

**Sub: Principles of Compiler Design****Class: BE (CSE)****Objective:** - To learn and understand the design of a compiler, To learn and use tools for construction of a compiler

Subject code:- CSE403

| Unit No | Unit Title                        | Contents   | Objectives  | Outcomes   |
|---------|-----------------------------------|--|---|--|
| 1       | Introduction to compilers         | Introduction to compilers: Compilers & translators, Phases of compilers, bootstrapping, compiler construction tools. Lexical analysis: Role of LA, Finite automata as recognizer Language for specifying LA – LEX programs, Implementation of LA. The syntactic specification of programming languages: Context free grammars, derivations & parse trees, Ambiguity, non context free languages.   | To Study lexical analysis steps of compiler construction                      | Student must aware about design of compiler at first step.                             |
| 2       | Syntax Analyzers (or Parsers)     | Syntax Analyzers (or Parsers): Parsing techniques, shift reduce parsing, top down parsing. Recursive Descent parsing left factoring, Predictive parsing – FIRST & FOLLOW functions, LR parsers, LR grammars, the canonical collection of LR (O) items, LALR parser. Automatic parser Generator YACC, YACC programs, Error detection and correction with YACC.  | To study syntax analysis or parser  | Student must aware about to generate parser code, YACC program                         |
| 3       | Syntax Directed Translation (SDT) | Syntax Directed Translation (SDT) : SDT schemes, SDT schemes for desks calculator, intermediate code, Postfix notations, parser trees and syntax trees, Three address code – Quadruples and triples, indirect triples. SDT scheme for translation of following types of statement – assignment statements, Boolean expressions, Boolean expressions with control flow method, if then else statement, while do statement, Translation with Top – down parsers.         | To study top down & bottom up parser in Syntax Directed Translation (SDT)     | An ability to use parsing techniques i.e. top down & bottom up parser in various appln |
| 4       | Symbol tables:                    | Symbol tables: Contents of symbol table, data structures for symbol table lists, Self organizing lists, search trees, hash tables, Representing scope information. Run – time storage Administration: Implementation of simple stack – allocation scheme, implementation of block structured languages – displays, parameter passing, returns. Error detection & Recovery: Types of errors, reporting curves, sources of errors, syntactic phase errors, panic mode of | To Study Symbol tables Contents error detection & recovery ,YACC Programming. | Ability to generate symbol table contents  |

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|   |                    | recovery, error recovery in LR passing, automatic error recovery in YACC.  |  |                                |
| 5 | Code Optimization: | Code Optimization: Principal sources of optimization , loop optimization - Basic blocks, flow graphs, loops, code motion, induction variables, DAG representation of basic blocks, Application of DAGs, Global Data Flow Analysis, Data Flow equations. Loop unrolling, loop jamming, constant folding. Code Generation: Object programs, the environment of code, generator, run-time addresses for names, problems in code generation, working of a simple code generator in brief, register allocation and assignments, peephole opt. | To Study Code Optimization techniques, flow graphs, problem in code generation | Ability to generate final code |

**Sub:Visual Modelling****Class: BE (CSE)  
Subject Code:- CSE404**

| <b>Unit No</b> | <b>Unit Title</b>                      | <b>Contents</b>   | <b>Objectives</b>  | <b>Outcomes</b>   |
|----------------|--|---|--|---|
| 1.             | Object Oriented Modeling- Introduction | Complexity of Software, Algorithmic and Object-Oriented Decomposition,<br>Software Modeling : Object-Oriented Methods and the Unified Modeling Language,<br>Software Architectural Design : Method and Notation , UML as a Standard , Multiple Views of Software Architecture , Evolution of Software Modeling and Design Methods , Evolution of Object-Oriented Analysis and Design Methods , Survey of Concurrent, Distributed, and Real-Time Design Methods<br>Unit  | Student should understand and able to use SDLC Methods and notation modeling<br>Software modeling Architectural modeling<br>Real time design methods                       | Student will be able to design and develop SDLC Methods and notation modeling<br>Software modeling Architectural modeling<br>Real time design methods                           |
| 2.             | UML Modeling                           | Basics of Use Cases System, Actors: Finding actors, actors in UML, Relationship between actors , Use case: Finding use cases, use cases in UML, Relationship between use cases,<br>Use Case Description : Types of use cases, elements of use case Description, Guidelines for Creating Use cases descriptions, Organizing use cases, describing use cases, realizing use cases and Use case Diagrams.<br>Structural Modeling: Structural Models: Classes, attributes, operations, Relationship Class Responsibility Collaboration (CRC Cards) , Class Diagram: Elements of Class Diagram | Student should understand Architectural design Use Cases and its element<br>Use case and relationship<br>Structural modeling –class diagram its attribute and relationship | Student will understand and apply knowledge and use Use Cases and its element<br>Use case and relationship<br>Structural modeling –class diagram its attribute and relationship |
| 3.             | Behavioral Modeling                    | Behavioral Models, Interaction Diagrams: Objects, operations and messages, Sequence diagram, Communication diagram. Activity Diagram: elements of activity diagram, guidelines for creating Activity diagram, Component diagram, deployment diagram   | Student should understand Behavioral model<br>Interaction diagram<br>Diagrams like object, diagram   | Student will be able understand and apply knowledge on Behavioral model<br>Interaction diagram<br>Diagrams like object, diagram   |

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| 4  | Introduction to Design Patterns | Introduction to Design Pattern, The Catalog of Design Patterns, Organizing the Catalog , Creational Design Pattern , Intent, applicability, structure, collaborations, consequence, implementations : Abstract Factory, Prototype, Singleton | Student should understand Design Pattern and its implementations Catalog of Design Patterns Prototype | Student will be able understand and apply knowledge on Design Pattern and its implementations               |
| 5. | Structural Design Patterns      | Intent, applicability, structure, collaborations, consequence, implementations: Adapter, Decorator, Proxy  | Student should understand Structural Design Patterns and its implementations                          | Student will be able understand and apply knowledge on Structural Design Patterns Adapter, Decorator, Proxy |
| 6  | Behavioral Design Patterns      | Intent, applicability, structure, collaborations, consequence, implementations: Command, Observer, strategy  | Student should understand Behavioral Design Patterns and its implementations                          | Student will be able understand and apply knowledge on Command, Observer, strategy                          |

**Sub: Elective –I Cloud Computing****Class: BE (CSE)****Subject Code:- CSE441**

| <b>Unit No</b> | <b>Unit Title</b>                 | <b>Contents</b>   | <b>Objectives</b>   | <b>Outcomes</b>   |
|----------------|-----------------------------------|---|---|---|
| 1.             | Evolution of Model Computing      | Introduction to Mainframe architecture, Client-server architecture, Cluster Computing, Grid Computing, Parallel Computing and Distributed Computing, Evolution of sharing on the Internet, Introduction of Cloud Computing: Definition of cloud, Cloud Deployment Models, Cloud Service Models, Key Characteristics, Benefits and Risks in Cloud Computing, Service oriented architecture (SOA) and Cloud Computing Reference Architecture by IBM                     | Student should understand and able to use Mainframe architecture<br>Introduction of Cloud Computing | Student will be able to design and able to use Mainframe architecture<br>Introduction of Cloud Computing    |
| 2              | Services Delivered from the Cloud | Model architecture, Benefits and Drawbacks: Infrastructure-as-a-Service (IaaS), Platform-as-aService (PaaS), Software-as-a-Service (SaaS), Business-Process-as-a-service (BPaaS), Identity-as-a-service (IDaaS), Communication-as-a-service (CaaS), Monitoring-as-a-service (MaaS), Storage as a service: Traditional storage versus storage cloud, Cloud Service providers: Infrastructure as service: Amazon EC2, Platform as Service: Google App Engine, Force.com | Student should understand Benefits and Drawbacks IaaS, PaaS, SaaS, IDaaS                            | Student will be able to Traditional storage versus storage cloud  |
| 3              | Cloud Technologies                | Web services: SOAP and REST, SOAP VS REST, Virtualization: Introduction to virtualization, Types of Virtualization, Pros and cons of virtualization, Virtualization applications in enterprises: Server virtualization, Desktop and Application Virtualization, Storage and Network Virtualization  | Student should understand and able to use Web services,<br>Types of Virtualization,                 | Student will be able Web services,<br>Types of Virtualization   |
| 4              | Big Data and Analytics            | Big Data, Challenges in Big Data, Hadoop: Definition, Architecture, Cloud file systems: GFS and HDFS, BigTable, HBase and Dynamo, MapReduce and extensions: Parallel computing, The MapReduce model: Parallel efficiency of MapReduce , Relational operations using MapReduce, Projects in Hadoop: Hive, HBase, Pig, Oozie, Flume, Sqoop  | Student should understand Big Data, Challenges in Big Data, Hadoop                                  | Student will be able to design and develop Big Data, Challenges in Big Data, Hadoop                         |
| 5              | Security in the Cloud             | Security, Cloud Security Challenges, Infrastructure Security: Network, Host and Application level, Data security and Storage, Security Management in the cloud, Data Privacy, Life cycle of Data, Key Privacy concerns in cloud and Disaster Recovery.  | Student should understand Cloud Security Challenges, Infrastructure Security:                       | Student will be able to design and develop policies for Cloud Security Challenges, Infrastructure Security: |
| 6              | Using Mobile Cloud                | Adopting mobile cloud applications, Feature phones and the cloud, Using Smartphones with the Cloud: Android, Apple iPhone, Research In Motion BlackBerry, Symbian, Windows Mobile, Working with Mobile Web Services: Mobile interoperability, Performing Service  | Student should understand mobile cloud applications   | Student will be able to mobile cloud applications   |

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|  |  | Discovery: Context-aware services, MEMS, Location awareness, Push services, Defining WAP and Other Protocols |  |  |
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Sub: CSSL

Class: BE (CSE)

Subject Code:-CSE451

**Objective:** To make students familiar with the fundamental concepts of computer ethics ,To know the linkage between computer, professional , philosophical ethics and decision making ,To develop the concepts in computer forensics ,To give emphasis on how cyber security operations are carried out ,To introduce the linkage between technology, law and ethics

| Unit No | Unit Title   | Contents  | Objectives                               | Outcomes  |
|---------|--|---|--|---|
| 1       | <b>Computer ethics and philosophical ethics</b>    | Vacuum of policies, conceptual muddles, social context, moral and legal issues, uniqueness of ethical issues, role of analogy, descriptive and normative claims, ethical relativism, utilitarianism, other theories <b>Professional Ethics:</b> Characteristics, the system of professions, computing as a profession, professional relationships, responsibilities, code of ethics and professional conduct <b>Privacy:</b> Computers and privacy issue, reframing this issue, legislative background, better privacy protection   | To study the ethical issues              | Students must know the ethical issues as well as they should understand ethical behavior in the society |
| 2       | <b>Intellectual property issues in cyberspace:</b> | Introduction to intellectual property Protections via Copyright, Trade Secrets, Trademarks, Patents, Contracting to protect intellectual property, Protection options – Encryption, copyright on web-content, copyright on software <b>Ethical Decision Making:</b> Types of ethical choices, Making defensible decisions, Ethical dilemmas, law and ethics, Guidelines for dilemma (Informal and Formal), Four-step analysis process of solving dilemma Case studies: i) A stolen password ii) Recovery of data leads to Discovery of confidential files iii) Do copyright ethics change overseas? | To study the protection of our property  | Students must know to protect our property from the ethical issue                                       |
| 3       | <b>Crime incident Handling Basics:</b>             | Hacking, cyber activism, Tracking hackers, clues to cyber crime, privacy act, search warrants, common terms, organizational roles, procedure for responding to incidents, reporting procedures, legal considerations <b>Information Technology Act 2000</b> Scope, jurisdiction, offense and contraventions, powers of police, adjudication   | To study procedure to handling incidents | Students should understand incident & its handling  |

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| 4 | <b>Cyber Forensics: Communications</b>     | Cyber forensics, cyber crime examples, forensics casework, investigative incident-response actions, computer forensics tools, Threats in cyberspaces, Blended attacks Sample Policy Documents: i) Antivirus Guidelines Policy ii) Internal Lab Security Policy iii) Server Security Policy iv) Wireless Communications Policy | To study cyber crime                           | Students must know cyber crime & its handling            |
| 5 | <b>Information Security Certifications</b> | Information Security Certifications, CISSP and SSCP, CISA and CISM, SCP, GIAC, certification weaknesses, Role of these certified professionals, Windows Server 2003 Security F  | To study certification of information security | Students should understand different certification in IS |



**Sub: Parallel & Distributed System****Class: BE (CSE)****Subject Code:- CSE402**

| <b>Unit No</b> | <b>Unit Title</b>                              | <b>Contents</b>  | <b>Objectives</b>   | <b>Outcomes</b>  |
|----------------|--|--|---|--|
| 1.             | <b>Introduction to Parallel Computing</b>      | Introduction to Parallel Computing, Scope and applications of Parallel Computing, Parallel Computing Platforms - Implicit Parallelism, limitations of Memory System Performance, Physical organization of Parallel platforms, Communication costs in parallel machines<br>Introduction to Message Passing Paradigm, Message Passing Interface  | To train the students with the concepts of Parallel Computing because of the need in the Availability of growing number of cores on a chip. | Student will get knowledge of basic concepts in parallel computing |
| 2.             | <b>Principles of Parallel Algorithm Design</b> | Principles of Parallel Algorithm Design, Granularity, Concurrency and Task interaction, Recursive Decomposition, Data Decomposition, Parallel Algorithm Models --The Data Parallel Model, The Task Graph Model, The Master-Slave Model<br>Programming Shared Address Space Platforms- Threads, Why threads, The POSIX Thread API, Thread creation-termination, Synchronization primitives in Pthreads--Mutual Exclusion for shared variables<br>OpenMP standard for Parallel Programming: Basics, specifying concurrent tasks in OpenMP, Use of various Directives | To train the students with the concepts of Parallel Computing because of the need in the availability of growing number of cores on a chip. | Student gets the knowledge of algorithm design                     |

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| 3. | <b>Compute Unified Device Architecture (CUDA)</b>    | <p>CUDA (Compute Unified Device Architecture) Architecture: Introduction to CUDA GPU (Graphics Processing Unit) architecture, Terms- Grid, Block, Threads. CUDA memory types, CUDA C program structure, CUDA thread organization, Matrix multiplication using multiple blocks Simple programs of merging and sorting</p>  | <p>To provide the concept of massive - core GPUs and parallel programming.</p> | <p>Student gets the knowledge CUDA concepts</p>                           |
| 4  | <b>Theoretical Foundation for Distributed System</b> | <p>Theoretical Foundation for Distributed System: Limitation of Distributed system, Differences between Distributed systems and Parallel systems, Models of distributed computation- Interleaving Model, Happened before Model, Potential Causality Model, Shared memory<br/>Temporal ordering of events, Logical clocks and Vector Clocks (Definition and algorithm)<br/>Mutual Exclusion using Time stamps, Lamport's Algorithm for Mutual exclusion.</p> | <p>To understand the basic concepts of Distributed Computing.</p>              | <p>Student gets the knowledge of basic concepts of distributed system</p> |
| 5. | <b>Distributed Shared Memory (DSM)</b>               | <p>Distributed Shared Memory (DSM): General architecture of DSM systems, Design and implementation of DSM, Granularity, structure of shared memory space, consistency models, Replacement Strategy, Thrashing, approaches to DSM, and Advantages of DSM<br/>Distributed Objects and Remote Invocation: Communication between</p>  | <p>To understand the basic concepts of Distributed Shared Memory</p>           | <p>Student gets the knowledge of distributed shared memory</p>            |

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|    |                            | distributed objects, Remote procedure call, Events and notifications, Java RMI case study .  |   |                                      |
| 6. | <b>Case Study (Hadoop)</b> | Case study- Hadoop - A distributed programming framework, Building blocks of Hadoop, Setting up SSH for Hadoop cluster, Running Hadoop, Working with Files in HDFS, Anatomy of MapReduce program, Writing basic MapReduce programs | To introduce students to one distributed programming framework. | Student gets the knowledge of Hadoop |

**Sub: Project Part –I****Objective:**Investigation of the latest development in a specific field of Computer Engineering**Class: BE (CSE)****Subject Code:- CSE425**

| <b>Unit No</b> | <b>Unit Title</b>  | <b>Contents</b>   | <b>Objectives</b>                           | <b>Outcomes</b>  |
|----------------|--------------------|---|---|--|
| <b>1</b>       | Introduction       | <b>Requirement gathering, data collection,data formatting, Scope of project</b> | To introduce requirement analysis concepts. | Student get knowledge of basic concept of project development .        |
| <b>2</b>       | Literature Survey  | <b>Detail study of literature survey</b>  | To introduce concept of literature survey   | Student get knowledge of Literature survey                             |
| <b>3</b>       | System Development | <b>System/problem definition, analysis, design,</b>                             | To introduce system development concept.    | Student get knowelge of system problem definition,analysis and design. |

**Sub: Soft Computing**

**Class: BE (CSE)**

**Subject Code:- CSE453**

**Objective:** To study models of ANN and Fuzzy Logic To be able to apply these models in practice for solving problems in diverse areas such as pattern recognition, pattern matching ,To study and understand techniques of Feed forward and feedback neural networks

| <b>Unit No</b> | <b>Unit Title</b>   | <b>Contents</b>  | <b>Objectives</b>  | <b>Outcomes</b>   |
|----------------|---|--|--|---|
| 1.             | <b>Basics of Artificial Neural Network</b>                        | Characteristics of Neural Networks, Structure and working of a biological neural network, artificial neural network: terminology, models of neurons: Mc-Culloch - Pitts model, Perceptron model, Adaline model, topology, Basic learning laws.<br><b>Functional Units for ANN for Pattern Recognition Task:</b> Pattern Recognition Problem, Basic Functional units, PR by functional units.   | To Study basic terminologies in Neural Networks, Fundamental laws, PR Tasks.   | Student must know knowledge about ANN & BNN. Learn all the basic learning laws. |
| 2.             | <b>Feedforward Neural Networks</b>                                | Supervised Learning I: Perceptrons – Learning and Memory, Learning Algorithms, Error Correction and Gradient Decent Rules, Perceptron Learning Algorithms,<br>Supervised Learning II: Backpropagation- Multilayered Network Architectures, Back propagation Learning Algorithm, example Applications of feed forward neural networks.  | To Study knowledge about Feedforward Neural Networks, Supervised Learning, UnSupervised Learning, Backpropagation algo | Student must gets Supervised Learning, UnSupervised Learnings laws.             |
| 3.             | <b>Feedback Neural Networks &amp; Self Organizing Feature Map</b> | Introduction, Associative Learning, Hopfield network, Error Performance in Hopfield networks, simulated annealing, Boltzmann machine and Boltzmann learning,<br>State transition diagram and false minima problem, stochastic update, simulated annealing, Boltzmann machine, Bidirectional Associative Memory, BAM Stability Analysis.<br>Self Organization, Generalized Learning Laws, Competitive Learning, Vector Quantization, self | To study Feedback Neural Networks & Self Organizing Feature Map  | Student must gets Feedforward Neural Networks & Feedback Neural Network models  |

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|    |  | organizing feature map, Applications of self organizing feature map.   |   |   |
| 4  | <b>Fuzzy Logic</b>   | Fuzzy set theory, crisp sets, operations on crisp set, fuzzy sets, fuzzy versus crisp, operations, fuzzy relations, crisp relations, properties Fuzzy logic<br>Application: Fuzzy Control of Blood Pressure  | To study Feedback various concepts of fuzzy logic                     | Students must gets all the concepts related to fuzzy logic  |
| 5. | Fuzzy Logic in database and Information systems- Application | Fuzzy Logic in database and Information systems- Fuzzy Information, Fuzzy Logic in database Systems, Fuzzy Relational data Models, operations in Fuzzy Relational data Models, Design theory for Fuzzy Relational databases, Fuzzy information Retrieval and Web search, Fuzzy Object Oriented databases. Introduction to Genetic Algorithms, Evolutionary Algorithms. | To study Fuzzy Logic in database and Information systems- Application | Students must gets to use database concepts in fuzzy logic. |

**Sub: Data Warehousing and Data Mining****Class: BE (CSE)****Subject Code:-CSE401**

**Objective:** To familiarize with the fundamental concepts of Data warehousing and OLAP ,To develop the concepts of data mining methods in database management skills ,To be able to efficiently design and manage data storages using data warehousing, OLAP, and data mining techniques, To use the concepts in Text mining, web mining and Knowledge Discovery ,To study models of ANN and Fuzzy Logic ,To be able to apply these models in practice for solving problems in diverse areas such as pattern recognition, pattern matching

| Unit No | Unit Title                               | Contents   | Objectives  | Outcomes  |
|---------|--|--|---|---|
| 1.      | <b>Introduction to Data Warehousing:</b> | Introduction to Decision Support System: DSS Defined, History of DSS, Ingredients of DSS, Data and Model Management, DSS Knowledge base, User Interfaces, The DSS Users, Categories and Classes of DSSs Need for data warehousing, Operational & informational data, Data Warehouse definition and characteristics, Operational Data Stores. | To study basic introduction to Data mining and warehousing.       | Student got knowledge of data mining and warehousing      |
| 2.      | <b>Data warehouse Components</b>         | Architectural components, Data Preprocessing: Why Preprocess Data? Data Cleaning Techniques, Data Integration and Transformation, Data Reduction Techniques, Discretization and Concept Hierarchy Generation for numeric and categorical data, Significant role of metadata , Building a Data warehouse,.                                    | To study data warehouse components.                               | Student gets the knowledge of data warehouse components.  |
| 3.      | <b>OLAP in the Data Warehouse</b>        | A Multidimensional Data Model, Schemas for Multidimensional Databases: Stars, Snowflakes, Star join and Fact Constellations Measures, Concept Hierarchies, OLAP Operations in the Multidimensional Data Model, Need for OLAP, OLAP tools , Mining Multimedia Databases, Mining Text Databases, Mining the World Wide Web.                    | To study OLAP in the data warehouse.                              | Student gets the knowledge of OLAP in the data warehouse. |
| 4       | <b>Data Mining Algorithms</b>            | Concept Description: What is Concept Description? Data Generalization and Summarization-Based Characterization, Mining Descriptive Statistical Measures in Large Databases. Mining Association Rules: Association Rule Mining, Market Basket   | To study Data mining concepts and classification and predication. | Student gets the knowledge of data mining algorithms.     |

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|    |  | <p>Analysis, Association Rule classification, The Apriori Algorithm, Mining Multilevel Association Rules, Constraint-Based Association Mining, Sequential mining. <b>Classification and Prediction:</b> What is Classification and Prediction?</p>  |   |  |
| 5. | <b>Classification, Knowledge Discovery</b> | <p>Classification Based on Association Rule Mining, Other Classification Methods Cluster Analysis: What is Cluster Analysis? Types of Data in Cluster Analysis, A Categorization of Clustering Methods. Introduction to <b>Knowledge Discovery</b>, innovative techniques for knowledge discovery, application of those techniques to practical tasks in areas such as fraud detection, scientific data analysis, and web mining, Introduction to huge data sets such as Web, telecommunications networks, relational databases, object-oriented databases, and other sources of structured and semi data</p> | To study basic introduction to knowledge discovery process. | Student get the knowledge of knowledge discover process. |



**Sub: Mobile Computing****Class: BE (CSE)**  
**Subject Code:-CSE452****Objective:**

1. To make students familiarize with Wireless Networking.
2. To know the basics of WAP and WML
3. To familiarize students with open source tools for Mobile Applications

| <b>Unit No</b> | <b>Unit Title</b>                               | <b>Contents</b>   | <b>Objectives</b>  | <b>Outcomes</b>   |
|----------------|---|---|--|---|
| 1.             | <b>Wireless and Mobile Network Architecture</b> | Principle of Cellular Communication, Overview 1G, 2G, 2.5G and 3G and 4G technologies, GSM Architecture and Mobility management hand off management, Network signaling, Mobile Devices – PDA and mobile OS, PalmOs, Win CE and Symbian.   | To study basic introduction to wireless mobile network and architecture. | Student gets knowledge of wireless mobile network and architecture. |
| 2.             | <b>Mobile IP Protocol Architecture</b>          | Mobile IPv4 and IP v 6 and its application in mobile computing. Cellular Digital Packet Data CDPD, VOIP, GPRS Services, Wireless Local Loop-WLL system.   | To study basic introduction to mobile IP protocol architecture.          | Students get knowledge of mobile IP protocol architecture.          |
| 3.             | <b>Wireless Application Protocol (WAP)</b>      | A Multidimensional Data Model, Schemas for Multidimensional Databases: Stars, Snowflakes, Star join and Fact Constellations Measures, Concept Hierarchies, OLAP Operations in the Multidimensional Data Model, Need for OLAP, OLAP tools , Mining Multimedia Databases, Mining Text Databases, Mining the World Wide Web. | To study basic introduction Wireless Application protocol.               | Students get knowledge of wireless application protocol.            |
| 4              | <b>Wireless Markup Language</b>                 | An Introduction to Wireless Technologies, Markup Languages, An Introduction to XML, Fundamentals of WML, Writing and Formatting Text, Navigating Between Cards and Decks, Displaying Images, Tables, Using Variables, Acquiring User Input  | To study basic introduction to wireless markup language.                 | Students get knowledge of WML.                                      |
| 5.             | <b>Wireless Markup Language Script</b>          | An Introduction to WMLScript, WMLScript Control Structures, Events, Phone.com Extensions, Usability, Application of Mobile computing: ASP and Dynamic WAP Sites.  | To study Wireless markup language script.                                | Students get the knowledge of WMLS.                                 |

**Sub: Elective –II Agile Methodology****Class: BE (CSE)****Subject Code:- CSE493**

| <b>Unit No</b> | <b>Unit Title</b>     | <b>Contents</b>  | <b>Objectives</b>   | <b>Outcomes</b>   |
|----------------|-----------------------|--|---|---|
| 1.             | Fundamentals of Agile | The Genesis of Agile, Introduction and background, Agile Manifesto and Principles, Overview of Scrum, Extreme Programming, Feature Driven development, Lean Software Development, Agile project management, Design and development practices in Agile projects, Test Driven Development, Continuous Integration, Refactoring, Pair Programming, Simple Design, User Stories, Agile Testing, Agile Tools.                                 | To understand the background and driving forces for taking an Agile approach to software development. | Students become aware about fundamentals of Agile Methodology.  |
| 2.             | Agile Scrum Framework | Introduction to Scrum, Project phases, Agile Estimation, Planning game, Product backlog, Sprint backlog, Iteration planning, User story definition, Characteristics and content of user stories, Acceptance tests and Verifying stories, Project velocity, Burn down chart, Sprint planning and retrospective, Daily scrum, Scrum roles – Product Owner, Scrum Master, Scrum Team, Scrum case study, Tools for Agile project management. | To understand the Working of Scrum and business value of adopting agile approaches.                   | Students will understand working of Scrum in Software industry and also concept of planning, tools, agile project management. |
| 3.             | Agile Testing         | The Agile lifecycle and its impact on testing, Test-Driven Development (TDD), x Unit framework and tools for TDD, Testing user stories - acceptance tests and scenarios, Planning and managing testing cycle, Exploratory testing, Risk based  | To drive development with unit tests using Test Driven Development                                    | Students will be able to know lifecycle and its impact on testing with Tools used for testing.                                |

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|    |                                       | testing, Regression tests, Test Automation, Tools to support the Agile tester.   |  |  |
| 4  | Agile Software Design and Development | Agile design practices, Role of design Principles including Single Responsibility Principle, Open Closed Principle, Liskov Substitution Principle, Interface Segregation Principles,   | To understand the Agile Design and development practices                     | Student becomes aware about role of Design and development in Agile ,      |
| 5. | Agile Software Design Principles      | Dependency Inversion Principle in Agile Design, Need and significance of Refactoring, Refactoring Techniques, Continuous Integration, and Automated build tools, Version control.  | To Apply design principles and refactoring to achieve Agility.               | Students will able to understand concept of principles of design software. |
| 6  | Industry Trends                       | Market scenario and adoption of Agile, Agile ALM, Roles in an Agile project, Agile applicability, Agile in Distributed teams, Business benefits, Challenges in Agile, Risks and Mitigation, Agile projects on Cloud, Balancing Agility with Discipline, Agile rapid development technologies | To deploy automated build tools, version control and continuous integration. | Students will get Industry trends in software and challenges in it.        |

| <b>Unit No</b> | <b>Unit Title</b>    | <b>Contents</b>   | <b>Objectives</b>   | <b>Outcomes</b>  |
|----------------|----------------------|---|---|--|
| 1.             | Introduction         | Overall description of project topic selected by the students   | Students must fix what should they do in their project    | Student must know output of their project<br>According to their requirement. |
| 2.             | Literature Survey    |   | Collects data from various offices/dept./industries/inst. | Output must be predefined  |
| 3.             | System Development   | the entire design process with necessary DFDs, other diagrams, design methodologies and other design and implements details | To study all the data required for database collection    | Students must know DFDs, Design methodologies                                |
| 4              | Performance Analysis | Student calculate performance of each module in their project by taking help from experts                                   |   |  |
| 5.             | Conclusions          | Detailed format of the project report is to be made available by the Dept   |   |  |

| <b>Unit No</b> | <b>Unit Title</b>                 | <b>Contents</b>   | <b>Objectives</b>   | <b>Outcomes</b>  |
|----------------|-----------------------------------|---|---|--|
| 1.             | <b>Digital Image Fundamentals</b> | Introduction: Image, Pixel, Digital Image<br>• Fundamental steps and Components of Digital Image Processing<br>• Brightness adaption and discrimination<br>• Image sensing and Acquisition<br>• Image Sampling and Quantization: Basic concepts in Sampling and Quantization, Representing Digital images, Spatial and intensity resolution.<br>• Relationship between Pixels: Neighbors of a Pixel, Adjacency, Connectivity, Regions, and Boundaries, Distance Measures,<br>• Basic Intensity transformations: Image Negatives, Log Transformation, Power law Transformations. Piecewise-Linear Transformation Functions<br>• Histogram Processing: Definition, Histogram Equalization | Student should understand and able to Image sensing and Acquisition and Basic Intensity transformations.                              | Student will be able to design and develop image sampling, and acquisition. Histogram Processing: Definition, Histogram Equalization.            |
| 2.             | <b>Image Enhancement</b>          | Fundamentals of Spatial Filtering- The Mechanics of Spatial Filtering, Generating Spatial Filter Masks .<br>• Noise Model<br>• Smoothing Spatial Filters : Linear filters – Mean filters Non-linear (Order Statistic filters) : Median, Mode, Max, Min filters,<br>• Sharpening Spatial Filters:- Foundation, Using the Second Derivative for Image Sharpening-The Laplacian. Unsharp Masking Highboost Filtering, Using First Order Derivative for (Nonlinear) Image sharpening- The Gradient<br>Image Enhancement by Frequency Domain Methods: Basic steps for Filtering in Frequency Domain.<br>• Frequency Domain low pass (Smoothing) and high pass (Sharpening ) Filters          | Student should understand Architectural design Use Cases Sharpening Spatial Filters, Smoothing Spatial Filters, and Frequency Domain. | Student will understand and apply knowledge and use use Cases Foundation, Using the Second Derivative for Image, Median, Mode, Max, Min filters. |
| 3.             | <b>Image Compression</b>          | Fundamentals:<br>• Coding Redundancy, Spatial and temporal (Interpixel)   | Student should understand Coding redundancy, spatial  | Student will be able understand  |

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|    |  | <p>Redundancy, Irrelevant Information(Psychovisual Redundancy)</p> <ul style="list-style-type: none"> <li>• Measuring image Information: Image Entropy, Fidelity Criteria, Image compression Model</li> <li>• Some Basic Compression Methods: Lossless Compression methods-Huffman coding, LZW coding, Run- Length Coding, Lossy Compression methods:- Block Transform Coding,</li> <li>• Image File formats: BMP, GIF, TIFF</li> <li>• Image Compression Standards: Binary image compression Standards, Continuous Tone Still Image Compression Standard,</li> </ul> | and temporal and irrelevant, Measuring image Information.   | and apply Fundamentals Measuring image Information: Image Entropy, Fidelity Criteria.  |
| 4  | <b>Image Segmentation</b>  | <p>Fundamentals : Point , Line and Edge Detection, Detection of Isolated Points, Line Detection, Edge Models, Basic Edge detection, Canny edge detector</p> <ul style="list-style-type: none"> <li>• Thresholding : Foundation, Basic Global Thresholding, Optimal global thresholding</li> <li>Multiple Thresholds, Variable , Multivariable Thresholding,</li> <li>• Region-Based Segmentation Methods: Region Growing, Region Splitting and Merging,</li> <li>• Segmentation Using Morphological Watersheds</li> </ul>   | Student should understand Thresholding, undamentals : Point , Line and Edge Detection, Detection of Isolated Points.  | Student will be able understand Region-Based Segmentation Methods: Region Growing, Region Splitting and Merging, • Segmentation Using Morphological Watersheds |
| 5. | <b>Morphological Image Processing and Color Image Processing, Morphological Image Processing</b> | <ul style="list-style-type: none"> <li>• Preliminaries ,Erosion and Dilation ,Opening and Closing</li> <li>• The Hit-or-Miss Transformation</li> <li>• Some Basic Morphological Algorithms: Boundary Extraction, Hole(Region) Filling, thinning</li> </ul> <p>Color Image Processing:</p> <ul style="list-style-type: none"> <li>• Color Fundamentals and Color Models</li> <li>• Basics of Full-Color Image Processing</li> <li>• Color Transformations</li> </ul>   | Student should understand Preliminaries ,Erosion and Dilation ,Opening and Closing The Hit-or-Miss Transformation Some Basic Morphological Algorithms: Boundary Extraction, Hole(Region) Filling, | Student will be able understand Color fundamental and Color models of image processing   |
| 6  | <b>Image Representation and Description</b>  | <p>Representation.</p> <ul style="list-style-type: none"> <li>• Boundary Descriptors.</li> <li>• Regional Descriptors</li> </ul>  | Student should understand Boundary Descriptors,Regional Descriptors   | Student will be able understand Boundary Descriptors,Regional Descriptors  |

**Sub: Operating Systems****Class: TE (CSE)****Subject Code:-CSE301**

**Objectives:** To provide the students complete knowledge of Operating Systems principles. To have a clear understanding of OS design methodologies adapted by designers To study the design concepts with illustration to a few particular Operating Systems

| Unit No | Unit Title                | Contents   | Objectives   | Outcomes  |
|---------|---------------------------|--|--|---|
| 1.      | <b>Introduction</b>       | <p>Introduction to OS, OS as extended machine, OS as resource manager, History of OS:- first to fourth generation (simple batch system , time - sharing systems, Real-time systems, parallelsystems, distributed system), OS concepts ( Process , Files, Shell), System calls</p> <p><b>Process Management:</b><br/>The process model, process states, PCB (process control block), Threads</p> <p><b>Process Synchronization:</b> Intercrosses communication (IPC), race condition, critical sections, mutual exclusion with busy waiting, sleep &amp; wake-up, semaphores, event counters, monitors, message passing, classical IPC problems: Dining philosophers problem, Readers &amp; Writers problems.</p> | <p>To make student aware of overall operating system concepts and fundamental of process ,PCB, ,process synchronization,And classical IPC problem.</p>     | <p>Student get the basics of operating system,and different types of operating system,and fundamentals of process PCB,process synchronization, And Classical IPC problem.</p> |
| 2.      | <b>Process scheduling</b> | <p>Round Robin scheduling, priority scheduling, multiple queues, shortest job first, policy driven scheduling, two level scheduling</p> <p><b>Memory management:</b><br/>Memory management without swapping or paging, use of multiprogramming.<br/>Swapping: Multiprogramming with fixed and variable partitions, memory management with bitmaps, linked lists and buddy system.<br/>Allocation of swap space, Virtual Memory: Paging, segmentation. Page Replacement Algorithms: Optimal page replacement, Not-Recently used page replacement, Firstin- first -out, least recently used random page replacement.</p>   | <p>To make student aware of different scheduling algorithms,concept of memory swapping,paging concept,,virtual memory,and page replacement algorithms.</p> | <p>Student get Knowlge of different scheduling algorithms,Concept of memory</p>   |

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| 3. | <b>Principles of I/O Hardware</b>         | I/O devices, Device controlling.<br><b>Principle of I/O software:</b> Goals of I/O software, Interrupt handlers, Device drivers, device -independent I/O software, user space I/O software. <b>Deadlocks:</b> Resources, deadlock modeling, the Ostrich algorithm, detection & recovery, deadlock prevention, deadlock avoidance (Banker's Algorithm)   | To make student aware of different devices controller devices and goals of in put output software deadlocks detection algorithms. | Student know devices c0ntroller, goals of input output software and hardware deadlocks.             |
| 4  | <b>RAM disks:</b><br><br><b>Terminals</b> | RAM disks H/W & S/W , overview of RAM disk driver.<br>Disks: Disk H/W disk S/W (disk scheduling algorithms)<br>Terminal H/W & S/W, Clocks H/W & clocks S/W<br><b>File System:</b> The user view of the file system: Files, directories,<br>File system implementation: Implementing files with Contiguous, Linked list, index and indexnodes (UNIX), disk space management, Implementing directories, file storage, Directory structures, shared files, file system reliability, consistency & performance. | To make student aware of RAM disk new File tem,user view and software ,file system implementation and directory.                  | Student get knowlge of RAM disk hardware and software, RAM disk drivers, file system and user view. |
| 5. | <b>Security</b>                           | security environment, flaws generic security attacks, user authentication, design principles of security. <b>Protection Mechanism:</b> Protection domains, access control lists, capabilities, protection models <b>Case study:</b> i) Windows NT: Introduction, MS-Windows & windows NT, History, architecture, features ii) LINUX: From the context of OS concepts  | To make sttudent aware, of security envirmnt and Windows NT, Linux.   | Student get the konwlge of Security envirmnt , windows nT and linux.                                |



**Sub: Design Analysis & Algorithm****Class: TE (CSE)**  
**Subject Code:-CSE352**

| <b>Unit No</b> | <b>Unit Title</b>   | <b>Contents</b>  | <b>Objectives</b>  | <b>Outcomes</b>  |
|----------------|---|--|--|--|
| 1.             | <b>Fundamental concept of algorithm design and Analysis</b> | Algorithm characteristics and specifications.Writing pseudo code,Asymptotic Notations,Analysis of searching Algorithms, Analysis of sorting methods  | To study basics concept of Algorithm   | Student get known to algorithm and its characteristics                           |
| 2.             | <b>Divide &amp; conquer Algorithm Design Method</b>         | Divide and conquer its algo and characteristics,Binary Search best,worst and average case,Quicksort &Merge sort,Finding largest and smallest number using D&C.Matrix multiplication using D&C. | To study Divide & conquer Algorithm and its methods                            | Student should be able to solve the problem of sorting using divide and conquer. |
| 3.             | <b>Greedy Method</b>  | Greedy Method:Basics & Algorithm.Fractional knapsack problem.Optimal Merge pattern.Job sequencing with deadlines.Huffman coding greedy method.Minimum Cost Spanning tree problems              | To knowGreedy Method Algorithm works and its methods                           | Student can understand the greedy way to solve the real life problems.           |
| 4              | <b>Dynamic Programming Method</b>                           | Dynamic Programming method:Basic Algo & its characteristics.0/1 knapsack problem.Multistage graph,OBST,TSP, Tree traversal techniques, DFS, BFS,Connected components,Biconnected components.   | To knowDynamic Programming concepts and its paradigms                          | Student can solve the problems using Dynamic Programming Method.                 |
| 5.             | <b>Backtracking Method</b>                                  | Backtracking Method:Basics & Algorithm,Solving n-Queens problem,Sum of subset problem,Graph coloring,Hamiltonian cycle.  | To study Backtracking methods and efficient algorithm to overcome the problem. | Increasing the Student ability in getting out of the real world problems.        |

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| 6 | <b>Branch and Bound technique</b> | Backtracking Method: Basics & Algorithm, characteristics, Solving n-Queens using branch and bound, FIFO branch and bound problem, Least cost search, 15 puzzle problem, Solving TSP problem using branch and bound method | To study the lower & upper bound of the given problem. | Student must be able to analyze and design the algorithm by knowing the lower & upper bound of the problem. |
|---|-----------------------------------|---|--|---|

**Sub: Software Engineering****Class: TE (CSE)**  
**Subject Code: - CSE302****Objectives:**

To be aware of • Different life cycle models, Requirement analysis process • Analysis modeling and specification  
 • Architectural and detailed design methods • Implementation and testing strategies • Verification and validation techniques • Project planning and management

| <b>Unit No</b> | <b>Unit Title</b>                    | <b>Contents</b>  | <b>Objectives</b>   | <b>Outcomes</b>   |
|----------------|--------------------------------------|--|---|---|
| <b>1</b>       | <b>The Product &amp; the Process</b> | <p>Software-characteristics, components, &amp; applications, Software Myths, Process Framework, Software Process, Layered Technology, Capability Maturity Model, Software Process Models, Waterfall Model, Linear Sequential Model, Prototyping Model, RAD Model, Incremental Model, Fourth Generation Techniques, The Unified Process, Software Development Life Cycle.</p> <p><b>Software Engineering Concepts:</b><br/>           Essence of Practices, Communication Practices, Software Phases, Planning Phase, Modeling Phase – Analysis &amp; Design, Construction Phase – Coding &amp; Testing, Deployment System Engineering, System Engineering, Information Engineering, Product Engineering.</p> | To study basic introduction to software engineering and SDLC.         | Student gets knowledge of basic concepts of software engineering, and stages of SDLC. |
| <b>2</b>       | <b>Project Management Concepts</b>   | <p>The Management Spectrum, People, Problem, Process, Project, Software Process &amp; Project Metrics, Software Scope, Resources, Software Project Estimation, Decomposition Techniques, Empirical Estimation Model.</p> <p><b>Requirement Analysis: Concepts &amp; Principles:</b><br/>           Requirement Analysis, Communication</p>   | To study basic concept of project management and software modeling's. | Student gets knowledge of project management and requirement analysis.                |

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|   |                                      | Techniques, Analysis Principles, Software Prototyping, Analysis Modeling, Data Modeling, Functional Modeling, Behavioral Modeling, Structured Modeling, Data Dictionary.  |   |   |
| 3 | <b>Design Concepts &amp; Methods</b> | Design Process & Principles, Design Concepts, Effective Modular Design, Architectural Design, Interface Design, Procedural Design, Object Oriented Design, Unified Modeling Language (UML):Basic Notations , Class diagram , State diagram activity diagrams , Use-case diagrams sequence diagrams. | To study basic introduction to Design concepts and methods. | Student get the knowledge of design methods and techniques.   |
| 4 | <b>Coding</b>                        | TOP-DOWN and BOTTOM-UP structure programming, information hiding, programming style, and internal documentation, verification, metrics, monitoring and control.<br><b>Software Testing Methods:</b><br>Software Testing Fundamentals, Test Case Design, White Box Testing, Black Box Testing.       | To study basic introduction to coding and method of coding. | Student get techniques of coding and verification techniques. |
| 5 | <b>Software Quality Assurance</b>    | Quality Concept, Quality Movement, Formal Technical Review.<br>Re-engineering: Business Process Engineering, Software Reengineering, Reverse Engineering, Restructuring, Forward Engineering  | To study basic introduction                                 | Student gets knowledge of STQA And quality assurance          |

**Sub: Database Management Systems****Class: TE (CSE)****Objectives –****Subject Code:-CSE303**

- To present an introduction to database management systems (DBMS)
- To give emphasis on how to organize, maintain and retrieve--efficiently, and effectively--information from a DBMS

| <b>Unit No</b> | <b>Unit Title</b>   | <b>Contents</b>  | <b>Objectives</b>  | <b>Outcomes</b>   |
|----------------|---|--|--|---|
| <b>1</b>       | Introduction  | The Database environment and Entity-Relationship model<br>Purpose of database system,<br>View of data-data abstraction, instances and schemas, Database Architecture, Database users, Data models-the E-R model, Entity sets, Relationship sets, Attributes,<br>Constraints, E-R diagram, weak entity sets, Extended ER features-specialization and Generalization, Aggregation. | Make the students aware about basic knowledge of DBMS<br>Understanding about ER modelling    | Students become aware about DBMS and what is ER modelling   |
| <b>2</b>       | Logical database design -The relational model and Normalization | Structure of relational model, Keys, Relational algebra operators, Mapping ER diagram to relational schemas, Functional dependencies, 3NF,BCNF and dependency preservation, multivalued dependency and 4NF,closure of functional dependencies, closure of attribute sets, canonical cover, lossless decomposition  | Let the students know relational model, normalization and FD, MVD                            | Students become aware about relational model, normalization, functional dependency and multivalued dependency |
| <b>3</b>       | Physical database design  | Introduction to SQL, Object-oriented model (8 hrs)Data definition, Set operations,   | Make the students aware about practical implementation of DBMS queries in different aspects. | Student expected different topics queries in practical sessions and so become aware about realistic           |

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|          |  | <p>aggregate functions, Views, Joined relations, nested sub queries,<br/> null values, recursive queries, integrity constraints, authorization., complex data types, structured types and inheritance in SQL, array and multiset types in SQL, object-identity and reference types in SQL.</p> |  | <p>approach of DBMS.</p>   |
| <b>4</b> | <p>Data and Database Administration and Client/server databases</p>          | <p>Creating a database, creating data dictionary, Managing data integrity, Managing password security and resources, Managing Users, managing roles, Centralized and client-server Architectures.</p>  | <p>How to manage database &amp; information about client server architecture</p> | <p>Students created different users, managed different aspects of them &amp; studied client server architectures</p> |
| <b>5</b> | <p>Transaction management, Concurrency control and Recovery and Security</p> | <p>Transaction state, ACID properties of transaction, Serializability, Two-Phase commit, Three Concurrency problem, deadlock, Statistical databases, and data encryption.</p>  | <p>To study what are the major features of DBMS</p>                              | <p>Students become aware about different properties of DBMS.</p>   |

**Sub: Theory and Computation****Class: TE (CSE)**  
**Subject Code:- CSE355****Objectives:**

- To have a complete understanding of discrete sources
- To understand encoding and decoding of digital data streams, error-control coding.
- To introduce methods for cryptography
- To have a knowledge of compression techniques.
- To introduce the concepts of multimedia communication.

| <b>Unit No</b> | <b>Unit Title</b>            | <b>Contents</b>   | <b>Objectives</b>  | <b>Outcomes</b>  |
|----------------|------------------------------|---|--|--|
| <b>1</b>       | Discrete Sources and Entropy | Overview of Digital Communication and Storage Systems, Discrete Information Sources and /entropy, source coding, Dictionary Codes and Lempel-Ziv Coding, Arithmetic coding, Source Models and Adaptive Source Coding. Shannon's Coding Theorems: Random coding, The average random code, A discussion of Shannon's Second Theorem, Shannon-Fano Coding, Shannon's Noiseless-Coding Theorem. | To study what is mean by discrete sources and entropy and various coding scheme in transmitting data | Students must aware about discrete sources & continuous sources and to obtain information contained in source alphabet |
| <b>2</b>       | Signals and Systems          | Introduction, Analog to digital conversion, Sampling theorem, Classification of signals, discrete time signals and systems, simple manipulation on discrete time signals, Input/Output description of system, classification of discrete time systems, interconnection of discrete time   | To study various types of signal & system  | An ability to get digital signal ,digital signal classification, ADC, Sampling theorem.                                |

|   |                                     | systems   |  |  |
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| 3 | Information Theory and Cryptography | Cryptosystems, Attacks on Cryptosystems, Perfect Secrecy, Language Entropy and Successful Ciphertext Attacks, Computational security, Diffusion and Confusion, Product Cipher Systems, Codes, Publickey Cryptosystems, Data Encryption standard (DES), Keys and key Management. | To study various concepts related to cryptography  | Student must aware about cryptography ,types of cryptography, at which place cryptography concepts are applied |
| 4 | Error Control Coding                | Coding for reliable digital transmission and storage, types of codes, error checking codes, error correcting codes, coding schemes, linear block codes, cyclic codes, error trapping, decoding for cyclic codes, convolution codes  | To study encoding and decoding of various digital data streams, error control coding techniques. | Students must aware about to control error occurred during data transmission.                                  |
| 5 | Compression Algorithms              | Huffman coding, Adaptive Huffman Compression, Statistical Compression, Dictionary Based Compression, Sliding Window Compression, Speech Compression, RLE, Lossy Compression schemes, Image Compression using DCT.   | To study various compression techniques used in digital transmission.                            | Students must aware about if bandwidth is less & if data more then which compression tech. will apply.         |



**Sub: Programming in Java****Class: TE (CSE)**  
**Subject Code:- CSE304****Objectives –**

- To train the student for programming using true object oriented language-JAVA
- To train the students on the concepts of Swing, Applets, JDBC etc.

| <b>Unit No</b> | <b>Unit Title</b>  | <b>Contents</b>  | <b>Objectives</b>   | <b>Outcomes</b>   |
|----------------|--------------------|--|---|---|
| <b>1</b>       | Basics of Java     | Java's importance to the internet, Java's Magic: The Byte Code, Java Buzzwords, Data types, basic syntax of Java<br><b>Classes in Java:</b> Introduction to Methods, Constructors, This Keyword, Overloading Methods, Overloading Constructors, Using objects as Parameters, A closer look at argument passing, Returning objects, Understanding Static, Command Line Arguments.<br><b>Inheritance:</b> Basics, Using Super, Method Overriding, Abstract methods and Class, Using Final with Inheritance, Packages, Importing Packages and Interfaces. | To train student for basics of java programming using object oriented concepts like classes, inheritance. | Student gets knowledge of how to implement different basics of java and how to implement inheritance in java. |
| <b>2</b>       | Exception handling | Fundamentals, Exception Types, Uncaught Exceptions, Using Try and Catch, Multiple Catch Clauses, Throw, throws, finally, Built-in Exceptions and creating your own Exception Sub Classes.  | To introduces basic concepts in exception handling and concept of multi inheritance.                      | Student gets knowledge about how to use exception handling in program and multithreading.                     |

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|   |                | <p><b>Multithreading:</b> Java Thread Model, The Main thread, Creating a Thread, Creating Multiple Threads, Using Alive ( ) and Join ( ), Thread Priorities, Synchronization, Interthread Communication, Suspending, Resuming and Stopping Threads.</p>   |   |  |
| 3 | Applets        | <p>An Overview of Applets, the Life Cycle of an Applet, creating applets, the Graphics Class, Using Colors, Displaying Text, Using Applets in a Web Page</p> <p><b>JDBC:</b> DBMS, RDBMS Concepts, Introduction to SQL, Basics of Database Connectivity, Introduction to JDBC, JDBC Architecture, Steps to create JDBC Application, JDBC Interfaces, classes and Exceptions</p> | To introduce the concept of applet and use of applet in webpages, and JDBC. | Student get knowledge about how to use applets for developing web pages and gets knowledge about JDBC for data base access |
| 4 | Event Handling | <p>Model View Controller, Event Classes, Event Listeners, Adapter Classes, Introduction to Abstract Window Toolkit (AWT),</p> <p><b>Swing:</b> Labels, Buttons, Canvases, Check Boxes, Choices, Text Fields And Text Areas, Lists, Panels, Windows and Frames, JApplet class, Menus And Menu Bars</p>   | To introduce concepts of event handling used in java and swings             | Student get knowledge about  |
| 5 | I/O Package    | Files and Directories, Overview of Codes and Streams, Buffered  | Introduce concept of input/output packages used in java.                    | Student gets knowledge about input/output packages in java and   |

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|  |  | Character Streams, the Print<br>Writer Class, Byte<br>Streams <b>Servlets:</b><br>Introduction To Web<br>Application Development,<br>Server Side Programming,<br>Introduction To<br>Servlets,Servlet Lifecycle,<br>Servlet With HTML, Server<br>Side Includes, HTTP Tunneling,<br>Servlets With JDBC,<br>Steps to configure Tomcat for<br>server |  | information about servlets in java |
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**Sub: Software Development Lab –I****Class: TE (CSE)**  
**Subject Code:-CSE324****Objectives:**

To provide the students, complete knowledge of VB.NET programming principles.

To provide a proper expertise on Software development using these techniques

| <b>Unit No</b> | <b>Unit Title</b> | <b>Contents</b>   | <b>Objectives</b>   | <b>Outcomes</b>   |
|----------------|-------------------|---|---|---|
| <b>1</b>       |                   | Windows forms, Components and Controls, MDI applications, Menus, Mouse and Keyboard events, using Timer, Collecting user Input using Buttons, Edit Text Boxes, Check Boxes, Radio Buttons, Combo Boxes. | To introduce concept of VB.net ,such as MDI,events,combo box,picture box,etc. | Student get knowledge of basics of VB.net                               |
| <b>2</b>       |                   | List box, Picture box, Tree view, creating user controls, File stream and Text IO operations, creating exe file to install project on any computer system.  | Students should use different controls  | Students get the knowledge of all controls use to design an application |

**Sub: Advanced Java****Class: TE (CSE)****Subject Code:- CSE351****Objectives:** To study advanced concepts of Java Language ,To enable students to develop Network based and Advanced Online Applications in Java

| <b>Unit No</b> | <b>Unit Title</b>               | <b>Contents</b>  | <b>Objectives</b>   | <b>Outcomes</b>   |
|----------------|---------------------------------|--|---|---|
| 1.             | <b>Client Server Technology</b> | Introduction to Single tire architecture two tire architecture multitier architecture. HTTP Protocol: Request & Response, Web containers, Web Servers. Overview of J2EE,, J2EE Architecture , J2EE Technology. Introduction to ajax, XML http request & response. Introduction to RMI, RMI Architecture. | To understand client server technology                                      | A student gets knowledge of client server technology                                  |
| 2.             | <b>Servlets Programming</b>     | Introduction, Definition, Servlet implementation, Servlet configuration, Servlet life cycle, Servlet session, context & collaboration, Web archive files, Deployment descriptor, Deployment Configuration.   | Construct a web application using servlet.                                  | A student gets knowledge about how to develop client server application using servlet |
| 3.             | <b>Java Server Pages</b>        | JSP: Overview, lifecycle, Architecture. JSP Elements: Directives, Scripting, Action tags, Implicit Objects, Comments. Custom Tags, Scope: page, request, session, application JSP and JDBC Connectivity, JSP Exception handling.   | Construct a web application using JSP.                                      | A student gets knowledge about how to develop client server application using JSP     |
| 4              | <b>Web Service, JAVA Mail</b>   | Introduction to Web services, Overview of Web-service.<br>Java Mail, Mail Protocols, Components of Java Mail, Sending mail, reading mail, saving & loading mail.   | To understand working of Web service.                                       | A student gets information about web service & all related technologies & JavaMail    |
| 5.             | <b>Hibernate and Struts</b>     | Introduction to Hibernate, Architecture, Hibernate Query language, Hibernate Object Relational Mapping,<br>Struts2: Overview, Architecture, Model View Controller Architecture, working of struts, struts controller, action class, struts validator framework.  | Fetch data effectively from traditional SQL and hibernate query language.   | A student gets knowledge how to use hibernate & struts framework                      |
| 6.             | <b>JSF &amp; EJB</b>            | Introduction, JSF Architecture, Components of JSF, JSF life cycle, JSF configuration. EJB: Enterprise bean architecture, Benefits of enterprise bean, Types of bean, Accessing bean, packaging.  | Construct an asynchronous enterprise application using message driver bean. | A student gets knowledge of how to use JSF & EJB to develop a web application.        |

**Objectives** – To identify correctness, completeness and quality of developed Software.

- To train students to create good test cases and improve the quality of software

| <b>Unit No</b> | <b>Unit Title</b>  | <b>Contents</b>   | <b>Objectives</b>   | <b>Outcomes</b>  |
|----------------|--|---|---|--|
| <b>1</b>       | <b>Introduction to Basic of software testing &amp; Terminology</b> | Quality Concepts, Quality Assurance, Quality Control, Necessity of testing, Objectives of testing, Software Development & Software Testing Life Cycle, Testing Standards:-IEEE, CMM, ANSI, Object – oriented testing, Web testing, GUI testing  | To introduce basic concept of STQA and basic of testing.                        | Student get knowledge of STQA,SDLC and different types of testing.     |
| <b>2</b>       | <b>Levels Of Testing</b>   | Verification and Validation Model, Techniques of Verification:-Peer Review, Walkthrough, Inspection, Unit testing, Integration testing, Function Testing<br>System testing:-Installation Testing, Usability Testing, Regression testing,<br>Performance testing:-Load Testing, Stress Testing.<br>Security testing, Volume testing<br>Acceptance testing:-Alpha testing, Beta testing, Gamma testing. | To study different levels of testing such as function, usability, load testing, | Student gets knowledge of levels of testing.                           |
| <b>3</b>       | <b>Testing methods and Testing tools</b>                           | Black Box methods:- Equivalence partitioning, Boundary-value analysis, Error guessing.  | To introduce testing methods of testing and testing tools.                      | Student gets knowledge of testing methods and different testing tools. |

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|          |   | White Box methods:-Statement coverage, Decision coverage, Condition coverage.<br>Testing Tools:-Win Runner, Load Runner. |  |  |
| <b>4</b> | <b>Test Planning &amp; Documentation</b>    | Testing Strategy:-type of project, type of software. Test Plans, Test Case, Test Data, Risk Analysis.                    | TO study test planning and documentation methods.                | Student gets knowledge of test planning and documentation      |
| <b>5</b> | <b>Defect Management and Test Reporting</b> | Defect Reporting, Tracking Workflow, Test reporting.   | To introduce basic concepts defect management and test reporting | Student gets knowledge of defect management and test reporting |

**Sub: Communication Skills****Class: TE (CSE)**  
**Subject Code: BSH331****Objective:**

To train student and introduce skills of basic data communication, personality development ,group discussion, rammer and interview techniques.

| <b>Unit No</b> | <b>Unit Title</b>                        | <b>Contents</b>  | <b>Objectives</b>  | <b>Outcomes</b>   |
|----------------|--|--|--|---|
| <b>1</b>       | <b>Basic Communication skills</b>        | Communication with peers, communication formulae, communication cauaalu, communication for daily requirement.                          | To know the concept of communion barriers in communication,  | Student get familiar with concept types, and communicate effectively in personal and professionals level. |
| <b>2</b>       | <b>Personality development.</b>          | Formal dressing, caual dreesing, dressing upto to the ocusaion, interview dressing ,body language, eye contact, persona management,    | To know various way to enhance personality in all respect. and to know use of proper body language.  | Student come to know how to groom, enhance their personality and use of proper body language.             |
| <b>3</b>       | <b>Group discussion</b>                  | Effecitve group discussion,what are judgets in GD,different topics of GD,Different modules of GD.                                      | To know methodology of GD ,types and how to contribute effectively,  | Student get familiar with GD.   |
| <b>4</b>       | <b>Effecive public specking</b>          | How to deliver an effective PS,how to invovlve public at large,stage courage,effective crowd alertness and zinc.                       | How to speak at large speed, stress, intonations, pronouncitions, sentence strute,etc.   | Student come to know art of effective public speaking.  |
| <b>5</b>       | <b>Grammer and interview techniques.</b> | English grammer, need, importance,difernt parts and practices interviews techniques. types, Telephioone etiquettes, Mock call handling | To study the grammar and its parts to avoid common errors in English. to know types of interviews how to deliver effectively in interview. | Student will avoid common errors in English, student will face interview confidently.                     |



**Sub: Software Development Laboratory-II (ASP.NET)****Class: TE (CSE)****Objectives:****Subject Code:- CSE375**

- To Study website development using GUI environment.
- To develop programming skills with ASP.NET

| <b>Unit No</b> | <b>Unit Title</b>                   | <b>Contents</b>   | <b>Objectives</b>  | <b>Outcomes</b>                              |
|----------------|-------------------------------------|---|--|--|
| <b>1</b>       | Introduction                        | Internet terminology, Web Server, Browser, Client Vs Server Side Scripting<br>Introduction to Java Script (Client Side Script) – Variables, Document Object Model, Functions, Event Handling.<br>Introduction to .NET framework, ASP.NET namespace hierarchy, Page life cycle, view state, postback, IsPostBack property, HTML and Web Controls | To introduce basic concept of ASP.NET, and java script, HTML, and java script.                           | Student gets knowledge of basics of ASP.NET  |
| <b>2</b>       | Web Controls                        | Text Box, Label, Button, Link Button, Hyperlink Button, Image Button, List Box, Drop DownList, CheckBox, Radio Button, CheckBoxList, RadioButtonList, Panel   | To introduce basic concept of web controls ,such as button, image button, check box, radio box list etc. | Student gets knowledge of of web controls.   |
| <b>3</b>       | Validation Controls & Rich Controls | RequiredFieldValidator, RangeValidator, CompareValidator, RegularExpressionValidator, CustomValidator and ValidationSummary<br>Rich Controls – Calendar   | To introduce validation control in ASP.NET.  | Student gets knowledge of validation control |

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|          |   | Control, AdRotator Control  |  |   |
| <b>4</b> | ADO.NET:<br>Overview of<br>ADO.NET,             | Overview of ADO.NET,<br>Advantages of ADO.NET,<br>Connected and disconnected<br>data access, Connection,<br>Command, DataReader,<br>DataAdapter, DataSet,<br>DataTables DataGrid<br>Control, DataList Control and<br>Repeater Control | To study basic concept of ADO.NET<br>dataset ,data grid control etc. | Student gets knowledge of<br>ADO.NET.     |
| <b>5</b> | Passing Data<br>between Pages &<br>Web Services | Cache, Session, Context,<br>QueryString, Post, Global.asax<br>Introduction to web services  | To introduce web services.   | Student gets knowledge of web<br>services |

**Objective:** To introduce basic concept of Vector calculus, Fourier transform, linear differential equation, and Laplace transform.

| <b>Unit No</b> | <b>Unit Title</b>                      | <b>Contents</b>  | <b>Objectives</b>  | <b>Outcomes</b>  |
|----------------|--|--|--|--|
| 1.             | <b>1.VECTOR CALCULUS :</b>             | Differentiation of vector, radial, transverse, normal, tangential component of velocity and acceleration. Scalar and vector point function, gradient of scalar point function. Divergence and curl and irrotational field.. Gauss`s divergence theorem, theorem. Cylindrical, sphericalpolar & curvilinear coordinates   | To study Vectors & Scalors and its functions               | Student get applied knowledge of vectors & its applications                                  |
| 2              | <b>2. FOURIER TRANSFORM</b>            | fourier integral, fourier sine and cosine integral, complex form of fourier integral. Fourier transform. Fourier sine and cosine transform. And inverse transform.   | To study Fourier Integral ,Fourier Transform & its Inverse | Student get applied knowledge of Fourier Transform   |
| 3              | <b>3. LINEAR DIFFERENTIAL EQUATION</b> | solution of linear differential equation of nth order with constant coefficients. integral. Method of variations of parameters, equations reducible to linear Cauchy`s and legendre`s form. Solution of simultaneous linear differential equation. Application to civil, mechanical, electrical and electronics engg.    | To study Linear Differential Equations                     | Student get applied knowledge of Linear Differential Equations in various Engineering Fields |
| 4              | <b>4: LAPLACE TRANSFORM</b>            | Introduction to laplase transform properties and theorem of laplace transform, laplace transform of special function, , displaced Heaviside unit step function, dirac-delta function (impulse function ) ,inverse laplace transform. Method to find inverse laplace transform by (i) use of laplace transform table (ii) | To study Laplace Transform & related functions             | Student get applied knowledge of Laplace Transform   |

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|  |  | use of theorems (iii) partial fraction<br>(iv) convolution theorem. Solution of linear<br>differential equation with constant coefficients<br>and simultaneous linear differential equation by<br>laplace transform. |  |  |
|--|--|--|--|--|

**Sub: Introduction to Web Programming****Class: SE (CSE)**  
**Subject Code:-CSE225**

| <b>Unit No</b> | <b>Unit Title</b>                                     | <b>Contents</b>   | <b>Objectives</b>   | <b>Outcomes</b>   |
|----------------|---|---|---|---|
| 1.             | <b>Introduction to web design</b>                     | Web page & web site, Web Publishing. Introduction to HTML, Horizontal Rules Colours in web page: Background colour, Text colour, Link colour. Lists: Ordered Lists, Unordered Lists, Definition List, Nesting lists. Linking HTML Documents.  | To study basics of HTML.  | Student become aware of designing of web pages using HTML |
| 2.             | <b>URLs Types of URLs</b>                             | Absolute URLs, Relative URLs. Linking HTML Documents: The Anchor tag, Linking to document in same folder, Linking to document in Different folder, Linking to document on theweb, Linking to specific locationwithindocument.Inserting E- mail links Including Images: Image formats Linking HTML Documents | To study Uniform Resource Locators & Linking of web page,images     | Student should be able to link the web pages              |
| 3.             | <b>Inserting E - mail links tables, Forms, Frames</b> | Tables: Creating Tables, Editing of rows and columns of table, rowspan, colspan, formatting tables using attributes border, Border colour, back ground, align, width, cell spacing, cell height. Forms  | To study construction of table and form tags with their properties. | Student can design the web page using table & form tags   |
| 4              | <b>Frames</b>   | Introduction to frames, Advantages and disadvantages of frames, creating basic frames Frame targeting. Style sheets: Adding style sheet to document: Linking to a Style sheet, Embedding style sheet, Using inline Style sheet Building a small web site  | To study frame tags and its attributes,CSS                          | Student becomes aware about dividing the web page and CSS |

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| 5. | <b>JavaScript</b> | Introduction to JavaScript, difference between Java and JavaScript, JavaScript syntax, variables and their types, JavaScript operators, arrays and array methods, Program flow: Control statements, exercise, Built-in objects in JavaScript, Array, String, Math, Date objects, documents forms and form elements window location, History object.. | To study JavaScript and its methods | Student becomes aware of JavaScript and design of dynamic web pages |
|----|-------------------|--|-------------------------------------|---|

**Sub: Discrete Mathematics****Class: SE (CSE)****Subject Code: CSE253**

**Objective:** To train the students with mathematical foundations of Computer Science, To give a feel of core mathematics required for many subjects of Computer Science

| <b>Unit No</b> | <b>Unit Title</b>  | <b>Contents</b>   | <b>Objectives</b>                               | <b>Outcomes</b>   |
|----------------|--|---|---|---|
| 1.             | <b>Sets and Probabilities</b>                                | Contribution of sets, finite and infinite sets, unaccountably infinite sets. The rules of sum and product, discrete conitional  | To study type of sets and probability           | Student get knowledge of sets, and probabilities        |
| 2.             | <b>Relations and Functions</b>                               | Properties of Binary Relations, Equivalence relation and partitions, Partial ordering Relations and Lattices. Chain and Anti-chains, A Job-Scheduling problem, Functions and Pigeonhole principles.   | To study different types relation & function    | Student gets knowledge of relations and functions.      |
| 3.             | <b>Graphs &amp; Trees</b>                                    | Basic terminology, Multigraphs and Weighted graphs, Paths and Circuits, Shortest paths in weighted graphs, Eulerian paths and circuits, The traveling salesman problem ,factors of a graph Planner graphs, Trees, Rooted Trees, Path lengths in rooted trees, Prefix codes, Binary search trees, spanning trees and cut sets, Minimum spanning trees. Transport networks. | To study manipulation with graph & trees        | Student knowledge of implementation of graphs and trees |
| 4              | <b>Discrete Numerical Functions and Recurrence Relations</b> | Manipulation and Numerical Functions, Asymptotic behavior, Generating functions and Combinatorial Problems, Recurrence relations, Linear recurrence relations with constant coefficients, Homogeneous solutions, Particular Solutions, Total Solutions, Solutions by the method of GF   | To study different types of numerical fun & R R | Student knowledge of implementation of DNF.             |
| 5.             | <b>Groups, Rings and Boolean Algebra</b>                     | Generators and Evaluation of powers, Closets and Lagrange's Theorem, Rings, integra, domains and fields, Lattices and Algebraic systems, Principal of duality, Basic properties of Algebraic systems defined by lattices, Boolean lattices and Boolean algebras, Boolean expressions, and Propositional Calculus, Design and implementation of digital networks, SN       | To study implementation of Boolean algebra      | Student get knowledge of groups and rings.              |

**Sub: Data Structures**

**Class: SE (CSE)**  
**Subject Code: CSE203**

**Objective:** - To train the students on fundamentals that one must learn of data structures  
- To train the students for a strong foundation for programming using data structures

| <b>Unit No</b> | <b>Unit Title</b>  | <b>Contents</b>  | <b>Objectives</b>  | <b>Outcomes</b>  |
|----------------|--|--|--|--|
| <b>1</b>       | <b>Introduction to data structure, The Stacks &amp; Queues</b> | The Arrays as an ADT: Using One-Dimensional Arrays, Using Two-Dimensional Arrays, Using Multidimensional Arrays, Definition and Examples, Primitive Operation, The stack as an ADT, The queue and its sequential representation, The queue as an ADT, Basic Definition and examples: | To study basic introduction to data structures, and Arrays | Student gets the knowledge of data structure and fundamentals of arrays. |



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|   |   | Infix,Postfix, and Prefix, Program to evaluate a Postfix expression, Limitations of the program,CircularQueue, priority queue   |   |   |
| 2 | <b>Linear Data Structure &amp; their representation</b> | Definition, concept, operation on linked lists, Circular linked lists Doubly linked lists, Operations like insertion, deletion, insertion in order, searching, updating ,Applications of linked lists such as polynomial manipulation, Comparison of singly linked, circularly linked & doubly linked list  | To study basic concept linked list and insertion methods. | Student gets the knowledge of linked list.                |
| 3 | <b>Trees</b>  | Definition, Basic terminology, operation on binary trees, linked storage representation for binary search trees, Basic operation on binary search tree such as creating a binary search tree, searching,modifying an element, inserting & deleting the element, destroy a binary search tree, tree traversals,in-order, pre-order, post-order , tree application for expression evaluation & for solving sparse matrices. | To study basic operation of trees.                        | Student gets knowledge of implementation of trees.        |
| 4 | <b>Graphs</b>   | Definitions, basic terminology, matrix representation & implementation of graphs, graph travels,DFS, BFS, Shortest path, spanning tree  | To study basic operation of graphs.                       | Student get knowledge of implementation of graphs         |
| 5 | <b>Sorting &amp; searching</b>                          | Different sorting tech, classification on the basis of big-O notation, tech such as straight selection sort, bubble sort, merge sort, quick sort, heap sort, shell sort, radix sort, comparisons between different sorting techniques Sequential searching, binary searching, height balanced trees2-3 tree, B trees, B+ trees, AVL trees   | To study Sorting and searching techniques.                | Student get knowledge of sorting and searching techniques |

**Sub: Digital Electronics**

**Class: SE (CSE)**

**Subject Code: CSE202**

**Objective:** To learn the fundamentals of digital electronics

To study various building blocks of digital circuits on which the computers are built. To learn the Boolean algebra, the base for digital maths

| <b>Unit No</b> | <b>Unit Title</b>                          | <b>Contents</b>  | <b>Objectives</b>  | <b>Outcomes</b>   |
|----------------|--|--|--|---|
| 1.             | <b>Fundamental concepts, Number system</b> | Digital signals, basic digital circuits, Boolean algebra, IC gates. Number system and codes: Number systems, Binary number system, signed binary numbers, binary arithmetic, 2's complement arithmetic, octal number system, Hexadecimal number system, Gray code, Excess three codes, error detecting and correcting codes. | To study Digital electronics basic concept, and number system. | Student get the knowledge of digital electronics and number system. |
| 2.             | <b>Semiconductor Devices and</b>           | Semiconductor devices: Review of p-n junction and Schottky diodes, Bipolar junction diodes,  | To Study semiconductor devices, and different types of diodes  | Student get knowledge of semiconductor devices and diodes.          |

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|    | <b>families</b>                                      | FETDigital logic families: Characteristics of digital ICs, RTL, TTL, Schottky TTL, ECL, MOS logic,CMOS logic, tri-state logic  |   |  |
| 3. | <b>Combinational logic design</b>                    | Standard representations for logical functions, Karnaugh Map representation of logical functions, Simplification of logical functions using K-map, Minimization of logical functions, don't care conditions, Design examples, Quine-McClusky minimization technique  | To study –map, and logical functions.                   | Student get knowledge of K-map and logical functions.  |
| 4  | <b>Combinational Logic design using MSI circuits</b> | Multiplexers and their use in combinational logic design. Demultiplexers/ decoders and their use in combinational logic design. Adders and their use as subtractors. BCD arithmetic, ALU,Digital comparators, parity generators/checkers, code converters.Flip-flops: A 1-bit memory cell, clocked S-R flip-flop, J-K, D-type, T-type, flip-flops,Excitation table of flip-flops, Clocked flip-flop design, edge triggered flip-flops, applications of flip-flops. | To Study combinational logic design using MSI circuits. | Student get knowledge of MSI circuits, Flip flops,.    |
| 5. | <b>Sequential logic design</b>                       | Registers, applications of shift registers, Ripple or asynchronous counters, synchronous counters, clocked sequential circuit design, asynchronous sequential circuits.Timing circuits: Application of logic gates in timing circuits, OP AMP and its application in timing circuits, Schmitt trigger ICs, Monostable  | To study sequential logic design and timing circuits.   | Students get the knowledge of timing circuits and SLD. |

**Sub: UNIX and Shell Programming**

**Class: SE (CSE)**  
**Subject Code:- CSE205**

| <b>Unit No</b> | <b>Unit Title</b> | <b>Contents</b>   | <b>Objectives</b>                             | <b>Outcomes</b>  |
|----------------|-------------------|---|---|--|
| 1.             | Unit-1            | The Unix Operating System, Unix Architecture, Command Usage In Unix.<br>File System of Unix | To understand basic of Unix Operating System. | Student will be able to know Introduction of Unix operating System.                          |
| 2.             | Unit-2            | Basic file Attributes, The Vi editor, More File Attributes                                  | To study File Attributes and Editors          | Students will be able to Understand Basic commands and file attributes also editors in Unix. |

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|    |        |   | used in Unix  |  |
| 3. | Unix-3 | The Shell, The Process, Customizing Environment in Unix.          | To Understand Concept of Shell and Process working in Unix. | Students will be able to understand Shell and Process in Unix.       |
| 4  | Unit-4 | Simple Filters, Filters using expressions<br>Awk-advanced Filter. | To study Filters and advanced filters.                      | Student becomes aware about concept of filters in Unix,              |
| 5. | Unit-5 | Essential Shell Programming.                                      | To study various Program in essential shell.                | Student will become aware about to Essential Shell Programming.      |
| 6  | Unit-6 | Perl-The Master Manipulator                                       | To understand concept of Perl in Unix.                      | Students will get introduction of new concept in Unix which is Perl. |

**Sub: Engineering Mathematics-IV**

**Class: SE (CSE)**

**Subject Code: BSH252**

**Objective:** To introduce basic concept of Complex variable,statics,probability,numerical method,ND,and Z -transform

| Unit No | Unit Title                    | Contents  | Objectives   | Outcomes   |
|---------|-------------------------------|---|--|--|
| 1.      | Function of complex variable. | Introduction, analytic function,CR Equation, harmonic function,integration,line integral,caunor integral,cauch integral,taler and Laurent's series,residu e integration along unit circle and along the upper of semi circle, on formal ,and bilinear transformation. | To introduce basic concept of complex variable, and it's integral. | Student gets knowledge of Complex variable its integral and application. |

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| 2. | Statics and probability                      | Statics and probability, skewers and kurtosis, binomial and poisson, normal distribution.  | To study different method of statics.                         | Student will get the knowledge of static's method.                              |
| 3. | Numerical methods                            | Newton's raphoson method, gauss elimination, Lagrangis inter potation formala,numerical differential ,Picard's method,taylor series method,eulaer's method, rang kutta method. | To introduce basic concept of numerical method .              | Student gets the knowledge of different numerical method.                       |
| 4  | Application of partial differential equation | Solution of partial differential equation by method of separation of variable, wave equation, one dimensional, two dimensional heat flow equation.                             | To study method of separation of variable, wave equation.     | Student gets applied knowledge of application of partial differential equation. |
| 5. | Z-Transform                                  | Z transform of elementary function ,properties ,solution of difference equation by z transform.  | To introduce basic concept of z transform and its properties. | Student get the applied knowledge of z transform and its properties.            |

**Sub: Computer Graphics**

**Class:SE (CSE)**

**Subject Code: CSE256**

**Objective:** Introduce the students to graphics fundamentals, Make them aware of 2-D and 3-D graphics primitives, Study the GUI design methods, Know the basics of multimedia applications

| Unit | Unit Title | Contents | Objectives | Outcomes |
|------|------------|----------|------------|----------|
|------|------------|----------|------------|----------|

| No |  |   |  |  |
|----|--|---|--|--|
| 1. | <b>Introduction and applications</b>           | <p>What is Computer Graphics?, GUI Applications, Conceptual framework for CG. Display Devices: Random scan and raster scan monitors, color CRT, Plasma panel displays, LCD panels, 3-D viewing devices Graphical Input Devices, Hard copy devices, Introduction to graphics standards (SRGP, PHIGS etc)</p> <p>Line drawing algorithms: DDA and Bresenham's. Graphics primitives, Line functions, character attributes, properties of circle, Circle generating algorithm, filling rectangles, filling polygons</p> | To study basic introduction to computer Graphics, input ,output devices. | Student get the current techniques of computer graphics and its application. |
| 2. | <b>2-D Drawing Geometry and transformation</b> | 2-D transformations, homogeneous coordinates and matrix representation of 2-D transformations, other 2-D transformations: reflection and shear, window to viewport transformation, clipping in raster world, clipping lines, clipping polygons, text clipping and exterior clipping   | To study properties of 2D transformation                                 | Student get actual properties of 2-D transformation.                         |
| 3. | <b>3 D transformations/ User interface</b>     | <p>3-D viewing: An introduction, Projections, 3-D transformations, matrix representation, composition of 3-D transformation, coordinate system GUI and interactive input methods: The user dialogue, features of GUI: Windows and icons, accommodating multiple skill levels, consistency, minimizing memorization, backup and error handling, feedback.</p> <p>Logical classification of input devices, input functions, concurrent use of input modes, interactive picture construction techniques</p>            | To study properties of 3D transformation                                 | Student get actual properties of 3-D transformation.                         |
| 4  | <b>Curves/ Visible surface Detection</b>       | <p>Curves: Parametric cubic curves, parametric bucolic surfaces. Curve drawing and fitting techniques.</p> <p>Bezier curves: Its properties, parametric representation.</p> <p>Techniques for visible surface detection, algorithm for visible line determination, Back face detection and removal, Z- buffer algorithm,</p>  | To Study different types of Curves and their properties.                 | Student get knowledge of different types of curves, and algorithms.          |

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|    |  | Visible surface Ray tracing algorithm.  |                                   |   |
| 5. | <b>Multimedia and its applications</b> | What is multimedia, multimedia building blocks:<br>text audio, images, animation, video.<br>Elements of multimedia system, multimedia hardware, basic tools in multimedia | To Study multimedia application's | Student get details knowledge of multimedia application of text, audio, video and text. |

**Sub: Microprocessors**

**Class: SE (CSE)**

**Subject Code: CSE255**

**Objective:** Have a deeper understanding of how computers work. Learn principle of working of microprocessor with the help of 8085, Learn the internal organization of computer and factors affecting their performance, Learn the design aspects of Processor, Control Unit and Memory



| Unit No | Unit Title                 | Contents   | Objectives   | Outcomes  |
|---------|----------------------------|--|--|---|
| 1.      | <b>Microprocessor</b>      | Basics of computer architecture, Evolution of microprocessor families, microprocessor architecture and its operation. Architecture of 8085 microprocessor: Instruction format, addressing modes, detail study of instruction set of 8085, assembly language programming, coding in 8085, stack, subroutine, code conversion. | To Study basic introduction to 8085 microprocessor ,and instructions.                  | Student get Knowles of 8085 microprocessor.                   |
| 2.      | <b>8085 details</b>        | 8085 architecture: Machine cycle, bus cycle concept, fetch and execute cycle, typical timing diagram for instructions. Interrupts in 8085: Introduction to interrupts, response to interrupts, hardware and software interrupts. Interrupt priority, maskable and non makeable interrupts of 8085                            | To study Architecture of 8085 architecture.  | Student get knowledge of architecture of 8085 microprocessor. |
| 3.      | <b>Processor Design</b>    | Processor organization. Information representation, instruction set, instruction format, instruction types, fixed point arithmetic: Addition, subtraction, multiplication and Division. ALU design.  | To study Processor organization. Information representation, instruction set           | Student get Knowles of Processor design                       |
| 4       | <b>Control Unit Design</b> | Introduction, instruction sequencing, instruction interpretation, hardwired control design, method, multiplier control unit, CPU control unit, Micro programmed control, control memory optimization.  | To Study instruction sequencing, instruction interpretation, hardwired control design, | Student get knowlge of control unit design.                   |
| 5.      | <b>Memory organization</b> | Memory types, memory device characteristics, RAM, Secondary memory, their access techniques, Virtual memory, memory hierarchies, main memory allocation, High speed memories.  | To study Memory types, memory device characteristics, RAM, Secondary memory            | Student get the Knowles of memory organization.               |

**Subject Code: CS24 Sub: Object Oriented Programming (Using C++)**

**Class: SE (CSE)**

**Subject Code:-CSE254**

**Objective:** To train the students on fundamentals of Object Oriented Programming, To train the students for a strong foundation for using these concepts in software development, To implement OOP concepts using the programming language C++

| <b>Unit No</b> | <b>Unit Title</b>                          | <b>Contents</b>  | <b>Objectives</b>                               | <b>Outcomes</b>  |
|----------------|--|--|---|--|
| 1.             | <b>Introduction to OOPS</b>                | Advantages of OOPS language & development platform, Basic programming construction functions, program statements preprogramming directives, include directives, header files ,I/O statement variables, manipulators, Loops & Decisions, Arrays , Structures, Functions   | To study basic concepts of OOPS.                | Student get knowledge of all OOPS concept such as classs, objects. |
| 2.             | <b>Objects and Classes</b>                 | Class as Data type, Object as function arguments, Encapsulation, Data hiding overloaded constructors, object as argument, returning object from function, static class data, Constructors, destructors.  | To Study basic concepts of objects and classes. | Student get knowledge of objects and classes.                      |
| 3.             | <b>Operator Overloading</b>                | Overloading unary and binary operators, Overloading binary operators, multiple overloading, comparison operators, conversion between basic types, conversion between objects of different classes conversion between basic types, conversion between basic types between objects of different classes.   | To study operator overloading.                  | Student gets knowledge of operating overloading.                   |
| 4              | <b>Inheritance and Polymorphism</b>        | Derived class and base class-specifying the derived class, accessing base class member, derived class constructors, overriding member functions public and private inheritance-access combinations classes and structures accessing specifies, levels of inheritance-multiple inheritance. Run time and compile time polymorphism  | To study inheritance and polymorphism.          | Students get knowledge of inheritance and polymorphism.            |
| 5.             | <b>Files and streams, Templates in C++</b> | Streams-stream class hierarchy, stream classes-string I/O Writing strings, detecting end of file, character I/O Object I/O,I/O with multiple objects-the Fstreams class, "open" function-file pointers specifying position, specifying the offset, the calling function, error handling-redirection-redirecting input, "car" and "clog" objects, IOS flags Template classes for Stack, vector, linked list | To study file handling in C++.                  | Student get knowlge of File handling concepts in C++.              |

