**Computer Science and Engineering**

**Batch (2022)**

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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Program Specific Outcomes:*** To analyse, design, develop, test and apply management principles, mathematical foundation and make them expert in designing computer software and hardware.
* To develop their skills to solve problems in area of programming and simulation.
* To demonstrate basic knowledge of computer applications and apply standard practices in software project development.
* To understand, analyse and develop computer programs for efficient design of computer based systems of varying complexity.
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**B.TECH 1st Year (1st Sem)**

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| **Program Name:** B.Tech (4Year) CSE CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Applied Physics | **Course Code**: CSEB1101T |
| **Course Outcomes:*** Understand the basic scientific skills that are imperative for effective understanding of engineering subjects
* Learn the phenomenon related to oscillations
* Understand the diffraction, interference and polarization
* Understand the basic concepts of lasers and optical fibres
* Understand the basic concepts of quantum mechanics
* Learn scientific knowledge to solve real world problems
* The knowledge of physics relevant to engineering is critical for converting ideas into technology
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Applied Mathematics-I | **Course Code**: CSEB1102T |
| **Course Outcomes:*** Effective understanding of Engineering subjects
* Development of basic mathematical skills
* To inculcate the knowledge of basic concepts of mathematics for the solutions of
* Engineering and mathematical problems
* Better understanding of various engineering and technological problems
* Improvement in scientific knowledge to solve real world problems
* Problem solving and analytic thinking
* To enhance the ability to identify, formulate, abstract and solve engineering problems
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Computer Programming | **Course Code**: CSEB1103T |
| **Course Outcomes:*** Understand the basic meaning and components of computer system
* Define and distinguish hardware and software components of computer system
* Design an algorithmic solution for a given problem
* Write a maintainable C program for a given problem
* Trace a given C program manually
* Write C program for simple applications of real life using structures and files
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Basic Electronics Engineering | **Course Code**: CSEB1104T |
| **Course Outcomes:*** Demonstrate the use of semiconductor diode in various applications
* Discuss and explain the working of transistor, their configuration and application.
* Recognize and apply the number system and Boolean algebra.
* Define the communication system and differentiate various modulation techniques.
* Explain radio transmission and reception.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Manufacturing Processes | **Course Code**: CSEB1105T |
| **Course Outcomes:*** To introduce the recent emerging areas in manufacturing process
* To understand the applications, advantages and applications of various manufacturing processes
* To analyze and access the foundry practices for understand the working of various casting processes like pattern making, mold making, core making and inspection of defects use of casting processes in manufacturing and understand the working of various casting processes
* To understand the basics of metal cutting operation such as Turning, Facing, Threading, Knurling and Grooving on Centre Lathe. and working of different types of machine tools
* To know the various metal forming processes such as Hot and Cold Working, Rolling, Forging, Extrusion and Drawing Processes
* To understand the basic principles of working of machine tools viz. Lathe, Shaper, Planer, Milling, Drilling machines
* To analyze and access the importance of welding processes in manufacturing and apply knowledge to select appropriate welding process based on the type of industrial applications
* To implement the Knowledge of Gained Subject in Industry
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Computer Programming Lab | **Course Code**: CSEB1106P |
| **Course Outcomes:*** Design an algorithmic solution for a given problem
* Write a maintainable C program for a given algorithm
* Trace the given C program manually.
* Write C program for simple applications of real life using structures and files.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Electrical and Electronics Lab | **Course Code**: CSEB1107P |
| **Course Outcomes:*** To acquire knowledge about basic tools used in electronic labs like multimeter.
* This course gives an overview of various electronic components like resistance, capacitance, inductors, switches, BJT and FET .
* Acquired knowledge about CRO, function generator, printed circuit board and logic gates.
* Able to understand the working principles of electronic circuits e.g. Rectifiers.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Manufacturing Processes Lab | **Course Code**: CSEB1108P |
| **Course Outcomes:*** Build thorough knowledge of various tools, machines, devices used in engineering practice
* Acquire thorough knowledge of carrying out various operations in mechanical engineering workshop
* Utilize measuring skills gained in workshop practice
* Acquire “Hands on” training and practice to students for use of various tools, devices and machine
* Acquire skills in basic engineering practice for creating objects from raw materials
* Utilize practical skills in guiding works the trades
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Applied Physics Lab | **Course Code**: CSEB1109P |
| **Course Outcomes:*** Thoroughly understand the theoretical concepts of physics by experimentation.
* Understand the concept of electromagnetic waves
* Understand the phenomena of reflection, refraction, interference and diffraction of electromagnetic light through various experiments.
* Understand the optical properties of waves through experiments
* Learn the use of Cathode ray oscilloscope.
* Learn the use of He-Ne laser for different experiments.
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**B.TECH 1st Year (2nd Sem)**

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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Applied Mathematics-II | **Course Code**: CSEB1201T |
| **Course Outcomes:*** Effective understanding of Engineering subjects
* Development of basic mathematical skills
* To inculcate the knowledge of basic concepts of mathematics for the solutions of
* Problem solving and analytic thinking in Engineering and mathematical problems
* Better understanding of various engineering and technological problems
* Improvement in scientific knowledge to solve real world problems
* To enhance the ability to identify, formulate, abstract and solve engineering problems
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Fundamentals of Computers and Information Technology | **Course Code**: CSEB1202T |
| **Course Outcomes:*** Sensitization about internals of computer and basic block architecture.
* Understanding of types of memories, internal construction and working.
* firm foundation in computer fundamentals,
* Ability to Configure and install operating system and applications
* Booting Procedures, Ability understand the working of printers and, Hard Disk etc.
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| **Program Name** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Communications Skills | **Course Code**: CSEB1203T |
| **Course Outcomes:*** The course has developed the overall personality of students.
* To acquire soft skills, interpersonal skills and LSRW skills in English.
* To enable students to enhance their vocabulary and develop comprehension skills by doing Textual analysis and interpretation through individual and group tasks.
* The language lab provides students with user friendly modes of language learning like computer based language software and multimedia instructions.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Digital Circuits & Logic Design | **Course Code**: CSEB1204T |
| **Course Outcomes:*** To realize AND, OR, NOT, NOR function using NAND/NOR gate.
* To implement EX-OR, EX-NOR using basic and universal gates.
* To verify laws of Multiplication/Addition.
* To realize and verify circuits of binary adders and subtractors.
* To construct and verify different types of Flip-flops.
* To implement and verify multiplexers, shift registers, counters and converters.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Objected Oriented Programming Using C++ | **Course Code**: CSEB1205T |
| **Course Outcomes:*** To detail the merits of a high-level language, the programming process, and the compilation process.
* To identify the importance of object-oriented programming and difference between structured oriented and object oriented programming features.
* To use various object-oriented concepts to solve different problems.
* To describe and use software tools in the programming process along with the way to compile, load, save, and debug a C++ program.
* To apply upright programming principles to the design and implementation of C++ programs along with the understanding of algorithms in the problem-solving process.
* To illustrate the process of virtual functions data file manipulations using C++.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Engineering Graphics | **Course Code**: CSEB1206T |
| **Course Outcomes:*** Acquire knowledge of different conventions and methods of engineering drawing
* Understand dimensioned projections
* Learn how to create two-dimensional images of objects using first angle orthographic projection,
* Learn how to create isometric, perspective and auxiliary projections.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Objected Oriented Programming Using C++ Lab | **Course Code**: CSEB1208P |
| **Course Outcomes:*** To use basic I/O to communicate with the user to populate variables and control program flow.
* To write a complete class definition with in the class definition, write class and instance methods including the constructor and overloaded methods.
* To analyse and write programs to solve more complicated problems using the concepts of Object Oriented programming.
* To describe the concept of function overloading, operator overloading, virtual functions and polymorphism.
* To classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming.
* To demonstrate the use of various Object Oriented programming concepts with the help of programs.
* To apply validation techniques to build a reliable solution to a given problem.
* To apply all the programming concepts as and when required in the future application development.
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**B.TECH 2nd Year (3rd Sem)**

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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Python Programming | **Course Code**: CSEB2301T |
| **Course Outcomes:*** Develop a basic understanding of the Python programming language.
* Learn various object types.
* Learn Numpy module for scientific computing.
* Learn to work with various types of data and convert it into meaningful information.
* Learn to visualize the data.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Data Structures | **Course Code**: CSEB2302T |
| **Course Outcomes:*** To impart the basic concepts of data structures and algorithms.
* To understand concepts about searching and sorting techniques.
* To understand basic concepts about stacks, queues, lists, trees and graphs.
* To understanding about writing algorithms and step by step approach in solving problems with the help of fundamental data structures.
* Able to analyze the performance of various sorting and searching algorithms.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Computer Networks | **Course Code**: CSEB2303T |
| **Course Outcomes:*** Build an understanding of the fundamental concepts of computer networking.
* Familiarize the student with the basic taxonomy and terminology of the computer networking area.
* Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking.
* Students gained expertise in some specific areas of networking such as the design and maintenance of individual networks.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Computer System Architecture | **Course Code**:CSEB2304T |
| **Course Outcomes:*** To have a thorough understanding of the basic structure and operation of a digital computer.
* To discuss in detail the operation of the arithmetic unit including the algorithms & implementation of fixed-point and floating-point addition, subtraction, multiplication & division.
* To study the different ways of communicating with I/O devices and standard I/O interfaces.
* To study the hierarchical memory system including cache memories and virtual memory.
* Describe the basics of hardwired and micro-programmed control of the CPU, pipelined architectures.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**:CSEB4PUP |
| **Course Name:** Discrete Mathematical Structures | **Course Code**: CSEB2305T |
| **Course Outcomes:*** Write an argument using logical notation and determine if the argument is or is not valid.
* Demonstrate the ability to write and evaluate a proof or outline the basic structure.
* Understand the basic principles of sets and operations in sets.
* Prove basic set equalities.
* Demonstrate different traversal methods for trees and graphs.
* Model problems in Computer Science using graphs and trees.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Python Programming Lab | **Course Code**: CSEB2351P |
| **Course Outcomes:*** Develop a basic understanding of the Python programming language.
* Learn various object types.
* Learn Numpy module for scientific computing.
* Learn to work with various types of data and convert it into meaningful information.
* Learn to visualize the data.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Data Structures Lab | **Course Code**: CSEB2352P |
| **Course Outcomes:*** To impart the basic concepts of data structures and algorithms.
* To understand concepts about searching and sorting techniques.
* To understand basic concepts about stacks, queues, lists, trees and graphs.
* To understanding about writing algorithms and step by step approach in solving problems with the help of fundamental data structures.
* Able to analyze the performance of various sorting and searching algorithms.
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**Qualifying Subjects**

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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Punjabi | **Course Code:** CSEB2306T |

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| **Program Name:** B.TECH (2nd year) | **Program Code**: CSEB4PUP |
| **Course Name:** Environment And Road Safety Awareness | **Course Code:** CSEB2307T |

**B.TECH 2nd Year (4th Sem)**

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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Algorithm Analysis & Design | **Course Code**: CSEB2401T |
| **Course Outcomes:*** Analyze the asymptotic performance of algorithms.
* Demonstrate a familiarity with major algorithms and data structures.
* Ability to derive and solve problems using divide-and-conquer algorithms, greedy algorithms, dynamic programming paradigm and so on.
* Apply important algorithmic design paradigms and methods of analysis.
* Synthesize efficient algorithms in common engineering design situations.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Microprocessor and Assembly Language Programming | **Course Code:** CSEB2402T |
| **Course Outcomes:*** To facilitate students to understand general architecture of a microcomputer system, architecture & the organization of
* To understand and realize the Interfacing of memory & various I/O devices with 8085 microprocessor.
* After completion of this course, student will be able to explain 8085 microprocessor as central device connected to memory and I/O devices.
* Describe basics of microprocessor, microprocessor architecture and programming.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Operating Systems | **Course Code:** CSEB2403T |
| **Course Outcomes:*** To learn the fundamentals of Operating Systems.
* To learn the mechanisms of OS to handle processes and threads and their communication
* To learn the mechanisms involved in memory management in contemporary OS.
* To gain knowledge on distributed operating system concepts that includes architecture, Mutual exclusion algorithms, deadlock detection algorithms and agreement protocols
* To know the components and management aspects of concurrency management.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Database Management Systems | **Course Code:** CSEB2404T |
| **Course Outcomes:*** To understand the different issues involved in the design and implementation of a database system.
* To study the physical and logical database designs, database modeling, relational, hierarchical, and network models
* To understand and use data manipulation language to query, update, and manage a database
* To develop an understanding of essential DBMS concepts such as: database security, integrity, concurrency
* To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modelling, designing, and implementing a DBMS
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Software Engineering | **Course Code**:CSEB2405T |
| **Course Outcomes:*** The program will prepare our students to be successful professionals in the field with solid fundamental knowledge of software engineering.
* Be successful professionals in the field with solid fundamental knowledge of software engineering.
* Utilize and exhibit strong communication and interpersonal skills, as well as professional and ethical principles when functioning as members and leaders of multi-disciplinary teams.
* Apply their foundations in software engineering to adapt to readily changing environments using the appropriate theory, principles and processes.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Algorithm Analysis & Design Lab | **Course Code**:CSEB2451T |
| **Course Outcomes:*** Analyze the asymptotic performance of algorithms.
* Demonstrate a familiarity with major algorithms and data structures.
* Ability to derive and solve problems using divide-and-conquer algorithms, greedy algorithms, dynamic programming paradigm and so on.
* Apply important algorithmic design paradigms and methods of analysis.
* Synthesize efficient algorithms in common engineering design situations.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Microprocessor and Assembly Language Programming Lab | **Course Code:** CSEB2452P |
| **Course Outcomes:*** To facilitate students to understand general architecture of a microcomputer system, architecture & the organization of
* To understand and realize the Interfacing of memory & various I/O devices with 8085 microprocessor.
* After completion of this course, student will be able to explain 8085 microprocessor as central device connected to memory and I/O devices.
* Describe basics of microprocessor, microprocessor architecture and programming.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Operating Systems Lab | **Course Code:** CSEB2453P |
| **Course Outcomes:*** To learn the fundamentals of Operating Systems.
* To learn the mechanisms of OS to handle processes and threads and their communication
* To learn the mechanisms involved in memory management in contemporary OS.
* To gain knowledge on distributed operating system concepts that includes architecture, Mutual exclusion algorithms, deadlock detection algorithms and agreement protocols
* To know the components and management aspects of concurrency management.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Database Management Systems Lab | **Course Code:** CSEB2454P |
| **Course Outcomes:*** To understand the different issues involved in the design and implementation of a database system.
* To study the physical and logical database designs, database modeling, relational, hierarchical, and network models
* To understand and use data manipulation language to query, update, and manage a database
* To develop an understanding of essential DBMS concepts such as: database security, integrity, concurrency
* To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modelling, designing, and implementing a DBMS.
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**Elective Subjects - I**

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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Management Practice and Organization Behaviour | **Course Code:** CSEB2406T |
| **Course Outcomes:*** To give a basic perspective of management theories and practices.
* This will form foundation to study other functional areas of management
* To provide the students with the conceptual framework and the theories underlying Organizational Behaviour.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Mathematics for Machine Learning | **Course Code:** CSEB2407T |
| **Course Outcomes:*** Able to perform basic computations in higher mathematics.
* Develop and maintain problem-solving skills.
* Use mathematical ideas to model real-world problems.
* Be able to communicate mathematical ideas with others.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Distributed Systems | **Course Code:** CSEB2408T |
| **Course Outcomes:*** Understand the distributed systems architecture and inter process communication.
* Explain the file accessing model and various services in distributed system.
* Demonstrate concurrency control and properties of transaction in Distributed systems.
* Discuss resource and process management in distributed system
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Building Enterprise Applications | **Course Code:** CSEB2409T |
| **Course Outcomes:*** The course provides students with the basic concepts of ERP systems for manufacturing or service companies, and the differences among (Material Requirement Planning) MRP, MRP II, and ERP systems
* Apply the principles of ERP systems, their major components, and the relationships among these components
* With the knowledge of typical ERP systems, and the advantages and limitations of implementing ERP systems.
* To comprehend the technical aspects of ERP systems
* To be able to map business processes using ERP concepts and techniques.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Business Intelligence | **Course Code:** CSEB2410T |
| **Course Outcomes:*** In this course students will gain Knowledge and skills for using data warehouses for business intelligence purposes.
* Gives overview of how business intelligence technologies can support decision making across any number of business sectors.
* These technologies have had a profound impact on corporate strategy, performance, competitiveness and broadly encompass decision support systems and visual analytics.
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| **Program Name:** B.Tech (4Year) CSE  | **Program Code**: CSEB4PUP |
| **Course Name:** Foundations of Financial Accounting | **Course Code:** CSEB2411T |

**B.TECH 3rd Year (5th Sem)**

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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Java Programming | **Course Code**: CSEB3501T |
| **Course Outcomes:*** To understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.
* To understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
* To demonstrate skills in writing programs using exception handling techniques and multithreading.
* To develop reusable programs using the concepts of inheritance, polymorphism, interfaces and packages.
* To understand how to design applications with threads in Java.
* To learn how to read and write files in Java.
* To design event driven GUI and web related applications which mimic the real word scenarios
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** RDBMS Using PL/SQL | **Course Code**: CSEB3502T |
| **Course Outcomes:*** To familiarise the students with Enhanced Entity Relationship Model constructs.
* To make students understand what a Distributed Database Management System is and what its components are.
* To make students competent in use of PL/SQL Block Structure, cursors, sub-programs, Packages and Triggers.
* Apply and relate the concept of Transaction, Concurrency Control, security and Recovery in database.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Cryptography and Network Security | **Course Code**: CSEB3503T |
| **Course Outcomes:*** To understand the fundamentals of Cryptography
* To acquire knowledge on standard algorithms used to provide confidentiality, integrity and authenticity.
* To understand the various key distribution and management schemes.
* To understand how to deploy encryption techniques to secure data in transit across data networks
* Understand key management and distribution schemes and design user authentication.
* Utilize various network security applications, IPSec, Firewall, IDS, Web security, Email security and Malicious software etc.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Theory of Computation | **Course Code**: CSEB3504T |
| **Course Outcomes:*** To understand the basic concepts in the theory of computation and importance of automata as modelling tool.
* To construct finite state machines and the equivalent regular expressions.
* To prove the equivalence of languages described by finite state machines and regular expressions.
* To construct pushdown automata, Turing machine and the equivalent context free grammars.
* To solve the current unsolved problems in theoretical computer science.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Artificial Intelligence | **Course Code**: CSEB3505T |
| **Course Outcomes:*** To have an appreciation for and understanding of achievements of artificial intelligence and the theory underlying those achievements.
* To have an appreciation for the engineering issues underlying the design of artificial intelligence systems.
* Analyse basic and advanced search techniques.
* To have a basic proficiency in traditional artificial intelligence languages like PROLOG and LISP including an ability to write simple to intermediate programs and an ability to understand code written in that language.
* To have a basic understanding of some of the more advanced topics of artificial intelligence such as learning, natural language processing, agents and robotics, and expert systems for concrete computational systems.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Summer Training | **Course Code:** CSEB3550P |
| **Course Outcomes:*** Demonstrate the application of knowledge and skill sets acquired from the course and workplace in the assigned job functions.
* Solve real life challenges in the workplace by analysing work environment and conditions, and selecting appropriate skill sets acquired from the course.
* Articulate career options by considering opportunities in company, sector, industry, professional and educational advancement.
* Communicate and collaborate effectively and appropriately with different professionals in the work environment through written and oral means.
* Exhibit critical thinking and problem solving skills by analysing underlying issue/s to challenges.
* Recommend ideas to improve work effectiveness and efficiency by analysing challenges and considering viable options.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Java Programming Lab | **Course Code**: CSEB3551P |
| **Course Outcomes:*** To understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.
* To understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
* To demonstrate skills in writing programs using exception handling techniques and multithreading.
* To develop reusable programs using the concepts of inheritance, polymorphism, interfaces and packages.
* To understand how to design applications with threads in Java.
* To learn how to read and write files in Java.
* To design event driven GUI and web related applications which mimic the real word scenarios
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** RDBMS Using PL/SQL Lab | **Course Code**: CSEB3552P |
| **Course Outcomes:*** Learn and apply the control structure of PL/SQL.
* Use conditional statement control structures.
* Know how to select data into variables.
* Be able to create and use cursors for data selections within PL/SQL.
* Know how to create procedures and functions.
* Be able to create and use packages and triggers.
* To create and apply Triggers to database for Database Security and implementation of User Constraints.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Cryptography and Network Security Lab | **Course Code:** CSEB3553P |
| **Course Outcomes:*** Learn the basic network components.
* To get working knowledge of network protocols.
* Analyze various networking concepts using packet tracer.
* To understand the various key distribution and management schemes.
* To understand how to deploy encryption techniques to secure data in transit across data networks
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**Qualifying Course**

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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Drug Abuse | **Course Code:** CSEB3506T |
| **Course Outcomes:*** Understand the biological, environmental, behavioural, and social causes and consequences of drug use and addiction across the lifespan.
* Develop new and improved strategies to prevent drug use and its consequences.
* Develop new and improved treatments to help people with substance use disorders achieve and maintain a meaningful and sustained recovery.
* Increase the public health impact of NIDA research and programs.
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**B.TECH 3rd Year (6th Sem)**

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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Machine Learning | **Course Code**: CSEB3601T |
| **Course Outcomes:*** Introduce the fundamental problems and applications of machine learning.
* Provide understanding of techniques and mathematical concepts used in machine learning to facilitate further study in this area.
* Provide understanding to evaluate performance of machine learning algorithms.
* Practice software implementation of different concepts and algorithms covered in the course using PYTHON&SCIKIT-LEARN library.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Mobile Apps Development | **Course Code**: CSEB3602T |
| **Course Outcomes:*** To facilitate students to understand android SDK
* To help students to gain a basic understanding of Android application development
* To inculcate working knowledge of Android Studio development tool
* Describe those aspects of mobile programming that make it unique from programming.
* Utilize rapid prototyping techniques to design and develop sophisticated mobile interfaces.
* Deploy applications to the Android marketplace for distribution.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Computer Graphics | **Course Code**: CSEB3603T |
| **Course Outcomes:*** To provide comprehensive introduction about computer graphics system, design algorithms and two-dimensional transformations.
* To make the students familiar with techniques of clipping, three-dimensional graphics and three-dimensional transformations.
* The computer graphics course prepares students for activities involving in design, development and testing of modelling, rendering, shading and animation.
* Explore projections and visible surface detection techniques for display of 3D scene on 2D screen.
* Extract scene with different clipping methods and its transformation to graphics display device
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Cloud Computing | **Course Code**: CSEB3604T |
| **Course Outcomes:*** Understand the basic concepts along with the evolution and features of cloud computing.
* Demonstrate the concept of existing cloud paradigms and platforms.
* Explore the security issues of cloud computing in addition to various cloud models.
* Understand virtualization through virtualization technologies and some advanced topics.
* Attain a handful of experience to use exiting cloud platforms.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Compiler Design | **Course Code**: CSEB3605T |
| **Course Outcomes:*** To facilitate students to understand general understanding of a compiler and its various constituent parts
* To explore the principles, algorithms and techniques involved in the design and construction of compilers
* To learn the process of translating a modern high-level language to executable code
* To learn context free grammars, compiler parsing techniques, construction of abstract syntax trees, symbol tables, intermediate machine representations and actual code generation
* To understand the machine dependent code
* Able to write the code by using YACC and Lex.
* To apply the optimization techniques to have a better code for code generation.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Communication Skills Lab | **Course Code**: CSEB3650P |
| * Introduce the fundamental problems and applications of machine learning.
* Provide understanding of techniques and mathematical concepts used in machine learning to facilitate further study in this area.
* Provide understanding to evaluate performance of machine learning algorithms.
* Practice software implementation of different concepts and algorithms covered in the course using PYTHON&SCIKIT-LEARN library.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Machine Learning Lab | **Course Code**: CSEB3651P |
| * Introduce the fundamental problems and applications of machine learning.
* Provide understanding of techniques and mathematical conceptsused in machine learning to facilitate further study in this area.
* Provide understanding to evaluate performance of machine learning algorithms.
* Practice software implementation of different concepts and algorithms covered in the course using PYTHON&SCIKIT-LEARN library.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Mobile Apps Development Lab | **Course Code**: CSEB3652P |
| * To facilitate students to understand android SDK
* To help students to gain a basic understanding of Android application development
* To inculcate working knowledge of Android Studio development tool
* Describe those aspects of mobile programming that make it unique from programming.
* Critique mobile applications on their design pros and cons.
* Utilize rapid prototyping techniques to design and develop sophisticated mobile interfaces.
* Program mobile applications for the Android OS that use basic and advanced phone features.
* Deploy applications to the Android marketplace for distribution.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Computer Graphics Lab | **Course Code**: CSEB3653P |
| * Knowledge of basic concepts used in computer graphics.
* Learn algorithmic development of graphics primitives like: line, circle and color filling.
* Learn the implementation of various clipping techniques.
* Design scans conversion problems using C++ programming.
* Apply clipping and filling techniques for modifying an object.
* Understand the concepts of different type of geometric transformation of objects in 2D and 3D.
* Understand the practical implementation of modeling, rendering, viewing of objects in 2D
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**Elective Subjects - II**

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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Internet of Things | **Course Code**: CSEB3606T |
| **Course Outcomes:*** Able to understand the application areas of IoT.
* To help the students to realize the revolution of Internet in Machines, Cloud environment& Sensor Networks.
* Able to understand embedded system and their characteristics.
* Understand the concepts of Internet of Things (Smart Devices)and Machines.
* Analyze basic communication protocols in IoT.
* Design IoT applications in different areas and compare their performances.
* Implement basic IoT applications on embedded platform
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Embedded Systems | **Course Code**: CSEB3607T |
| **Course Outcomes:*** To facilitate students to understand about the basic working of a microcontroller system and its programming in assembly language.
* To provide experience to integrate hardware and software for microcontroller applications systems.
* Implement embedded systems using different peripheral devices, input, and communications devices
* An ability to identify, design, and implement an embedded system (including hardware and software) that solves a real-world problem using engineering processes.
* An ability to use hardware and software development techniques, skills, and computer tools to solve a real-world problem
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Blockchain Technology | **Course Code**: CSEB3608T |
| **Course Outcomes:*** Understand and explore the working of Blockchain technology (Understanding)
* Analyze the working of Smart Contracts (Analyze)
* Understand and analyze the working of Hyperledger (Analyze).
* Apply the learning of solidity and de-centralized apps on Ethereum (Apply).
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Foundations of Managerial Accounting | **Course Code**: CSEB3609T |

**B.TECH 4th Year (7th Sem)**

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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Computer Crime Investigation and Forensics | **Course Code**: CSEB4701T |
| **Course Outcomes:*** Understanding and investigation about the basics of cybercrime, its types and impact on society in sociological and criminological perspectives.
* Investigation of various sources of cybercrimes, its reasons and IT act related to cyber crimes
* Understanding of digital forensic, various forms of digital forensic and its investigating process
* Understanding of different types of image forensic tools and techniques.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Data Mining & Warehousing | **Course Code**: CSEB4702T |
| **Course Outcomes:*** To understand Data Pre-processing concepts, warehousing architectures and tools for systematically organizing large database and to make strategic decisions.
* To analyse and characterize the kind of patterns that can be discovered by clustering, associations and correlations.
* Discover interesting patterns from large amounts of data to analyse for predictions andclassification.
* To perform Data mining on complex data and applications.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** System Simulation & Modeling | **Course Code**: CSEB4703T |
| **Course Outcomes:*** Understand the system concept and apply functional modeling method to model the activities of a static system.
* Understand the behaviour of a dynamic system and create an analogous model for a dynamic system.
* Simulate the operation of a dynamic system and make improvement according to the simulation results
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Major Project | **Course Code**: CSEB4750P |
| **Course Outcomes:*** Understand programming language concepts and object-oriented concepts or go through research activities.
* Plan, analyze, design and implement a software project or gather knowledge over the field of research and design or plan about the proposed work.
* Demonstrate the ability to locate and use technical information from multiple sources.
* Learn to work as a team and to focus on getting a working project done on time with each student being held accountable for their part of the project.
* Learn about and go through the software development cycle with emphasis on different processes - requirements, design, and implementation phases.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Computer Crime investigation and Forensics Lab | **Course Code**: CSEB4751P |
| **Course Outcomes:*** Understanding and investigation about the basics of cybercrime, its types and impact on society in sociological and criminological perspectives.
* Investigation of various sources of cybercrimes, its reasons and IT act related to cyber crimes
* Understanding of digital forensic, various forms of digital forensic and its investigating process
* Understanding of different types of image forensic tools and techniques.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Data Mining & Warehousing Lab | **Course Code**: CSEB4752P |
| **Course Outcomes:*** To understand Data Pre-processing concepts, warehousing architectures and tools for systematically organizing large database and to make strategic decisions.
* To analyse and characterize the kind of patterns that can be discovered by clustering, associations and correlations.
* Discover interesting patterns from large amounts of data to analyse for predictions andclassification.
* To perform Data mining on complex data and applications.
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**Elective Subjects - III**

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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Digital Image Processing | **Course Code**: CSEB4704T |
| **Course Outcomes:*** To familiarize students about image fundamentals
* Understand the basic techniques for handling images and developing algorithms for image processing (quality enhancement, restoration, compression, segmentation and representation)
* Students will able to perform the basic image processing operations.
* Able to implement the image enhancement, edge detection and noise analysis, image compression and segmentation techniques
* To apply these concepts in digital image processing applications.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Soft Computing | **Course Code**: CSEB4705T |
| **Course Outcomes:*** To introduce soft computing concepts and techniques and foster their abilities in designing appropriate technique for a given scenario.
* To implement soft computing based solutions for real-world problems.
* To implement machine learning algorithms.
* To give students knowledge of non-traditional technologies and fundamentals of fuzzy sets, fuzzy logic, neural networks, genetic algorithms.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Natural Language Processing | **Course Code**: CSEB4706T |
| **Course Outcomes:*** Demonstrate a basic understanding of the concepts of Natural language Processing
* Learn about various word forms and models therein basic concepts of machine translation
* Understand Structures by using Parsing and its Algorithms
* Explain about the Lexical knowledge Networks and Semantic Analysis
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Parallel Computing | **Course Code**: CSEB4707T |
| **Course Outcomes:*** Parallelism improves application performance.
* After learning student will be able to optimize sequential code for fastest possible execution.
* Parallelism gives cost effective solutions.
* Learn to develop, analyse, and implement algorithms for parallel computers.
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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Foundation of Finance | **Course Code**: CSEB4708T |

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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Foundation of International Business | **Course Code**: CSEB4709T |

**B.TECH 4th Year (8th Sem)**

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| **Program Name:** B.Tech (4Year) CSE | **Program Code**: CSEB4PUP |
| **Course Name:** Project Based Industrial Training | **Course Code**: CSEB4801P |
| **Course Outcomes:*** The students will be able to demonstrate the use, interpretation and application of an appropriate international engineering standard in a specific situation.
* The students will be able to analyse a given engineering problem, identify an appropriate problem solving methodology, implement the methodology and propose a meaningful solution.
* The students will be able to apply prior acquired knowledge in problem solving.
* The students will be able to adopt a factual approach to decision engineering making.
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