## Semester-I

<table>
<thead>
<tr>
<th>Paper No.</th>
<th>Title of the Paper/s</th>
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<th>Internal Assessment</th>
<th>Total Maximum Marks</th>
<th>Total Minimum Marks</th>
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<tr>
<td></td>
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<td>Max.</td>
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<td>OOPs using JAVA</td>
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<td>Advanced Operating System</td>
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<td>6</td>
<td>Lab 2: Java Programming</td>
<td>100</td>
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Total Marks 600

## Semester-II

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<th>Paper No.</th>
<th>Title of the Paper/s</th>
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<td>Analysis and Design of Algorithm</td>
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<td>20</td>
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<td>Lab 3: RDBMS</td>
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Total Marks 600

**Note:** Internal assessment of 20 marks will consist of two parts -

1. Unit Test (10 Marks): Two tests will be conducted and average of these tests will be the marks of Unit Test.
2. Seminar/Assignment (10 Marks): To be conducted by the Department concerned.
### SEMESTER-III

<table>
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<th>Paper No.</th>
<th>Title of the Paper/s</th>
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<td>Lab 5: MATLAB</td>
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### SEMESTER-IV (In paper-2, Student have to choose any one Elective out of four)

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<th>Internal Assessment</th>
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<td>GRAND TOTAL 2400</td>
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UNIT–I
Evolution of Digital System & Logic Families
Semiconductor Materials, Types of Solids, Imperfections and Impurities in Solids, pn Junction Diodes, BJTs and other junction Devices, FET and MOSFET, Digital Electronic Signals and Switches, Diode and Transistor as a Switch, Logic Families – Significance and Types, Electrical characteristics of logic families, Comparison of Different Logic Families.

UNIT–II
Boolean concepts and Design of Combinational Circuits

UNIT–III
Design of Combinational Circuits
Implementing Combinational Circuits using K-Map: Half-Adder, Full Adder, Half-Subtractor, Full Subtractor, BCD Adder, Design of code converters, comparators and various Circuits: BCD to excess- 3 code and excess-3 to BCD converters, Binary to Gray Code and Gray Code to Binary Code converter, One & Two Bit Comparator, BCD to 7-segment decoder, BCD to 84-2-1 code converter and other code converter, Carry Propagation–Look-Ahead Carry Generator, Multipliers. Design of Multiplexers, Demultiplexers, Decoder and Encoder.

UNIT–IV
Design of Sequential Circuit

UNIT–V
Microprocessors System
Introduction to Microprocessors, Evolution of Microprocessors and family of microprocessor, Architecture of Microprocessor, Microprocessor Instructions, Addressing Modes and needs, Absolute or Memory Direct Addressing Mode, Immediate Addressing Mode, Register Direct Addressing Mode, Register Indirect Addressing Mode, Indexed Addressing Mode, Implicit Addressing Mode and Relative Addressing Mode.
Text Books:
1. Digital Electronics, William H. Gothmann, PHI
2. Introduction to Digital Systems, Palmer and Perlman, Tata Mc Graw-Hill
4. Digital Design, M. Mano, PHI
5. Microprocessors; Principal and Application, Gilmore, Tata Mc Graw-Hill
6. Circuit Design and Simulation with VHDL, V. Pedroni, MIT Press

Reference Book:
1. Digital Design, Samuel Lee, Pearson
2. The Intel Microprocessor- Architecture, Programming and Interfacing, Brey, PHI.
3. Introduction to Microprocessor for Engineers and Scientists, Hosh and Sridhar, PHI.
SEMESTER SYLLABUS
M.Sc. COMPUTER SCIENCE

SEMESTER-I
PAPER-II
ADVANCE COMPUTER NETWORK

UNIT–I
Basics of Data Communication

UNIT–II
Physical layer and Media

UNIT–III
Data Link Layer
Data link layer design issues: Services, Framing, Error detection and correction, Error and flow control, Stop-and-Wait protocol, Sliding Window protocol, HDLC, Channel allocation: Static and Dynamic allocation, Multiple Access Protocols: ALOHA, CSMA, Collision-free and limited-contention protocols, Virtual LAN, LAN and MANs: IEEE Standards for LAN and MAN, High Speed LAN, Bluetooth, Cellular telephony, Broadband wireless technologies, Wireless LAN, Transmission in ISDN, Broad Band ISDN, ATM Networks.

UNIT–IV
Upper Layers

UNIT–V
Advanced Concept and Network Security

Text Books:
2. Computer Networks, Andrew S. Tanenbaum, PHI / Pearson Education Inc.,
8. Introduction to Data Communications and Networking, Wayne Tomasi, Pearson Education Inc., New Delhi.

**Reference Books:**
3. Data & Computer Communication, Black, PHI.
4. Communication Networks, Walrand, TMH.
5. Internetworking with TCP/IP, Douglas E. Comer, and Prentice Hall India.
UNIT–I
An overview of Java

UNIT–II
Package, Applet, Swing and JDBC
Packages, Interfaces, and Encapsulation, Abstract Classes, , Graphic User Interface, Event Handling , Java Applets: Writing Applets Using Swing, Error Handling, Java Exceptions, Databases Using JDBC: JDBC Driver Types.

UNIT–III
Network-Socket Programming and JDBC

UNIT–IV
Servlet, Java Beans and JNDI

UNIT–V
Enterprise JavaBeans (EJB) and other APIs
Overview of EJB, Types of EJB, Stateless and Stateful Session Beans, Singleton Beans, Deploying EJB, Message-Driven Beans, Timer Service. Introduction to the Java Persistence API: Mapping Objects to Database Tables, JPQL, Overview of Spring MVC, Introduction to Hibernate Framework

Text Books:
2. Introduction to Programming with JAVA – A Problem Solving Approach , John Dean, Raymond Dean, Tata McGraw Hill
5. Introduction to Java Programming: comprehensive version, Y. Daniel Liang, Pearson Education

Reference Books:
5. Using JAVA 2, Joseph L weber, PHI
6. JSP Java Server Pages, Barry Burd, IDG Books India(p) Ltd
SEMESTER SYLLABUS
M.Sc. COMPUTER SCIENCE

SEMESTER-I
PAPER-IV
ADVANCED OPERATING SYSTEM

UNIT–I
Operating System Basics

UNIT–II
Processes and Process Control Strategy

UNIT–III
Memory Management and Scheduling

UNIT–IV
I/O Management and File Management

UNIT–V
Advance Topics of Operating System

Text Books:
2. Operating Systems, Madnick E., Donovan J., Tata McGraw Hill,
3. Operating Systems, A. S. Tannenbaum, PHI
Reference Books:
## SEMESTER-I
### LAB 1: DIGITAL ELECTRONICS

### SEMESTER-I
### LAB 2: JAVA PROGRAMMING

<table>
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<th>S. No.</th>
<th>Argument</th>
<th>Maximum Marks</th>
<th>Minimum Passing Marks</th>
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<td>1.</td>
<td>Viva-voce</td>
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<td>Program Development and Execution</td>
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<td><strong>Total Marks</strong></td>
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<td><strong>36</strong></td>
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</table>

**************First Semester**************
SEMESTER-II
PAPER-I
ANALYSIS AND DESIGN OF ALGORITHM

UNIT-I
Introduction:
Analysis of algorithms, asymptotic notations, Standard notations and common functions, Recurrence solution: Substitution method, iteration method and the master method, algorithm design techniques: basic

UNIT-II
Divide and Conquer
Binary search, Min-Max Problem, merge sort, quick sort, and Matrix Multiplication.
Introduction to NP-Completeness
The class P and NP, Polynomial reduction, NP-Completeness Problem, NP-Hard Problems

UNIT-III
Graph Algorithms
Undirected Graph, Directed Graph, Traversing Graphs, Representation of graphs, Breadth-first search, Depth-first search, strongly connected components, topological sort.

UNIT-IV
Greedy Method
Knapsack problem, Huffman codes, job sequencing with deadlines, Minimum Spanning trees: Prim’s and Kruskal’s algorithms, Single Source Shortest path: Dijkstra’s algorithm and Bellman Ford algorithms.

UNIT-V
Dynamic Programming
O/1 Knapsack problem, all Pair’s shortest paths: Warshal’s and Floyd’s algorithms, Single source shortest paths, Backtracking, Branch and Bound: Travelling Salesman Problem.

Text Books:

Reference Books:
1. A practical guide to data Structures and algorithms Using JAVA, Sally Goldman & Kenneth Goldman, CRC Press
SEMESTER-II
PAPER-II
RELATIONAL DATABASE MANAGEMENT SYSTEM

UNIT–I
Fundamentals of Relational DBMS
Data Models, Schemas and Instances, Data Abstraction, Data Independence, Codd’s 12 rules,
Overview & Architecture of commercial RDBMSs: Oracle, SQL Server, My SQL etc.,

UNIT–II
Entity - Relationship (ER) Model, Relational data model concepts, Database Language: SQL,
SQL Programming Techniques: DDL, DML, DCL query statements, Constraints and Triggers,
Views and Indexes, SQL in Server Environment. Data dependency, Functional dependencies
and Normalization of Relational Databases, First, Second and Third Normal forms, Boyce-Codd
Normal form (BCNF),

UNIT–III
Transaction Processing
ACID Properties of Transactions, Concurrency control, Serializability and Recoverability,
Transaction support in SQL, Locking Techniques, Time Stamp ordering, Validation Techniques,
Granularity of Data Items, Database recovery techniques - Shadow paging, Log Based
Detection, Avoidance and Recovery.

UNIT–IV
Object Model and Object-Oriented Databases
User defined abstract data types and structured types, Subclasses, Super classes, Inheritance,
Specialization and Generalization, Overview of Object-Oriented concepts, Database schema
design for OODBMS; OQL, Persistent programming languages; OODBMS architecture and
storage issues; Transactions and Concurrency control, Example of ODBMS, Query processing
and Optimization.

UNIT–V
Parallel and Distributed Databases and Client-Server Architecture
Architectures for parallel databases, Parallel query evaluation; Parallelizing individual
operations, Sorting, Joins; Distributed database concepts, Data fragmentation, Replication, and
allocation techniques for distributed database design; Query processing in distributed
databases; Concurrency control and Recovery in distributed databases. An overview of Client-
Server architecture.

Text Books:
   Education Inc., New Delhi.
2. Database Systems Concepts, Abraham Silberschatz, Henry F. Korth and S. Sudarshan,
   McGraw-Hill Education , New Delhi
3. Fundamentals of Database Management Systems, Mark L. Gillenson, Wiley India
4. Introduction To Database Systems, C.J.Date, Longman, Pearson Education

Reference Books:
2. Database Systems: Design, Implementation, and Management, Peter Rob & Carlos Coronel,
   CENGAGE Learning India Pvt. Ltd., New Delhi.
UNIT-I
Introduction
Data structure, Data types: primitive, non-primitive data types, ADT, Linear and non-linear data structure, Complexity and its Notation, List Structures:

Arrays
One dimensional, Multidimensional arrays, allocation methods, address calculations, sparse arrays.

Linked List
Singly and Doubly Linear link lists, singly and doubly circular linked list: Definitions, operations (INSERT, DELETE, TRAVERSE) on these list. (Insertion operation includes – insertion before a given element, insertion after a given element, insertion at given position, insertion in sorted linked list)

UNIT-II
Stack
Definition, Operations PUSH, POP, TRAVERSE, implementations using array and linked list, Applications of stack: Infix, Prefix, Postfix representation and conversion using stack, Postfix expression evaluation using stack, use of stack in recursion, Stacks in C++ Using Templates

Queue
Introduction, and Types of Queues: Priority Queue, Circular queue, Double Ended Queue, operations (INSERT, DELETE, TRAVERSE), implementation using array and linked list and applications.

UNIT-III
Tree

UNIT-IV
Sorting
Types of sorting, Sequential Sort, Insertion Sort, Bubble Sort, Quick Sort, Merge Sort, Heap Sort, Radix sort, complexity analysis of sorting techniques SEARCHING: Linear or sequential search, Binary search, Hashing, collision resolution methods.

UNIT-V
Graph
Definition of Graph, Basic Terminology types of Graph, adjacency and incident (matrix & linked list) representation of graphs, Graph Traversal – Breadth first Traversal, Depth first Traversal, Connectivity of graphs; Connected components of graphs, Weighted Graphs, Shortest path Algorithm, spanning tree, Minimum Spanning tree, Krushkal and prims algorithms.
Text Book:
2. Data Structures using C by A. K. Sharma, Pearson Education
6. Data Structures and Program Design in C, Robert Kruse, PHI.

Reference Books:
1. Theory & Problems of Data Structures, Jr. Symour Lipschetz, Schaum’s outline by TMH
4. Classical Data Structure, D. Samanta, PHI
5. Data Structures, schaum’s Outlines, Adapted by G A PAI
UNIT–I
Fundamentals of Software Engineering and Process models

UNIT–II
S/W Requirements and Design Engineering
Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management, System models: Context Models, Behavioral models, Data models, Object models, Design process and Design quality, Design concepts, the design model, software architecture, Fundamental issues in software design: Goodness of design, cohesions, coupling. Function-oriented design: structured analysis and design.

UNIT–III
Testing Strategies and Product metrics
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, Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

UNIT–IV
Testing Plan and Maintenance
Snooping for information, Coping with complexity through teaming, Testing plan focus areas, Testing for recoverability, Planning for troubles, Preparing for the tests: Software Reuse, Developing good test programs, Data corruption, Tools, Test Execution, Testing with a virtual computer, Simulation and Prototypes, Managing the Test, Customer’s role in testing, Software maintenance issues and techniques. Software reuse. Client-Server software development.

UNIT–V
Software Reengineering and Project Management
Software Reengineering, Evolution of Software Economics, Life Cycle Phases and Process artifacts, Model based software architectures, Software process workflows, Iteration workflows, Major milestones, Minor milestones, Periodic status assessments, Process Planning, Project Control and process instrumentation: Seven core metrics, management indicators, quality indicators, life-cycle expectations

Text Books:
Reference Books:
5. Software Project Management, Bob Hughes & Mike Cotterell, fourth edition, TMH.
SEMESTER-II
LAB 1: RDBMS

SEMESTER-II
LAB 2: DATA STRUCTURE

<table>
<thead>
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<td>Program Development and Execution</td>
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***************Second Semester***************
SEMESTER SYLLABUS
M.Sc. COMPUTER SCIENCE

SEMESTER-III
PAPER-I
THEORY OF COMPUTATION AND COMPILER DESIGN

UNIT-I
Automata, Regular Expressions and Languages
Principles of mathematical induction, Finite Automata (FA), Deterministic Finite Automata (DFA), Non-deterministic Finite Automata (NFA). Regular Expression, FA and Regular Expressions, Proving languages not to be regular, Closure properties of regular languages, Equivalence and minimization of Automata.

UNIT-II
Context-Free Grammars and Languages
Context-Free Grammar (CFG), Parse Trees, Ambiguity in grammars and languages, Definition of the Pushdown automata, Languages of a Pushdown Automata, Equivalence of Pushdown automata and CFG, Deterministic Pushdown Automata.

UNIT-III
Properties of Context-Free Languages, Undecidability
Normal forms for CFG, Pumping Lemma for CFL, Closure Properties of CFL, Turing Machines, A language that is not Recursively Enumerable (RE), An undecidable problem that is RE, Undecidable problems about Turing Machine, Post's Correspondence Problem.

UNIT-IV
Introduction to Compiling & Syntax Analysis
Compilers – Analysis of the source program, Phases of a compiler, Compiler construction tools, Lexical analysis, Role of lexical analyzer, Role of the parser, Writing grammars, Context-free grammars, Top down parsing, Bottom-up parsing, Shift reduce parsing, Operator precedence parsing, LR parsers, SLR parser.

UNIT-V
Code Generation & Optimization, Run Time Environments
Issues in the design of code generation, Basic blocks and flow graphs, A simple code generator – DAG representation of basic blocks, Peephole optimization, Principal sources of optimization, Optimization of basic blocks, Introduction to global data flow analysis, Runtime environments.

TEXT BOOK:

Reference Books:
UNIT I
Introduction
Overview of Artificial Intelligence (AI), Foundations of A.I., History of AI, Areas and state of the art in A.I., Knowledge: Introduction, Knowledge Based system, Knowledge representation techniques.

UNIT II
A.I. Programming Languages
Introduction to LISP, Basic list manipulation functions, Input/output and local variables, Lists and Arrays, simple program in LISP, Introduction to PROLOG.

UNIT III
Problems And Heuristic Search Techniques
Problem solving as state space search, production system, control strategies and problem characteristics; Search techniques: Breadth First, Depth-first search, Hill-climbing, Heuristics search, Best-First search.

UNIT IV
Knowledge Representation
Approaches and Issues, Frame, Conceptual dependency, Semantic Net, Scripts etc., Propositional Logic, First order Propositional Logic (FOPL), Conversion to clausal form, Inference rules, Resolution principal.

UNIT V
Expert System
Introduction, Application, Existing Expert systems. Components of typical expert system, Rule based system architecture,

Text Book:
1. Dan W. Patterson, Introduction to Artificial Intelligence and Expert Systems, PHI Publication.
2. Elaine Rich and Kevin Knight, Artificial Intelligence, TMH publication.
3. Ravi Bhusan Mishra, Artificial Intelligence, PHI learning privet limited.

Reference Books:
1. AI-Structures and Strategies for Complex Problem Solving, George Lugar, Pearson Educations.
4. Decision Support Systems and Intelligent Systems, Efraim Turban Jay E. Aronson, PHI.
UNIT–I
Introduction
What is soft computing? Different tools of soft computing and its comparison, Area of application.

UNIT-II
Artificial Neural Network (ANN)

UNIT-III
Fuzzy Logic

UNIT–IV
Genetic Algorithm
What is Optimization?, Introduction, Application, GA operators: selection, crossover and mutation , different techniques of selection , crossover and mutation, different types of chromosomes, Application of GA.

UNIT-V
Hybrid Soft Commuting

Text Books:
6. Neural Networks and Fuzzy Logic, K. Vinoth Kumar, R. Saravana Kumar, S. K. Kataria and Sons publication.
7. Fuzzy Sets, Uncertainty and Information, G. J. Klir and T.A. Folger, PHI learning private limited.

Reference Books:
4. Artificial Neural Networks, B. Yegnanarayana Prentice Hall of India P Ltd.
5. Neural networks in Computer intelligence, Li Min Fu, TMH.
6. Neural networks, James A Freeman & David M S kapura, pearson education
SEMESTER-III
PAPER-IV
.NET TECHNOLOGY

UNIT–I
Introduction
Introduction to .NET Technology, .NET Framework, and its evolutions, Components of .NET
CLR and Class Library Importance of MSIL, CTS etc., Class Libraries, Introduction to Visual

UNIT–II
C# Language
Basic, variable and Data Types, Arrays, Strings, type conversion operation, statement,
conditional statements, loop statements, Methods, class, object, properties, static member,
overloading, inheritance, constructor, events, partial class, namespace and assemblies,
Generics Collections, Threading.

UNIT–III
ASP.NET
Creating Websites, Designing Web form, Anatomy of a Web Form, Writing Code, ASP.NET
page life cycle,. Page class, Application events, ASP.NET configuration; Web controls: Textbox,
Picture, File Upload, Button Controls, List Controls, Input Validation Controls etc, Master Page
Basics, Website Navigation: Site Maps, Tree View Control, Menu Control.

UNIT–IV
Error Handling
Common Error, Exception Handling, Handling Exceptions, Creating and Throwing Your Own
Exceptions, ADO.NET Fundamentals: ADO.NET architecture, Connection class, Command
class, Data reader class, DataSet, DataAdopter class, DataView class.

UNIT–V
Data Binding
Basic Data Binding, Data Source Controls, SqlDataSource, ObjectDataSource; Rich Data
Controls: GridView, Formatting the GridView, GridView Row Selection, Sorting the GridView,
Paging the GridView, GridView Templates, ListView, DetailsView and FormView.

Text Books:
1. Professional Visual Studio 2013, Bruce Johnson, Wrox Publication
2. Beginning ASP.NET 4.5.1: in C# and VB, Imar Spaanjaars, Wrox Publication
3. Professional C# 5.0 and .NET 4.5.1, Christian Nagel, Jay Glynn, Morgan Skinner, Wrox
   Publication
4. Pro ASP.NET 3.5 in C# 2008, Matthew MacDonald and Mario Szpuszta, Wrox Publication
5. Pro ASP.NET MVC 3 Framework, Adam Freeman; Steven Sanderson, Apress
6. Professional ASP.NET MVC 3, Jon Galloway; Phil Haack; Brad Wilson; K. Scott Allen, Wrox
7. The Complete reference, ASP.NET, M M Donald, TMH

Reference Books:
1. Pro ASP.NET 4 in C# 2010, Matthew MacDonald; Adam Freeman; Mario Szpuszta, Apress
2. Microsoft® ASP.NET 4 Step by Step, George Shepherd, Microsoft Press
3. Programming Microsoft® ASP.NET 4, Dino Esposito, Microsoft Press.
### Break-up of marks for External Practical Examination

<table>
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<tr>
<th>Sr. No.</th>
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***************Third Semester***************
SEMESTER-IV
PAPER-I
ADVANCED TRENDS AND TECHNOLOGY IN COMPUTER SCIENCE

UNIT–I
Big Data Analytics
Applications: Product Selection, Design and Engineering, Location-Based Services, Online Advertising; Architecture Components: Massively Parallel Processing (MPP) Platforms, Unstructured Data Analytics and Reporting : Search and Count, Context-Sensitive and Domain-Specific Searches, Categories and Ontology, Qualitative Comparisons, Data Privacy Protection, Real-Time Adaptive Analytics and Decision Engines.

UNIT–II
Cloud Computing

UNIT–III
Grid Computing

UNIT–IV
Cluster Computing

UNIT–V
Pervasive Computing

Text Books:
1. Big Data Analytics: Disruptive Technologies for Changing the Game, Dr. Arvind Sathi, IBM Corporation.
9. Pervasive Computing: Technology And Architecture Of Mobile Internet Applications, Jochen Burkhardt, Horst Henn, Stefan Hepper, Klaus Rindtorff, Thomas Schaeck

Reference Books:
SEMESTER IV
PAPER-II
(Elective–I)
DATA MINING AND DATA WAREHOUSING

UNIT-I
Introduction
What is data mining, why it is important? Mining on what kind of data, Data mining Functionalities, steps of data mining, Knowledge discovery.

UNIT-II
Data Pre-processing and Data Warehouse
Why data pre-processing? Data Cleaning, Data Integration and Transformation, Data Reduction. Data Warehouse: Meaning, Definition, OLTP vs. OLAP, Data warehouse architecture, Data cube and OLAP technology

UNIT-III
Classification and prediction
What is classification and prediction?, Issue regarding classification and prediction, Classification by decision tree induction: CART, ID3 C4.5, CHAID etc. , Naive Bayesian classification, Rule based classification, Classification by backpropogation, Support vector machine, Association classification and other classification methods, Prediction using Linear and multiple regression and Neural Network methods, Accuracy measures, Ensemble methods.

UNIT-IV
Association Rule
Basic concept, Market Basket analysis, frequent item set mining: Apriori algorithm-Finding frequent itemsets using candidate generation, mining various kind of association rules: Mining Multilevel association rules, mining multidimensional association rules

UNIT-V
Cluster analysis and Data mining Tool
What is cluster analysis?, Partitioning method, Hierarchical methods, K-means clustering, Introduction of Data Mining tools, Experiments with WEKA data mining tool for data pre-processing, feature selection, classification, prediction, clustering and Association rule mining with experimental data of various domains.

Text Books
1. Data Mining: Concepts and Techniques, Jiawei Han, Micheline Kamber, Morgan Kaufmann Publishes (Elsevier, 2nd edition), 2006

Reference Books
SEMESTER IV
PAPER-II
(Elective-II)
COMPUTER GRAPHICS AND MULTIMEDIA

UNIT I
Introduction

UNIT II
Various Algorithms
Line Generation Algorithms: DDA algorithm, Bresenham’s algorithm; Circle Generation Algorithms: Midpoint Circle algorithm

UNIT III
Two Dimensional Viewing and Clipping
Window to Viewport coordinates transformation, Clipping operations, Point clipping, Line clipping: Cohen Sutherland Algorithm, Liang Barsky Algorithm, Nicholl-Lee-Nicholl Algorithm, Polygon clipping: Sutherland- Hodgeman Algorithm, Weiler Atherton Algorithm, Text clipping, Exterior clipping
Two Dimensional Transformations: Translation, Scaling, Rotation, Reflection, Shear

UNIT IV
Three Dimensional Viewing and Color Application
3D Geometry, 3D display techniques, transformations. Projections: Parallel Projection, Perspective Projection, Orthogonal Projection

UNIT V
Multimedia Technology
Framework for multimedia systems; multimedia devices; Multimedia Presentation and Authoring; professional development tools; Multimedia servers & databases; vector graphics; Animation techniques; Shading; Anti Aliasing; Morphing; Video on demand, Image Compression & Standards: Making still images; editing and capturing images; scanning images; JPEG-objectives and architecture; JPEG-DCT encoding and quantization, Overview of other image file formats as GIF, TIFF, BMP, PNG etc., Introduction to MPEG, MP3, MP4 etc.

Text Books:
5. Multimedia: Sound & Video, Lozano, 1997, PHI, (Que)

Reference Books:
5. Introduction to Computer Graphics By N. Krishanmurthy T.M.H 2002
SEMESTER-IV  
PAPER-II  
( Elective–III)  
EMBEDDED SYSTEM

UNIT–I  
Introduction to Embedded Systems  

UNIT–II  
AVR 8515 microcontroller  

UNIT–III  
The 8051 Micro controller & Embedded System Programming  

UNIT–IV  
Embedded System Software  
Design tradeoffs due to thermal considerations and Effects of EMI/ES etc., Software aspect of embedded systems: Challenges and issues in embedded software development, Co-design, Embedded Software Development Tools: Host and Target machines, Linker/Locators for Embedded Software, Embedded software development environments: Real time operating systems, Kernel architecture: Hardware, Task/process control subsystem, Device drivers, File subsystem, system calls, Embedded operating systems, Task scheduling in embedded systems: task scheduler, first in first out, shortest job first, round robin, priority based scheduling.

UNIT–V  
Development for embedded systems  
Embedded system development process, Determine the requirements, Design the system architecture, Choose the operating system, Choose the processor, Choose the development platform, Choose the programming language, Coding issues, Code optimization, Efficient input/output, Testing and debugging, Verify the software on the host system.

Text Books:  
5. Embedded System Design- A unified Hardware/software Introduction, Frankvahid/Tony Givargis, Pearson Education
6. Embedded Systems, Raj Kamal, TMH.

Reference Books:
2. AVR 8515 manual.
5. Embedding system building blocks, Labrosse, via CMP publishers.
6. Micro Controllers, Ajay V Deshmukhi, TMH.
UNIT-I
Classical Encryption Technique

UNIT-II
Symmetric cipher
Symmetric cipher model, Traditional block cipher: Stream and block cipher, Feistel cipher network structure, Design Principles of Block Ciphers, Data Encryption Standard (DES), Strength of DES Triple DES, Block cipher design principal, Block cipher operation, Advance encryption Standard (AES), Evaluation criteria of AES, AES transformation function, key distribution.

UNIT-III
Public Key cryptography and Hash Function
Principles of public key cryptosystem, requirement, RSA algorithm. Hash function, Key management: Diffie-Helman Key exchange, Man in the middle attack, elliptic curve arithmetic, elliptic curve cryptography, Application of cryptographic hash function, Hash and Message authentication Code (MAC), Hash and MAC algorithms, MAC based on hash function, Digital signature and Authentication protocol. Key management and distribution: Distribution of symmetric key and public key, Public key Infrastructure (PKI).

UNIT-IV
IP and Web security protocols

UNIT-V
System Security
Firewall, Intrusion Detection and prevention system (IDPS), Malicious Software.

Text Books

Reference Books
Important Guidelines for Major Project

A project report has to be submitted as per the rules described below:

1. **Number of Copies**: The student should submit one hard bound copy of the Project Report with one RW/CD/DVD.

2. **No of students**: Every student has to submit separate project.

3. **Acceptance / Rejection of Project Report**: The student must submit a project report to the Head of Department/Project Guide for approval. The Head of Department/Project Guide holds the right to accept the project or suggest modifications for resubmission.

4. **Format of the Project Report**: The student must adhere strictly to the following format for the submission of the Project Report
   
   a. **Paper**: The report shall be typed on white paper, A4 size or continuous computer stationary bond, for the final submission. The report to be submitted to the University must be original and subsequent copies may be photocopied on any paper.
   
   b. **Typing**: The typing shall be of standard letter size, double-spaced and on one side of the paper only, using black ribbons and black carbons.
   
   c. **Margins**: The typing must be done in the following margins
      
      Left ----- 35mm, Right ----- 20mm
      
      Top ----- 35mm, Bottom ----- 20mm
   
      i. **Binding**: The Report shall be Rexene bound in black, Plastic, spiral bound Project Reports not be accepted.
   
      ii. **Front Cover**: The front cover should contain the following details:
      
      TOP: The title in block capitals of 6mm to 15mm letters.
      
      CENTER: Full name in block capitals of 6mm to 10mm letters.
      
      BOTTOM: Name of the University, year of submission- all in block capitals of 6mm to 10mm letters on separate lines with proper spacing and centring.
   
      iii. **Blank Sheets**: At the beginning and end of the report, two white black bound papers should be provided, one for the purpose of binding and other to be blank.

5. **Abstract**: Every report should have an abstract following the Institute’s Certificate. The abstract shall guide the reader by highlighting the important material contained in the individual chapters, section, subsection etc.

6. **Certificates etc**: The report should contain the following:
   
   a. Certificate from Company
   
   b. Institute Certificate: Successful completion of project by competent authority.
   
   c. Acknowledgment
   
   d. List of Figures
   
   e. Tables
   
   f. Nomenclature and Abbreviations

7. **Contents of the Project Report**: The project report must contain following in form of chapter, however student may include any other relevant chapter(s):
   
   a. **Company Profile**: This chapter should highlight the company details. This would be chapter 1 and should include the main stream activity of the company, the product
line of the company and the details of the department where the student has carried out his/her project work. This should not exceed two pages or 800 words.

b. **Introduction to the project:** This chapter shall highlight the purpose of project work, it will also define the chapters to be followed in the Project Report.

c. **Scope of work:** Brief scope of the project work done

d. **Existing System and Need for proposed System:** If there is some system already in use, then give brief detail of it in order to help to understand the enhancements carried out by the student in the existing system.

e. **Operating Environment:** Hardware and Software required and used

f. **Proposed System:** Which may contain following:
   i. **Objectives to be fulfilled:** clearly define the objective(s) of the system.
   ii. **User Requirements:** State the requirements of the use in an unambiguous manner.
   iii. **Requirements Determination Techniques and Systems Analysis Methods Employed:** Use the formal methods to describe the requirements of the use like Fact Finding Methods, Decision Analysis, Data Flow Analysis etc.
   iv. **Prototyping:** If the prototypes has been developed prior to the detailed design, then give details of the prototype.
   v. **System Feature:** Which includes as follows:
      - Module specifications
      - D.F.D. and ER
      - System flow charts
      - Data Dictionary
      - Structure charts
      - Database/File layouts
      - Design of Input Design of Output screens and reports
      - User Interfaces
      - Design of Control Procedures

8. **Testing procedures and Implementation phase**

9. **Problems encountered, Drawbacks and Limitations**

10. **Proposed Enhancements/ Future enhancement**

11. **Conclusions**

12. **Bibliography**

**Annexure**

The break-up of marks for forth semester’s Major Project will be as under:

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************ Fourth Semester************