

**COURSE STRUCTURE AND SYLLABUS APPROVED IN THE BOARD OF STUDIES  
MEETING ON 19<sup>TH</sup> MARCH 2018 TO BE EFFECTIVE FROM THE  
ACADEMIC YEAR 2018-19  
(Accordance to CBSC System)**

<b>First Semester</b>							
Paper Code	Title	Workload Per Week		Marks			No. of Hours/ week/ session
		Theory	Practical	Sessional	University	Total	
MSCS 101	Discrete Mathematical Structures	4	-	25	75	100	4
MSCS 102	Object Oriented Programming through Java	4	-	25	75	100	4
MSCS 103	Data Base Management Systems	4	-	25	75	100	4
MSCS 104	Principles of Programming Languages	3	-	25	75	100	3
MSCS 105	Data Structures	3	-	25	75	100	3
MSCS 106P	Object Oriented Programming through Java Laboratory	-	3x2=6		100	100	6
MSCS 107P	Data Base Management Systems Laboratory	-	3x2=6		100	100	6
MSCS 108P	Data Structures Laboratory	-	3x2=6		100	100	6
<b>Total</b>						<b>800</b>	<b>36</b>

<b>Second Semester</b>							
Paper Code	Title	Workload Per Week		Marks			No. of Hours/ week/ session
		Theory	Practical	Sessional	University	Total	
MSCS 201	Advanced Java Programming	4	-	25	75	100	4
MSCS 202	Computer Networks	4	-	25	75	100	4
MSCS 203	Web Technologies	4	-	25	75	100	4
MSCS 204	Software Engineering	3	-	25	75	100	3
MSCS 205	Artificial Intelligence	3	-	25	75	100	3
MSCS 206P	Advanced Java Programming Laboratory		3x2=6		100	100	6
MSCS 207P	Computer Networks Laboratory		3x2=6		100	100	6
MSCS 208P	Web Technologies Laboratory		3x2=6		100	100	6
<b>Total</b>						<b>800</b>	<b>36</b>

Third Semester							
Paper Code	Title	Workload Per Week		Marks			No. of Hours/ week/ session
		Theory	Practical	Sessional	University	Total	
MSCS 301	Dot Net Programming	4	-	25	75	100	4
MSCS 302	Data Warehousing & Data Mining	4	-	25	75	100	4
MSCS 303	Cryptography & Network Security	4	-	25	75	100	4
MSCS 304 A/B/C/D	Elective I: A) Grid Computing, B) Machine Learning, C) Distributed System, D) Management Information System	3	-	25	75	100	3
MSCS 305 A/B/C/D	Elective II: A) Digital Image Processing, B) Mobile Computing, C) Cloud Computing, D) Enterprise Application Integration	3	-	25	75	100	3
MSCS 306P	Dot Net Programming Laboratory	-	3x2=6		100	100	6
MSCS 307P	Cryptography & Network Security Laboratory	-	3x2=6		100	100	6
MSCS 308D	Mini Project	-	3x2=6	50	50	100	
<b>Total</b>						<b>800</b>	

Fourth Semester							
Paper Code	Title	Workload Per Week		Marks			No. of Hours/ week/ session
		Theory	Practical	Sessional	University	Total	
	Seminar in Project Work			50		100	
	Project Report Writing			50			
	Major Project Work				200	200	
<b>Total</b>						<b>300</b>	
Note: 1. Every Student must give the Seminar at least 2. Seminar will be conducted only by Internal Staff							

## SCHEME OF EXAMINATION AND MAXIMUM MARKS

Semester	No. of Papers	Max. Marks in Each Paper			Total Marks	Total Marks
		Internal	University	Total		
I Semester	Theory -5	25	75	100	500	800
	Practical-3		100	100	300	
II Semester	Theory -5	25	75	100	500	800
	Practical-3		100	100	100	
III Semester	Theory -5	25	75	100	500	800
	Practical-2			100	200	
	Mini Project	50	50	100	100	
IV Semester	Seminar in Project Work	50				300
	Project Report Writing	50		100	100	
	Major Project Work		200	200	200	
<b>TOTAL</b>						

## PROCEDURE TO EVALUATE INTERNAL ASSESSMENT

Paper Category	Theory	Practical	Seminar	Minor Project Work	Major Project Work
Sessional Marks	25	---	50 Content Preparation (12)+ Communication Skills (12)+ Presentation Skills (12)+ Attempting Queries (14)	50 Project Documentation (20) + Presentation(20) + Viva Voce (10)	---
University Examination Marks	75	100 Record (20) + Designing of the Program (20) + Program execution (40) + (20) Viva Voce	---	50 Project Documentation (20) + Presentation(20) + Viva Voce(10)	200 Project Documentation (75)+ Presentation (75)+ Viva Voce (50)

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YOGI VEMANA UNIVERSITY  
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# 101 Paper-I: Discrete Mathematical Structures

## UNIT 1:

**The Foundations: Logic and Proofs:** Propositional Logic – Propositional Equivalences – Predicates and Quantifiers – Nested Quantifiers – Rules of Inference – Introduction to Proofs – Proof Methods and Strategy

**Basic Structures: Sets, Functions, Sequences and Sums:** Sets – Set Operations – Functions – Sequences and Summations

**The Fundamentals Algorithms , The Integers and Matrices:** Algorithms – The Growth of Functions – Complexity of Algorithms – The Integers And Divisions – Primes and Greatest Common Divisors – Integers and Algorithms – Applications of Number Theory – Matrices

**Introduction and Recursion :** Mathematical Induction – Strong Induction and Well-Ordering – Recursive Definitions and Structural Induction – Recursive Algorithms – Program Correctness

## UNIT 2:

**Counting:** The Basics of Counting – The Pigeon Hole Principle – Permutations and Combinations – Binomial Coefficients – Generalized Permutations and Combinations – Generating Permutations and Combinations

**Advanced Counting Techniques:** Recurrence Relations – Solving Linear Recurrence Relations – Divide and Conquer Algorithms and Recurrence Relations – Generating Functions – Inclusion – Exclusion – Applications of Inclusion & Exclusion.

**Relations :** Relations and Their Properties – n-ary Relations and Their Applications – Representing Relations – Closures of Relations – Equivalence Relations – Partial Orderings

## UNIT 3:

**Graphs:** Graphs and Graph Models – Graph Terminology and Special Types of Graphs – Representing Graphs and Graph Isomorphism's – Connectivity – Euler and Hamilton Paths – Shortest Path Problems – Planar Graphs - Graph Coloring.

## UNIT 4:

**Trees:** Introduction to Trees – Applications of Trees – Tree Traversal – Spanning Trees – Minimum Spanning Trees - Kruskal's algorithm - Prim's algorithm.

### Text Books:

1. Discrete Mathematics and its Applications, Kenneth H Rosen, 6th Edition, McGraw-Hill, 2007
2. Rosen K H. Discrete Mathematics and its Applications, 5<sup>th</sup> edition. Tata McGraw-Hill, 2003. Vijayalakshmi and Bhupender, Discrete Mathematics.

### Reference Books:

1. Johnson Baugh R, and Carman R, Discrete Mathematics, 5<sup>th</sup> edition, Pearson Education, 2003.
2. Mott J L. Kandel A, and Baker T P, Discrete Mathematics for Computer Scientists and Mathematicians, 2<sup>nd</sup> edition, Prentice-Hall of India, 2002.
3. Gary Haggard, John Schipf and sue whitesides, Discrete Mathematics for Computer Science, Thomson, 2005.

## 102 Paper-II: Object Oriented Programming through JAVA

### UNIT 1:

**Java Basics** - History of Java, Java buzzwords, comments, data types, variables, constants, scope and life time of variables, operators, operator hierarchy, expressions, type conversion and casting, enumerated types, control flow-block scope, conditional statements, loops, break and continue statements, simple java program, arrays, input and output, formatting output, Review of OOP concepts, encapsulation, inheritance, polymorphism, classes, objects, constructors, methods, parameter passing, static fields and methods, access control, this reference, overloading methods and constructors, recursion, garbage collection, building strings, exploring string class, Enumerations, autoboxing and unboxing, Generics.

### UNIT 2:

**Inheritance** – Inheritance concept, benefits of inheritance , Super classes and Sub classes, Member access rules, Inheritance hierarchies, super uses, preventing inheritance: final classes and methods, casting, polymorphism- dynamic binding, method overriding, abstract classes and methods, the Object class and its methods.

**Interfaces** – Interfaces vs. Abstract classes, defining an interface, implementing interfaces, accessing implementations through interface references, extending interface.

**Packages**-Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages.

### UNIT 3:

**Exception handling** – Dealing with errors, benefits of exception handling, the classification of exceptions- exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, rethrowing exceptions, exception specification, built in exceptions, creating own exception sub classes, Guide lines for proper use of exceptions.

**Multithreading** - Differences between multiple processes and multiple threads, thread states, creating threads, interrupting threads, thread priorities, synchronizing threads, interthread communication, thread groups, daemon threads.

### UNIT 4:

**GUI Programming with Java** - The AWT class hierarchy, Introduction to Swing, Swing vs. AWT,MVC architecture, Hierarchy for Swing components, Containers – Top-level containers – JFrame, JApplet, JWindow, JDialog, Light weight containers – JPanel, A simple swing application, Overview of several swing components- JButton, JToggleButton, JCheckBox, JRadioButton, JLabel, JTextField, JTextArea, JList, JComboBox, JMenu, Java's Graphics capabilities – Introduction, Graphics contexts and Graphics objects, color control, Font control, Drawing lines, rectangles and ovals, Drawing arcs, Layout management - Layout manager types – border, grid, flow, box.

**Event Handling** - Events, Event sources, Event classes, Event Listeners, Relationship between Event sources and Listeners, Delegation event model, Semantic and Low-level events, Examples: handling a button click, handling mouse and keyboard events, Adapter classes.

### TEXT BOOKS:

1. Java: the complete reference, 7<sup>th</sup> edition, Herbert Schildt, TMH.
2. Java for Programmers, P.J.Deitel and H.M.Deitel, Pearson education / Java: How to Program P.J.Deitel and H.M.Deitel, 8th edition, PHI.

### REFERENCES:

1. Core Java, Volume 1-Fundamentals, eighth edition, Cay S.Horstmann and Gary Cornell, Pearson education.
2. Java Programming, D.S.Malik, Cengage Learning.
3. Object Oriented Programming with Java, B.Eswara Reddy, T.V.Suresh Kumar, P.Raghavan, Pearson-Sanguine.
4. An introduction to Java programming and object oriented application development, R.A. Johnson- Cengage Learning.
5. Advanced Programming in Java2, K.Somasundaram, Jaico Publishing House.
6. Starting out with Java, T.Gaddis, dreamtech India Pvt. Ltd.
7. Object Oriented Programming with Java, R.Buyya, S.T.Selvi, X.Chu, TMH.
8. Object Oriented Programming through Java, P.Radha Krishna, Universities Press.
9. An introduction to programming and OO design using Java, J.Nino, F.A.Hosch, John Wiley & Sons.
10. Java and Object Orientation, an introduction, John Hunt, second edition, Springer.
11. Maurach's Beginning Java2,D.Lowe, J.Murach, A. Steelman, SPD.
12. Programming with Java, M.P.Bhave, S.A.Patekar, Pearson Education

## 103 Paper-III: Data Base Management Systems

### UNIT 1:

INTRODUCTION: Database Systems vs. File Systems-View of Data- Data Models-Database Languages-Transaction Management- Database Systems Structure-History of Database Systems-Database Systems Applications-Entity Relationship Model.

### UNIT 2:

RELATIONAL DATABASES: SQL-Basic Structure-Set Operations-Complex Queries-Joined Queries-DDL-DML

Embedded SQL-Dynamic SQL-Other SQL Functions-Query by Example-Integrity and Security of searching-Relational Database Design-Normalization.

### UNIT 3:

DATA STORAGE, INDEXING QUERY EVALUATION & OPTIMIZATION: Storage & File Structure-Disks-RAID-File Organization-Indexing & Hashing-B+ TREE-B Tree-Static Hashing-Dynamic Hashing-Multiple Key Access

Query Processing-Selection Operation-Sorting-Join Operation-Evaluation of Expressions-Query Optimization.

### UNIT 4:

TRANSACTION MANAGEMENT: Transaction Concept-Static Implementation-Concurrency Control-Protocols-Deadlock Handling

Recovery Systems-Recovery with Concurrent Transactions-Shadow Paging-Buffer Management-Case Studies-Oracle-Microsoft SQL Server.

### TEXT BOOKS

1. Abraham Silberschatz, Henry F.Korth and S.Sudharssan,"Database System Concepts", 4th Edition, Tata McGraw Hill, 2002.
2. Raghu Ramakrishnan & Johannesgerhrke, "Data Base Management Systems", Mc Graw Hill International Edition, 2000.

## 104 Paper -IV: Principles of Programming Languages

### UNIT1:

**Preliminary Concepts:** Reasons for studying, concepts of programming languages, Programming domains, Language Evaluation 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.

### UNIT2:

**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, denotational semantics and axiomatic semantics for common programming language features.

**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.

### UNIT3:

**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.

**Subprograms and Blocks:** Fundamentals of sub-programs, Scope and lifetime of variable, static and dynamic scope, Design issues of subprograms and operations, local referencing environments, 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 4:

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

**Functional Programming Languages:** Introduction, fundamentals of FPL, LISP, ML, Haskell, application of Functional Programming Languages and comparison of functional and imperative Languages

### TEXT BOOKS:

1. Concepts of Programming Languages Robert .W. Sebesta 6/e, Pearson Education.
2. Programming Languages –Louden, Second Edition, Thomson.

### REFERENCE BOOKS:

1. Programming languages –Ghezzi, 3/e, John Wiley
2. Programming Languages Design and Implementation – Pratt and Zelkowitz, Fourth Edition PHI/Pearson Education
3. Programming languages –Watt, Wiley Dreamtech
4. LISP Patric Henry Winston and Paul Horn Pearson Education.
5. Programming in PROLOG Clocksin, Springer

## 105 Paper-V: Data Structures

### UNIT 1:

Introduction: Primitive and Composite data Types, Abstract Data Type, Data Structure, Storage Structure, File Structure, Complexity of an algorithm, Big O Notation. Arrays; Sparse matrix representation and operations. Linked lists: Single double, Circular lists and Operations.

### UNIT 2:

Stacks: Representation, Operations, Array and Linked List Implementation, Applications.

Queues: Representation, Operations, Array and Linked list Implementation of single, multiple, priority, dqueue and circular queues, Applications.

### UNIT 3:

Trees: Definitions and concepts, Storage representation and manipulation of general trees, Binary trees, Conversion of general tree to binary tree, AVL tree, Tries, B-Trees, Tree traversing techniques

File Organization: Sequential file organization; ISAM, Direct Files, Inverted Lists, Multi lists.

Graphs: Representation, Warshall and Minimal algorithm, Traversal and other operations, Topological sorting; Minimum Spanning tree;

### UNIT 4:

Hashing: Access table handling, Choosing a hash function, Collision resolution methods, Analysis of hashing.

Sorting: Internal Sorting Techniques: Selection sort, Bubble sort, Merge sort, Quick sort, heap sort and Radix sort External Sorting Techniques: Run lists, Tape sorting, sorting on disks, generating extended run lists. Searching Techniques: Linear and Binary search.

### TEXT BOOKS:

1. J.P. Trembly and P.G. Sorensen, —An Introduction to Data Structures with ApplicationsII, Tata McGraw Hill, Second edition.

### Reference Books:

1. E. Horowitz and S. Sahani, —Fundamentals of Data StructuresII, Galgotia Book Source, 1996.
2. Sartaj Sahni, —Data Structures, Algorithms, and Applications in C++II, Tata McGraw-Hill International Editions, 1999

# PRACTICALS

## 106P: Object Oriented Programming through JAVA Laboratory

1. Programs to illustrate constructors.
2. Programs to illustrate Overloading & Overriding methods in Java.
3. Programs Illustrate the Implementation of Various forms of Inheritance. (Ex. Single, Hierarchical, Multilevel inheritance.)
4. Program which illustrates the implementation of multiple Inheritance using interfaces in Java.
5. Program to illustrate the implementation of abstract class.
6. Programs to illustrate Exception handling
7. Programs to create packages in Java.
8. Program to Create Multiple Threads in Java.
9. Program to Implement Producer/Consumer problem using synchronization.
10. Program to Write Applets to draw the various polygons.
11. Create and Manipulate Labels, Lists, Text Fields, Text Areas & Panels
12. Handling Mouse Events & Keyboard Events.
13. Using Layout Managers.
14. Create & Manipulate the Following Text Areas, Canvas, Scroll bars, Frames, Menus, Dialog Boxes.
15. Programs, which illustrate the manipulation of strings.
  - a. Ex. 1. Sorting an array of Strings.
  - b. Frequency count of words & Characters in a text.
16. Programs, which illustrate the use of Streams.
17. Java Program that reads on file name from the user and displays the contents of file.
18. Write an applet that displays a simple message.
19. Write an applet that computes the payment of a loan based on the amount of the loan, the interest rate and the number of months. It takes one parameter from the browser: Monthly rate; if true, the interest rate is per month; Otherwise the interest rate is annual.
20. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the + - X % operations. Add a text field to display the result.
21. Write a Java program for handling mouse events.
22. Write a Java program for creating multiple threads
23. Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication.
24. Write a Java program that lets users create Pie charts. Design your own user interface (with AWT)
25. Write a Java program that allows the user to draw lines, rectangles and ovals.
26. Write a Java program that illustrates how run time polymorphism is achieved.



## 107P: Database Management Systems Laboratory

1. Programs in SQL covering all the SQL Queries.
2.
  - a) Write a program in PL/SQL to determine Statistical functions.
  - b) Write a program in PL/SQL to demonstrate functions.
  - c) Write a program in PL/SQL to demonstrate cursors.
  - d) Write a program in PL/SQL to demonstrate parameterized cursors.
  - e) Write a program in PL/SQL to demonstrate procedures.
  - f) Write a program in PL/SQL to demonstrate packages.
  - g) Write a program in PL/SQL to demonstrate overloading packages.
  - h) Write a program in PL/SQL to demonstrate exceptions.
  - i) Write a program in PL/SQL to demonstrate triggers.

## 108P: Data Structures Laboratory

### The following assignments shall be Implement in C

1. Create a singly linked list and perform operations on it.
2. Create a doubly linked list and perform operations on it.
3. Create a stack and perform operations on it.
4. Create a queue and perform operations on it.
5. At least three classical applications of linked lists.
6. At least three classical applications of stacks.
7. At least three classical applications of queues.
8. Create a binary tree and traverse it in in-order, pre-order and post-order using iterative and recursive methods.
9. Create a binary search tree and perform search, insert and delete operations.
10. Create an AVL tree and perform search, insert and delete operations.
11. Create a priority queue and perform insert and delete operations.
12. Implement graph traversals: BFS and DFS
13. Implement Dijkstra's algorithm.
14. Implement Prim's algorithm.
15. Implement Kruskal algorithm.
16. Represent sparse matrices using multi-linked structures and perform addition, subtraction and multiplication operations.
17. Implement quick, heap, radix and address calculation sorting techniques.

## 201 Paper-I: Advanced JAVA Programming

### UNIT 1:

FILES AND STREAMS: Introduction, Data Hierarchy, Files and Streams, Creating a Sequential-Access File, Random-Access Files, Reading Data Sequentially from a Random-Access File.

NETWORKING: Introduction, Manipulating URLs, Reading a File on a Web Server, Establishing a Simple Server, Establishing a Simple Client, Client/Server Interaction with Stream Socket Connections, Connectionless Client/Server Interaction with Datagrams, Client/Server Tic-Tac-Toe Using a Multithreaded Server, Security and the Network. (Chapter 17 and 21 of Book 1)

### UNIT 2:

JDBC DATABASE ACCESS: JDBC Basics, New Features in the JDBC 2.0 API (Chapter 26 and 27 of Book 2)

### UNIT 3:

REMOTE METHOD INVOCATION (RMI): Introduction, Case Study: Creating a Distributed System with RMI, Defining the Remote Interface Implementing the Remote Interface, Define the Client, Compile and Execute the Server and the Client.

### UNIT 4:

SERVLETS: Overview of Serves, Interacting with Clients, The Life Cycle of a Servlet, Saving Client State, The servletrunner Utility, Running Servlets. (Chapters 34 to 39 of Book 2)

### TEXT BOOKS:

1. JAVA How to Program Third Edition - Deitel & Deitel
2. The JAVA Tutorial Continued Compione, Walrath, Huml, Tutorial Team - Addison Wesley

### REFERENCE BOOKS:

1. Java tutorial continued – campione (addison wesley)
2. The complete reference java 2 (fourth edition) by - patrick naughton & herbet schildt (TMH)
3. Programming java - decker&hirsh field vikas publisking (3001) (thomson learning) (second edition)
4. Introduction to java programming - Y.Daniel Liang PHI(3002)
5. Object oriented programming through JAVA2 by - Thamus WU (Mc.Graw Hill)
6. JAVA 2 - Dietel & Dietel (Pearson Education)
7. Introduction to JAVA –Bala Guru Swamy

## 202 Paper-II : Computer Networks

### UNIT 1:

Introduction, Uses of Computer Networks, Network Hardware, network software, Reference Models, Example Networks, Example Data Communication Services.

Physical Layer: Transmission media, Guided media, unguided media, Wireless transmission, Telephone system, Narrowband ISDN, Broadband ISDN and ATM, Communication Satellites.

### UNIT 2:

Data Link Layer: Data Link Layer Design Issues, Error Detection and Correction, Elementary data link protocols – An unrestricted Simplex protocols, A simplex Stop and Wait Protocol, Sliding Window Protocol – one bit sliding window protocol, Go back-N ARQ, Selective repeat protocol, Media Access Sub Layer: Static Channel Allocation, Dynamic Channel allocation, Aloha, , IEEE Standard 802.4 token bus, IEEE Standard 802.5 token ring. Comparison 802.4 and 802.5.

### UNIT 3:

Network Layer: Network layer design issues, Routing algorithms – classification of routing algorithms, routing tables, Shortest path routing, flooding, Hierarchical routing, Distance Vector routing, Link state routing, Broadcast routing, Multicast routing.

Congestion control algorithms, open loop control, closed loop control, Internetworking design principles, Types of Internetworking, IP Protocol, IPV4 addressing, subnet addressing.

### UNIT 4:

Transport layer: The Transport Service, Elements of Transport Protocols, Internet Transport Protocols(TCP and UDP).

Application Layer: Network Security, Secret key algorithms DES, Domain Name System, Electronic Mail, the World Wide Web.

### TEXT BOOKS:

1. Computer Networks -- Andrew S Tanenbaum, 4th Edition. Pearson Education/PHI

### Reference Books:

1. Computer Communications and Networking Technologies –Michael A.Gallo, William M .Hancock - Thomson Publication
2. Data Communications and Networking – Behrouz A. Forouzan. Third Edition TMH

## 203 Paper- III : Web Technologies

### UNIT 1:

Introduction to XHTML : Introduction – First XHTML –XHTML Validation service – Headers – Linking– Images – Unordered Lists – Nested and Ordered Lists – Basic XHTML Tags – Intermediate XHTML Tables and Formatting – XHTML Forms – Internal Linking – Creating and Using Image maps – meta Elements – frameset element – Nested framesets.

Cascading Style Sheets – Introduction –Inline Styles – Embedded Style Sheets – Conflicting Styles– Linking External Style Sheets – Positioning Elements – Backgrounds – Element dimensions – Text flow and the Box Model – User Style Sheets

### UNIT 2:

Java Script: Introduction to Scripting: Introduction – A Sample Program: Printing a Line of Text in a Web Page – Obtaining user with prompt Dialogs

Functions: Introduction – Program Modules in JavaScript – Programmer-Defined Functions – Function Definitions – Random Number Generation – Example – Scope Rules – JavaScript Global Functions– Recursion vs. Iteration

Arrays: Declaring and Allocating Arrays – Examples Using Arrays – References and Reference Parameters – Passing Arrays to Functions – Sorting Arrays – Searching Arrays : Linear Search and Binary Search – Multidimensional Arrays.

Objects: Introduction – Thinking About Objects – Math Object – String Object – Date Object – Boolean, Number, document, window Object

### UNIT 3:

Dynamic HTML – Object Model and Collections: Introduction – Object Referencing – Collections all and Children – Dynamic Styles – Dynamic Positioning – Using the frames Collection – navigator Object Event Model – Event Onclick – Event onload – Error Handling with onerror – Tracking the Mouse with Event onmousemove – Rollovers with onmouseover and onmouseout – Form Processing with onfocus and onblur – More Form Processing with onsubmit and onreset – Event Bubbling – More DHTML Events.

Filters and Transitions: Flip filters: flipv and fliph – Transparency with the chroma Filter – Creating Image masks – Miscellaneous Image filters: invert, gray and xray – Adding shadows to Text – Creating Gradients with alpha – Making Text glow – Creating Motion with blur – Using the wave Filter – Advanced Filters: dropshadow and light – blendTrans Transitions – revealTrans Transitions

### UNIT 4:

XML (Extensible Markup Language): Introduction – Structuring Data – XML Namespaces Document Type Definitions ( DTDs) and schemas– XML vocabularies- Document Object Model – DOM methods- Simple API for XML - Extensible Style Language(XSL) – Simple Object Access Protocol(SOAP)

Web Servers (IIS, Apache): Introduction – HTTP request Types – System Architecture – Client side scripting vs Server Side Scripting - Microsoft Internet Information Server (IIS) – Apache Web Server– Requesting documents

### TEXT BOOKS:

1.DEITEL & DEITEL: *Internet & World Wide Web - How to Program*, Pearson Education -Third Edition

### REFERENCE BOOKS

1. Ivan Bayross : *HTML, DHTML, Java Script, Perl, CGI, BPB*
2. Web Technologies by Achyut S Godbole and Atul Kahate, TMH

## 204 Paper-IV: Software Engineering

### UNIT 1:

**Introduction to Software Engineering:** The evolving role of software, Changing Nature of Software, Software myths.

**A Generic view of process:** A layered technology, A process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models.

**Process models:** The waterfall model, Incremental model, Rad model, Spiral model, Evolutionary process models, The Unified process.

**An Agile View of process:** Agility, Agile process models- Scrum process model, Extreme programming (XP).

### UNIT2:

**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.

**System models:** Context Models, Behavioral models, Data models, Object models, structured methods.

### UNIT 3:

**Product metrics:** Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

**Testing Strategies:** A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging.

**Metrics for Process and Products :** Software Measurement, Metrics for software quality.

### UNIT 4:

**Risk Management:** Reactive vs Proactive risks strategies, software risks, risk identification, risk projection, risk refinement, RMMM, RMMM plan.

**Quality Management:** Quality concepts, software quality assurance, software reviews, formal technical reviews, statistical software quality assurance, software reliability.

### TEXT BOOKS:

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition. McGrawHill International Edition.
2. Software Engineering- Sommerville, 7th edition, Pearson education.
3. Designing Flexible Object Oriented systems with UML-Charles Ritcher
4. Object Oriented Analysis & Design, Sat/.inger. Jackson, Burd Thomson

### REFERENCE BOOKS:

1. Software Engineering- K.K. Agarwal & Yogesh Singh, New Age International Publishers
2. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, John Wiely.
3. Systems Analysis and Design- Shely Cashman Rosenblatt, Thomson Publications.
4. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-Hill Companies.

## 205 Paper V: Artificial Intelligence

### UNIT 1:

**Problems and Search:** What is Artificial Intelligence?, The AI Problems, The Underlying Assumption, What is an AI Technique, The Level of the Model, Criteria for Success.

### UNIT 2:

**Problems, Problem Spaces, and Search:** Defining the Problem as a State Space Search, Production systems, Problem Characteristics, Production System Characteristics, Issues in the Design of Search Programs.

**Heuristic Search Techniques:** Generate and Test, Hill Climbing, Best-First Search, Problem Reduction, Constraint Satisfaction, Means Ends Analysis.

### UNIT 3:

**Knowledge Representation:-** Knowledge Representation Issues, Representations and Mappings, Approaches to knowledge Representation, Issues in Knowledge Representation.

### UNIT 4:

**Using Predicate Logic:-** Representing Instance and Isa Relationships, Computable Functions and Predicates, Resolution, Natural Deduction.

**Representing Knowledge Using Rules:-** Procedural Versus Declarative knowledge, Logic Programming, Forward versus Back ward Reasoning, Matching, Control Knowledge.

### TEXT BOOK:

1. Artificial Intelligence, Elaine Rich, Kevin Knight, Tata McGrawHill

### REFERENCE:

1. Artificial Intelligence – A modern approach, Stuart Russel, Peter Norwig, Pearson Education.

# PRACTICALS

## 206P: Advanced JAVA Programming Laboratory

1. Programme to illustrate the File Class.
2. Programme to illustrate the IO, Utility Package & Display the File Properties.
3. Programme to illustrate the File Input Stream.
4. Programme to illustrate the nio, io package.
5. Programme for simple Railway Reservation System.
6. Programme to illustrate the Client & Server.
7. Programme for DDL, DML operations on a database through JDBC.
8. Programme for DDL, DML operations of a Database through JDBC prepared Statement.
9. Programme for DDL, DML operations of a Database through JDBC to Result set Metadata.
10. Programme for RMI Methods.
11. Programme to using of servlet print the current date & time.
12. Programme to demonstrate JAVA URL class.



## 207P: Computer Networks Laboratory

### Computer Networks Lab:

1. Implement The Shortest path routing algorithm.
2. Implement Distance Vector Routing algorithm
3. Implement the Link state routing algorithm.
4. Implement data encryption and decryption shifting algorithm.

### Operating System Lab:

1. Demonstrate creation of Threads and Synchronization in C++
2. Implement Banker's Algorithm for deadlock prevention in C++
3. Design and develop C++ program for FCFS & SJF CPU Scheduling compare for same set of jobs.

Process	Burst Time
P1	10
P2	1
P3	2
P4	1
P5	5

4. Design and develop C++ program for Round Robin Scheduling for a given set of jobs (above table) and Show average waiting time, turnaround time.
5. Demonstrate producers and Consumers problem for Inter process communication in C++.
6. Design and develop C++ program for FIFO page replacement algorithm for following set of page references 1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6 and show no. of page faults.
7. Design and develop C++ program for LRU page replacement algorithm for following set of page references 1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6 and show of no. of page faults and belady's anomaly if it occurs.
8. Design and develop C++ program for Optimal page replacement algorithm for following set of page references 1,2,3,4,2,1,5,6,2,1,2,3,5,5,3,4,1 and show of no. of page faults and belady's anomaly if it occurs.

## 208P: Web Technologies Laboratory

1. Create your own Resume using HTML 5 Tags
2. Debug and validate your HTML document ( Resume ) using W3C validator and fix the issues.
3. Add Styles to your Resume using CSS 3 Properties.
  - a. Add External, Internal and Inline CSS styles to know the priority.
  - b. Add CSS3 Animation to your profile.
4.
  - a. Add functionalities that use any 2 of HTML 5 API"s.
  - b. Create a student Registration form for Job Application and validate the form fields using JavaScript
5.
  - a. Create a CGPA Calculator in Web Brower using HTML, CSS and JavaScript. Use functions in JavaScript.
  - b. Create a Quiz Program with adaptive questions using JavaScript.
6. Create a Pan Card Validation form using Object Oriented JavaScript, consider the 10th character to be an alphabet.
  - a. Get the user"s First Name, Last Name and other required fields as input
  - b. Assume the last digit of the Pan Number to be an alphabet
  - c. Validate the PAN Number
7.
  - a. Create an online Event Registration form and validate using JQuery
  - b. Create an online video Player which will allow you to play videos from the system and also create custom playlist using JQuery.
8. Construct a JSON Structure for a bookstore and validate it using JSON Validator such as <http://jsonlint.com/> and parse the Json file to list the books under the category "Fiction". Use Javascript or JQuery for parsing
9. Using PHP and MySQL, develop a program to accept book information viz. Accession number, title, authors, edition and publisher from a web page and store the information in a database and to search for a book with the title specified by the user and to display the search results with proper headings.
10. Develop a Social Media Web Application using HTML5, CSS3, JQuery, AJAX & PHP.

## 301 Paper-I : Dot Net Programming

### UNIT 1:

**Fundamentals of Visual Basic**, Exception handling, windows forms, Control Classes, Different Types of Boxes, Labels, Buttons, Panels. (Chapters 1 to 7)

### UNIT 2:

**WINDOWS FORMS:** Different types of Bars, Menus, Views. **OBJECT - ORIENTED PROGRAMMING:** Classes and objects constructors and destructors, inheritance, modifiers, Interfaces, Polymorphism, Vate Binding, Graphics handling and File handling. (Chapters 8 to 13)

### UNIT 3:

**WEB FORMS:** Working with webforms, Web forms and HTML, The Web control class, Web Forms and Boxes, Web Forms and Buttons, Validation Controls, Ad Rotators, Web Forms and HTML controls. (Chapters 14 to 19)

### UNIT 4:

**DATA ACCESS WITH ADO.NET:** Accessing data with the server explorer, Data adapters and Data sets, Binding Controls to databases, Handling databases in code, Database access in Web Applications. Creating user Controls, Web user Controls, and Multithreading creating Windows services, Web Services and Deploying applications. (Chapters 30 to 25)

### TEXT BOOK:

1. VB.NET PROGRAMMING (BLACK BOOK) BY STEVEN HOLZNER (Dreamtech-3003)

### REFERENCE BOOKS:

1. VB.NET PROGRAMMING BY T. GADDIS (Dreamtech)
2. Microsoft Visual Basic. Net step by step By Halvosrson (PHI)
3. OOP with Microsoft Visual Basic.Net By Reynold Hacrtte (PHI)

## 302 Paper-II : Data Warehousing & Data Mining

### UNIT1:

**Introduction:** Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Major issues in Data Mining.

**Data Preprocessing:** Needs Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.

### UNIT2:

Data Warehouse and OLAP Technology for Data Mining Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse. Implementation, Further Development of Data Cube Technology, From Data Warehousing to Data Mining.

### UNIT3:

**Concepts Description: Characterization and Comparison:** Data Generalization and Summarization-Based Characterization, Analytical Characterization: Analysis of Attribute Relevance, Mining Class Comparisons: Discriminating between Different Classes, Mining Descriptive Statistical Measures in Large Databases.

**Mining Association Rules in Large Databases:** Association Rule Mining, Mining Single-Dimensional Boolean Association Rules from Transactional Databases, Mining Multilevel Association Rules from Transaction Databases, Mining Multidimensional Association Rules from Relational Databases and Data Warehouses, From Association Mining to Correlation Analysis, Constraint-Based Association Mining.

### UNIT4:

**Classification:** Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Classification by Back propagation, Classification Based on Concepts from Association Rule Mining, Other Classification Methods, Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Density-Based Methods, Grid-Based Methods, Model-Based Clustering Methods, Outlier Analysis.

### TEXT BOOKS:

1. Data Mining – Concepts and Techniques - JIAWEI HAN & MICHELINE KAMBER Harcourt India.

### REFERENCE BOOKS:

1. Data Mining Introductory and advanced topics –MARGARET H DUNHAM, PEARSON EDUCATION
2. Data Mining Techniques – ARUN K PUJARI, University Press.
3. Data Warehousing in the Real World – SAM ANAHORY & DENNIS MURRAY. Pearson Edn Asia.
4. Data Warehousing Fundamentals – PAULRAJ PONNAIAH WILEY STUDENT EDITION.
5. The Data Warehouse Life cycle Tool kit – RALPH KIMBALL WILEY STUDENT EDITION.

## 303 Paper-III : Cryptography and Network Security

### UNIT 1:

Introduction: Security trends, OSI Security Architecture, Security Attacks, services and mechanisms, Model for Network Security.

Classical techniques: Symmetric Cipher model, Substitution Techniques, Transposition Techniques, Steganography.

Modern techniques: Simplified DES, block cipher principles, data encryption standard, strength of DES, differential and linear crypt analysis, block cipher design principles and modes of operations. Algorithms: Triple DES, international data encryption algorithm, characteristics of advanced symmetric block ciphers.

### UNIT 2:

Conventional encryption: Placement of encryption function, traffic confidentiality, key distribution.

Public key cryptography: Principles of public key cryptosystems, RSA algorithm, key management, Diffie-Hellman key exchange.

Message authentication and hash functions: Authentication requirements and functions, Message Authentication, Hash functions, security of hash functions and Macs

### UNIT 3:

Authentication applications: Kerberos, X.509 directory authentication service. Electronic mail security: Pretty good privacy, S/MIME.

### UNIT 4:

System Security: Intruders, Intrusion detection, Password management. Malicious Software: Virus and related threats, Virus counter measures. Firewall: Firewall design principles, Trusted systems.

### TEXT BOOKS:

1. Cryptography and Network Security: Principles and Practice – William Stallings, Pearson Education.
2. Network Security Essentials (Applications and Standards) by William Stallings, Pearson Education.

### REFERENCE BOOKS:

1. Fundamentals of Network Security by Eric Maiwald (Dreamtech Press)
2. Network Security – Private Communication in a Public World by Charlie Kaufman, Radia Perlman and Mike Speciner, Pearson/PHI.
3. Introduction to Cryptography, Buchmann, Springer.

## **304A Elective I: Grid Computing**

### **UNIT I**

Introduction – Early Grid Activities, Current Grid Activities, an overview of Grid business areas, Grid applications, Grid infrastructure – Grid computing organizations and their roles – Grid computing Anatomy – Grid computing Roadmap

### **UNIT II**

Service-Oriented and ,Web Service Architecture- XML Messages and enveloping – Service message description mechanisms, relationship between web and grid service – Sample use cases that drive OGSA – The OGSA Platform components

### **UNIT III**

A high level introduction to OGSI – Technical details of OGSI specification, Service data concepts - Grid Service: Naming and change Management – OGSA Basic Services: Common Management Model, Service domains, Policy and Security Architecture

### **UNIT IV**

The Grid Computing Toolkits – GLOBUS GT3 Toolkit: Architecture - GLOBUS GT3 Toolkit: Programming Model

### **TEXTBOOK**

1. Joshy Joseph & Craig Fellenstein, "Grid Computing", Pearson-2004.

### **REFERENCE**

1. Ahmar Abbas, "Grid Computing: A Practical Guide to technology and Applications", Firewall media – 2006.

## 304B Elective I: Machine Learning

### UNIT - I

**Introduction** - Well-posed learning problems, designing a learning system Perspectives and issues in machine learning

**Concept learning and the general to specific ordering** – Introduction, A concept learning task, concept learning as search, Find-S: Finding a Maximally Specific Hypothesis, Version Spaces and the Candidate Elimination algorithm, Remarks on Version Spaces and Candidate Elimination, Inductive Bias.

**Decision Tree Learning** – Introduction, Decision Tree Representation, Appropriate Problems for Decision Tree Learning, The Basic Decision Tree Learning Algorithm Hypothesis Space Search in Decision Tree Learning, Inductive Bias in Decision Tree Learning, Issues in Decision Tree Learning.

### UNIT - II

**Artificial Neural Networks** Introduction, Neural Network Representation, Appropriate Problems for Neural Network Learning, Perceptions, Multilayer Networks and the Back propagation Algorithm. Discussion on the Back Propagation Algorithm, An illustrative Example: Face Recognition **Evaluation Hypotheses** – Motivation, Estimation Hypothesis Accuracy, Basics of Sampling Theory, A General Approach for Deriving Confidence Intervals, Difference in Error of Two Hypotheses, Comparing Learning Algorithms.

### UNIT - III

**Bayesian learning** - Introduction, Bayes Theorem, Bayes Theorem and Concept Learning Maximum Likelihood and Least Squared Error Hypotheses, Maximum Likelihood Hypotheses for Predicting Probabilities, Minimum Description Length Principle , Bayes Optimal Classifier, Gibbs Algorithm, Naïve Bayes Classifier, An Example: Learning to Classify Text, Bayesian Belief Networks, EM Algorithm. **Computational Learning Theory** – Introduction, Probably Learning an Approximately Correct Hypothesis, Sample Complexity for Finite Hypothesis Space, Sample Complexity for Infinite Hypothesis Spaces, The Mistake Bound Model of Learning.

**Instance-Based Learning** – Introduction, k-Nearest Neighbor Learning, Locally Weighted Regression, Radial Basis Functions, Case-Based Reasoning, Remarks on Lazy and Eager Learning.

### UNIT - IV

**Pattern Comparison Techniques**, Temporal patterns, Dynamic Time Warping Methods, Clustering, Codebook Generation, Vector Quantization

**Pattern Classification:** Introduction to HMMS, Training and Testing of Discrete Hidden Markov Models and Continuous Hidden Markov Models, Viterbi Algorithm, Different Case Studies in Speech recognition and Image Processing

**Analytical Learning** – Introduction, Learning with Perfect Domain Theories: PROLOG-EBG Remarks on Explanation-Based Learning, Explanation-Based Learning of Search Control Knowledge, Using Prior Knowledge to Alter the Search Objective, Using Prior Knowledge to Augment Search Operations.

**Combining Inductive and Analytical Learning** – Motivation, Inductive-Analytical Approaches to Learning, Using Prior Knowledge to Initialize the Hypothesis.

### TEXT BOOKS:

1. Machine Learning – Tom M. Mitchell, MGH
2. Fundamentals of Speech Recognition By Lawrence Rabiner and Biing – Hwang Juang.

### REFERENCE BOOKS:

1. Machine Learning : An Algorithmic Perspective, Stephen Marsland, Taylor & Francis

## 304C Elective I: Distributed System

### UNIT 1:

Characterization of Distributed Systems-Introduction-Examples-Resource Sharing and the Web-Challenges. System Models-Architectural-Fundamental.

Interprocess Communication-Introduction-API for Internet protocols-External data representation and marshalling--Client-server communication-Group communication-Case study: Interprocess Communication in UNIX.

### UNIT 2:

Distributed Objects and Remote Invocation-Introduction-Communication between distributed objects-Remote procedure calls-Events and notifications

Case study: Java

RMI, Operating System Support-Introduction-OS layer-Protection-Processes and threads-Communication and invocation OS architecture.

### UNIT 3:

Distributed File Systems-Introduction-File service architecture-Case Study: Sun Network File System-Enhancements and further developments.

Name Services-Introduction-Name Services and the Domain Name System-Directory Services Case Study: Global Name Service.

### UNIT 4:

Time and Global States-Introduction-Clocks, 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.

### TEXT BOOK:

1. George Coulouris, Jean Dollimore, Tim Kindberg, , "Distributed Systems: Concepts and Design", 4th Edition, Pearson Education, 2005.

### REFERENCE BOOKS:

1. A.tS. Tanenbaum and M. V. Steen, "Distributed Systems: Principles and Paradigms", Second Edition, Prentice Hall, 2006.
2. M.L.Liu, —Distributed Computing Principles and Applicationsll, Pearson Addison Wesley, 2004.
3. Mukesh Singhal, —Advanced Concepts In Operating Systemsll, McGrawHill Series in Computer Science, 1994.
4. Nancy A. Lynch, "Distributed Algorithms", The Morgan Kaufmann Series in Data Management System, Morgan Kaufmann Publishers, 2000.



## 304D Elective I : Management Information System

### UNIT I

The meaning and role of MIS: What is MIS? Decision support systems, systems approach, the systems view of business, MIS organization within the company, Managers view of Information systems. Management organizational theory and the systems approach - Development of organizational theory, organizational behavior, management - information and the systems approach – Data processing and the computer – components of computer system – computer based information system -Applications Information systems for decision making: Evolution of an information system - Basic information systems - decision making and MIS - MIS as a technique for making programmed decisions - decision assisting information systems –DSS

### UNIT II

Strategic and project planning for MIS: General business planning - appropriate MIS response - MIS planning general - MIS planning details

Conceptual system design: Define the problems - set system objectives - establish system constraints - determine information needs - determine information sources - develop alternative conceptual designs and select one - prepare the conceptual design report.

Detailed system design: Inform and involve the organization - aim of detailed design - project management of MIS detailed design - identify dominant and trade off criteria - sketch the detailed operating subsystems and information flows – automation - inputs, outputs, and processing - software, hardware and tools - propose an organization to operate the system - document the detailed design - revisit the manager-user.

### UNIT III

Implementation, evaluation and maintenance of the MIS: Plan the implementation - acquire floor space and plan space layouts - organize for implementation - develop procedures for implementation train the operating personnel - computer related acquisitions - develop forms for data collection and information dissemination - develop the files - test the system - evaluate the MIS - control and maintain the system.

Pitfalls in MIS development: Fundamental weaknesses - soft spots in planning - design problems - implementation

### UNIT IV

Systems concepts and control: Systems classifications – concepts – control: Key system concept – business organization as a system – control and system design

Management science and systems modeling for MIS: What is Management science? – What are models? – Kinds and use of models for analysis of systems characteristics – simulation – construction of models Case studies

### TEXT BOOK:

1. Information systems for modern management, 3rd Edition by R.G Murdick, J.E Ross and J. R clagget, PHI-2004.

### REFERENCE BOOKS:

1. Management Information Systems, 9/e, Laudon & Laudon, V.M.Prasad, Pearson, 2005,
2. Management Information Systems , C.S.V.Murthy, Himalaya Publications, 2004

## 305A Elective II: Digital Image Processing

### UNIT 1:

INTRODUCTION: What is Digital Image Processing, The origins of Digital Image Processing, Examples of Fields that use Digital Image Processing, Fundamentals steps in Digital Image Processing, Components of an Image Processing System

DIGITAL IMAGE FUNDAMENTALS: Elements of Visual Perception, Light & Electro magnetic spectrum, Image sensing and acquisition, Image sampling & quantization, some basic relationships between pixels, Linear and non linear operations.

### UNIT2:

IMAGE ENHANCEMENT IN THE SPATIAL DOMAIN: Background, some gray level transformations, histogram processing , enhancement using arithmetic/logic operations, basics of spatial filtering, smoothing spatial filters, sharpening spatial filters, combining spatial enhancement methods

IMAGE ENHANCEMENT IN THE FREQUENCY DOMAIN: Background, Introduction to fourier transform and frequency domain, smoothing frequency domain filters, sharpening frequency domain filters, homomorphism filtering, implementation.

### UNIT 3:

IMAGE RESTORATION: A model of the image degradation, restoration process, noise models, restoration in the presence of noise only spatial filtering, periodic noise reduction by frequency domain filtering, Linear, position invariant degradation, Estimating the degradation function, inverse filtering, minimum mean square error filtering, constrained least squares filtering, geometric mean filter, geometric transformation

### UNIT 4:

IMAGE COMPRESSION: Fundamentals, image compression models, elements of information theory, error free compression, lossy compression, image compression standards

### TEXT BOOKS:

1. Digital Image Processing by Rafael C. Gonzalez & Richard E. Woods, Second Edition, Pearson Education.

### REFERENCE BOOKS:

1. Image Processing, Analysis, and Machine Vision, Milan Sonka, Vaclav Hlavac and Roger Boyle, Second Edition, Thomson Learning.
2. Digital Image Processing by S Jayaraman, S Esakkirajan, T VeeraKumar (Tata McGraw Hill Education Pvt Ltd)
3. Computer Vision and Image Processing, Adrian Low, Second Edition, B.S.Publications
4. Digital Image Processing using Matlab, Rafeal C.Gonzalez, Richard E.Woods, Steven L. Eddins, Pearson Education.
5. Digital Image Processing, William K. Prat, Wily Third Edition
6. Digital Image Processing and Analysis, B. Chanda, D. Datta Majumder, Prentice Hall of India.

## 305B Elective II: Mobile Computing

### UNIT 1:

**Introduction:** Mobile Communications, Mobile Computing–Paradigm, Promises/Novel applications and Impediments and Architecture; Mobile and Handheld Devices, Limitations of Mobile and Handheld Devices.

GSM–Services, System Architecture, Radio Interfaces, Protocols, Localization, Calling, Handover, Security, New Data Services, GPRS.

### UNIT-2:

**(Wireless) Medium Access Control (MAC) :** Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.

### UNIT-3:

**Mobile Network Layer :** IP and Mobile IP Network Layers, Packet Delivery and Handover Management, Location Management, Registration, Tunneling and Encapsulation, Route Optimization, DHCP.

### UNIT-4:

**Mobile Transport Layer:** Conventional TCP/IP Protocols, Indirect TCP, Snooping TCP, Mobile TCP, Other Transport Layer Protocols for Mobile Networks.

**Database Issues:** Database Hoarding & Caching Techniques, Client-Server Computing & Adaptation, Transactional Models, Query processing, Data Recovery Process & QoS Issues.

### TEXT BOOKS:

1. Jochen Schiller, —Mobile CommunicationsII, Addison-Wesley, Second Edition, 2009.
2. Raj Kamal, —Mobile ComputingII, Oxford University Press, 2007, ISBN: 0195686772

### REFERENCE BOOK:

1. ASOKE K TALUKDER, HASAN AHMED, ROOPA R YAVAGAL, —Mobile Computing, Technology Applications and Service CreationII Second Edition, Mc Graw Hill.
2. UWE Hansmann, Lothar Merk, Martin S. Nocklous, Thomas Stober, —Principles of Mobile Computing,II Second Edition, Springer.

## 305C Elective II: Cloud Computing

### UNIT 1:

**Systems modeling, Clustering and virtualization:** Scalable Computing over the Internet, Technologies for Network based systems, System models for Distributed and Cloud Computing, Software environments for distributed systems and clouds, Performance, Security And Energy Efficiency

### UNIT 2:

**Virtual Machines and Virtualization of Clusters and Data Centers:** Implementation Levels of Virtualization, Virtualization Structures/ Tools and mechanisms, Virtualization of CPU, Memory and I/O Devices, Virtual Clusters and Resource Management, Virtualization for Data Center Automation.

### UNIT 3:

**Cloud Platform Architecture:** Cloud Computing and service Models, Architectural Design of Compute and Storage Clouds, Public Cloud Platforms, Inter Cloud Resource Management, Cloud Security and Trust Management. Service Oriented Architecture, Message Oriented Middleware.

### UNIT 4:

**Cloud Programming and Software Environments:** Features of Cloud and Grid Platforms, Parallel & Distributed Programming Paradigms, Programming Support of Google App Engine, Programming on Amazon AWS and Microsoft Azure, Emerging Cloud Software Environments.

### TEXT BOOKS:

1. Distributed and Cloud Computing, Kai Hwang, Geoffry C. Fox, Jack J. Dongarra MK Elsevier.
2. Cloud Computing, Theory and Practice, Dan C Marinescu, MK Elsevier.
3. Cloud Computing, A Hands on approach, Arshadeep Bahga, Vijay Madiseti, University Press

### REFERNCE BOOK:

1. Cloud Computing, A Practical Approach, Anthony T Velte, Toby J Velte, Robert Elsenpeter, TMH
2. Mastering Cloud Computing, Foundations and Application Programming, Raj Kumar Buyya, Christen vecctiola, S Tammarai selvi, TMH

## 305D Elective II: Enterprise Application Integration

### UNIT I

**Defining EAI :** What Is EAI?, Applying Technology, How Did Things Get This Bad?, Chaos Today, Order Tomorrow.

**Evolution of Stovepipes:** Traditional Systems, Microcomputer Systems, Distributed Systems, Packaged Applications.

**Making the Business case for EAI:** The Virtual System, E-Business, Types of EAI.

### UNIT II

**Data-Level EAI:** Going for the Data, Data-Level EAI by Example, Database-to-Database EAI, Federated Database EAI.

**Consider the Data Source:** Relational Data, Object-Oriented, Multidimensional, Other Data Storage Models

**Application Interface-Level EAI:** Application Interfaces, What's an API?, Interface by Example, Approaching Application Interfaces, The Interface Tradeoff, Packaged Applications, Custom Applications.

### UNIT III

**Method-Level EAI:** Method-Level Example, What's a Process?: Scenarios, Rules, Logic, Data, Objects.

**Method Warehousing:** Leveraging Frameworks for EAI, Enabling Technology, Sharing Methods to Bind Your Enterprise.

**User Interface-Level EAI:** Leveraging User Interface-Level EAI, Going to the User Interface.

### UNIT IV

**The EAI Process—Methodology or Madness?:** Applying a Procedure/Methodology, Understanding the Enterprise and Problem Domain, Making Sense of the Data, Making Sense of the Processes, The Common Business Model, Identifying Application Interfaces, Identifying the Business Events, Identifying the Schema and Content Transformation Scenarios, Mapping Information Movement, Applying Technology, Testing, Testing, Testing, Considering Performance, Defining the Value, Creating Maintenance Procedures, Method or Madness?

### TEXT BOOKS

1. David S. Linthicum, Enterprise Application Integration, Addison Wesley Information Technologies Series, printed December 2003.

# PRACTICALS

## 306P: Dot Net Programming Laboratory

1. Design and develop a program to process electricity bill with the given condition by choosing console application.
2. Design and develop a program to demonstrate array of strings by using console application.
3. Design and develop a program to demonstrate exception handling by using console application.
4. Design and develop a VB.Net program for login form creation by using Windows form application.
5. Design and develop a VB.Net program for calculating simple interest and compound interest by using radio buttons.
6. Design and develop a VB.Net program to demonstrate ComboBox, ListBox and CheckedListBox.
7. Design and develop a VB.Net program to demonstrate Menu creation.
8. Design and develop a VB.Net program to demonstrate Status Bar.
9. Design and develop a VB.Net program for Single Inheritance.
10. Design and develop a VB.Net program for Graphics Handling.
11. Design and develop a VB.Net program to Create a Directory and Copy the selected file to the Directory.
12. Design and develop a VB.Net program to write a File using Console application.
13. Design and develop a web form for validating whether the person is eligible for vote or not.
14. Design and develop a Registration form to demonstrate validation controls in ASP.Net.
15. Design and develop a web form for demonstration of AdRotator control in ASP.Net.
16. Design and develop a form to s Inserting, deleteting, update and Searching records from database

### **307P : Cryptography & Network Security Laboratory**

1. write a programme to implement Ceaser Cipher.
2. write a programme to implement hill cipher.
3. write a programme to implement Simplified DES.
4. write a programme to implement Double EES
5. write a programme to implement Triple DES.
6. write a programme to implement different Modes of DES.
7. write a programme to implement RSA Algorithms.
8. write a programme to implement Diffie-Hellman Key exchange Algorithm.