Program Outcomes (POs)

Graduates of Electronics & Telecommunication Engineering by the time of graduation will

Demonstrate:

PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

PO2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program specific outcomes

PSO 1: Development of Hardware/Software Co-designs: An ability to apply electronic design principles in the development of hardware/software prototypes and systems with progressive depth of complexity.

PSO 2: Development of Electronics Communication Systems: An ability to deploy conventional & next-gen. techniques/tools for analysis & design of Information and Communication systems.

PSO 3: Development of Signal Processing Applications: An ability to apply algorithmic knowledge of signal processing towards analysis, Recognition, and synthesis of multi-dimensional data.

CO'S OF SEM-I
(Scheme-2022)

- **Course Title:** Mathematics-I for Computer Science and Engineering stream

  Course Code: BMATS101

  Course objectives:

  The goal of the courseMathematics-I for Computer Science and Engineering stream(22MATS11) is to

  Familiarize the importance of calculus associated with one variable and multivariable for computer science and engineering.

  AnalyzeComputer science and engineering problems by applying Ordinary Differential Equations.

  Apply the knowledge of modular arithmetic to computer algorithms. Develop the knowledge of Linear Algebra to solve the system of equations.

- **Course Title**: Applied Physics for CSE Stream

  Course Code: BPHYS102

  Course objectives

  To study the essentials of photonics and its application in computer science.

  To study the principles of quantum mechanics and its application in quantum computing.

  To study the electrical properties of materials

  To study the essentials of physics for computational aspects like design and data analysis.

- **Course Title:** Principles of Programming using C

  Course Code: BPOPS103

Course Objectives:

CLO 1. Elucidate the basic architecture and functionalities of a Computer

CLO 2. Apply programming constructs of C language to solve the real-world problems

CLO 3.Explore user-defined data structures like arrays, structures and pointers in implementing solutions to problems

CLO 4. Design and Develop Solutions to problems using structured programming constructs such as functions and procedures

- **Course Title:** Communicative English

  Course Code: BENGK106

  Course objectives: The course Communicative English (22ENG16) will enable the students,

  1. To know about Fundamentals of Communicative English and Communication Skills in general.

  2. To train to identify the nuances of phonetics, intonation and enhance pronunciation skills for better Communication skills.

  3. To impart basic English grammar and essentials of important language skills.

  4. To enhance with English vocabulary and language proficiency for better communication skills. 5. To learn about Techniques of Information Transfer through presentation.

- **Course Title:** Samskruthika Kannada

  Course Code: BKSKK107

Course objectives : ಸಾಂಸ್ಕೃತಿಕ ಕನ್ನಡ ಪಠ್ಯ ಕಲಿಕೆಯ ಉದ್ದೇಶಗಳು:

The course (22KSK17/27) will enable the students,

1. ವೃತ್ತಿಪರ ಪದವಿ ವಿದ್ಯಾರ್ಥಿಗಳಾಗಿರುವುದರಿಂದ ಕನ್ನಡ ಭಾಷೆ, ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡದ ಸಂಸ್ಕೃತಿಯ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.
2. ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಪ್ರಧಾನ ಭಾಗವಾದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳನ್ನು ಸಾಂಕೇತಿಕವಾಗಿ ಪರಿಚಯಿಸಿವುದು.
3. ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಸಾಹಿತ್ಯ ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಅರಿವು ಹಾಗೂ ಆಸಕ್ತಿಯನ್ನು ಮೂಡಿಸುವುದು.
4. ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯವನ್ನು ಹಾಗೂ ಅವರುಗಳ ಸಾಧಿಸಿದ ವಿಷಯಗಳನ್ನು ಪರಿಚಯಿಸುವುದು.
5. ಸಾಂಸ್ಕೃತಿಕ, ಜನಪದ ಹಾಗೂ ಪ್ರವಾಸ ಕಥನಗಳ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.

- **Course Title:** INNOVATION and DESIGN THINKING

  Course Code: BIDTK158

  Course objectives:

  To explain the concept of design thinking for product and service development

  To explain the fundamental concept of innovation and design thinking

  To discuss the methods of implementing design thinking in the real world.

- **Course Title:** Introduction to Civil Engineering

  Course Code: BESCK104A

  Course objectives

  To make students learn the scope of various specializations of civil engineering. To make students learn the concepts of sustainable infrastructure

  To develop students' ability to analyse the problems involving forces, moments with their applications.

  To develop the student's ability to find out the center of gravity and moment of inertia and their applications.

  To make the students learn about kinematics

- **Course Title:** RENEWABLE ENERGY SOURCES

Course Code: BETCK105E

Course objectives

To understand energy scenario, energy sources and their utilization.

To explore society's present needs and future energy demands.

To Study the principles of renewable energy conversion systems.

To exposed to energy conservation methods.

CO'S OF SEM-II
(Scheme-2022)

- **Course Title:** Mathematics-II for Computer Science and Engineering stream
  Course Code: BMATS201

  Course objectives:

  The goal of the courseMathematics-II for Computer Science and Engineering stream(22MATS21) is to

  Familiarize the importance of Integral calculus and Vector calculus.

  Learn vector spaces and linear transformations.

  Develop the knowledge of numerical methods and apply them to solve transcendental and differential equations.

- **Course Title:** Applied Chemistry for Computer Science &Engineering stream

  Course Code: BCHES202

  Course objectives

  To enable students to acquire knowledge on principles of chemistry for engineering applications.

To develop an intuitive understanding of chemistry by emphasizing the related branches of engineering.

To provide students with a solid foundation in analytical reasoning required to solve societal problems.

- **Course Title:** Computer Aided Engineering Drawing

  Course Code: BCEDK203

  Course objectives:

  CLO1: To understand the basic principles and conventions of engineering drawing
  CLO2: To use drawing as a communication mode

  CLO3: To generate pictorial views using CAD software

  CLO4: To understand the development of surfaces

  CLO5: To visualize engineering components

- **Course Title:** Professional Writing Skills in English

  Course Code: BPWSK206

  Course objectives:

  1.To Identify the Common Errors in Writing and Speaking of English.

  2. To Achieve better Technical writing and Presentation skills for employment.

  3. To read Technical proposals properly and make them to write good technical reports.

  4. To Acquire Employment and Workplace communication skills.

  5. To learn about Techniques of Information Transfer through presentation in different level.

- **Course Title:** Indian Constitution

  Course Code: BICOK207

  Course objectives:

  1. To know about the basic structure of Indian Constitution.

  2. To know the Fundamental Rights (FR's), DPSP's and Fundamental Duties (FD's) of our constitution.

  3. To know about our Union Government, political structure & codes, procedures.
  4. To know the State Executive & Elections system of India.

  5. To learn the Amendments and Emergency Provisions, other important provisions given by the constitution.

- **Course Title:** Scientific Foundations of Health

  Course Code: BSFHK258

  Course objectives:

  1. To know about Health and wellness (and its Beliefs) & It's balance for positive mindset.

  2. To Build the healthy lifestyles for good health for their better future.

  3. To Create a Healthy and caring relationships to meet the requirements of good/social/positive life.

  4. To learn about Avoiding risks and harmful habits in their campus and outside the campus for their bright future

  5. To Prevent and fight against harmful diseases for good health through positive mindset

- **Course Title:** Introduction to Python Programming

  Course Code: BPLCK205B

Course objectives

Learn the syntax and semantics of the Python programming language.

● Illustrate the process of structuring the data using lists, tuples

● Appraise the need for working with various documents like Excel, PDF, Word and Others.

● Demonstrate the use of built-in functions to navigate the file system.

● Implement the Object Oriented Programming concepts in Python.

- **Course Title:** Introduction to Mechanical Engineering

  Course Code: BESCK204D

  Course objectives

  To develop basic Knowledge on Mechanical Engineering, Fundamentals and Energy Sources.

  Understand the concept of different types of Machine tool operations and Modern Manufacturing Processes like CNC, 3D printing.

  To know the concept of IC engines and Future Mobility vehicles.

  To give exposure in the field of Engineering Materials and Manufacturing Processes Technology and its applications

  To acquire a basic understanding role of Mechanical Engineering in the Robotics and Automation in industry.

CO'S OF SEM-III
(Scheme-2022)

- **Course Title:** Mathematics for Computer Science

  Course Code: BCS301

Course objectives:

1. To introduce the concept of random variables, probability distributions, specific discrete and continuous distributions with practical application in Computer Science Engineering and social life situations.

2. To Provide the principles of statistical inferences and the basics of hypothesis testing with emphasis on some commonly encountered hypotheses.

3. To Determine whether an input has a statistically significant effect on the system's response through ANOVA testing.

- **Course Title:** Digital Design and Computer Organization

  Course Code: BCS302

  Course objectives:

  ● To demonstrate the functionalities of binary logic system

  ● To explain the working of combinational and sequential logic system

  ● To realize the basic structure of computer system

  ● To illustrate the working of I/O operations and processing unit

- **Course Title:** OPERATING SYSTEMS

  Course Code: BCS303

  Course objectives:

  To Demonstrate the need for OS and different types of OS

  ● To discuss suitable techniques for management of different resources

  ● To demonstrate different APIs/Commands related to processor, memory, storage and file system management.

- **Course Title:** DATA STRUCTURES AND APPLICATIONS

  Course Code: BCS304

  Course objectives:

  CLO 1. To explain fundamentals of data structures and their applications.

  CLO 2. To illustrate representation of Different data structures such as Stack, Queues, Linked Lists, Trees and Graphs.

  CLO 3. To Design and Develop Solutions to problems using Linear Data Structures CLO 4. To discuss applications of Nonlinear Data Structures in problem solving. CLO 5. To introduce advanced Data structure concepts such as Hashing and Optimal Binary Search Trees

- **Course Title:** DATA STRUCTURES LABORATORY

  Course Code: BCSL305

  Course objectives:

  This laboratory course enables students to get practical experience in design, develop, implement, analyze and evaluation/testing of

  ● Dynamic memory management

  ● Linear data structures and their applications such as stacks, queues and lists

  ● Non-Linear data structures and their applications such as trees and graphs

- **Course Title:** OBJECT ORIENTED PROGRAMMING with C++

  Course Code: BCS306B

  Course objectives:

  To understand object-oriented programming using C++and Gain knowledge about the capability to store information together in an object.

● To illustrate the capability of a class to rely upon another class and functions.

● To Create and process data in files using file I/O functions

● To understand the generic programming features of C++ including Exception handling

- **Course Title:** Social Connect & Responsibility

  Course Code: BSCK307

  Course objectives:

  1. Provide a formal platform for students to communicate and connect to the surrounding.

  2. create a responsible connection with the society.

  3. Understand the community in general in which they work.

  4. Identify the needs and problems of the community and involve them in problem –solving.

  5. Develop among themselves a sense of social & civic responsibility & utilize their knowledge in finding practical solutions to individual and community problems. 6. Develop competence required for group-living and sharing of responsibilities & gain skills in mobilizing community participation to acquire leadership qualities and democratic attitudes.

- **Course Title:** Data Analytics with Excel

  Course Code: BCS358A

  Course objectives:

  To Apply analysis techniques to datasets in Excel

  ● Learn how to use Pivot Tables and Pivot Charts to streamline your workflow in Excel

● Understand and Identify the principles of data analysis

● Become adept at using Excel functions and techniques for analysis

● Build presentation ready dashboards in Excel

CO'S OF SEM-IV
(Scheme-2022)

- **Course Title:** Analysis & Design of Algorithms

  Course Code: BCS401

  Course objectives:

  ● To learn the methods for analyzing algorithms and evaluating their performance.

  ● To demonstrate the efficiency of algorithms using asymptotic notations.

  ● To solve problems using various algorithm design methods, including brute force, greedy, divide and conquer, decrease and conquer, transform and conquer, dynamic programming, backtracking, and branch and bound.

  ● To learn the concepts of P and NP complexity classes.

- **Course Title:** MICROCONTROLLERS

  Course Code: BCS402

  Course objectives:

  CLO 1: Understand the fundamentals of ARM-based systems and basic architecture of CISC and RISC.

  CLO 2: Familiarize with ARM programming modules along with registers, CPSR and Flags.

CLO 3: Develop ALP using various instructions to program the ARM controller.

CLO 4: Understand the Exceptions and Interrupt handling mechanism in Microcontrollers.

CLO 5: Discuss the ARM Firmware packages and Cache memory polices.

- **Course Title:** DATABASE MANAGEMENT SYSTEM

  Course Code: BCS403

  Course objectives:

  ● To Provide a strong foundation in database concepts, technology, and practice.

  ● To Practice SQL programming through a variety of database problems.

  ● To Understand the relational database design principles.

  ● To Demonstrate the use of concurrency and transactions in database.

  ● To Design and build database applications for real world problems.

  ● To become familiar with database storage structures and access techniques.

- **Course Title:** Analysis & Design of Algorithms Lab

  Course Code: BCSL404

  Course objectives:

  ● To design and implement various algorithms in C/C++ programming using suitable development tools to address different computational challenges.

  ● To apply diverse design strategies for effective problem-solving.

  ● To Measure and compare the performance of different algorithms to determine their efficiency and suitability for specific tasks.

- **Course Title:** DISCRETE MATHEMATICAL STRUCTURES

  Course Code: BCS405A

  Course objectives:

  - To help students to understand discrete and continuous mathematical structures

  - To impart basics of relations and functions.

  - To facilitate students in applying principles of Recurrence Relations to find the generating functions and solve the Recurrence relations.

  - To have the knowledge of groups and their properties to understand the importance of algebraic properties relative to various number systems.

- **Course Title:** Technical Writing using LaTeX

  Course Code: BCSL456D

  Course objectives:

  ● To introduce the basic syntax and semantics of the LaTeX scripting language

  ● To understand the presentation of tables and figures in the document

  ● To illustrate the LaTeX syntax to represent the theorems and mathematical equations

  ● To make use of the libraries (Tikz, algorithm) to design the diagram and algorithms in the document

- **Course Title:** BIOLOGY FOR ENGINEERS (CSE)

Course Code: BBOC407

Course objectives:

To familiarize the students with the basic biological concepts and their engineering applications.

To enable the students with an understanding of biodesign principles to create novel devices and structures.

To provide the students an appreciation of how biological systems can be re-designed as substitute products for natural systems.

To motivate the students to develop interdisciplinary vision of biological engineering.

- **Course Title:** Universal Human Values (UHV)

  Course Code: BUHK408

  Course objectives:

  To help the students appreciate the essential complementarity between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.

  To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence. Such a holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way.

  To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behaviour and mutually enriching interaction with Nature.

  This course is intended to provide a much-needed orientation input in value education to the young enquiring minds. Teaching-Learning Process (General

- **Course Title:** National Service Scheme (NSS)

  Course Code: BNSK459

  Course objectives:

  1. Understand the community in general in which they work.

  2. Identify the needs and problems of the community and involve them in problem –solving.

  3. Develop among themselves a sense of social & civic responsibility & utilize their knowledge in finding practical solutions to individual and community problems. 4. Develop competence required for group-living and sharing of responsibilities & gain skills in mobilizing community participation to acquire leadership qualities and democratic attitudes.

  5. Develop capacity to meet emergencies and natural disasters & practice national integration and social harmony in general.

CO'S OF SEM-V
(Scheme-2018)

- **Course Title:** MANAGEMENT AND ENTREPRENEURSHIP FOR IT INDUSTRY

  Course Code: 18CS51

  Course objectives:

  - Explain the principles of management, organization and entrepreneur.

  - Discuss on planning, staffing, ERP and their importance

  - Infer the importance of intellectual property rights and relate the institutional support

- **Course Title:** COMPUTER NETWORKS AND SECURITY

  Course Code: 18CS52

  Course objectives:

  - Demonstration of application layer protocols

  - Discuss transport layer services and understand UDP and TCP protocols

  - Explain routers, IP and Routing Algorithms in network layer

  - Disseminate the Wireless and Mobile Networks covering IEEE 802.11 Standard

  - Illustrate concepts of Multimedia Networking, Security and Network Management

- **Course Title:** DATABASE MANAGEMENT SYSTEM

  Course Code: 18CS53

  Course objectives:

  - Provide a strong foundation in database concepts, technology, and practice.

  - Practice SQL programming through a variety of database problems.

  - Demonstrate the use of concurrency and transactions in database

  - Design and build database applications for real world problems.

- **Course Title:** AUTOMATA THEORY AND COMPUTABILITY

  Course Code: 18CS54

  Course objectives:

  - Introduce core concepts in Automata and Theory of Computation

- Identify different Formal language Classes and their Relationships

- Design Grammars and Recognizers for different formal languages

- Prove or disprove theorems in automata theory using their properties

- Determine the decidability and intractability of Computational problems

- **Course Title:** APPLICATION DEVELOPMENT USING PYTHON

  Course Code: 18CS55

  Course objectives:

  - Learn the syntax and semantics of Python programming language.

  - Illustrate the process of structuring the data using lists, tuples and dictionaries.

  - Demonstrate the use of built-in functions to navigate the file system.

  - Implement the Object Oriented Programming concepts in Python.

  - Appraise the need for working with various documents like Excel, PDF, Word and Others.

- **Course Title:** UNIX PROGRAMMING

  Course Code: 18CS56

  Course objectives:

  - Interpret the features of UNIX and basic commands.

  - Demonstrate different UNIX files and permissions

  - Implement shell programs.

  - Explain UNIX process, IPC and signals.

- **Course Title:** COMPUTER NETWORK LABORATORY

Course Code: 18CSL57

Course objectives:

- Demonstrate operation of network and its management commands

- Simulate and demonstrate the performance of GSM and CDMA

- Implement data link layer and transport layer protocols.

- **Course Title:** DBMS LABORATORY WITH MINI PROJECT

  Course Code: 18CSL58

  Course objectives:

  - Foundation knowledge in database concepts, technology and practice to groom students into well-informed database application developers.

  - Strong practice in SQL programming through a variety of database problems.

  - Develop database applications using front-end tools and back-end DBMS.

  -

- **Course Title:** ENVIRONMENTAL STUDIES

  Course Code: 18CIV59

  Course objectives:

  - CO1: Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale,

  - CO2: Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.

  - CO3: Demonstrate ecology knowledge of a complex relationship between biotic and abiotic components.

- CO4: Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues.

CO'S OF SEM-VI
(Scheme-2018)

- **Course Title:** SYSTEM SOFTWARE AND COMPILERS

  Course Code: 18CS61

  Course objectives:

  - Define System Software.

  - Familiarize with source file, object file and executable file structures and libraries

  - Describe the front-end and back-end phases of compiler and their importance to students

- **Course Title:** COMUTER GRAPHICS AND VISUALIZATION

  Course Code: 18CS62

  Course objectives:

  - Explain hardware, software and OpenGL Graphics Primitives.

  - Illustrate interactive computer graphic using the OpenGL.

  - Design and implementation of algorithms for 2D graphics Primitives and attributes.

  - Demonstrate Geometric transformations, viewing on both 2D and 3D objects.

  - Infer the representation of curves, surfaces, Color and Illumination models

- **Course Title:** WEB TECHNOLOGY AND ITS APPLICATIONS

  Course Code: 18CS63

  Course objectives:

  - Illustrate the Semantic Structure of HTML and CSS

  - Compose forms and tables using HTML and CSS

  - Design Client-Side programs using JavaScript and Server-Side programs using PHP

  - Infer Object Oriented Programming capabilities of PHP

  - Examine JavaScript frameworks such as jQuery and Backbone

- **Course Title:** DATA MINING AND DATA WAREHOUSING

  Course Code: 18CS641

  Course objectives:

  - Define multi-dimensional data models.

  - Explain rules related to association, classification and clustering analysis.

  - Compare and contrast between different classification and clustering algorithms

- **Course Title:** OBJECT ORIENTED MODELING AND DESIGN

  Course Code: 18CS642

  Course objectives:

  - Describe the concepts involved in Object-Oriented modelling and their benefits.

- Demonstrate concept of use-case model, sequence model and state chart model for a given problem.

- Explain the facets of the unified process approach to design and build a Software system.

- Translate the requirements into implementation for Object Oriented design.

- Choose an appropriate design pattern to facilitate development procedure.

- **Course Title:** CLOUD COMPUTING AND ITS APPLICATIONS

  Course Code: 18CS643

  Course objectives:

  - Explain the fundamentals of cloud computing

  - Illustrate the cloud application programming and aneka platform

  - Contrast different cloud platforms used in industry

- **Course Title:** ADVANCED JAVA AND J2EE

  Course Code: 18CS644

  Course objectives:

  - Identify the need for advanced Java concepts like Enumerations and Collections

  - Construct client-server applications using Java socket API

  - Make use of JDBC to access database through Java Programs

  - Adapt servlets to build server side programs

  - Demonstrate the use of JavaBeans to develop component-based Java software

- **Course Title:** SYSTEM MODELLING AND SIMULATION

  Course Code: 18CS645

  Course objectives:

  - Explain the basic system concept and definitions of system;

  - Discuss techniques to model and to simulate various systems;

  - Analyze a system and to make use of the information to improve the performance.

- **Course Title: Course Title:** INTRODUCTION TO DATA SRUCTURES AND ALGORITHM

  Course Code: 18CS652

  Course objectives:

  - Identify different data structures in C programming language

  - Appraise the use of data structures in problem solving

  - Implement data structures using C programming language.

- **Course Title: Course Title:** SYSTEM SOFTWARE LABORATORY

  Course Code: 18CSL66

  Course objectives:

  - To make students familiar with Lexical Analysis and Syntax Analysis phases of Compiler Design and implement programs on these phases using LEX & YACC tools and/or C/C++/Java

  - To enable students to learn different types of CPU scheduling algorithms used in operating system.

- To make students able to implement memory management - page replacement and deadlock handling algorithms

- **Course Title: Course Title:** COMPUTER GRAPHICS LABORATORY WITH MINI PROJECT

  Course Code: 18CSL67

  Course objectives:

  - Demonstrate simple algorithms using OpenGL Graphics Primitives and attributes.

  - Implementation of line drawing and clipping algorithms using OpenGL functions

  - Design and implementation of algorithms Geometric transformations on both 2D and 3D objects.

CO'S OF SEM-VII
(Scheme-2018)

- **Course Title: Course Title:** BIG DATA AND ANALYTICS

  Course Code: 18CS72

  Course objectives:

  - Understand fundamentals of Big Data analytics

  - Explore the Hadoop framework and Hadoop Distributed File system

  - Illustrate the concepts of NoSQL using MongoDB and Cassandra for Big Data

  - Employ MapReduce programming model to process the big data

- Understand various machine learning algorithms for Big Data Analytics, Web Mining and Social Network Analysis.

- **Course Title: Course Title:** SOFTWARE ARCHITECTURE AND DESIGN PATTERNS

  Course Code: 18CS731

  Course objectives:

  - Learn How to add functionality to designs while minimizing complexity.

  - What code qualities are required to maintain to keep code flexible?

  - To Understand the common design patterns.

  - To explore the appropriate patterns for design problems

- **Course Title: Course Title:** HIGH PERFORMANCE COMPUTING

  Course Code: 18CS732

  Course objectives:

  - Introduce students the design, analysis, and implementation, of high performance computational science and engineering applications.

  - Illustrate on advanced computer architectures, parallel algorithms, parallel languages, and performance-oriented computing.

- **Course Title: Course Title:** ADVANCED COMPUTER ARCHITECTURES

  Course Code: 18CS733

  Course objectives:

  - Describe computer architecture.

  - Measure the performance of architectures in terms of right parameters.

  - Summarize parallel architecture and the software used for them

- **Course Title: Course Title:** NETWORK MANAGEMENT

  Course Code: 18CS742

  Course objectives:

  - Illustrate the need for interoperable network management.

  - Explain the concepts and architecture behind standards based network management.

  - Differentiate the concepts and terminology associated with SNMP and TMN

  - Describe network management as a typical distributed application

- **Course Title: Course Title:** ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING LABORATORY

  Course Code: 18CSL76

  Course objectives:

- Implement and evaluate AI and ML algorithms in and Python programming language.

CO'S OF SEM-V
(Scheme-2021)

- **Course Title: Course Title: AUTOMATA THEORY AND COMPILER DESIGN**

  Course Code: 21CS51

  Course objectives:

- CLO 1. Introduce the fundamental concepts of Automata Theory, Formal Languages and compiler design

- CLO 2. Principles Demonstrate Application of Automata Theory and Formal Languages in the field of compiler design

- CLO 3. Develop understanding of computation through Push Down Automata and Turing Machines

- CLO 4. Introduce activities carried out in different phases of Phases compiler

- CLO 5. Identify the undecidability problems.

- **Course Title: Course Title: AUTOMATA THEORY AND COMPILER DESIGN**

  Course Code: 21CS52

  Course objectives:

  - CLO 1. Fundamentals of data communication networks.

  - CLO 2. Software and hardware interfaces

  - CLO 3. Application of various physical components and protocols

  - CLO 4. Communication challenges and remedies in the networks.

- **Course Title: Course Title: DATABASE MANAGEMENT SYSTEMS**

  Course Code: 21CS53

  Course objectives:

  - CLO 1. Provide a strong foundation in database concepts, technology, and practice.

  - CLO 2. Practice SQL programming through a variety of database problems.

  - CLO 3. Demonstrate the use of concurrency and transactions in database

- CLO 4. Design and build database applications for real world problems.

- **Course Title: Course Title: ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING**

  Course Code: 21CS54

  Course objectives:

  - CLO 1. Gain a historical perspective of AI and its foundations

  - CLO 2. Become familiar with basic principles of AI toward problem solving

  - CLO 3. Familiarize with the basics of Machine Learning & Machine Learning process, basics of Decision Tree, and probability learning

  - CLO 4. Understand the working of Artificial Neural Networks and basic concepts of clustering algorithms

- **Course Title: Course Title: DATABASE MANAGEMENT SYSTEM LABORATORY WITH MINI PROJECT**

  Course Code: 21CSL55

  Course objectives:

  - CLO 1. Foundation knowledge in database concepts, technology and practice to groom students into well-informed database application developers.

  - CLO 2. Strong practice in SQL programming through a variety of database problems.

  - CLO 3. Develop database applications using front-end tools and back-end DBMS.

- **Course Title: Course Title: ANGULAR JS**

  Course Code: 21CSL581/ 21CBL583

Course objectives:

- To learn the basics of Angular JS framework.

- To understand the Angular JS Modules, Forms, inputs, expression, data bindings and Filters

- To gain experience of modern tool usage (VS Code, Atom or any other] in developing Web applications

- **Course Title: Course Title: C# PROGRAMMING**

  Course Code: 21CSL582/ 21CBL584

  Course objectives:

  - To learn basic features of C# programming

  - To understand C# support for OOP with programming examples

  - To gain experience of modern tool usage (VS Code, Visual Studio or any other] in developing C# programs

CO'S OF SEM-VI
(Scheme-2021)

- **Course Title: Course Title: SOFTWARE ENGINEERING & PROJECT MANAGEMENT**

  Course Code: 21CS61

  Course objectives:

  - CLO 1. Outline software engineering principles and activities involved in building large software programs. Identify ethical and professional issues and explain why they are of concern to Software Engineers.

  - CLO 2. Describe the process of requirement gathering, requirement classification, requirement specification and requirements validation.

- CLO 3. Infer the fundamentals of object oriented concepts, differentiate system models, use UML diagrams and apply design patterns.5

- CLO 4. Explain the role of DevOps in Agile Implementation.

- CLO 5. Discuss various types of software testing practices and software evolution processes.

- CLO 6. Recognize the importance Project Management with its methods and methodologies.

- CLO 7. Identify software quality parameters and quantify software using measurements and metrics. List software quality standards and outline the practices involved

- **Course Title: Course Title: FULLSTACK DEVELOPMENT**

  Course Code: 21CS62

  Course objectives:

  - CLO 1.Explain the use of learning full stack web development.

  - CLO 2.Make use of rapid application development in the design of responsive web pages.

  - CLO 3.Illustrate Models, Views and Templates with their connectivity in Django for full stack web development.

  - CLO 4.Demonstrate the use of state management and admin interfaces automation in Django.

  - CLO 5.Design and implement Django apps containing dynamic pages with SQL databases.

- **Course Title: Course Title: COMPUTER GRAPHICS AND FUNDAMENTALS OF IMAGE PROCESSING**

  Course Code: 21CS63

Course objectives:

- CLO 1. Overview of Computer Graphics along with its applications.

- CLO 2. Exploring 2D and 3D graphics mathematics along with OpenGL API's.

- CLO 3. Use of Computer graphics principles for animation and design of GUI's .

- CLO 4. Introduction to Image processing and Open CV.

- CLO 5. Image segmentation using Open CV.

- **Course Title: Course Title: ADVANCED COMPUTER ARCHITECTURE**

  Course Code: 21CS643

  Course objectives:

  - CLO 1. Describe computer architecture.

  - CLO 2. Measure the performance of architectures in terms of right parameters.

  - CLO 3. Summarize parallel architecture and the software used for them

- **Course Title: Course Title: COMPUTER GRAPHICS AND IMAGE PROCESSING LABORATORY**

  Course Code: 21CSL66

  Course objectives:

  - CLO 1: Demonstrate the use of Open GL.

  - CLO 2: Demonstrate the different geometric object drawing using openGL

  - CLO 3: Demonstration of 2D/3D transformation on simple objects.

  - CLO 4: Demonstration of lighting effects on the created objects.

- CLO 5: Demonstration of Image processing operations on image/s.

CO'S OF SEM-VII
(Scheme-2021)

- **Course Title: Course Title: BIG DATA ANALYTICS**

  Course Code: 21CS71

  Course objectives:

  - CLO 1. Understand fundamentals and applications of Big Data analytics

  - CLO 2. Explore the Hadoop framework and Hadoop Distributed File system and essential Hadoop Tools

  - CLO 3. Illustrate the concepts of NoSQL using MongoDB and Cassandra for Big Data

  - CLO 4. Employ MapReduce programming model to process the big data

  - CLO 5. Understand various machine learning algorithms for Big Data Analytics, Web Mining and Social Network Analysis.

- **Course Title: Course Title: CLOUD COMPUTING**

  Course Code: 21CS72

  Course objectives:

  - CLO 1. Introduce the rationale behind the cloud computing revolution and the business drivers

  - CLO 2. Introduce various models of cloud computing

  - CLO 3. Introduction on how to design cloud native applications, the necessary tools and the design tradeoffs.

- CLO 4. Realize the importance of Cloud Virtualization, Abstraction`s and Enabling Technologies and cloud security

- **Course Title: Course Title: INTERNET OF THINGS**

  Course Code: 21CS735

  Course objectives:

  - CLO 1. Understand about the fundamentals of Internet of Things and its building blocks along with their characteristics.

  - CLO 2. Understand the recent application domains of IoT in everyday life.

  - CLO 3. Understand the protocols and standards designed for IoT and the current research on it.

  - CLO 4. Understand the other associated technologies like cloud and fog computing in the domain of IoT.

  - CLO 5. Improve their knowledge about the various cutting-edge technologies in the field IoT and machine learning applications.

  - CLO 6. Gain insights about the current trends of machine learning and AI techniques used in IoT to orient towards the present industrial scenario.

- **Course Title: Course Title: SOFTWARE ARCHITECTURE AND DESIGN PATTERNS**

  Course Code: 21CS741

  Course objectives:

  - CLO 1. Learn How to add functionality to designs while minimizing complexity.

  - CLO 2. What code qualities are required to maintain to keep code flexible?

  - CLO 3. To Understand the common design patterns.

  - CLO 4. To explore the appropriate patterns for design problems