**Information System**

**UNIT – I**

**Attack on Computers and Computer Security** : 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 cryptography, steganography , key range and key size, possible types of attacks.

**UNIT – II**

**Symmetric key Ciphers:** Block Cipher principles and Algorithms(DES, AES, Blowfish), Differential and Linear Cryptanalysis, Block cipher modes of operation, Stream ciphers, RC4, Location and placement of encryption function, Key distribution Asymmetric key Ciphers: Principles of public key cryptosystems, Algorithms(RSA, Diffie-Hellman, ECC), Key Distribution.

**UNIT – III**

**Message Authentication Algorithms and Hash Functions:** Authentication requirements, Functions, Message authentication codes, Hash Functions, Secure hash algorithm, Whirlpool, HMAC, CMAC, Digital Signatures, knapsack algorithm **Authentication Applications**: Kerberos, X.509 Authentication Service, Public – key Infrastructure, Biometric Authentication.

**UNIT – IV**

**Email Security:** Pretty Good Privacy, S/MIME IP Security: IP Security overview , IP Security architecture, Authentication Header, Encapsulating security payload, combining security associations, key management**.**

**UNIT – V**

**Web Security :** Web security considerations, Secure Socket Layer and Transport Layer Security, Secure electronic transaction Intruders, **Virus and Firewalls:** Intruders, Intrusion detection, password management, Virus and related threats, Countermeasures, Firewall design principles, Types of firewalls **Case Studies on Cryptography and security:** Secure Inter – branch Payment Transactions, Cross site scripting Vulnerability, Virtual Elections .

**TEXT BOOKS**

T1 : Cryptography and Network Security : William Stallings, Pearson Education, 4th Edition.

T2 : Cryptography and Network Security: Atul Kahate, MC Graw Hill, 2nd Edition

**REFERENCE BOOKS**

R1 : Cryptography and Network Security: C.K Shyamala, N Harini, Dr T R Padmanabhan, Wiley India, 1st Edition

R2 : Cryptography and Network Security : Forouzan Mukhopadhya, Mc Graw Hill, 2nd Edition

R3 : Information Security, Principles and Practice: Mark Stamp, Wiley India.

R4 : Principles of Computer Security: WM.Arthur Conklin, Greq White, TMH

R5 : Introduction to Network Security : Neal Krawetz, CENGAGE learning

R6 : Cryptography and Network Security : Bernard Menezes, CENGAGE Learning

**PPL**

**UNIT-I**

##### Preliminary Concepts: Reasons for studying, Concepts of programming languages, programming domains, Language Evolution criteria, influences on language design, Language categories, Programming Paradigms—Imperative, Object Oriented, Functional Programming, Logic programming.Programming Language Implementation – Compilation and Virtual machines, programming environments.

Syntax and Semantics: general Problem of describing Syntax and Semantics, formal methods of Describing syntax - BNF, EBNF for common programming languages features, parse trees, Ambiguous grammars, attribute grammars, Denotation semantics and axiomatic semantics for common programming language features.

**UNIT-II**

Data types: Introduction, primitive, character, user defined, array, associative, record, union, Pointer and reference types, design and implementation uses related to these types. Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, Variable initialization.

Expressions and Statements: Arithmetic relational and Boolean expressions, Short circuit Evaluation mixed mode assignment, Assignment Statements, Control Structures – Statement Level, Compound Statements, Selection, Iteration, Unconditional Statements, guarded commands.

 **UNIT-III**

Subprograms and Blocks: Fundamentals of sub-programs, Scope and lifetime of variable, static and dynamic scope, Design issues of subprograms and operations, local referencing environment parameter passing methods, overloaded sub-programs, generic sub-programs, parameters that are sub-program names, design issues for functions user defined overloaded operators, co routines.

**UNIT-IV**

Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, design issues, language examples, C++ parameterized ADT, object oriented programming in small talk, C++, Java, C#, Ada 95.

Concurrency: Subprogram level concurrency, semaphores, monitors, massage passing, Java threads, C# threads.

Exception handling :Exceptions, exception Propagation, Exception handler in Ada, C++ and Java.

Logic Programming Language :Introduction and overview of logic programming, basic elements of prolog, application of logic programming.

**UNIT - V**

Functional Programming Languages: Introduction, fundamentals of FPL, LISP, ML, Haskell, application

of Functional Programming Languages and comparison of functional and imperative Languages.

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:**

T1. Concepts of Programming Languages by Robert. W. Sebesta 8/e, Pearson Education, 2008.

**T2. Programming Language Design Concepts by D.A. Watt, Wiley Dreamtech, rp-2007.**

**Web Technologies**

**UNIT-I**

**Introduction to PHP:** Declaring variables, Data types,Arrays,Strings,Operators, Expressions,control structures,functions, Reading data from Web controls, From Text boxes, Radio Buttons,Lists etc.

Handling File Uploads,Connecting to databases, Executing simple queries,Handling results,Sessions and cookies

**File Handling in PHP:** File operations like opening,closing,reading and writing and deleting data from different types of files, Listing Directories

**UNIT-II**

**XML:** Introduction to XML,Defining XML tags, Attributes and values, Document Type definition,XML Schemas, Document Object Model,XHTML

**Parsing XML data:** Dom and Sax Parsers in Java

**UNIT-III**

**Introduction to Servlets:** Common Gateway Interface, Life cycle of servlet,Deploying a Servlet, Servlet API,Reading Servlet Parameters,Reading Initialization Parameters,Handling HttpRequests and Responses , using cookies and Sessions and Connecting to Database using JDBC.

**UNIT-IV**

**Introduction to JSP:** 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.

**UNIT-V**

**Client side Scripting:** Introduction to Javascript ,Javascript Language, Declaring variables, scope of variables,Functions, Event handlers, Document Object Model,Form Validation

Simple AJAX application

**TEXT BOOKS**

**T1:** Web technologies,Uttam K Roy,Oxford University Press

**T2:** The Complete Reference PHP.Steven Holzner,Tata McGraw -Hill

**REFERENCE BOOKS:**

**R1:** Web Programming ,Building Internet Applications ,Chris Bates 2nd Edition,Wiley Dreamtech

**R2:** Java Server Pages –Hans Bergsten,SPD O’Reilly

**R3:** Java Script , D.Flanagan, SPD O’Reilly

**R4:** Beginning web Programming –Jon Duckett WROX

**R5:** Programming World wide Web.R.W.Sebesta,Fourth edition,Pearson

**R6:**Internet and World Wide Web-How to program,Dietel and Neito,Pearson

**Software Testing Mthodologies**

**UNIT-I**

**Introduction:**

Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs.

**Flow graphs and Path testing.**

Basic concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

**UNIT-II**

**Transaction Flow Testing:**Transaction flows, transaction flow testing techniques, data flow testing, Basics of data flow testing, Strategies in data flow testing, application of data flow testing

**UNIT-III**

**Domain Testing:**

Domains & paths, nice & ugly domains, domain testing, domains & interfaces testing, domains & testability

 **UNIT-IV**

**Paths, Path products & Regular expression:** Path products & path expressions, reduction procedure, applications, regular expressions & flow anomaly detection.

**Logic Based Testing:**

Overview, decision tables, path expressions, kv charts, specifications

**UNIT-V**

**State, State Graphs & Transition Testing:**

State graphs, good & bad state graphs, state testing, testability tips.

**Graph Matrices & Application:**

Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools. (Student should be given an exposure to a tool like JMeter or Winrunner)

**TEXT BOOKS:**

**T1**: Boris Beizer, ***“Software Testing techniques”*** ,Second edition, Dreamtech,

 published on 2004.

 **T2**: Dr.K.V.K.K.Prasad, ***“Software Testing Tools”***, Dreamtech, revised 2005 edition

**Object Oriented Analysis and Design**

**UNIT I**

 **Introduction to UML**: Importance of modeling, Principles of modeling, Object Oriented modeling, Conceptual model of UML, Architecture, Software Development Life Cycle.

 **UNIT II**

 **Basic structural modeling:** Classes, relationships, common mechanisms and diagrams.

**Advanced structural modeling** : advanced classes, advanced relationships, interfaces, types and roles, packages.

 **Class & Object diagrams:** Terms, concepts, Modeling techniques for class & object diagrams.

 **UNIT III**

**Basic Behavioral modeling-I**: Interactions, Interaction diagrams.

 **Basic Behavioral modeling- II:** Use cases, Use case Diagrams, Activity Diagrams.

To study about architectural modeling i)e., the set of significant decisions about the organization of a software system. To study the component and deployment diagrams

 **UNIT IV**

**Advanced Behavioral Modeling**: Events and signals, state machines, processes and Threads, time and space, state chart diagrams.

 **Architectural Modeling:** Component, Deployment, Component diagrams and Deployment diagrams.

 **UNIT VIII**

 Patterns and frameworks,Artifacts Diagrams,Case Study: The Unified Library application.

 **TEXT BOOKS**

1. Grady Booch, James Rumbaugh, Ivar Jacobson : The Unified Modeling Language User Guide, Pearson Education.

 2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2, Toolkit, WILEY-Dreamtech India Pvt. Ltd.

 **REFERENCE BOOKS:**

 1. Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education.

2. Pascal Roques: Modeling Software Systems Using UML2, WILEY- Dreamtech India Pvt. Ltd.

3. Atul Kahate: Object Oriented Analysis & Design, The McGraw-Hill, Companies.

4. Mark Priestley: Practical Object-Oriented Design with UML,TATA McGrawHill

5. Appling UML and Patterns: An introduction to Object – Oriented Analysis and Design and Unified Process, Craig Larman, Pearson Education.

**UNIT-I:**

**Characterization of Distributed Systems:** Introduction, Examples of Distributed Systems,

Resource sharing and the Web, Challenges.

**System Models**: Introduction, Architectural Models, Fundamental Models.

**UNIT-II:**

**Time and Global States:** Introduction, Clock Events and Process States, Synchronizing

Physical Clocks, Logical Time and Logical Clocks, Global States, Distributed Debugging.

**Coordination and Agreement:** Introduction, Distributed Mutual Exclusion, Elections, Multicast

Communication, Consensus and Related Problems.

**UNIT-III:**

 **Inter Process Communication:** Introduction, The API for the Internet Protocols, External Data

Representation and Marshalling, Client-Server Communication, Group Communication, Case Study: IPC in **UNIX**

**Distributed Objects and Remote Invocation:** Introduction, Communication between Distributed Objects, Remote Procedure Call, Events and Notifications, Case Study: JAVA RMI.

**UNIT-IV:**

 **Distributed File Systems:** Introduction, File Service Architecture,

Case Study 1. Sun Network file system Case Study 2. The Andrew File System.

**Name Services:** Introduction, Name Services and the Domain Name System, Directory Services,

Case Study of the Global name Services.

**Distributed Shared Memory:** Introduction, Design and Implementation Issues, Sequential

Consistency and IVY Case study, Release Consistency, Munin Case Study, Other Consistency Models.

**UNIT V:**

**Transactions and Concurrency Control:** Introduction, Transactions, Nested Transactions,

Locks, Optimistic Concurrency Control, Timestamp Ordering, Comparison of Methods for

Concurrency control.

**Distributed Transactions:** Introduction, Flat and Nested Distributed Transactions, Atomic

Commit Protocols, Concurrency Control in Distributed Transactions, Distributed Deadlocks,

Transaction Recovery.

**TEXT BOOKS:**

George Coulouris, Jean Dollimore, Tim Kindberg “Distributed Systems Concepts and Design” Third Edition – 2002- Pearson Education Asia.

**REFERENCE BOOKS:**

1. Distributed Systems, Principles and Paradigms, Andrew S. Tanenbaum, Maarten Van Steen,

2nd Edition, PHI.

1. Distributed Systems, An Algorithm Approach, Sukumar Ghosh, Chapman&Hall/CRC,

Taylor &Fransis Group, 2007.

1. A.S.Tanenbaum, M.Van Steen “ Distributed Systems” Pearson Education 2004
2. Mukesh Singhal, Ohio State University, Columbus “Advanced Concepts In Operating Systems” McGraw-Hill Series in Computer Science, 1994