completeness theory ,lower bound theory and String Matching.
Data Warehousing and Data Mining (R2031053)	CO-1	Illustrate the importance of Data Warehousing, Data Mining and its functionalities and Design schema for real time data warehousing applications.
	CO-2	Demonstrate on various Data Preprocessing Techniques viz. data cleaning, data integration, data transformation and data reduction and Process raw data to make it suitable for various data mining algorithms.
	CO-3	Choose appropriate classification technique to perform classification, model building and evaluation.
	CO-4	Make use of association rule mining techniques viz. Apriori and FP Growth algorithms and analyze on frequent itemsets generation.
	CO-5	Identify and apply various clustering algorithm (with open source tools), interpret, evaluate and report the result.

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Open Elective-I Basic Electronics (R203104O)	CO-1	Understand the formation of p-n junction and how it can be used as a p-n junction as diode in different modes of operation.
	CO-2	Know the construction, working principle of rectifiers with and without filters with relevant expressions and necessary comparisons.
	CO-3	Understand the construction, principle of operation of transistors
	CO-4	To learn Field-Effect Transistors (FETs).
	CO-5	To Learn Thyristors and Other Devices.
Professional Elective-I Artificial Intelligence (R203105A)	CO-1	To Understand the fundamental concepts in Artificial Intelligence
	CO-2	To Analyze the applications of search strategies and problem reductions
	CO-3	To Apply the mathematical logic concepts.
	CO-4	To Develop the Knowledge representations in Artificial Intelligence.
	CO-5	To Explain the Fuzzy logic systems.
Data Warehousing and Data Mining Lab (R2031054)	CO-1	To Apply preprocessing techniques on real world datasets
	CO-2	To Apply a priori algorithm to generate frequent item sets.
	CO-3	To Apply Classification and clustering algorithms on different datasets.
	CO-4	To effectively communicate their findings.
	CO-5	To perform exploratory data analysis using various statistical and visualization techniques.
Computer Networks Lab (R2031055)	CO-1	To Know how reliable data communication is achieved through data link layer.
	CO-2	To Suggest appropriate routing algorithm for the network.
	CO-3	To Provide internet connection to the system and its installation.
	CO-4	To Provide internet connection to the system and its installation.
	CO-5	To Work on various network management tools.
Skill Oriented Course – III Animation course: Animation Design (R2031056)	CO-1	To learn various tools of digital 2-D animation.
	CO-2	To understand production pipeline to create 2-D animation.
	CO-3	To apply the tools to create 2D animation for films and videos.
	CO-4	To understand different styles and treatment of content in 3D model creation.
	CO-5	To apply tools to create effective 3D modeling texturing and lighting.
Employability Skills-I (R2031058)	CO-1	To Understand the corporate etiquette.
	CO-2	To Make presentations effectively with appropriate body language.
	CO-3	To Be composed with positive attitude.
	CO-4	To Understand the core competencies to succeed in professional and personal life.
	CO-5	Essential Employability Skills (EES) are emphasized throughout the program, with opportunities for students to practice these skills in real-world scenarios.
	CO-1	Internship learning outcomes are crucial for students participating in internships. These outcomes serve as learning targets, providing interns with a clear understanding of what they should learn or achieve by the end

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		of the internship.
Summer Internship 2 Months (Mandatory) after second year (to be evaluated during V semester) (R2031059)	CO-2	Student learning outcomes for internships include exploring career alternatives, integrating theory and practice, developing work habits and attitudes necessary for job success, building a record of work experience, and acquiring employment contacts leading to full-time job.
	CO-3	The internship program aims to provide students with an introduction to the organization's professional culture, develop critical skills like communication and interpersonal skills, and promote academic, career, and personal development.
	CO-4	Setting successful internship goals is essential for both interns and employers.
	CO-5	Internship goals are measurable expectations that interns set for themselves and share with their employers and advisors.
COURSE OUTCOMES FOR THIRD YEAR SECOND SEMESTER		
Course Title With Code	**CO's**	**After Completion of the course, the student will be able to**
Machine Learning (R2032051)	CO-1	Explain the fundamental usage of the concept Machine Learning system
	CO-2	Demonstrate on various regression Technique
	CO-3	Analyze the Ensemble Learning Methods
	CO-4	Illustrate the Clustering Techniques and Dimensionality Reduction Models in Machine Learning.
	CO-5	Discuss the Neural Network Models and Fundamentals concepts of Deep Learning.
Compiler Design (R2032052)	CO-1	Demonstrate phases in the design of compiler.
	CO-2	Organize Syntax Analysis, Top Down and LL(1) grammars.
	CO-3	Design Bottom Up Parsing and Construction of LR parsers.
	CO-4	Analyze synthesized, inherited attributes and syntax directed translation schemes.
	CO-5	Determine algorithms to generate code for a target machine.
Cryptography and Network Security (R2032053)	CO-1	Explain different security threats and countermeasures and foundation course of cryptography mathematics.
	CO-2	Classify the basic principles of symmetric key algorithms and operations of some symmetric key algorithms and asymmetric key cryptography.
	CO-3	Revise the basic principles of Public key algorithms and Working operations of some Asymmetric key algorithms such as RSA, ECC and some more.
	CO-4	Design applications of hash algorithms, digital signatures and key management techniques.
	CO-5	Determine the knowledge of Application layer, Transport layer and Network layer security Protocols such as PGP, S/MIME, SSL,TSL, and IPsec .

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College Code : 35

Professional Elective-II Object Oriented Analysis and Design (R203205C)	CO-1	Analyze the nature of complex system and its solutions.
	CO-2	Illustrate & relate the conceptual model of the UML, identify & design the classes and relationships.
	CO-3	Analyze &Design Class and Object Diagrams that represent Static Aspects of a Software System and apply basic and Advanced Structural Modeling Concepts for designing real time applications.
	CO-4	Analyze & Design behavioral aspects of a Software System using Use Case, Interaction and Activity Diagrams.
	CO-5	Analyze & Apply techniques of State Chart Diagrams and Implementation Diagrams to model behavioral aspects and Runtime environment of Software Systems.
Open Elective-II Principles of Communications (R203204O)	CO-1	Analyze the performance of analog modulation schemes in time and frequency domains.
	CO-2	Analyze the performance of angle modulated signals.
	CO-3	Characterize analog signals in time domain as random processes and noise.
	CO-4	Characterize the influence of channel on analog modulated signals.
	CO-5	Determine the performance of analog communication systems interms of SNR, Analyze pulse amplitude modulation.
Machine Learning using Python Lab (R2032054)	CO-1	To Implement procedures for the machine learning algorithms.
	CO-2	To Design and Develop Python programs for various Learning algorithms.
	CO-3	To Apply appropriate data sets to the Machine Learning algorithms.
	CO-4	To Develop Machine Learning algorithms to solve real world problems.
	CO-5	To Understanding the mathematical and statistical perspectives of machine learning algorithms through Python programming.
Compiler Design Lab (R2032055)	CO-1	Design simple lexical analyzers.
	CO-2	Determine predictive parsing table for a CFG.
	CO-3	Apply Lex and Yacc tools.
	CO-4	Examine LR parser and generating SLR Parsing table.
	CO-5	Relate Intermediate code generation for subset C language.
Cryptography and Network Security Lab (R2032056)	CO-1	To Apply the knowledge of symmetric cryptography to implement encryption and decryption using Ceaser Cipher.
	CO-2	Demonstrate the different algorithms like DES, BlowFish, and Rijndael, encrypt the text "Hello world" using Blowfish Algorithm.
	CO-3	Analyze and implement public key algorithms like RSA, Diffie-Hellman Key Exchange mechanism, the message digest of a text using the SHA-1 algorithm
	CO-4	To learn basic understanding of cryptography, how it has evolved, and some key encryption techniques.
	CO-5	Apply the knowledge of symmetric cryptography to implement encryption and decryption using Substitution Cipher, Hill Cipher.
	CO-1	Develop professional web pages of an application using HTML elements like lists, navigations, tables, various form elements, embedded media which

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Skill Oriented Course - IV MEAN Stack Technologies- Module I (R2032058)		includes images, audio, video and CSS Styles.
	CO-2	Utilize JavaScript for developing interactive HTML web pages and validate form data.
	CO-3	Build a basic web server using Node.js and also working with Node Package Manager (NPM).
	CO-4	Build a web server using Express.js.
	CO-5	Make use of Typescript to optimize JavaScript code by using the concept of strict type checking.
Employability skills-II (R2032059)	CO-1	To Solve various Basic Mathematics problems by following different methods.
	CO-2	To Follow strategies in minimizing time consumption in problem solving Apply shortcut methods to solve problems.
	CO-3	To Solve confidently any mathematical problems and utilize these mathematical skills both in their professional as well as personal life.
	CO-4	To Develop a set of own responsibilities and objectives, such as creative planning, financial analysis, business proposals, training provision, and balancing staffing lists to achieve efficiency, productivity, and cost reduction.
	CO-5	Demonstrating initiative and self-direction through high achievement and lifelong learning, managing workload efficiently, setting and achieving high standards and goals, engaging in effective problem-solving processes, delivering quality job performance on time, communicating and working productively with others to increase innovation and quality of work.

COURSE OUTCOMES FOR FOURTH YEAR FIRST SEMESTER

Course Title With Code	CO's	After Completion of the course, the student will be able to
Professional Elective-III Cloud Computing (R204105A)	CO-1	Illustrate the key dimensions of the challenge of Cloud Computing.
	CO-2	Classify the Levels of Virtualization and mechanism of tools.
	CO-3	Analyze Cloud infrastructure including Google Cloud and Amazon Cloud.
	CO-4	Create Combinatorial Auctions for cloud resource and design scheduling algorithms for computing cloud
	CO-5	Assess control storage systems and cloud security, the risks involved its impact and develop cloud application
Professional Elective-IV Social Networks & Semantic Web (R204105F)	CO-1	Demonstrate social network analysis and measures.
	CO-2	Analyze random graph models and navigate social networks data
	CO-3	Apply the network topology and Visualization tools.
	CO-4	Analyze the experiment with small world models and clustering models.
	CO-5	Compare the application driven virtual communities from social network Structure.
	CO-1	Demonstrate the block chain basics, Crypto currency

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Course	CO	Description
Professional Elective-V Block-Chain Technologies (R204105I)	CO-2	To compare and contrast the use of different private vs. public block chain and use cases
	CO-3	Design an innovative Bit coin Block chain and scripts, Block chain Science on varies coins
	CO-4	Classify Permission Block chain and use cases – Hyper ledger, Corda
	CO-5	Make Use of Block-chain in E-Governance, Land Registration, Medical Information Systems and others.
Open Elective-III IOT and Applications (R204104Q)	CO-1	Understand internet of Things and its hardware and software components.
	CO-2	Interface I/O devices, sensors & communication modules.
	CO-3	Remotely monitor data and control devices.
	CO-4	Design real time IoT based applications.
	CO-5	To design IoT case studies and mini projects based on Industrial automation.
Open Elective-IV Data Communications (R204104V)	CO-1	Know the Categories and functions of various Data communication Networks
	CO-2	Design and analyze various error detection techniques.
	CO-3	Demonstrate the mechanism of routing the data in network layer.
	CO-4	Know the significance of various Flow control and Congestion control Mechanisms.
	CO-5	To Learn Principles of Networking Applications.
Universal Human Values 2: Understanding Harmony (R2041011)	CO-1	To become more aware of themselves
	CO-2	To handling problems with sustainable solutions
	CO-3	To apply what they have learnt to their own self in different day-to-day settings in real life
	CO-4	To keeping human relationships and human nature in mind
	CO-5	To would have better critical ability
Skill Oriented Course - V PYTHON: Deep Learning (R2041052)	CO-1	Demonstrate the basic concepts fundamental learning techniques and layers.
	CO-2	Discuss the Neural Network training, various random models.
	CO-3	Apply various optimization algorithms to comprehend different activation functions to understand hyper parameter tuning
	CO-4	Build a convolution neural network, and understand its application to build a recurrent neural network.
	CO-5	Understand its usage to comprehend auto encoders to briefly explain transfer learning.
Industrial/Research Internship 2 months (Mandatory) after	CO-1	To practical skills, industry knowledge, and professional contacts that enhance their employability
	CO-2	To help interns collaborate with multidisciplinary teams, fostering teamwork, cooperation
	CO-3	To help interns improve their communication skills by interacting with supervisors, colleagues, and clients

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| third year (to be evaluated during VII semester (R2041055) | CO-4 | To learn research methodologies, experimental design, data collection, analysis |
| | CO-5 | To acquire and enhance technical skills specific to their discipline, such as laboratory techniques, data analysis |

COURSE OUTCOMES FOR FOURTH YEAR SECOND SEMESTER		
Course Title With Code	**CO's**	**After Completion of the course, the student will be able to**
Major project work,seminar, internship (R204205P)	CO-1	To understanding of theoretical concepts and practical applications relevant to their field of study
	CO-2	To help in Presenting seminar topics, collaborating with team members on projects, and communicating findings
	CO-3	To learn how to conduct comprehensive literature reviews, gather and analyze data, and draw meaningful conclusions
	CO-4	To help in engaging in research and project work encourages students to think critically
	CO-5	To encourage on their learning process, identify strengths and areas for improvement