**B. Tech Computer Science & Engineering**

**III YEAR I-SEMESTER**

| Sl.No | Course Code | Course Title | Category | L | T | P | C |
|---|---|---|---|---|---|---|---|
| 1 | 19CS3111 | Computer Networks | PC | 3 | 1 | - | 4 |
| 2 | 19CS3112 | Compiler Design | PC | 3 | - | - | 3 |
| 3 | 19CS3113 | Software Engineering | PC | 3 | - | - | 3 |
| 4 | **Open Elective – I** | | | 3 | - | - | 3 |
| | **Professional Elective – I** | | | | | | |
| | 19CS3171 | Digital Image Processing | PE | | | | |
| | 19CS3172 | Principles of Programming Languages | PE | 3 | - | - | 3 |
| 5 | 19CS3173 | Data Analytics | PE | | | | |
| | 19CS3174 | Distributed Databases | PE | | | | |
| 6 | 19MC0005 | Professional Ethics | MC | 2 | - | - | - |
| 7 | 19CS3151 | Compiler Design & computer Networks Lab | PC | - | - | 3 | 1.5 |
| 8 | 19CS3152 | Unified Modeling Language & Python Lab | PC | - | - | 3 | 1.5 |
| 9 | 19HS3151 | Advanced English Communication Skills Lab | HS | - | - | 2 | 1 |
| 10 | 19CS3181 | Summer Internship* | PW | - | - | 2 | 1 |
| | **Total** | | | **24** | **17** | **1** | **10** | **21** |

**\*Note:** Summer Internship to be carried out during summer    break after II yr II semester.

**III YEAR II- SEMESTER**

| Sl.No | Course Code | Course Title | Category | L | T | P | C |
|---|---|---|---|---|---|---|---|
| 1 | 19CS3211 | Web Technologies | PC | 3 | 1 | - | 4 |
| 2 | 19CS3212 | Cryptography & Network Security | PC | 3 | 1 | - | 4 |
| 3 | 19MB3211 | Business Economics and Financial Analysis | HS | 3 | - | - | 3 |
| 4 | **Open Elective – II** | | | 3 | - | - | 3 |
| | **Professional Elective – II** | | | | | | |
| | 19CS3271 | Artificial Intelligence | PE | | | | |
| 5 | 19CS3272 | Computer graphics | PE | 3 | - | - | 3 |
| | 19CS3273 | Information Retrieval Systems | PE | | | | |
| | 19CS3274 | Software Testing Methodologies | PE | | | | |
| 6 | 19CS3251 | Web Technologies Lab | PC | - | - | 3 | 1.5 |
| 7 | 19CS3252 | Cryptography and Network Security Lab | PC | - | - | 3 | 1.5 |
| 8 | 19CS3291 | Technical Paper Presentation | PW | - | - | 2 | 1 |
| | **Total** | | | **25** | **15** | **2** | **8** | **21** |

# 19CS3111: COMPUTER NETWORKS

**B.Tech. III Year I Sem.**                                                          **L  T  P  C**
                                                                                    **3  1  -  4**

## Prerequisites
- A course on "Programming for problem solving"
- A course on "Data Structures"

## Course Objectives
1. The objective of the course is to equip the students with a general overview of the concepts and fundamentals of computer networks.
2. Familiarize the students with the standard models for the layered approach to communication between machines in a network and the protocols of the various layers.

## Course Outcomes
1. Gain the knowledge of the basic computer network technology.
2. Gain the knowledge of the functions of each layer in the OSI and TCP/IP reference model.
3. Obtain the skills of sub netting and routing mechanisms.
4. Familiarity with the essential protocols of computer networks, and how they can be applied in network design and implementation.
5. Gain Knowledge of E-Mail Protocols, Streaming Audio and Video on Web.

## UNIT – I
Network hardware, Network software, OSI, TCP/IP Reference models, Example Networks: ARPANET, Internet.
**Physical Layer**: Guided Transmission media: twisted pairs, coaxial cable, fiber optics, Wireless transmission.

## UNIT – II
**Data link layer**: Design issues, framing, Error detection and correction.
**Elementary data link protocols**: simplex protocol, A simplex stop and wait protocol for an error-free channel, A simplex stop and wait protocol for noisy channel.
**Sliding Window protocols**: A one-bit sliding window protocol, A protocol using Go-Back-N, A protocol using Selective Repeat, Example data link protocols.
**Medium Access sub layer**: The channel allocation problem, Multiple access protocols: ALOHA, Carrier sense multiple access protocols, collision free protocols. Wireless LANs, Data link layer switching.

## UNIT – III
**Network Layer**: Design issues, Routing algorithms: shortest path routing, Flooding, Hierarchical routing, Broadcast, Multicast, distance vector routing, Congestion Control Algorithms, Quality of Service, Internetworking, The Network layer in the internet.

## UNIT – IV
**Transport Layer**: Transport Services, Elements of Transport protocols, Congestion Control, Connection management, TCP and UDP protocols.

**UNIT – V**
**Application Layer** –Domain name system, SNMP, Electronic Mail; the World WEB, HTTP, Streaming audio and video.

**TEXT BOOK:**
1. Computer Networks - Andrew S Tanenbaum, David. j. Wetherall, 5th Edition. Pearson Education/PHI.

**REFERENCES:**
1. An Engineering Approach to Computer Networks-S. Keshav, 2 nd Edition, Pearson Education.
2. 2. Data Communications and Networking – Behrouz A. Forouzan. Third Edition TMH.

# 19CS3112: COMPILER DESIGN

**B.Tech. III Year I Sem.**                                                    **L T P C**

                                                                              **3 - - 3**

**Prerequisites**
1. A course on "Formal Languages and Automata Theory"
2. A course on "Computer Organization and architecture"
3. A course on "Computer Programming and Data Structures"

**Course Objectives**
1. To understand the various phases in the design of a compiler.
2. To understand the design of top-down and bottom-up parsers.
3. To understand syntax directed translation schemes.
4. To introduce lex and yacc tools.
5. To learn to develop algorithms to generate code for a target machine.

**Course Outcomes**
1. Demonstrate the ability to design a compiler given a set of language features.
2. Demonstrate the knowledge of patterns, tokens & regular expressions for lexical analysis.
3. Acquire skills in using lex tool & yacc tool for developing a scanner and parser.
4. Design and implement LL and LR parsers
5. Design algorithms to do code optimization in order to improve the performance of a program in terms of space and time complexity.
6. Design algorithms to generate machine code.

## UNIT –I
**Introduction**: The structure of a compiler, the science of building a compiler, programming language basics.
**Lexical Analysis**: The Role of the Lexical Analyzer, Input Buffering, Recognition of Tokens,  The Lexical-Analyzer Generator Lex, Finite Automata, From Regular Expressions to Automata, Design of a Lexical-Analyzer Generator, Optimization of DFA-Based Pattern Matchers.

## UNIT –II
**Syntax Analysis**: Introduction, Context-Free Grammars, Writing a Grammar, Top-Down Parsing, Bottom-Up  Parsing.
**Introduction to LR Parsing**: Simple LR, More Powerful LR Parsers, Using Ambiguous Grammars and Parser Generators.

## UNIT –III
**Syntax-Directed Translation**: Syntax-Directed Definitions, Evaluation Orders for SDD's, Applications of Syntax-Directed Translation, Syntax-Directed Translation Schemes, and Implementing L-Attributed SDD's.

**Intermediate-Code Generation**: Variants of Syntax Trees, Three-Address Code, Types and Declarations, Type Checking, Control Flow, Switch-Statements, Intermediate Code for Procedures.

## UNIT –IV
**Run-Time Environments**: Stack Allocation of Space, Access to Nonlocal Data on the Stack, Heap Management, Introduction to Garbage Collection, Introduction to Trace-Based Collection.

**Code Generation**: Issues in the Design of a Code Generator, The Target Language, Addressesin the Target Code, Basic Blocks and Flow Graphs, Optimization of Basic Blocks, A Simple Code Generator, Peephole Optimization, Register Allocation and Assignment, Dynamic Programming Code-Generation.

## UNIT –V
**Machine-Independent Optimization**: The Principal Sources of Optimization, Introduction to Data-Flow Analysis, Foundations of Data-Flow Analysis, Constant Propagation, Partial-Redundancy Elimination, Loops in Flow Graphs.

## TEXT BOOK:
1. Compilers: Principles, Techniques and Tools, Second Edition, Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffry D. Ullman.

## REFERENCES:
1. Lex & Yacc –John R. Levine, Tony Mason, Doug Brown, O'reilly
2. Compiler Construction, Louden, Thomson.

## 19CS3113: SOFTWARE ENGINEERING

**B.Tech. III Year I Sem.**                                                                    **L T P C**
                                                                                              **3 - - 3**

**Prerequisites:**
1. Computer Programming
2. Database Management Systems

**Course Objectives**
1. To understand fundamental principles of Software engineering, and their application in the development of software products.
2. To understand and create the software requirements specifications document.
3. To understand and use unified modeling language for specifying, analysis and designing.
4. To understand testing strategies for testing software applications
5. To understand Software metrics and Risk Management strategies to identify potential problems before they occur.

**Course Outcomes**
1. Able to apply the software engineering lifecycle phases communication, planning, analysis, design, construction, and deployment.
2. Ability to translate end-user requirements into system and software requirements into Software Requirements specification Document (SRS)
3. Able to apply UML in object-oriented software modeling to develop computer software.
4. Able to identify problems in software and will be able to develop a simple testing report.
5. To understand Software Metrics, potential risk and how to manage them though RMMM plan.

**UNIT - I**
**Introduction:** The evolving role of software, Changing Nature of Software, legacy software, Software myths.
**A Generic view of process:** Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models, COCOMO Model.
**Process Models**: The waterfall model, Incremental process models, Evolutionary process models, specialized process models, The Unified process.

**UNIT - II**
**Software Requirements:** Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.
**Requirements engineering process:** Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management, Software requirements documents
**System models:** Context Models, Behavioral models, Data models, Object models, structured methods.

## UNIT - III

**Modeling Techniques using UML:** The Unified Approach to Modeling, Structural and Behavioral Diagrams.
**Design Engineering:** Data Flow Diagrams, Design process and Design quality, Design concepts, the design model, pattern-based software design.
**Creating an architectural design:** Architectural styles and patterns, Architectural Design, assessing alternative architectural designs.

## UNIT - IV

**Implementation:** Structured coding Techniques, Coding Styles-Standards and Guidelines.
**Testing Strategies:** A strategic approach to software testing, test strategies for conventional software, Regression Testing, Unit Testing, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging.
**Quality Management:** Quality concepts, software quality assurance, software reviews, statistical software quality assurance, software reliability, the ISO 9000 quality standards.

## UNIT - V

**Product metrics:** Software quality, metrics for analysis model, metrics for design model, metrics for source code, metrics for testing, metrics for maintenance.
**Risk management:** Reactive Vs proactive risk strategies, software risks, risk identification, risk projection, risk refinement, RMMM, RMMM plan.

## TEXT BOOKS:

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition, Mc Graw Hill International Edition.
2. Software Engineering- Sommerville, 7th edition, Pearson Education.
3. The unified modeling language user guide Grady Booch, James Rambaugh, Ivar Jacobson, Pearson Education.

## REFERENCES:

1. "Software Engineering", Ian Sommerville, Addison-Wesley, 9th Edition, 2010, ISBN- 13: 978- 0137035151.
2. Richard Fairley, "Software Engineering Concepts", Tata McGraw Hill.
3. Fundamentals of object-oriented design using UML Meiler page-Jones: Pearson Education.
4. Software testing techniques by Boris Beizer, dreamtech.
5. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, John Wiley.
6. Software Engineering principles and practice- Waman S Jawadekar, The Mc Graw-Hill Companies.

# 19CS3171: DIGITAL IMAGE PROCESSING
## (Professional Elective - I)

**B.Tech. III Year I Sem.**                                                                    **L T  P  C**
                                                                                               **3 -  -  3**

**Prerequisites**
1. Students are expected to have knowledge in linear signals and systems, Fourier Transform, basic linear algebra, basic probability theory and basic programming techniques; knowledge of Digital Signal Processing is desirable.
2. A course on "Computational Mathematics"
3. A course on "Computer Oriented Statistical Methods"

**Course Objectives**
1. Provide a theoretical and mathematical foundation of fundamental Digital Image Processing concepts.
2. The topics include image acquisition; sampling and quantization; preprocessing; enhancement; restoration; segmentation; and compression.

**Course Outcomes**
1. Demonstrate the knowledge of the basic concepts of two-dimensional signal acquisition, sampling, and quantization.
2. Demonstrate the knowledge of filtering techniques.
3. Demonstrate the knowledge of 2D transformation techniques.
4. Demonstrate the knowledge of image enhancement, segmentation, restoration and compression techniques.
5. Demonstrate the knowledge of Image Compression Models.

**UNIT – I**
**Digital Image Fundamentals**: Digital Image through Scanner, Digital Camera. Concept of Gray Levels. Gray Level to Binary Image Conversion. Sampling and Quantization. Relationship between Pixels, Color Models, Imaging Geometry. 2D Transformations-DFT, DCT, KLT and SVD.

**UNIT – II**
Image Enhancement in Spatial Domain Point Processing, Histogram Processing, Spatial Filtering, Low pass filtering, High pass filtering, Enhancement in Frequency Domain, Image Smoothing, Image Sharpening.

**UNIT – III**
Image Restoration Degradation Model, Algebraic Approach to Restoration, Inverse Filtering, Least Mean Square Filters, Constrained Least Squares Restoration, Interactive Restoration.

**UNIT - IV**
Image Segmentation Detection of Discontinuities, Edge Linking and Boundary Detection, Thresholding, Region Oriented Segmentation, Morphological processing- erosion and dilation.

**UNIT - V**

Image Compression Redundancies and their Removal Methods, Fidelity Criteria, Image Compression Models, Source Encoder and Decoder, Error Free Compression, Lossy Compression.

**TEXT BOOKS:**

1. Digital Image Processing: R.C. Gonzalez & R. E. Woods, Addison Wesley/ Pearson Education, 2nd Ed, 2004.
2. Fundamentals of Digital Image Processing: A. K. Jain , PHI.

**REFERENCES:**

1. Digital Image Processing using MAT LAB: Rafael C. Gonzalez, Richard E. Woods, Steven L. Eddins: Pearson Education India, 2004.
2. Digital Image Processing: William K. Pratt, John Wilely, 3rd Edition, 2004.

# 19CS3172: PRINCIPLES OF PROGRAMMING LANGUAGES
## (Professional Elective - I)

**B.Tech. III Year I Sem.**                                                     **L T P C**
                                                                               **3 - - 3**

**Prerequisites**
1. A course on "Mathematical Foundations of Computer Science"
2. A course on "Computer Programming and Data Structures"

**Course Objectives**
1. Introduce important paradigms of programming languages.
2. To provide conceptual understanding of high-level language design and implementation
3. Topics include programming paradigms; syntax and semantics; data types, expressions and Statements; subprograms and blocks; abstract data types; concurrency; functional and logic Programming languages; and scripting languages.

**Course Outcomes**
1. Acquire the skills for expressing syntax and semantics in formal notation.
2. Identify and apply a sub programming paradigms for a given computing application.
3. Able to understand high-level language design and implementation.
4. Gain knowledge on Interprocess communication.
5. Gain knowledge of and able to compare the features of various programming languages.

## UNIT – I
**Preliminary Concepts:** Reasons for Studying Concepts of Programming Languages, Programming Domains, Language Evaluation Criteria, Influences on Language Design, Language Categories, Language Design Trade-Offs, Implementation Methods, Programming Environments.

**Syntax and Semantics:** General Problem of Describing Syntax and Semantics, Formal Methods of Describing Syntax, Attribute Grammars, Describing the Meanings of Programs.

## UNIT - II
**Names, Bindings, and Scopes:** Introduction, Names, Variables, Concept of Binding, Scope, Scope and Lifetime, Referencing Environments, Named Constants.

**Data Types:** Introduction, Primitive Data Types, Character String Types, User Defined Ordinal Types, Array, Associative Arrays, Record, Union, Tuple Types, List Types, Pointer and Reference Types, Type Checking, Strong Typing, Type Equivalence.

**Expressions and Statements:** Arithmetic Expressions, Overloaded Operators, Type Conversions, Relational and Boolean Expressions, Short Circuit Evaluation, Assignment Statements, Mixed-Mode Assignment .

**Control Structures** – Introduction, Selection Statements, and Iterative Statements, Unconditional Branching, Guarded Commands.

## UNIT - III

**Subprograms and Blocks:** Fundamentals of Sub-Programs, Design Issues for Subprograms, Local Referencing Environments, Parameter Passing Methods, Parameters that Are Subprograms, Calling Subprograms Indirectly, Overloaded Subprograms, Generic Subprograms, Design Issues for Functions, User Defined Overloaded Operators, Closures, Coroutines.

**Implementing Subprograms:** General Semantics of Calls and Returns, Implementing Simple Subprograms, Implementing Subprograms with Stack-Dynamic Local Variables, Nested Subprograms, Blocks, Implementing Dynamic Scoping.

**Abstract Data Types:** The Concept of Abstraction, Introductions to Data Abstraction, Design Issues, Language Examples, Parameterized ADT, Encapsulation Constructs, Naming Encapsulations.

## UNIT – IV

**Object Oriented Programming:** Design issues for OOP, OOP in Smalltalk, C++, Java, Ada 95, Ruby, Implementation of Object-Oriented constructs.

**Concurrency:** Introduction, Introduction to Subprogram Level Concurrency, Semaphores, Monitors, Ada support for concurrency, Message Passing, Java Threads, Concurrency in Function Languages, Statement Level Concurrency.

**Exception Handling and Event Handling**: Introduction, Exception Handling in Ada, C++, Java, Introduction to Event Handling, Event Handling with Java and C#.

## UNIT-V

**Functional Programming Languages:** Introduction, Mathematical Functions, Fundamentals of Functional Programming Language, LISP, Support for Functional Programming in Primarily Imperative Languages, Comparison of Functional and Imperative Languages.

**Logic Programming Language:** Introduction, an Overview of Logic Programming, Basic Elements of Prolog, Applications of Logic Programming.

**Scripting Language:** Pragmatics, Key Concepts, Case Study: Python – Values and Types, Variables, Storage and Control, Bindings and Scope, Procedural Abstraction, Data Abstraction, Separate Compilation, Module Library.

## TEXT BOOKS:
1. Concepts of Programming Languages Robert. W. Sebesta 10/E, Pearson Education.
2. Programming Language Design Concepts, D. A. Watt, Wiley Dream Tech, 2007.

## REFERENCES:
1. Programming Languages, 2nd Edition, A.B. Tucker, R. E. Noonan, TMH.
2. Programming Languages, K. C. Louden, 2nd Edition, Thomson, 2003.

# 19CS3173: DATA ANALYTICS
## (Professional Elective - I)

**B.Tech. III Year I Sem.**                                         **L T P C**
                                                                    **3 - - 3**

### Prerequisites
- Data Base Management Systems, Computer Oriented Statistical Methods

### Course Objectives
1. To explore the fundamental concepts of data analytics.
2. To learn the principles and methods of statistical analysis
3. To develop problem solving abilities using Mathematics
4. To apply algorithmic strategies while solving problems

### Course Outcomes
1. Identify the various sources of Big Data.
2. Apply several key big data technologies used for storage, analysis and manipulation of data.
3. Design methodologies to extract data from structured and un-structured data for analytics
4. Apply Regression algorithms to perform data analytics.
5. Apply advanced regression and Time series modeling to Discover interesting patterns

### UNIT - 1
**Data Management**: Design Data Architecture and manage the data for analysis, understand various sources of Data like Sensors/Signals/GPS etc. Data Management, Data pre-processing , Missing Values - Outlier Detection and Treatment.

### UNIT- 2
Introduction to Tools and Environment, Application of Modelling in Business, Databases & Types of data and variables, Data Modelling Techniques, Missing imputations etc. Need for Business Modeling.

### UNIT - 3
**Regression** – Concepts, Blue property assumptions, Least Square Estimation, Variable Rationalization, and Model Building etc. Logistic Regression: Model Theory, Model fit Statistics, Model Construction, Analytics applications to various Business Domains etc.

### UNIT - 4
Regression Vs Segmentation – Supervised and Unsupervised Learning, Tree Building – Regression, Classification, Over fitting, Pruning and Complexity, Multiple Decision Trees etc. Time Series Methods: Arima, Measures of Forecast Accuracy, STL approach, Extract features from generated model as Height, Average Energy etc and Analyze for prediction.

## UNIT - 5

**Working with Documents**:

Standard Operating Procedures for documentation and knowledge sharing. Defining purpose and scope documents, Understanding structure of documents — case studies, articles, white papers, technical reports etc., Intellectual Property and Copyright, Document preparation tools.

**TEXT BOOKS:**

1. Data Mining Concepts and Techniques, Han, Kamber, 3rd Edition, Morgan Kaufmann Publishers.
2. Associate Analytics Handbook.

**REFERENCES:**

1. Mining of Massive Datasets, Jure Leskovec Stanford Univ. Anand Rajaraman Milliway Labs Jeffrey D Ullman Stanford Univ.
2. Michael Minelli, Michele Chambers, AmbigaDhiraj ,"Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends", John Wiley & Sons, 2013.
3. Bart Baesens, "Analytics in a Big Data World: The Essential Guide to Data Science and its Applications", John Wiley & Sons, 2014

## 19CS3174: DISTRIBUTED DATABASES
## (Professional Elective - I)

**B.Tech. III Year I Sem.**                                                     **L T P C**

                                                                                **3 - - 3**

**Prerequisites**
- A course on "Database Management Systems"

**Course Objectives**
1. The purpose of the course is to enrich the previous knowledge of database systems and
2. Exposing the need for distributed database technology to confront with the deficiencies of the centralized database systems. Introduce basic principles and implementation techniques of distributed database systems.
3. Equip students with principles and knowledge of parallel and object-oriented databases.
4. Topics include distributed DBMS architecture and design; query processing and optimization;
5. Distributed transaction management and reliability; parallel and object database management systems.

**Course Outcomes**
1. Understand theoretical and practical aspects of distributed database systems.
2. Study and identify various issues related to the development of distributed database system.
3. Understand the design aspects of object-oriented database system and related development.
4. Able to Practice Parallel distributed databases.
5. Identify the differences between OODBMS and ORDBMS.

**UNIT - I**
**Introduction**: Distributed Data Processing, Distributed Database System, Promises of DDBSs, Problem areas. Distributed DBMS Architecture: Architectural Models for Distributed DBMS, DDMBS Architecture.
**Distributed Database Design**: Alternative Design Strategies, Distribution Design issues, Fragmentation, Allocation.

**UNIT - II**
**Query processing and decomposition**: Query processing objectives, characterization of query processors, layers of query processing, query decomposition, localization of distributed data.
**Distributed query Optimization**: Query optimization, centralized query optimization, distributed query optimization algorithms.

**UNIT - III**
**Transaction Management**: Definition, properties of transaction, types of transactions.
**Distributed Concurrency Control**: serializability, concurrency control mechanisms & algorithms, time - stamped & optimistic concurrency control Algorithms, deadlock Management.

**UNIT - IV**

**Distributed DBMS Reliability**: Reliability concepts and measures, fault-tolerance in distributed systems, failures in Distributed DBMS, local & distributed reliability protocols, site failures and network partitioning.

**Parallel Database Systems**: Parallel database system architectures, parallel data placement, parallel query processing, load balancing, database clusters.

**UNIT - V**

**Distributed object Database Management Systems**: Fundamental object concepts and models, object distributed design, architectural issues, object management, distributed object storage, object query Processing.

**Object Oriented Data Model**: Inheritance, object identity, persistent programming languages, persistence of objects, comparison OODBMS and ORDBMS.

**TEXT BOOKS:**
1. M. Tamer OZSU and Patuck Valduriez: Principles of Distributed Database Systems, Pearson Edn. Asia, 2001.
2. Stefano Ceri and Giuseppe Pelagatti: Distributed Databases, McGraw Hill.

**REFERENCES:**
1. Hector Garcia-Molina, Jeffrey D. Ullman, Jennifer Widom: "Database Systems: The Complete Book", Second Edition, Pearson International Edition
2. Chanda Ray (2012), Distributed Database Systems, 1st Edition, Pearson Education India.

# 19MC0005: PROFESSIONAL ETHICS

**B.Tech. III Year I Sem.**                                                  **L T P C**
                                                                             **2 0 0 0**

## Course Objectives
1. To enable the students to imbibe and internalize the Values and Ethical Behaviour in the personal and Professional lives.

## Course Outcomes
1. The students will understand the importance of Values and Ethics in their personal lives and professional careers.
2. The students will learn the rights and responsibilities as an employee, team member and a global citizen.

## UNIT - I
**Introduction to Professional Ethics:** Basic Concepts, Governing Ethics, Personal & Professional Ethics, Ethical Dilemmas, Life Skills, Emotional Intelligence, Thoughts of Ethics, Value Education, Dimensions of Ethics, Profession and professionalism, Professional Associations, Professional Risks, Professional Accountabilities, Professional Success, Ethics and Profession.

## UNIT - II
**Basic Theories:** Basic Ethical Principles, Moral Developments, Deontology, Utilitarianism, Virtue Theory, Rights Theory, Casuist Theory, Moral Absolution, Moral Rationalism, Moral Pluralism, Ethical Egoism, Feminist Consequentialism, Moral Issues, Moral Dilemmas, Moral Autonomy.

## UNIT - III
**Professional Practices in Engineering:** Professions and Norms of Professional Conduct, Norms of Professional Conduct vs. Profession; Responsibilities, Obligations and Moral Values in Professional Ethics, Professional codes of ethics, the limits of predictability and responsibilities of the engineering profession. Central Responsibilities of Engineers - The Centrality of Responsibilities of Professional Ethics; lessons from 1979 American Airlines DC-10 Crash and Kansas City Hyatt Regency Walk away Collapse.

## UNIT - IV
Work Place Rights & Responsibilities, Ethics in changing domains of Research, Engineers and Managers; Organizational Complaint Procedure, difference of Professional Judgment within the Nuclear Regulatory Commission (NRC), the Hanford Nuclear Reservation. Ethics in changing domains of research - The US government wide definition of research misconduct, research misconduct distinguished from mistakes and errors, recent history of attention to research misconduct, the emerging emphasis on understanding and fostering responsible conduct, responsible authorship, reviewing & editing.
.

**UNIT - V**
Global issues in Professional Ethics: Introduction – Current Scenario, Technology Globalization of MNCs, International Trade, World Summits, Issues, Business Ethics and Corporate Governance, Sustainable Development Ecosystem, Energy Concerns, Ozone Deflection, Pollution, Ethics in Manufacturing and Marketing, Media Ethics; War Ethics; Bio
Ethics, Intellectual Property Rights.

**TEXT BOOKS:**
1. Professional Ethics: R. Subramanian, Oxford University Press, 2015.
2. Ethics in Engineering Practice & Research, Caroline Whitbeck, 2e, Cambridge University Press 2015.

**REFERENCES:**
1. Engineering Ethics, Concepts Cases: Charles E Harris Jr., Michael S Pritchard, Michael J Rabins, 4e , Cengage learning, 2015.
2. Business Ethics concepts & Cases: Manuel G Velasquez, 6e, PHI, 2008.

# 19CS3151: COMPILER DESIGN & COMPUTER NETWORKS LAB

**B.Tech. III Year I Sem.**                                                    **L  T  P  C**
                                                                                **-  -  3  1.5**

## Course Objectives
1. To understand the various phases in the design of a compiler & to understand the design of top-down and bottom-up parsers.
2. To understand syntax directed translation schemes
3. To  introduce lex and yacc tools.
4. To understand the working principle of various communication protocols.
5. To analyze the traffic flow and the contents of protocol frames

## Course Outcomes
1. Ability to design, develop, and implement a compiler for any language , use lex and yacc tools for developing a scanner and a parser.
2. Able to design and implement LL and LR parsers.
3. Implement data link layer farming methods , analyze error detection and error correction codes
4. Implement and analyze routing and congestion issues in network design
5. Implement Encoding and Decoding techniques used in presentation layer

## COMPILER DESIGN LAB

**List of experiments:**
1. Design a lexical analyzer for given language and the lexical analyzer should ignore redundant spaces, tabs and new lines. It should also ignore comments. Although the syntax specification states that identifiers can be arbitrarily long, you may restrict the length to some reasonable value. Simulate the same in C language.
2. a.Write a C program to identify whether a given line is a comment or not
   b.Write a C program to test whether a given identifier is valid or not.
3. Write a C program to simulate lexical analyzer for validating operators
4. To Study about Lexical Analyzer Generator(LEX) and Flex(Fast Lexical Analyzer)
5. Implement following programs using Lex.
   A.Create a Lexer to take input from text file and count no of characters, no. of lines & no. of words.
   B.Write a Lex program to count number of vowels and consonants in a given input string.
6. Implement following programs using Lex.
   A.Write a Lex program to print out all numbers from the given file.
   B.Write a Lex program to printout all HTML tags in file.c.
7. Write a Lex program which adds line numbers to the given file and display the same onto the standard output.
8. Write a C program for constructing of LL (1) parsing.
9. Write a C program for constructing recursive descent parsing
10. Write a C program to implement LALR parsing.

**COMPUTER NETWORKS LAB**

**List of Experiments**:
1. Implement the data link layer framing methods such as character, character-stuffing and bit stuffing.
2. Write a program to compute CRC code for the polynomials CRC-12, CRC-16 and CRC CCIP
3. Develop a simple data link layer that performs the flow control using the sliding window protocol, and loss recovery using the Go-Back-N mechanism.
4. Implement Dijsktra's algorithm to compute the shortest path through a network
5. Take an example subnet of hosts and obtain a broadcast tree for the subnet.
6. Implement distance vector routing algorithm for obtaining routing tables at each node.
7. Write a program for congestion control using Leaky bucket algorithm.
8. Write a program for frame sorting technique used in buffers.
9. Programs for IP address conversion function
10. Write a client-server application for chat using UDP
    i. Wire shark
    ii. Packet Capture Using Wire shark
    iii. Starting Wire shark
    iv. Viewing Captured Traffic
    v. Analysis and Statistics & Filters

## 19CS3152: UNIFIED MODELLING LANGUAGE & PYTHON LAB

**B.Tech. III Year I Sem.**                                                    **L  T  P  C**
                                                                               **-  -  3  1.5**

### Course Objectives
1. To have hands on experience in developing a software project by using various software engineering principles and methods in each of the phases of software development.
2. Learn Syntax and Semantics and create Functions in Python, Handle Strings and Files in Python.

### Course Outcomes
1. Ability to translate end-user requirements into system and software requirements specification document.
2. Ability to create dataflow diagrams.
3. Ability to create software application design using UML Diagrams
4. The students should be able to examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
5. Demonstrate proficiency in handling Strings and File Systems.


### UNIFIED MODELLING LAB
**Tools:**
1. Use smart draw for data flow diagrams
2. Rational Rose or Star UML for UML diagrams


### LIST OF EXPERIMENTS:
Do the following exercises for projects given in the list of sample projects
1. Development of problem statement.
2. Preparation of Software Requirement Specification Document, Design Documents and Testing Phase related documents.
3. Draw level 0, level 1, and level 2 dataflow diagrams
4. Study and usage of any Design phase CASE tool
5. Performing the Design by using any Design phase CASE tools.
6. Performing functional testing and create simple testing report

### Sample Projects:
1. Hospital management system
2. Online mobile recharge portal
3. Online Exam Registration
4. Stock Maintenance System
5. E-ticketing  for Travel system
6. Credit Card Processing
7. E-book management System.
8. Online Recruitment system

# PYTHON PROGRAMMING LAB

| S.No | Title / Description |
|------|---------------------|
| 1 | Write a program to demonstrate different number data types in Python. |
| 2 | Write a program to perform different Arithmetic Operations on numbers in Python. |
| 3 | Write a program to create, concatenate and print a string and accessing sub-string from a given string |
| 4 | Write a python script to print the current date in the following format "Sun May 29 02:26:23 IST 2017". |
| 5 | Write a program to create, append, and remove lists in python. |
| 6 | Write a program to demonstrate working with tuples in python. |
| 7. | Write a program to demonstrate working with dictionaries in python. |
| 8. | Write a python program to find largest of three numbers. |
| 9. | Write a Python program to convert temperatures to and from Celsius, Fahrenheit. [ Formula: c/5 = f-32/9] |
| 10. | Write a Python program to construct the following pattern, using a nested for loop<br><pre>    *<br>    * *<br>    * * *<br>    * * * *<br>    * * * * *<br>    * * * *<br>    * * *<br>    * *<br>    *</pre> |
| 11. | Write a Python script that prints prime numbers less than 20. |
| 12. | Write a python program to find factorial of a number using Recursion. |
| 13. | Write a program that accepts the lengths of three sides of a triangle as inputs. The program output should indicate whether or not the triangle is a right triangle (Recall from the Pythagorean Theorem that in a right triangle, the square of one side equals the sum of the squares of the other two sides). |
| 14. | Write a python program to define a module to find Fibonacci Numbers and import the module to another program. |
| 15. | Write a python program to define a module and import a specific function in that module to another program. |
| 16. | Write a script named **copyfile.py**. This script should prompt the user for the names of two text files. The contents of the first file should be input and written to the second file. |

# 19HS3151:  ADVANCED ENGLISH COMMUNICATION SKILLS LAB

**B.Tech. III Year I Sem.**                                          **L  T  P  C**

                                                                    **-  -  2  1**

## Introduction

A course on Advanced English Communication Skills (AECS) Lab is considered essential at the third year level of B.Tech and Pharmacy courses. At this stage, the students need to prepare themselves for their career which requires them to listen to, read, speak and write in English both for their professional and interpersonal communication. The main purpose of this course is to prepare the students of Engineering for their placements.

## Course Objectives

This Lab focuses on using multi-media instruction for language development to meet the following targets:

1. To improve students' fluency in spoken English
2. To enable them to listen to English spoken at normal conversational speed
3. To help students develop their vocabulary
4. To read and comprehend texts in different contexts
5. To communicate their ideas relevantly and coherently in writing
6. To make students industry-ready
7. To help students acquire behavioural skills for their personal and professional life
8. To respond appropriately in different socio-cultural and professional contexts

## Course Outcomes

 **Students will be able to:**

1. Acquire vocabulary and use it contextually
2. Listen and speak effectively
3. Develop proficiency in academic reading and writing
4. Increase possibilities of job prospects
5. Communicate confidently in formal and informal contexts

## Unit-I

Inter-personal Communication and Building Vocabulary –Starting a Conversation–Responding Appropriately and Relevantly –Using Appropriate Body Language –Role Play in Different Situations –Synonyms and Antonyms, One-word Substitutes, Prefixes and Suffixes, Idioms and Phrases and Collocations.

## Unit-II

Reading Comprehension –General Vs Local Comprehension, Reading for Facts, Guessing Meanings from Context, , Skimming, Scanning, Inferring Meaning.

## Unit-III

Writing Skills –Structure and Presentation of Different Types of Writing –Letter Writing/Resume Writing/ e-correspondence/ Technical Report Writing.

**Unit-IV**
Presentation Skills –Oral Presentations (individual or group) through JAM Sessions/Seminars/PPTs and Written Presentations through Posters/Projects/Reports/ emails/Assignments…etc.

**Unit-V**
 Group Discussion and Interview Skills –Dynamics of Group Discussion, Intervention, Summarizing, Modulation of Voice, Body Language, Relevance, Fluency and Organization of Ideas and Rubrics of Evaluation-Concept and Process, Pre-interview Planning, Opening Strategies, Answering Strategies, Interview through Tele-conference & Video-conference and Mock Interviews.

**REFERENCES:**
1. Kumar, Sanjay and Pushp Lata. English for Effective Communication, Oxford University Press, 2015.
2. Konar, Nira. English Language Laboratories –A Comprehensive Manual, PHI Learning Pvt. Ltd., 2011

# 19CS3211: WEB TECHNOLOGIES

**B.Tech. III Year II Sem.**                                    **L  T  P  C**
                                                                **3  1  -  4**

## Course Objectives
1. To introduce Client-side scripting with Java script and AJAX.
2. To introduce PHP language for server-side scripting
3. To introduce XML and processing of XML Data with Java
4. To introduce Server-side programming with Java Servlets
5. To introduce Server-side Programming with JSP

## Course Outcomes
1. Understand basics of HTML and CSS and Design and Development of Dynamic Web Pages (using Validations) with Java Script and AJAX programming
2. Understand Server-side Scripting with PHP language.
3. Analyse what is XML and how to parse and use XML data with JAVA
4. Develop Server side Application with Servlets (Sessions and Cookies).
5. Create JSP pages with Database Server**.**

## UNIT- I
**HTML Common tags**- List, Tables, images, forms, Frames; Cascading Style sheets;
**Client-side Scripting:** Introduction to JavaScript, JavaScript language – declaring variables, scope of variables, functions, event handlers (onclick, on submit etc.), Document Object Model, Form validation.

## UNIT- II
**Introduction to PHP:** Declaring variables, data types, arrays, strings, operators, expressions, control structures, functions, Reading data from web form controls like text boxes, radio buttons, lists etc., Handling File Uploads. Connecting to database (MySQL as reference), executing simple queries, handling results, Handling sessions and cookies
**File Handling in PHP:** File operations like opening, closing, reading, writing, appending, deleting etc. on text and binary files, listing directories.

## UNIT- III
**XML:** Introduction to XML, Defining XML tags, their attributes and values, Document Type Definition, XML Schemes, Document Object Model, XHTML Parsing XML Data – DOM and SAX Parsers in java.

## UNIT - IV
**Introduction to Servlets:** Common Gateway Interface (CGt), Life cycle of a Servlet, deploying a servlet, The Servlet API, Reading Servlet parameters, Reading Initialization parameters, Handling Http Request & Responses, Using Cookies and Sessions, connecting to a database using JDBC.

**UNIT – V**

**Introduction to JSP:** The Anatomy of a JSP Page, JSP Processing, Declarations, Directives, Expressions, Code Snippets, implicit objects, Using Beans in JSP Pages, Using Cookies and session for session tracking, connecting to database in JSP.

**TEXT BOOKS:**
1. Web Technologies, Uttam K Roy, Oxford UniversityPress
2. The Complete Reference PHP — Steven Holzner, TataMcGraw-Hill

**REFERENCES:**
1. Web Programming, building internet applications, Chris Bates 2″ edition, WileyDreamtech
2. Java Server Pages —Hans Bergsten, SPDO'Reilly,
3. Java Script,D.Flanagan
4. Beginning Web Programming-Jon DuckettWROX.
5. Programming world wide web, R.W.Sebesta, Fourth Edition,Pearson.
6. Internet and World Wide Web — How to program. Dietel and Nieto,Pearson.

# 19CS3212: CRYPTOGRAPHY & NETWORK SECURITY

**B.Tech. III Year II Sem.**                                                    **L  T P C**

                                                                                 **3  1 -  4**

**Prerequisites:**
- Should have knowledge of computer networks

**Course Objectives**
1. To impart knowledge on network security issues, services, goals and mechanisms
2. To classify various algorithms and fundamental ideas of public-key cryptography
3. To explain the authentication codes and digital signatures
4. To analyze the security of communication systems, networks and protocols

**Course Outcomes**
1. Demonstrate the knowledge of cryptography and network security concepts and applications
2. Ability to compare various cryptographic algorithms
3. Ability to identify the requirements and security of  Message Authentication and hash functions
4. Ability to apply security principles in networks and mobile devices
5. Ability to analyze various E-Mail privacy techniques

## UNIT – I
**Introduction to Cryptography**: Introduction, The need for security, Security approaches, Principles of security, Types of Security attacks, Security services, Security Mechanisms, A model for Network Security Cryptography Concepts and Techniques: Introduction, plain text and cipher text, substitution techniques, transposition techniques, encryption and decryption, symmetric and asymmetric key cryptography, steganography, key range and key size, possible types of attacks.

## UNIT – II
**Symmetric and Asymmetric key Ciphers**: Block Cipher principles, DES, AES, Blowfish, RC5, IDEA, Differential and Linear Cryptanalysis, Block cipher modes of operation, Stream ciphers, RC4. Principles of public key cryptosystems, RSA algorithm, Elgamal Cryptography, Diffie-Hellman Key Exchange, Knapsack Algorithm.

## UNIT – III
**Message Authentication Algorithms and Hash Functions:** Message Authentication, MD5, Secure Hash Algorithm (SHA512), Message authentication codes: Authentication requirements, authentication functions ,message authentication code ,HMAC, CMAC,hash functions, birthday attacks , security of hash functions and MACS, Elgamal Digital Signature Scheme Symmetric Key Distribution Using Symmetric & Asymmetric Encryption, Distribution of Public Keys, Kerberos, X.509 Authentication Service, Public – Key Infrastructure.

## UNIT – IV
**Transport-level Security**: Web security considerations, Secure Socket Layer and Transport Layer Security, Secure Electronic Transaction (SET), HTTPS, Secure Shell (SSH)
**Wireless Network Security**: Wireless Security, Mobile Device Security, IEEE 802.11 Wireless LAN, IEEE 802.11i Wireless LAN Security

## UNIT – V
**E-Mail and IP Security**: Pretty Good Privacy, S/MIME ,IP Security overview, IP Security architecture, Authentication Header, Encapsulating security payload, Combining security associations, Internet Key Exchange
**Case Studies on Cryptography and security**: Secure Multiparty Calculation, Virtual Elections, Single sign On, Secure Inter-branch Payment Transactions, Cross site Scripting Vulnerability.

## RESOURCES:
### Video Lectures
1. http://nptel.ac.in/courses/106105031/lecture by Dr. Debdeep MukhopadhyayIIT Kharagpur
2. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-033-  computer-system-engineering-spring-2009/video-lectures/ lecture by Prof. Robert Morris and Prof. Samuel Madden MIT.

## TEXT BOOKS:
1. Cryptography and Network Security- Principles and Practice: William Stallings, Pearson Education, 6th Edition.
2. Cryptography and Network Security: Atul Kahate, Mc Graw Hill, 3rd  Edition
3. Information Security, Principles, and Practice: Mark Stamp, Wiley India.

## REFERENCES:
1. Cryptography and Network Security: C K Shyamala, N Harini, Dr T R Padmanabhan, Wiley India, 1st Edition.
2. Cryptography and Network Security : Forouzan Mukhopadhyay, Mc Graw Hill, 3rd Edition
3. Wade Trappe, Lawrence C Washington, " Introduction to Cryptography with coding theory", Pearson.
4. Principles of Computer Security: WM. Arthur Conklin, Greg White, TMH
5. Introduction to Network Security: Neal Krawetz, CENGAGE Learning
6. Network Security and Cryptography: Bernard Menezes, CENGAGE Learning W. Mao,
7. "Modern Cryptography – Theory and Practice", Pearson Education.
8. Security in computing : Charles P. Pfleeger, Shari Lawrence Pfleeger

# 19MB3211: BUSINESS ECONOMICS AND FINANCIAL ANALYSIS

**B.Tech. III Year II Sem.**                                                    **L  T P C**
                                                                                 **3  - -  3**

## Course Objectives
1. To learn the basic Business types, impact of the Economy on Business and Firms specifically.
2. To analyze the Business from the Financial Perspective.

## Course Outcomes
1. The students will understand the various Forms of Business and the impact of economic variables on the economic variables on the Business.
2. The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt.
3. The Students can study the firm's financial position by analysing the Financial Statements of a Company.

## UNIT – I
**Introduction to Business and Economics**: Business: Structure of Business Firm, Theory of Firm, Types of Business Entities, Limited Liability Companies, Sources of Capital for a Company, Non-Conventional Sources of Finance. Economics: Significance of Economics, Micro and Macro Economic Concepts, Concepts and Importance of National Income, Inflation, Money Supply in Inflation, Business Cycle, Features and Phases of Business Cycle. Nature and Scope of Business Economics, Role of Business Economist, Multidisciplinary nature of Business Economics.

## UNIT - II
**Demand and Supply Analysis**: Elasticity of Demand: Elasticity, Types of Elasticity, Law of Demand, Measurement and Significance of Elasticity of Demand, Factors affecting Elasticity of Demand, Elasticity of Demand in decision making, Demand Forecasting: Characteristics of Good Demand Forecasting, Steps in Demand Forecasting, Methods of Demand Forecasting. Supply Analysis: Determinants of Supply, Supply Function & Law of Supply.

## UNIT - III
**Production, Cost, Market Structures & Pricing**: Production Analysis: Factors of Production, Production Function, Production Function with one variable input, two variable inputs, Returns to Scale, Different Types of Production Functions. Cost analysis: Types of Costs, Short run and Long run Cost Functions.
**Market Structures**: Nature of Competition, Features of Perfect competition, Monopoly, Oligopoly, Monopolistic Competition.
**Pricing**: Types of Pricing, Product Life Cycle based Pricing, Break Even Analysis, Cost Volume Profit Analysis.

**UNIT - IV**

**Financial Accounting**: Accounting concepts and Conventions, Accounting Equation, Double-Entry system of Accounting, Rules for maintaining Books of Accounts, Journal, Posting to Ledger, Preparation of Trial Balance, Elements of Financial Statements, Preparation of Final Accounts.

**UNIT - V**

**Financial Analysis through Ratios**: Concept of Ratio Analysis, Liquidity Ratios, Turnover Ratios, Profitability Ratios, Proprietary Ratios, Solvency, Leverage Ratios (simple problems).Introduction to Fund Flow and Cash Flow Analysis (simple problems).

**TEXT BOOKS:**
1. D.D. Chaturvedi, S.L. Gupta, Business Economics - Theory and Applications, International Book House Pvt. Ltd. 2013.
2. Dhanesh K Khatri, Financial Accounting, Tata McGraw Hill, 2011.
3. Geethika Ghosh, Piyali Gosh, Purba Roy Choudhury, Managerial Economics, 2e, Tata McGraw Hill Education Pvt. Ltd. 2012.

**REFERENCES:**
1. Paresh Shah, Financial Accounting for Management 2e, Oxford Press, 2015.
2. S.N. Maheshwari, Sunil K Maheshwari, Sharad K Maheshwari, Financial Accounting, 5e, Vikas Publications, 2013

**B.Tech. III Year II Sem.**                                              **L  T P C**

                                                                         **3  - -  3**

## Course Objectives
1. To train the students to understand different types of AI agents.
2. Various AI search algorithms.
3. Fundamentals of knowledge representation.
4. To apply knowledge representation, reasoning.
5. Study of Markov Models enable the student ready to step into applied AI.

## Course Outcomes
1. Understand AI problems and problem solving agents and search strategies
2. Apply advanced search techniques and acquire basic knowledge representation and reasoning logic.
3. Apply reasoning under uncertainty.
4. Understand learning strategies.
5. Understand implementation of expert system.

## UNIT - I
**Introduction**: AI problems, Agents and Environments, Structure of Agents, Problem Solving Agents Basic Search Strategies: Problem Spaces, Uninformed Search (Breadth-First, Depth-First Search, Depth-first with Iterative Deepening), Heuristic Search (Hill Climbing, Generic Best-First, A*), Constraint Satisfaction (Backtracking, Local Search).

## UNIT - II
**Advanced Search**: Constructing Search Trees, Stochastic Search, A* Search Implementation, Minimax Search, Alpha-Beta Pruning.
**Basic Knowledge Representation and Reasoning**: Propositional Logic, First-Order Logic, Forward Chaining and Backward Chaining, Introduction to Probabilistic Reasoning, Bayes Theorem

## UNIT - III
**Advanced Knowledge Representation and Reasoning**: Knowledge Representation Issues, Non monotonic Reasoning, Other Knowledge Representation Schemes
**Reasoning Under Uncertainty**: Basic probability, Acting Under Uncertainty, Bayes' Rule, Representing Knowledge in an Uncertain Domain, Bayesian Networks.

## UNIT - IV
**Learning**: What Is Learning? Rote Learning, Learning by Taking Advice, Learning in Problem Solving, Learning from Examples, Winston's Learning Program, Decision Trees.

## UNIT - V
**Expert Systems**: Representing and Using Domain Knowledge, Shell, Explanation, Knowledge Acquisition.

**TEXT BOOK:**
1. Russell, S. and Norvig, P, Artificial Intelligence: A Modern Approach, Third Edition, PrenticeHall, 2010.

**REFERENCES:**
1. Artificial Intelligence, Elaine Rich, Kevin Knight, Shivasankar B. Nair, The McGraw Hill publications, Third Edition, 2009.
2. George F. Luger, Artificial Intelligence: Structures and Strategies for Complex Problem Solving, Pearson Education, 6th ed., 2009.

<div align="center">

**19CS3272: COMPUTER GRAPHICS**
**(Professional Elective - II)**

</div>

**B.Tech. III Year II Sem.**                                                    **L  T  P  C**
                                                                                **3  -  -  3**

**Course Objectives**
1. The aim of this course is to provide an introduction of fundamental concepts and theory of computer graphics.
2. Topics covered include graphics systems and input devices; geometric representations and2D/3D transformations; viewing and projections; illumination and colour models; animation; rendering and implementation; visible surface detection.

**Course Outcomes**
1. Acquire familiarity with the relevant mathematics of computer graphics.
2. Be able to design basic graphics application programs, including animation
3. Be able to design applications that display graphic images to given specifications.
4. Implement 3-D geometric transformation and 3-D viewing.
5. Apply Computer animation.

**UNIT- I**
**Introduction:** Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices.
**Output primitives**: Points and lines, line drawing algorithms (Bresenham's and DDA Algorithm), midpoint circle and ellipse algorithms.
**Polygon Filling**: Scan-line algorithm, boundary-fill and flood-fill algorithms

**UNIT-II**
**2-D geometrical transforms**: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems.
**2-D viewing**: The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland algorithms, Liang- Bersky line clipping algorithm, Hidden Line Elimination algorithm, Sutherland –Hodgeman polygon clipping algorithm.

**UNIT-III**
**3-D object representation**: Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Basic illumination models, Colour Models.

**UNIT-IV**
**3-D Geometric transformations**: Translation, rotation, scaling, reflection and shear transformations, composite transformations.
**3-D viewing**: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping, Visible Surface Detection Methods.

**UNIT-V**
**Computer animation**: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications, morphing, tweening.

**TEXTBOOKS:**
1. Computer Graphics *C version*", Donald Hearn and M. Pauline Baker, Pearson Education
2. Computer Graphics Principles & practice", second edition in C, Foley, Van Dam, Feiner and Hughes, Pearson Education.
3. Computer Graphics, Steven Harrington, TMH

**REFERENCES:**
1. Procedural elements for Computer Graphics, David F Rogers, Tata Mc Graw hill, 2nd edition.
2. Principles of Interactive Computer Graphics", Neuman and Sproul, TMH.
3. Principles of Computer Graphics, Shalini Govil, Pai, 2005, Spring

## 19CS3273: INFORMATION RETRIEVAL SYSTEM
### (Professional Elective-II)

**B.Tech. III Year II Sem.**                                    **L  T P C**

                                                               **3  - -  3**

### Course Objectives
1. To learn the important concepts and algorithms in IRS
2. To understand the data/file structures that are necessary to design, and implement information retrieval (IR) systems.

### Course Outcomes
1. Ability to understand IR principles to locate relevant information in large collections of data
2. Ability to understand information extraction using indexing, and various data structure algorithms.
3. Ability to design different document clustering algorithms and understand automatic indexing.
4. Ability to use various search algorithms and perform information visualization.
5. Ability to understand the ways to design an Information Retrieval System for web search tasks.

### UNIT – I
**Introduction to Information Retrieval Systems:** Definition of Information Retrieval System, Objectives of Information Retrieval Systems, Functional Overview, Relationship to Database Management Systems, Digital Libraries and Data Warehouses.
**Information Retrieval System Capabilities:** Search Capabilities, Browse Capabilities, Miscellaneous Capabilities.

### UNIT - II
**Cataloging and Indexing:** History and Objectives of Indexing, Indexing Process, Automatic Indexing, Information Extraction.
**Data Structure:** Introduction to Data Structure, Stemming Algorithms, Inverted File Structure, N-Gram Data Structures, PAT Data Structure, Signature File Structure, Hypertext and XML Data Structures, Hidden Markov Models.

### UNIT - III
**Automatic Indexing:** Classes of Automatic Indexing, Statistical Indexing, Natural Language, Concept Indexing, Hypertext Linkages.
**Document and Term Clustering:** Introduction to Clustering, Thesaurus Generation, Item Clustering, Hierarchy of Clusters.

**UNIT - IV**
**User Search Techniques:** Search Statements and Binding, Similarity Measures and Ranking, Relevance Feedback, Selective Dissemination of Information Search, Weighted Searches of Boolean Systems, Searching the INTERNET and Hypertext.
**Information Visualization:** Introduction to Information Visualization, Cognition and Perception, Information Visualization Technologies.

**UNIT - V**
**Text Search Algorithms:** Introduction to Text Search Techniques, Software Text Search Algorithms, Hardware Text Search Systems.
**Multimedia Information Retrieval:** Spoken Language Audio Retrieval, Non-Speech Audio Retrieval, Graph Retrieval, Imagery Retrieval, Video Retrieval, Web search basics. Web crawling and indexes.

**TEXT BOOKS:**
1. Information Storage and Retrieval Systems – Theory and Implementation, Second Edition, Gerald J. Kowalski, Mark T. Maybury, Springer.

**REFERENCES:**
1. Frakes, W.B., Ricardo Baeza-Yates: Information Retrieval Data Structures and Algorithms, Prentice Hall, 1992.
2. Information Storage & Retrieval By Robert Korfhage – John Wiley & Sons.
3. Modern Information Retrieval By Yates and Neto Pearson Education.

# 19CS3274: SOFTWARE TESTING METHODOLOGIES
## (Professional Elective-II)

**B.Tech. III Year II Sem.**        **L   T P C**

           **3 - - 3**

**Prerequisites**

● A course on "Software Engineering".

**Course Objectives**

1. To provide knowledge of the concepts in software testing such as testing process, criteria, strategies, and methodologies.
2. To develop skills in performing manual testing.
3. To develop skills in software test automation and management using latest tools.
4. To provide knowledge in taking decision of when to use automation testing and manual testing based on the context to be tested.

**Course Outcomes**

1. Acquire knowledge on STLC phases and consequences of bugs.
2. Acquire skills to perform various testing techniques.
3. Acquire knowledge on logic based testing and regular expressions.
4. Demonstrate the test planning and management.
5. Ability to develop skills in software test automation and management using latest tools.

## UNIT- I
**Introduction:** Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs, STLC (software testing life cycle) phases.
**Flow graphs and Path testing: -**Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

## UNIT - II
**Integration Testing:** Integration Testing as a Type of Testing, Integration Testing as a Phase of Testing, Scenario Testing, Defect Bash.
**System and Acceptance Testing:** Overview, Functional Versus Non-Functional, Functional System Testing & Non-Functional, Acceptance Testing.
**Dataflow Testing:**- Basics of data flow testing, strategies in data flow testing, application of dataflow testing.
**Regression Testing:** Introduction, Types, When to do Regression testing, how to do Regression Testing, Best Practices in Regression Testing.

## UNIT- III
**White Box Testing:** Static Testing, Structural Testing, Challenges, **Black Box Testing, and Logic Based Testing:** Overview, decision tables, path expressions, kv charts, specifications.
**Paths, Path products and Regular expressions:** Path products & path expression, reduction procedure, applications, regular expressions & flow anomaly detection.

**UNIT-IV**

**State, State Graphs and Transition testing:** State graphs, good & bad state graphs, state testing, Testability tips, Automation Testing versus Manual Flow Testing.

**Test Planning, Management, Execution and Reporting:** Introduction, Planning, Management, Process, and Reporting, Best Practices.

**UNIT - V**

**Software Test Automation:** Terms used in Automation, Skills needed for Automation, What to Automate, Scope of Automation, Design and Architecture for Automation, Generic Requirements for Test Tools, Process Model for Automation, Selecting a Test Tool, Automation for Extreme Programming Model, Challenges.

**Test Metrics and Measurements:** Metrics & Measurements, Types, Project, Progress, Productivity, Release

**TEXT BOOKS:**
1. Software Testing techniques - BarisBeizer, Dreamtech, second edition.
2. Software Testing Tools – Dr.K.V.K.K.Prasad, Dreamtech.
3. Srinivasa Desikan & Gopalaswamy Ramesh, "Software Testing – Principles and Practices", Pearson Education, 2007.

**REFERENCES:**
1. The craft of software testing - Brian Marick, Pearson Education.
2. Software Testing Techniques – SPD(Oreille)
3. Software Testing in the Real World – Edward Kit, Pearson.
4. Effective methods of Software Testing, Perry, John Wiley.
5. Art of Software Testing – Meyers, John Wiley.
6. "Software Testing – Effective Methods, Tools and Techniques", RenuRajani, Pradeep Oak, TMK.
7. Effective methods of Software Testing, Perry, John Wiley.
8. Art of Software Testing – Meyers, John Wiley.

# 19CS3251: WEB TECHNOLOGIES LAB

**B.Tech. III Year II Sem.**                                                    **L  T  P    C**
                                                                               **-  -  3   1.5**

## Course Objectives

1. To enable the student to program web applications using the following technologies HTML, Java script , AJAX, PHP, Tomcat Server, Servlets ,JSP.

## Course Outcomes

1. USE LAMP / XAMP for Web Applications
2. Simple Applications with Technologies like HTML, JavaScript and AJAX
3. Design web application using PHP
4. Parse XML Files using JAVA(DOM AND SAX Parsers)
5. Use Tomcat Server for Servlets and connect to Database
6. Develop JSP  Applications using Tomcat Server and Java Bean development

## List of Experiments

1. Write an HTML page that contains a selection box with a list of 5 countries.  When the user selects a country, its capital should be printed next to the list. Add CSS to customize the properties of the font of the capital (color, bold and font size).
2. Develop static pages (using Only HTML) of an online book store. The pages should resemble: www.amazon.com. The website should consist the following pages.
   a) Home page
   b)  Registration and user Login
   c)  User Profile Page
   d)  Books catalog
   e)  Shopping Cart
   f)   Payment By credit card
   g)  Order Conformation

3. Write an HTML page including java script that takes a given set of integer numbers and shows them after sorting in descending order.
4. Write an HTML page including any required Java script that takes a number from one text field in the range of 0 to 999 and shows it in another text field in words. If the  number is out of range, it should show "out of range" and if it is not a number, it should show "not a number" message in the result box.
5. Write an HTML page including any required Java script that takes a number from one text field in the range of 0 to 999 and shows it in another text field in words. If the  number is out of range, it should show "out of range" and if it is not a number, it should show "not a number" message in the result box.

6. Validate the Registration, user login, user profile and payment by credit card pages using JavaScript.

7. Write a PHP script to print prime numbers between1-50.

8. PHP script to
   a. Find the length of a string.
   b. Count no of words in a string.
   c. Reverse a string.
   d. Search for a specific string.

9. Write a PHP script to merge two arrays and sort them as numbers, in descending order.

10. Write a PHP script that reads data from one file and write into another file.

11. Create an XML document that contains 10 users information. Write a Java program, which takes User Id as input and returns the user details by taking the user information from the XML document using (a) DOM Parser and (b)SAX parser

12. Create and save an XML document on the server, which contains 10 users information. Write a program, which takes User Id as an input and returns the user details by taking the user information from the XML document.

13. A web application that takes name and age from an HTML page. If the age is less than18, it should send a page with "Hello <name>, you are not authorized to visit this site" message, where <name> should be replaced with the entered name. Otherwise it should send "Welcome <name>to this site" message.

14. Install TOMCAT web server. Convert the static web pages of assignments 2 into dynamic web pages using servlets and cookies. Hint: Users information (user id, password, credit card number) would be stored in web.xml. Each user should have a separate Shopping Cart.

15. Redo the previous task using JSP by converting the static web pages of assignments 2 into dynamic web pages. Create a database with user information and books information. The books catalogue should be dynamically loaded from the database. Follow the MVC architecture while doing the website.

**TEXT BOOKS:**

1. WEB TECHNOLOGIES: A Computer Science Perspective, Jeffrey C. Jackson, Pearson Education

**REFERENCES:**

1. Deitel H.M. and Deitel P.J., "Internet and World Wide Web How to program", Pearson International, 2012, 4th Edition.

2. J2EE: The complete Reference By James Keogh,McGraw-Hill

3. Bai and Ekedhi, The Web Warrior Guide to Web Programming,Thomson

4. Paul Dietel and Harvey Deitel," Java How to Program", Prentice Hall of India, 8thEdition

5. Web technologies, Black Book, Dreamtechpress.

# 19CS3252: CRYPTOGRAPHY AND NETWORK SECURITY LAB

**B.Tech. III Year II Sem.**　　　　　　　　　　　　　　　　　　　**L　T P C**

　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　**-　- 3 1.5**

## Course Objectives
1. To understand basics operations involved in encryption and decryption algorithms.
2. To be able to implement Conventional Encryption Algorithms.
3. To be able to implement Public Key Cryptography Algorithms.
4. To be able to implement Message Authentication Algorithms.
5. To be able to implement cryptographic Hash Functions algorithms.

## Course Outcomes
1. Student will be able to understand basic mathematical operations involved in cryptography.
2. Student will be able to implement Conventional Encryption Algorithms. i.e DES,AES, Blowfish,RC4 algorithms..
3. Student will be able to implement Public Key Cryptography Algorithms i.e RSA, Diffie-Hellman algorithms
4. Student will be able to implement Message Authentication Algorithms.
5. Student will be able implement cryptographic Hash Functions algorithms.

## EXPERIMENTS:

1. Write a C program that contains a string (char pointer) with a value 'Hello world'. The program should XOR each character in this string with 0 and displays the result.

2. Write a C program that contains a string (char pointer) with a value 'Hello world'. The program should AND or and XOR each character in this string with 127 and display the result.

3. Write a Java program to perform encryption and decryption using the following algorithms a. Ceaser cipher b. Substitution cipher c. Hill Cipher

4. Write a C/JAVA program to implement the DES algorithm logic.

5. Write a C/JAVA program to implement the Blowfish algorithm logic.

6. Write a C/JAVA program to implement the Rijndael algorithm logic.

7. Write the RC4 logic in Java Using Java cryptography; encrypt the text "Hello world" using Blowfish. Create your own key using Java key tool.

8. Write a Java program to implement RSA algorithm.

9. Implement the Diffie-Hellman Key Exchange mechanism using HTML and JavaScript.

10. Calculate the message digest of a text using the SHA-1 algorithm in JAVA.

11. Calculate the message digest of a text using the MD5 algorithm in JAVA.

**TEXT BOOKS:**
1. Cryptography and Network Security- Principles and Practice: William Stallings, Pearson Education, 6th Edition
2. Cryptography and Network Security: Atul Kahate, Mc Graw Hill, 3rd  Edition

**REFERENCES**
1. Cryptography and Network Security: C K Shyamala, N Harini, Dr T R Padmanabhan, Wiley India, 1st Edition.
2. Cryptography and Network Security : Forouzan Mukhopadhyay, Mc Graw Hill, 3rd Edition.

# 19CS3291: TECHNICAL PAPER PRESENTATION

**B.Tech. III Year II Sem.**                                    **L  T  P  C**
                                                                **0  0  2  1**

## GENERAL INSTRUCTIONS

1. **Pick The Right Topic**: Make sure that you find this topic genuinely interesting, or find some aspect of it that is especially cool.

2. **Skim Your Textbook:** Look over the syllabus, read the newspapers regularly, look through recent issues of relevant journals and magazines, surf the net, watch the Technical news, talk to your classmates and friends to get innovative Ideas.

3. **Narrow down Your Topic**:  Many good ideas are wasted because students have a hard time focusing on a narrow enough topics. If your topic is way too broad, try homing in on some part of that topic, and exploring that area in more depth.

4. **My Topic is Too Narrow**: Generalize to similar or related topics (cloning of humans vs. cloning of animals, unexpected social problems that might result from cloning, technical aspects of cloning, moral or religious issues related to cloning, etc.). But keep your focus clear throughout

5. **Organize Your Thoughts In A Good Outline**:  Outlining is a genuine pain, especially in the early stages of your paper, by forcing you to come in terms of writing the topic. Try to reveal major deficiencies in your approach. Use it on your first draft to get your bearings, or on your final draft to check the way you've organized your paragraphs.