SRM UNIVERSITY
Faculty of Science & Humanities
Master of Science in Information Technology
CHOICE BASED CREDIT SYSTEM
REGULATIONS
(w.e.f. 2011 - 2012)

1. Aim of the Course

The course strives to inculcate job-oriented and value based quality education in Information Technology and Commercial Application Development. . At the end of the course, the students will be well-versed, particularly in core subjects with quality in inter-personal and professional skills.

2. Eligibility for Admission

A Candidates who has passed any Bachelor's degree of not less than three years duration having studied Mathematics or Statistics or Business Mathematics or Business Statistics or Mathematical Physics as Main or Allied subject or any other degree course from any other University accepted as equivalent thereto.

3. Duration of the Course

The Course duration shall be for two years consisting of four semesters. In order to be eligible for the award of the degree the candidate shall successfully complete the course in a maximum period of four years from the date of enrolment for the first semester of the course.

4. Choice Based Credit System

The University follows the '**Choice Based Credit System (CBCS)**' for all its programmes. Each credit is worth 12 hours of student study time, comprising all learning activities. Thus a four-credit course involves 48 study hours. This helps the student to understand the academic effort and to successfully complete a course.

A candidate shall be eligible for the award of the degree only if he/she has undergone the prescribed course of study in the University for a period of two academic years and passed the examination of all the four semesters earning 95 credits.

5. Structure of the Course and Evaluation Pattern

Internal Marks: 50 External Marks: 50

The duration of University examination for both theory and practical subjects shall be 3 hours. The maximum marks for each theory and practical course is 100. Continues Internal Assessment (CIA) will be 50. The university theory examination will be conducted for 100 marks, which will be then converted to 50 in order to add with continues internal assessment to make 100 marks for the course.

For the conduct of University examinations in practical, the question paper for the practical examination will be set by both internal and external examiners appointed by the University.

6. Procedures for Awarding Marks for Internal Assessment

THEORY COURSES

For regularity and discipline	- 10 Marks
For two assignment (Equal weightage)	- 10 Marks
For two tests to be conducted (Equal weightage)	- 20 Marks
Model examination	- 10 Marks
Total	- 50 Marks

PRACTICAL COURSES

For regularity and discipline	- 10 Marks
Completion of all Experiments prescribed for the course	- 20 Marks
Observation Record	- 10 Marks
For model Examination at the end of the Semester	- 10 Marks
Total	- 50 Marks

In the case of CIA, a candidate who secures not less than 40% of total marks prescribed for any course shall be declared to have passed for that course, failing which the candidate has to redo the academic activities prescribed for the continuous internal assessment (CIA).

7. Requirements for the completion of the semester

The candidate who has fulfilled the following conditions shall be deemed to have satisfied the requirements for the completion of the semester.

1. He/ She secures not less than 75% of overall attendance in that semester taking into account the total no of periods in all courses put together attended by the candidate as against the total no of periods in all courses offered during that semester. Condo- notion of attendance up to 10% is permitted on medical grounds. Relaxation in attendance is permitted up to 10% for the student who represents the university in sports and games. The above two relaxation cannot be taken concurrently.

2. He / She earn a progress certificate from the head of the institution for having satisfactorily completed all the courses pertaining to that semester as judged by Internal Assessment. A Student is expected to have scored not less than 40% in internal Assessment.

3. His / Her conduct has been satisfactory throughout the semester. Candidates who do not complete the semester will not be permitted to write the end semester Examination and are not permitted to go the next semester. They are required to repeat the incomplete semester in the next academic year.

8. Requirements for Proceeding to Subsequent Semester

i. Candidates shall register their name for the First Semester Examination after the admission in the P.G. course.
ii. Candidates shall be permitted to proceed from the First Semester up to Final Semester irrespective of their failure in any of the Semester examinations subject to the condition that the candidates should register for all the arrear subjects of earlier semesters along with current (subsequent) semester subjects.
iii. Candidates shall be eligible to go to subsequent semester, only if they earn sufficient attendance as prescribed thereof by the University from time to time.

Provided in the case of candidate earning less than 50% of attendance in any one of the semesters due to any extraordinary circumstance such as medical grounds, such candidates who shall produce Medical Certificate issued by the Authorized Medical Attendant (AMA), duly certified by the Dean, Faculty of Science & Humanities, shall be permitted to proceed to the next semester and to complete the course of study. Such candidates will have to repeat the missed semester by rejoining after completion of final semester of the course, after paying the fee for the break of study as prescribed by the University from time to time.

9. Examinations

1. The end semester examinations will ordinarily be conducted during October to December in the odd semesters and during March to May in the even semesters. For all the theory courses question papers will be set by external examiners and valued by external and/or internal examiners.

2. All practical examinations including the project work viva voce will be conducted by internal & External examiners appointed by the University

3. The project work report/thesis will be evaluated by the External examiner and the thesis viva Board consists of HOD, Internal Examiner (Guide), and External Examiner.

10. Software Project – Final Semester

Total Marks: 100

- The Project work can be either carried out in any Industry/University/Institute.
- A Coordinator will be appointed by the HOD to coordinate the Project Work.
- Internal guides from the department will be assigned to the students.
    - As soon as a student gets the project work, he/she has to sent the contact details of the organization and the external guide to the department Project title and the Platform
    - Address of the Organization (Phone, Fax number, E-mail address, URL)
    - Address for Communication
    - Telephone / Mobile number (Personal) / Personal E-mail ID.
- Periodically (weekly) the students should submit project Task Report to their internal guide.
- Two Reviews will be conducted before the Final Viva-Voce.
- The Project work should be an independent one; if the project is a part of a bigger project, the student's work should have a few independent modules.
- If more than one student is working on parts of the same project (big enough to share) the report of each student should be different and not two copies of the same report.

Evaluation Scheme

- Internal Guide (Continuous Assessment) 40 Marks
- External Examiner Project Report 40 Marks

- An External Examiner will conduct the Viva Voce along with the respective Internal Guide for 10 marks each.
- If a student fails in final semester software project then the student has to perform the set of activities required for it. The student has to appear for the review fixed by the department and should also appear for the semester exam viva voce.

11. Passing Minimum

1. A candidate shall be declared to have passed in each paper / practical / Mini Project and Viva-voce, if he / she secures not less than 50% of marks (the continuous internal assessment (CIA) and the University examinations (External) put together), provided a minimum of 50% of marks secured in the University examination and a minimum of 50% in Continuous Internal Assessment.

2. If a candidate fails to secure a pass in a particular course, it is mandatory that he/she shall register and reappear for the examination in that course during the next semester when examination is conducted in that course. He / She should continue to register and reappear for the examination till he/she secures a pass. However, the internal assessment marks obtained by the candidate in the first attempt shall be retained and considered valid for all subsequent attempts. If a candidate fails to secure 50% of the marks prescribed in Continuous Internal Assessment, he has to redo the academic activities prescribed for the same.

12. Award of Letter Grade

All assessment of course will be done on absolute marks basis. However for the purpose of the reporting the performance of a candidate, letter grades, each carrying certain points, will be awarded as per the range of total marks (out of 100) obtained by the candidate as detailed below.

Range of total marks	Letter Grade	Grade Points
90 – 100	S	10
80 – 89	A	9
70 – 79	B	8
60 – 69	C	7
50 – 59	D	6
40 – 49	E	5
0 – 39	F	0
Incomplete	I	0
Withdrawal	W	0

“F” denotes failure in the course
“I” denotes incomplete and hence prevented from writing end semester examination.
“W” denotes withdrawal from the course. After results are declared, Grade sheets will be issued to each student, containing the list of courses enrolled during semester and the grade scored the grade point average (GPA) for the semester and the Cumulative Grade point average (CGPA) of all courses enrolled from first semester onwards.

GPA is the ratio of the sum of the products of the number of credits of courses registered and the points corresponding to the grades scored in those courses, taken for all the courses, to the sum of the number of credits of all the courses in the semester.

GPA = (C*GP)/ C Where CGPA will be calculated in a similar manner, considering all the courses enrolled from first semester.

13. Eligibility for the Award of the Degree

A Student shall be declared to be eligible for the award of the Degree provided if,

1. The student has successfully completed the course requirements and has passed all the prescribed examinations in all the four semesters within a maximum period of four years reckoned from the commencement of the first semester to which the candidate was admitted.
2. No disciplinary action is pending against him/her.

14. Classification of the Degree Award

1. A candidate who qualifies for the award of the degree having passed the examination in all the courses in his/her first appearance securing a CGPA of not less than 8.00 shall be declared to have passed the examination in First Class with distinction

2. A candidate who qualifies for the award of the degree having passed the examination in all the courses within four semesters from the date of joining for study securing a CGPA of not less than 6.5 shall be declared to have passed the examination in First class

3. A candidate who qualifies for the award of the degree having passed the examination in all the courses securing a CGPA of not less than 5.0 shall be declared to have passed the examination in Second class

4. All other candidates who qualify for the award of the degree shall be declared to have passed the examination in Third class

5. A candidate who is absent in semester examination in a course / project work after having enrolled for the same shall be considered to have appeared in that examination purpose for classification.

15. Pattern of Question Paper (Theory)

Time 3 hours Max Marks 100

Part - A: (10 X 2 = 20 Marks)
All questions are to be answered. Two questions from each Unit

Part - B (5X 7 = 35 Marks)
Five Questions are to be answered, Two questions from each unit in the **either or pattern**

Part -C (3 x 15 = 45 Marks)
Three Questions are to be answered out of five questions – one question from each unit

Marks secured by the candidate will be converted to 50 to make the aggregate 100, while adding with continuous Internal Assessment 50.

16. Pattern of Question Paper (Practical)

Time: 3 Hours Max: 100 Marks.

One compulsory problem (may contain subdivisions) to be solved within 3 hours. The External Examiner will set a question paper on the spot with the help of the question bank.

Each student will get a single question to be answered. The question will have two subdivisions (2 x 20 = 40) and 10 for Record. No more than three candidates should get the same question in a batch.

17. Temporary Break of Study from a Programme

1) A candidate is not normally permitted to temporarily break study. However if a candidate intends to temporarily discontinue the programme in the middle for valid reasons (Such as accident or hospitalization due to prolonged ill health) and rejoin the programme in a later year he/she shall apply to the Head of the Institution in advance but not later than the last date for registering for the final examinations of the year in question. Such applications should be routed through the Head of the department and the Head of the institution stating the reason for break of study.

2) The Candidate who rejoins the programme after the break shall be governed by the rules and regulations in force at the time of rejoining.

3) The duration specified for passing all the courses for the purpose of classification vide shall be increased by the period of such break of study permitted.

4) The total period for completion of the programme should be reckoned from the commencement of the first semester to which the candidate was admitted and shall not exceed the maximum period specified in clause irrespective of the period of break of study in order that he/she may be eligible for the award of the degree.
5) If any student is detained for want of requisite attendance, progress and good conduct, the period spent in that semester shall not be considered as 'Break of Study'.

18. Discipline

Every student is required to observe disciplined and decorous behavior both inside and outside the college and not to indulge in any activity which will tend to bring down the prestige of the University/College. Boys should wear decent dresses. No casual wear like T – shirts or jeans pant is permitted. Girls shall wear decent dresses like churidars with Thuppattas and sarees.

19. Revision of Regulation and Curriculum

The University may from time to time revise, amend or change the regulations, scheme of examinations and syllabi as found necessary.

20. Authority of Board of Studies

The Board of Studies has the full authority to change the syllabus any time according to IT trend.

21. Procedure in Event of Failure

1. If a candidate fails in a particular subject (Other than project work) he/she may appear for the university examination in that subject in subsequent semesters and obtain pass marks.

2. In the event of failure in project work, the candidates will reregister for project work and redo the project work in a subsequent semester and resubmit the dissertation a fresh for evaluation. The internal assessment marks will be freshly allotted – in this Case.

22. Structure of the Course

The main subjects of study for Post Graduate Degree Course shall consist of the following.

1. **Core Courses**
2. **Technology Electives**
3. **Domain Electives**

M.Sc. INFORMATION TECHNOLOGY

COURSE STRUCTURE

Course Code	Course Name	L	P	C
SEMESTER – I				
MIT101	Optimization Techniques	4	0	4
MIT102	Software Engineering	4	0	4
MIT103	Data Structures	4	0	4
MIT104	Advanced Database Management Systems	4	0	4
MIT105	Java Programming	4	0	4
MIT106	RDBMS Lab	0	4	2
MIT107	Java Programming Lab	0	4	2
MIT108	Information Literacy **(Internal Assessment Only)**	2	0	2
SEMESTER – II				
MIT201	Object Oriented Analysis and Design	4	0	4
MIT202	Internet Concepts and Web Design	4	0	4
MIT203	Software Process	4	0	4
MIT204	Advanced Operating Systems	4	0	4
MIT205	Windows Application using .NET	4	0	4
MIT206	Windows Application using .NET Lab	0	4	2
MIT207	Web Technology Lab	0	4	2
MIT208	Software Documentation **(Internal Assessment Only)**	2	0	2
SEMESTER – III				
MIT301	Open Source Technologies	4	0	4
MIT302	Computer Networks	4	0	4
MIT303	Technology Elective	4	0	4
MIT304	Domain Elective – I	4	0	4
MIT305	Domain Elective – II	4	0	4
MIT306	Information Storage and Management	4	0	4
MIT307	Technology Elective Lab	0	4	2
MIT308	Quantitative Aptitude Techniques **(Internal Assessment Only)**	2	0	2
SEMESTER – IV				
MIT401	Software Project	0	0	15

TECHNOLOGY ELECTIVE(S)

MIT303T11. Web Applications using .NET

MIT303T12. Advanced Enterprise Java Programming

Domain Elective(S)

Domain Elective - I

MIT304E11. Game Programming

MIT304E12. Cryptography and Network Security

MIT304E13. Software Testing and Quality Assurance

Domain Elective - II

MIT305E21. Grid and Cloud Computing

MIT305E22. Mobile Computing

MIT305323. Algorithms for Bio-Informatics

Skill Development Courses (Internal Assessment Only)

Total Marks: 100 (For Each Course)

MIT108. Information Literacy

MIT208. Software Documentation

MIT308. Quantitative Aptitude Techniques

Note: Internal Assessment Shall be done by Assigning Seminars, Assignments, Group discussions, Presentations and Class tests.

SEMESTER – I

OPTIMIZATION TECHNIQUES

UNIT I

Overview of Operations Research – Concept of Linear Programming Model – Graphical Method – Linear Programming Methods – Duality

UNIT II

Transportation Problem – Assignment Problem – Network Techniques

UNIT III

Integer Programming – Formulations – Cutting-plane Algorithm – Branch-and-Bound Technique – Zero-One Implicit Enumeration Technique

UNIT IV

Inventory Control – Queuing Theory – Decision Theory – Game Theory

UNIT V

Dynamic Programming – Project Management – Replacement and Maintenance Analysis

TEXT BOOK

R.Panneerselvam, "Operations Research ", Prentice Hall of India, 2002. Chapters 1 to 13.

REFERENCES

S.Dharani Venkatakrishnan, "Operations Research – Principles And Problems", Keerthi Publishing House, 1992.

Kanti Swarup, Manmohan, P.K.Gupta, " Operations Research", Sultan Chand & Sons, 1991.

I – SEMESTER

SOFTWARE ENGINEERING

1. INTRODUCTION TO SOFTWARE ENGINEERING

Basic Concept about Software Engineering, Professional and ethical responsibility - Socio-technical Systems: Emergent system properties, Systems engineering, Organizations, people and computer systems, Legacy systems - Critical Systems: A simple safety-critical system - Software Processes: Software process models - Process iteration - Process activities - Rational Unified Process - Computer-aided software engineering - Project Management: Management activities - Project planning - Project scheduling - Risk management.

2. REQUIREMENTS ENGINEERING AND ANALYSIS MODEL

Software Requirements: Functional and non-functional requirements - User requirements - System requirements - Interface specification - 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.

3. DESIGN Architectural Design - Architectural design decision, System organization, Decomposition styles, Control styles, Reference architectures - Distributed Systems Architecture: Multiprocessor architectures, Client-server architectures, Distributed object architectures - Application Architectures: Data processing systems - Transaction processing systems - Object-oriented Design: Objects and object classes - An object-oriented design process- Design evolution - User Interface Design : Design issues - User interface design process-User analysis - User interface prototyping - Interface evaluation.

4. SOFTWARE DEVELOPMENT AND TESTING Rapid Software Development: Agile methods, Extreme programming, Rapid application development, and Software prototyping - Component-based Software Engineering: Components and component models -The CBSE process - Component composition. - Verification and Validation: Planning Verification and validation, Software inspections, Automated static analysis, Verification and formal methods - Software Testing: System testing, Component testing, Test case design, Test automation.

5. MANAGEMENT, QUALITY AND CONFIGURATION

Managing People: Selecting staff, Motivating people, Managing groups, People Capability Maturity Model - Software Cost Estimation: Software productivity, Estimation techniques, Algorithmic cost modeling, Project duration and staffing - Quality Management: Process and product quality - Quality assurance and standards- Quality planning- Quality control- Software measurement and metrics - Configuration Management: Configuration management Planning - Change management - Version and release management- System building- CASE tools for configuration management.

TEXT BOOK

Ian Sommerville, "Software Engineering", 7th Edition, Addison Wesley, 2004.

Unit I : Ch. 1, 2, 3, 4, 5

Unit II : Ch. 6, 7, 8

Unit III: Ch. 11, 12, 13, 14, 16

Unit IV: Ch. 17, 19, 22, 23

Unit V : Ch. 15, 26, 27, 29

REFERENCES

Roger Pressman, "Software Engineering A practitioner's Approach", 6th Edition, McGraw-Hill International Edition, 2005.

Pankaj Jalote, "An Integrated Approach to Software Engineering", Second Edition, Narosa Publishing House, 1997.

SEMESTER – I

DATA STRUCTURES

1. ORDERED LIST AND POLYNOMIALS

Abstract Data Types – Arrays - Representation of Arrays - Operations on Arrays - Ordered List- Polynomial: Representation, Addition, Multiplication -Sparse Matrices.

2. LISTS, STACK AND QUEUE

Singly Linked Lists - Circular Linked Lists - Doubly Linked Lists - General Lists-Stacks – Queues - Evaluation of Expressions-Multiple Stacks and Queues.

3. TREES

Trees - Binary Trees - Binary Tree Traversals - Binary Tree Representations - Binary Search Trees - Threaded Binary Trees – Additional Binary Tree Operations- Heaps –Selection Trees - Set Representation.

4. GRAPHS

Representations of Graphs - Graphs Implementation - Graph Traversals - Application of Graph Traversals - Minimum Cost Spanning Trees - Shortest path Problems – Activity Networks.

5. HASHING AND ADVANCED TREES

Symbol Table – Static Hashing : Hash Tables – Hashing Functions – Overflow Handling - AVL Trees – 2-3 Trees - Red-Black Trees – B-Trees - Splay Trees.

TEXT BOOKS

E.Horwitz, S. Sahni and Mehta, "Fundamentals of Data Structures in C++", Galgotia,1999.

Gregory L. Heileman, "Data Structures, Algorithms and object Oriented Programming", McGraw Hill International Edition, 1996.

REFERENCES

Robert Kruse & Clovis L. Tondo, ―Data Structures and Program Design in C‖, Prentice Hall, 2nd edition, 1991.

Weiss, ―Data Structures and Algorithm Analysis in C‖, Addison Wesley, Second Edition, 1997.

SEMESTER – I

ADVANCED DATABASE MANAGEMENT SYSTEMS

RELATIONAL MODEL & DATABASE DESIGN

Structure of Relational Database – Relational Algebra – Relational Query Languages: Introduction – SQL – ER Model : Basic ER Concepts – ER Diagram Symbols – Enhanced Entity Relationship Model(EER) : Specialization and Generalization. DBLC - Functional Dependency Diagram and Examples – Lossy Decomposition-Lossless-join Decomposition. Normalization: Boyce-Codd Normal Form – Multi-valued Dependencies and Fourth Normal Form – Join Dependencies and Fifth Normal Form.

2. QUERY, TRANSACTION PROCESSING & CONCURRENCY CONTROL

Query Processing – Syntax Analyzer – Query Decomposition and Optimization – Cost Estimation in Query Optimization – Pipelining and Materialization – Structure of Query Evaluation Plans – Transaction Processing and Concurrency Control – Transaction Concepts – Concurrency Control Locking Methods for Concurrency Control.

3. DATABASE RECOVERY AND SECURITY

Database Recovery Concepts – Types of Database Failures – Types of Database Recovery – Recovery Techniques – Buffer Management – Database Security – Goals of Database Security – Discretionary Access Control – Mandatory Access Control – Firewalls – Statistical Database Security – Data Encryption.

4. PARALLEL AND DISTRIBUTED DATABASES

Parallel Database Systems: Introduction – Parallel Databases – Architecture – Key Elements of Parallel Database Processing – Query Parallelism. Distributed Database Systems: Introduction – Distributed Databases – Architecture – Distributed Database System Design – Distributed Query Processing – Concurrency Control – Recovery Control.

5. EMERGING DATABASE TECHNOLOGIES

Data Warehousing: Evaluation-Main Components-Characteristics-Benefits-Limitations-Architecture. Data Mining: Process-Knowledge Discovery-Goals-Tools-Applications Emerging Databases: Spatial Data-Spatial Database Characteristics-Spatial Database queries-Techniques of Special Database Query

TEXT BOOKS

Singh. S. K., “Database Systems” Concepts, Design and Applications‖, Pearson Education Publications, New Delhi, 2006.

REFERENCES

Abraham Silberschatz, Henry F. Korth and S. Sudarshan, “Database System Concepts”, 5th edition, McGraw-Hill, International Edition, 2006.

Elmasri et al, “Fundamentals of Database Systems”, Pearson Publications, New Delhi,2006.

Jeffrey A. Hoffer, Mary B. Prescottand Fred R. McFadden, “Modern Database Management”, Prentice Hall, 2007.

C.S.R. Prabhu, “Data Warehousing – Concepts, Techniques, Products and Applications”, Prentice Hall, 2004.

C.S.R. Prabhu, “Object-Oriented Database Systems: Approaches and Architectures”, Prentice Hall, 2nd edition, 2005.

Rajesh Narang, “Object Oriented Interfaces and Databases”, Prentice-Hall of India, Pvt.Ltd., 2004.

SEMESTER – I

JAVA PROGRAMMING

1. BASICS

OOP and Java - Objects and Classes, Encapsulation, Inheritance, Polymorphism, Java Language, The Primaries – Character Set, Tokens, Constants, Variables, Operators and Expressions, Library Methods, Strings, I/O Streams, Formatting the Output values, Control Statements – If, Switch, While, Do-While-for.

2. ARRAYS AND OO FEATURES

One, Two dimensional Arrays, Methods – General form, invoking, method overloading, recursion, Classes and objects – General form, creation, constructors, constructor overloading, copy constructor, 'this' keyword, Static members, finalize method, Inner class and anonymous classes, Inheritance – inheriting, abstract classes and final classes, Interfaces – structure, implementation, interface inheritance.

3. PACKAGES, APPLETS AND THREADING

Packages – Package Hierarchy, Import Statement, Hiding the Classes, Access Control Modifiers, Applets – Life Cycle, Applet Class, Syntax of Applet Tag, Methods in Graphics Class, Threading – Life Cycle, Creating and Running, Methods in Thread Class, Priority Thread, Synchronization, Dead Lock, Inter Thread Communication, Applets Involving Threads.

4. AWT AND EXCEPTION HANDLING

Events, Listeners, Event Handling Methods, Inheritance of Control Classes, Labels, Button Control, Check Box Control, Radio Button, Choice Control, List Control, Scroll Bars, Layouts and Panel, Windows and Frames, Menus and Dialogs, Mouse Events and Listeners, Adapter Class and Inner Class, Exception Handling – Default Exception – User Defined Exception Handling, Exception and Error Classes, Catch Block Searching Pattern, Throw and Throws.

5. NETWORKING, JDBC AND FILES

Networks, Domain Names and Protocols, Layers in Network Communication, Ports, TCP, Server Socket Class, Socket Class, UDP Approach, JDBC – Establishing Connection, Creating Tables, Enter Data, Table Updation, Use Of Prepared Statement, Obtaining Metadata, Using Transactions, Files – Creation, Reading/Writing Characters/Bytes/Primitive Data Types, Random Access Files.

TEXT BOOK

Muthu C, "Programming in Java", Thompson Learning, 2004.

REFERENCES

Herbert Schildt, "The Complete Reference – Java 2", 4th Edition, Tata McGraw Hill, 2001.
Keyur Shah, "Gateway to Java Programmer Sun Certification", Tata Mc Graw Hill 2002.
Balaguruswamy, "Programming with JAVA", 2nd Edition, Tata McGraw Hill, 1999.

I – SEMESTER

RDBMS LAB

Experiments are to be carried out in ORACLE / MySQL with the required front end software

1. **Study of SQL:** Primitive Data Types – User Defined data Types – Built-in Functions – Parts of Speech of create, alter, drop, select, insert, delete, update, commit, rollback.

2. **Study of Query Types:** Queries involving Union, Intersection, Difference, Cartesian product, and Divide Operations – Sub Queries – Join Queries – Nested Queries – Correlated Queries Recursive Queries.

3. **Study of PL/SQL:** Blocks, Exception Handling, Functions, Procedures, Cursors, Triggers, Packages.

4. **Application:** Design and develop any two of the following:
• Library Information System
• Students‘ Information System
• Hotel Management System
• Inventory Control
• Employee Information System
• Payroll System
• Any other Similar System

Note:

1. *Clearly mention the scope of the system. Use standard tools for expressing the design of the systems.*
2. *Frontend should be Java*

I – SEMESTER

JAVA PROGRAMMING LAB

1. I/O Streams

2. Method Overloading and Overriding

3. Class and Objects

4. Static members

5. Inheritance and Interfaces

6. Packages

7. Applets

8. AWT 1 with controls, panels,

9. AWT 2 with menus and layouts

10. Inter thread communication and deadlock avoidance.

11. Exception Handling

12. Socket programming

13. JDBC

14. Files

SEMESTER – II

OBJECT ORIENTED ANALYSIS AND DESIGN

1. MODELING IN GENERAL

Object Oriented development – Evidence for Usefulness of Object Oriented development - Modeling Concepts: Modeling – Abstraction - The Three Models – Overview of Unified Modeling Language and introduction to UML diagrams.

2. CLASS MODELING

Class Modeling: Object and Class Concepts – Link and Association Concepts -Inheritance - Sample Class Model - Navigation of Class Models - Advanced Class Modeling: Advanced Object & Class Concepts - Association Ends -N-ary Associations – Aggregation - Abstract Classes - Multiple Inheritance –Metadata – Reification – Constraints - Derived Data – Packages.

3. DYNAMIC MODELING

State Modeling: Events – States – Transitions & Conditions - State diagrams - State Diagram Behavior - Advanced State Modeling: Nested State Diagrams - Nested States - Signal Generalization – Concurrency - Sample State Model - Relation of Class & State Models - Interaction Modeling: Use Case Models - Sequence Models - Activity Models - Advanced Interaction Modeling: Use Case Relationships - Procedural Sequence Models - Special Constructs for Activity Models.

4. SYSTEM ANALYSIS

Process Overview: Development Stages - Development Life Cycle - System Conception: Devising a System Concept - Elaborating a Concept- Preparing a problem Statement - Domain Analysis: Overview of Analysis - Domain Class Model - Domain State Model - Domain Interaction Model - Iterating the Analysis - Application Analysis: Application Interaction Model -Application Class Model - State Model – Operations.

5. SYSTEM DESIGN

System Design: Overview of System Design - Estimating performance - Making a Reuse plan - Breaking a System into Subsystems - Identifying Concurrency-Allocation of Subsystems - Management of Data Storage - Handling Global Resources - Choosing a Software Control Strategy - Handling Boundary Conditions -Setting Trade-off Priorities - Common Architectural Styles - Architecture of the ATM System - Class Design: Bridging the Gap - Realizing Use Cases - Designing Algorithms - Recursing Downward – Refactoring - Design Optimization - Reification of Behavior -Adjustment of Inheritance – Organizing Class Design.

TEXT BOOK

Object-Oriented Modeling and Design with UML, Michael Blaha and James Rumbaugh, Prentice Hall of India Private Limited, New Delhi, 2006.

REFERENCES

Object-oriented Systems Development using UML, Ali Bahrami, McGraw Hill, Boston, 1999.

SEMESTER – II

INTERNET CONCEPTS AND WEB DESIGN

1. INTERNET CONCEPTS

Internet Concepts – Domain Name Service – Online Chatting, Messaging and Conferencing Concepts – Usenet Newsgroup Concepts –World Wide Web Concepts – Web Security: Privacy and Site – Blocking- Browsers : IE, Netscape, Opera – Web Servers: IIS, Apache- Web Site Creation Concepts: Planning Your Web Site - Creating Your Site - Publishing Your Site - Publicizing Your Site

2. HTML

Web Technologies – HTML - Structure of a Page – Dynamic and Static Pages – Basic Document Structure – Attribute Groups – Text Formatting – Presentational, Phrase Elements – Lists - Editing Text - Character Entities for Special Characters – Links and Navigation - Links – Directories and Directory Structures – Creating Links– Colors, Images and Objects – Using Images as Links – Tables– Basic Table Elements and Attributes –Advanced Tables – Accessibility issues with Tables.

3. ADVANCED HTML

Forms – Form Controls – Label - structuring forms – Focus- Frames – The Frameset, Frame No- frames elements – Creating Links between Frames – Nested Framesets- Depreciated and Browser Specific Mark up – Fonts- Backgrounds – Formatting – Links – Lists – Tables- Miscellaneous Attributes – Cascading Style Sheets – CSS – CSS properties – Text Formatting – Text Pseudo-Classes– Selectors – Lengths - Percentages – More CSS – Backgrounds – Lists – Tables - Outlines- Positioning with CSS – Page Layout – Design Issues.

4. CRIPTING LANGUAGES

VB Script

Purpose - Client Side Script Vs Server Side Script - Program Structure – Data Types and Variables – Procedures - Conditional – Looping – Functions – Constants – Events – Methods – Objects – Operators –Statements - Validation Scripts - Error Handling and Debugging.

JavaScript

Learning Java script – Adding a Script to Web Page – Document object Model – Variables – Operators- Functions – Conditional Statements – Looping – Built-in Objects: String, Date, Array, Boolean, Math – JavaScript Validation – Cookies – Animation

5. jQuery

Introduction to jQuery : What Does jQuery Do for Me?, Obtaining jQuery, Installing jQuery - Selecting and Filtering : Using the Selectors API, Filtering a Selection, Searching within a Selection with find method, Finding an Element‘s Siblings with siblings method, Searching Ancestors Using the parents and parent Methods - Events - Filtering Selections and Arrays : Basic Iteration, Filtering Selections and Arrays - jQuery CSS : CSS Method, The outerWidth and outerHeight Methods - jQuery Effects : Showing and Hiding Elements, Sliding Elements, Fading Elements, Custom Animation.

TEXTBOOKS

Unit I Margaret Levine Young, “Internet-The Complete Reference”, McGraw Hill, 2nd Edition. *(Chapters: 1,2,5,7,9,10,11,17 & 20)*

Unit II & III Jon Ducket, “Web Programming with HTML, CSS and JavaScript”, Wiley Publishing, 2005.

WEB REFERENCES

www.jquery.com, www.w3schools.com, www.hscripts.com, www.tizag.com, www.dynamicdrive.com

SEMESTER – II

SOFTWARE PROCESS

1. INTRODUCTION TO SOFTWARE ENGINEERING

Evolving role of software –Legacy Software –Software Myths -A Generic View of Process**:** Software Engineering-Layered technology – Process framework –CMMI – Process Patterns – Process Assessment – Personal and Team Process Models – Process Technology – Product and Process.

2. PERSONAL SOFTWARE STRATEGY

Personal Software Process strategy- the logic for a software engineering discipline – Software process– Process Maturity –Logic & productivity of PSP -Baseline process –PSP process elements – PSPO process, measures & project plan summary – Time & Defect recording log –Measurement overview – Fundamental process measures – Goal-Question-Metric Paradigm – General PSP objectives, Goals and questions – GQM example – Gathering data — Establishing a baseline for your personal process.

3. PLANNING PROCESS

Planning process- Contents of a software plan – Planning a software project – Producing a quality plan - Measuring software size - Size measures & framework – Establishing a counting standard – Using LOC counts & counters – Reuse considerations – Line of code Accounting – Calculating Productivity–Estimating software size: Background – Popular estimating methods – Proxy-based estimating – the PROBE size estimating method – Object categories – Estimating considerations -Resource and schedule estimating: Resource planning – Estimating development time – Combining multiple estimates – Using multiple regression – Schedule Estimating – Earned value tracking – Estimating accuracy

4. SOFTWARE DESIGN & QUALITY

Design and code reviews- Personal reviews – Reviews principles –Design review principles – Review measures – Check lists –Relationship between reviews and inspections -Software Quality Management–Economics of software quality–Developing a quality strategy–Process Benchmarking – Yield Management – Defect removal strategies – Defect prevention strategies - Design process – Design quality – Structuring the design process–Design notation–Design Templates–Functional specification template – State specification template – Logic specification template – Operational scenario template – Using templates in design – Design Guidelines

5. SOFTWARE VERIFICATION

Design Verification– Design standards – Verification methods – Verifying the object state machine – Program tracing – Verifying program correctness – Comments on verification methods -Scaling up the personal software process: Using abstractions –Stages of product size – Developing large-scale programs – Potential problem with abstractions – Development strategy – PSP3 -Defining the software process– Software process basics – Process definition – Defining process phases – Process development considerations – Process evolution – Development Process.

TEXT BOOKS

Unit I Roger S Pressman, "Software Engineering", *4th* Edition, McGraw Hill International Edition, 1997

Units II – V Watts S. Humphrey, "A Discipline for Software Engineering", Pearson Education, 2001

REFERENCES

Watts S. Humphrey, "A Self-Improvement Process for Software Engineers", Addison-Wesley Professional, March 03, 2005

Watts S. Humphrey,"Using a defined and measured Personal Software Process by", IEEE *Software*, May, 1996.

SEMESTER – II

ADVANCED OPERATING SYSTEMS

1. FUNDAMENTALS AND MESSAGE PASSING

Fundamentals: Evolution of Distributed Operating Systems – Advantages of Distributed Operating Systems – Issues in designing Distributed Operating Systems – Distributed Computing Environment-Message Passing: Features of Message passing systems – Issues – Synchronization – Buffering – Multidatagram Messages – Encoding and decoding messages – Processor Addressing – Failure Handling.

2. REMOTE PROCEDURE CALLS AND SHARED MEMORY

RPC : Transparency – Implementation – Stub Generation – RPC Messages – Parameter Passing Semantics – Complicated RPCs – Client Server Binding – Exception Handling-Shared Memory: General Architecture of Distributed Shared Memory – Design and Implementation – Granularity – Structure – Consistency Models – Thrashing – Heterogeneous and advantages.

3. SYNCHRONIZATION

Synchronization: Clock Synchronization: Computer Clocks-Drifting of clocks-Issues-Algorithms-Mutual Exclusion: Centralized Approach-Distributed Approach-Token Passing Approach–Deadlock: Necessary Conditions-Deadlock Modeling-Handling Deadlocks–Election Algorithms

4. RESOURCE MANAGEMENT

Process Management: Process Migration–Threads-Distributed File Systems: Features – File Models – File Accessing, Sharing, Caching Models – File Replication – Fault Tolerance.

5. SECURITY AND CASE STUDY

Security: Cryptography: Concepts and terminologies-Requirements-Symmetric and Asymmetric cryptosystems-Key distribution problem-Authentication: Approaches-User Login-One Way-Two Way-Access Control: Protection Domains-Access Matrix -Digit Signatures – Design Principles-Caste Study: Mach

TEXT BOOK

Pradeep K. Sinha, “Distributed Operating Systems”, Prentice Hall, 2004

REFERENCES

Tanenbaum. A.S., “Distributed Operating Systems”, Prentice Hall, 1995.

SEMESTER – II

WINDOWS APPLICATION USING .NET

INTRODUCTION TO C#

Introduction to .NET – Features of C# - Data Types – Value Types – Reference Types - Variables and Constants – Declaring – Assigning values – variables of nullable types – Operators – Type Conversions – Implicit and Explicit Type Conversions – Arrays – Single Dimensional and Multidimensional – Control Flow Statements – Selection – Iteration and Jump – Classes and Objects – Access Modifiers – Defining a Class – Variables – Properties and Methods – Creating Objects – Constructor and Destructors – Partial Classes – Static Classes – Extension Methods – Inheritance – Defining a Derived Class – Accessing Members of a Base Class – Abstract Classes – Sealed Classes – Interfaces – Defining Interfaces – Implementation – Inheritance – Polymorphism – Compile Time – Run Time

2. WINDOWS FORMS AND WPF

Windows Forms – Form Class – Common Operations on Forms – Creating a Message Box – Handling Events – Mouse Events – Keyboard Events – Common Controls in Windows Forms – Label – TextBox – Button – Combo Box – List Box – Check Box – Radio Button – Group Box – Picture Box – Timer – Open File Dialog – Save File Dialog – Font Dialog – Color Dialog – Print Dialog – Tree View - Menu – WPF – Architecture of WPF – XAML and WPF – Common Controls in WPF – Grid – Button – Text Box – Password Box – Text Block – Border – Grid Splitter – Canvas – Stack Panel – Designer

3. POINTERS, EVENTS, DELEGATES AND THREADS

Pointers – Unsafe Code – Declaring Pointers – Delegates – Declaring a Delegate – Defining Delegate Methods – Invoking Delegate Objects – Multicasting with Delegates – Events – Event Sources – Event Handlers – Events and Delegates – Threading – Thread Class – Multithreading – Thread Priorities – Thread States – Thread Synchronization.

4. REMOTING AND REFLECTION

Reflection – Using Reflection – Reflecting the Members of a Class - Dynamic Loading and Reflection - .NET Remoting – Architecture – Hosting of Objects – Single Ton and Single Call – Remoting Server – Remoting Client

5. XML AND DATA ACCESS

Creating Connection String – Creating a Connection to a Database – Creating a Command Object – Working with Data Adapters – Using DataReader to work with Databases – Creating a Simple and Complex Data Binding in Windows Forms – Using the Binding Context Class – XML – Support for XML in .NET Framework – Working with Streamed XML – XML Reader and XMLWriter – File Handing – Text Reader and Text Writer - Binary Reader and Binary Writer

TEXT BOOKS

David S.Platt , “Introducing Microsoft .Net”, Prentice Hall, New Delhi

Vikas Gupta , “Comdex .NET Programming “, Dream Tech Press, New Delhi, 2010

REFERENCES

Kogent Solutions,”C# 2008 Programming Black Book”, Dream Tech Press, New Delhi, 2009

Microsoft ADO .Net Step by Step, Prentice Hall, New Delhi.

SEMESTER – II

WINDOWS APPLICATIONS USING .NET Lab

1. Variables and Constants
2. Arrays
3. Classes and Objects
4. Inheritance 4. Polymorphism
5. Windows Form Controls (Label, Text, Button, Check Box, Radio)
6. Windows Form Controls (List, Combo, Timer, Group Box, Picture Box)
7. Menu Handling
8. Windows Presentation Framework Controls.
9. Threading
10. Remoting
11. Reflection
12. XML
13. ADO.NET Connection
14. Data Command
15. Data Reader and Data Adaptor

SEMESTER – II

WEB TECHNOLOGY LAB

HTML

1. Creating HTML page and Run
2. Font tag, colors and images
3. Hyperlinks, Lists in HTML
4. Tables
5. Physical and Logical Tags
6. Forms Controls
7. Frames with tags
8. CSS

JAVA SCRIPT

1. Data types and variables, operators
2. Conditional Statements and Looping
3. Functions
4. Strings, Date and Time
5. Array and Math
6. Cookies
7. Debugging JavaScript
8. Handling Mouse Events
9. Develop Digital Clock & Calculator
10. Web Page with forms and Validations
11. Authentication and Verifications
12. Events Handling

VBSCRIPT

1. Basics of VBSCRIPT.
2. Data Types & Variables
3. Procedures, Conditional, Looping
4. Functions, Date, Time
5. Constants, Events, Methods, Objects, Operators
6. Validation
7. Error Handling

jQuery

1. Obtaining and Installing jQuery
2. Selectors
3. Events
4. Effects
5. Callback
6. HTML
7. CSS

SEMESTER – II

SOFTWARE DOCUMENTATION

1. INTRODUCTION TO SOFTWARE DOCUMENTATION

Understanding Task orientation –Principles of Software Documentation –Theory Behind Task Orientation –Forms of Software Documentation –Processes of Software Documentation

2. FORMS OF SOFTWARE DOCUMENTATION

Writing to Teach (Tutorials) – Writing to Guide (Procedures) – Writing to Support (Reference)

3. PROCESS OF SOFTWARE DOCUMENTATION

Analyzing Your Users – Planning and Writing your Documents – Getting Useful Reviews – Conducting Usability Tests – Editing and Fine Tuning

4. TOOLS FOR SOFTWARE DOCUMENTATION

Designing for Task Orientation – Laying out Pages and Screens – Getting the Language Right – Using Graphics Effectively – Designing Indexes

5. SYSTEM DOCUMENTATION

Requirements Document - System Architecture – Description of Functionality and Interfaces - Program Source Code Listings - Validation Documents - System Maintenance Guide.

6. USER DOCUMENTATION

Functional Description - Installation Document - Introductory Manual - Reference Manual - System Administrator's Guide

7. CASE WORK

TEXT BOOK Thomas T. Barker, "Writing Software Documentation, A Task-Oriented Approach", 2nd Edition, Pearson Education, 2004.

SEMESTER – III

OPEN SOURCE TECHNOLOGIES

1. BASIC PHP

Web Server-Apache-PHP-Data Types-User defined Variables-Constants-Operators-Control Structures-User defined Functions-Directory Functions-File system Functions-Arrays-String Functions-Date and Time Functions-Mathematical Functions-Miscellaneous Functions

2. ADVANCED PHP with MySQL

Exceptions handling-Error Handling Functions-Predefined Variables-Cookies-Sessions-COM-DOM-CURL-SOAP-Classes and Objects-Mail Function-URL Functions. PHP with MySQL: PHP MySQL Functions-Database driven application.

3. ADVANCED PHP with AJAX, SEO and CMS

PHP with AJAX: Introducing Ajax-Ajax Basics-PHP and Ajax-Database Driven Ajax. PHP with SEO: Basic SEO-Provocative SE Friendly URLs-Duplicate Content- CMS: Wordpress Creating an SE-Friendly Blog

4. BASIC PERL

Introduction-Scalar Data- Lists and Arrays-Subroutines-Input and Output- Hashes-Regular Expressions-Control Structures-Perl Modules-File Tests

5. ADVANCED PERL

Directory Operations-Strings and Sorting-Smart Matching-Process Management- Advanced Perl Techniques

TEXT BOOKS

Unit I & II Mehdi Achour, Friedhelm, Betz Antony Dovgal, Nuno Lopes, Hannes Magnusson, Georg Richter, Damien Seguy, Jakub Vrana And several others, **"**PHP Manual (Download the manual from PHP official website www.php.net)"**,** 1997-2011 the PHP Documentation Group.

Unit III Lee Babin, "Beginning Ajax with PHP From Novice to Professional", Apress, 2007 *(Chapters 1, 2, 3 and 4)*

Jaimie Sirovich and Cristian Darie, "Professional Search Engine Optimization with PHP A Developer's Guide to SEO", Wiley Publishing, Inc., Indianapolis, Indiana, 2007 *(Chapters 2, 3, 5 and16)*

Unit IV & V Randal L. Schwartz, Tom Phoenix, brian d foy, **"**Learning Perl, Fifth Edition Making Easy Things Easy and Hard Things Possible", O'Reilly Media, June 2008

REFERENCES

Steven D. Nowicki, Alec Cove, Heow Eide-goodman ,"Professional PHP",Wrox Press, 2004.

Shawn M. Lauriat, "Advanced Ajax Architecture and Best Practices", Prentic Hall, 2008.

WEB REFERENCES

www.w3schools.com, www.php.net, www.phpclasses.org www.tizag.com, www.tutorialspoint.com, www.perl.org, www.oracle.com

SEMESTER – III

COMPUTER NETWORKS

1. INTRODUCTION TO COMPUTER NETWORKS

History and Need for Networking - Service Description – Connectionless and Connection-Oriented Services – Circuit and Packet Switching – Access Networks and Physical Media – Wireless Links and Characteristics – OSI Reference Model - Service Models –Ad-hoc network, GPS, Sensor network.

2. APPLICATION LAYER

Principles of Network Applications – The Web and HTTP – FTP – Electronic Mail – SMTP – Mail Message Formats and MIME – DNS – Socket Programming with TCP and UDP. Multimedia Networking: Internet Telephony – RTP – RTCP – RTSP. Network Security: Principles of Cryptography – Firewalls – Application Gateway – Attacks and Counter measures.

3. TRANSPORT LAYER

Transport Layer Services – Multiplexing and Demultiplexing – UDP – Reliable Data Transfer – Go-Back-N and Selective Repeat. Connection-Oriented Transport: TCP – Segment Structure – RTT estimation – Flow Control – Connection Management – Congestion Control – TCP Delay Modeling – SSL and TLS. Integrated and Differentiated Services: Intserv– Diffserv.

4. NETWORK LAYER

Forwarding and Routing – Network Service Models – Virtual Circuit and Datagram Networks – Router – Internet Protocol (IP) – IPv4 and IPv6 – ICMP – Link State Routing – Distance Vector Routing – Mobile IP

5. LINK LAYER

Layer Services – Error Detection and Correction Techniques – Multiple Access Protocols – Link Layer Addressing – ARP – DHCP – Ethernet – Hubs, Bridges, and Switches –PPP. Ring Topology - Physical Ring – Logical Ring.

TEXT BOOK

James F. Kurose and Keith W. Ross, “Computer Networking: A Top-Down Approach Featuring the Internet”, Pearson Education, 3rd edition, 2006.

REFERENCES

Andrew S. Tanenbaum, “Computer Networks”, Prentice-Hall of India, 4th edition, 2003.

Larry L. Peterson and Bruce S. Davie, “Computer Networks: A Systems Approach”, Elsevier, 4th edition, 2007.

SEMESTER – III

INFORMATION STORAGE AND MANAGEMENT

Unit I - Introduction to Information Storage Technology: Review data creation and the amount of data being created and understand the value of data to a business, Challenges in Data Storage and Management, Data Storage Infrastructure. **Storage Systems Environment:** Components of a Storage System Environment: Disk drive components, Disk Drive Performance, Logical Components.

Unit II _ Data protection: Concept of RAID and its Components, Different RAID levels and their suitability for different application environments: RAID 0, RAID 1, RAID 3, RAID 4, RAID 5, RAID 0+1, RAID 1+0, RAID 6, Comparison of Levels. **Intelligent Storage Systems:** Components, Intelligent Storage Array, High-level architecture and working of an intelligent storage system.

Unit III - Introduction to Networked Storage: Evolution of networked storage, Architecture, Overview of FC-SAN, NAS, and IP-SAN. Network-Attached Storage (NAS): Benefits of NAS, Components, Implementations, File Sharing, I/O operations, Performance and Availability. **Content Addressed Storage (CAS):** features and Benefits of a CAS. CAS Architecture, Storage and Retrieval, Examples. **Storage Virtualization**: Forms, Taxonomy, Configuration, Challenges, Types of Storage Virtualizations.

Init IV - Information Availability & Monitoring & Managing Datacenter: Information Availability, Business continuity, Failure Analysis, Business impact Analysis, Differentiate between business continuity (BC) and disaster recovery (DR). D**isaster Recovery:** Backup, Methods, And Technologies, Replication technologies: Local replicas, Technologies, Restore and Restart, Multiple Replicas. Remote Replication. DR in practice.

Unit V - Storage Security and Management: Security Framework, Storage security domains, List and analyzes the common threats in each domain, Security Implementations. **Managing The Storage Infrastructure:** Monitoring the Storage Infrastructure, Storage Management Activities, Challenges and solutions.

Text Book:

1. EMC Educational Services, .Information Storage and Management., Wiley India.

Reference Books:

1. Richard Barker and Paul Massiglia, .Storage Area Network Essentials: A Complete Guide to Understanding and Implementing SANs., Wiley India.

2. Robert Spalding, .Storage Networks: The Complete Reference., Tata McGraw Hill Osborne,2003.

3. Marc Farley, .Building Storage Networks., Tata McGraw Hill, Osborne, 2001.

4. Meet Gupta, .Storage Area Network Fundamentals., Pearson Education Limited, 2002.

TECHNOLOGY ELECTIVES

WEB APPLICATIONS USING .NET

1. INTRODUCTION

Web Architecture-The way the web works-Client side processing-How ASP.NET ties it together.Setting up and Installing ASP.NET-IIS manager-Virtual home directory-Installing .NET framework SDK.Overview of ASP.NET framework-ASP.NET and framework-Understanding namespaces- The Structure of ASP.NET pages-Directives-Code Declaration blocks-Code render block-A simple application from start to finish-The Global.asax code behind-Application events-ASP.NET configuration-The Web.config file –Configuration file section.

2. WEB FORMS

Web Form Fundamentals - A Simple Page Applet - The Problem With Response.Write - Server Controls - HTML Server Controls - ViewState - The HTML Control Classes - Events - Event Handling Changes - The Currency Converter application-Adding Support for Multiple Currencies - Adding Linked Images - Setting Styles – A Deeper Look at HTML control classes-HTML control events-The HTML control Base class-The HtmContainerControl Class-The HtmlInputControl Class-The Page class-The Controls collection-The HttpRequest Class-The HttpResponse Class-The ServerUtility Class-Assessing HTML Server controls

3. WEB CONTROLS

Stepping Up to web Controls - Basic Web Control Classes - The web Control Tags - The WebControl Base Class- AutoPostBack and Web Control Events - How Postback Events Work - The Page Lifecycle-Using the standard controls-Using the navigation controls-Using the validation controls-Using the Rich controls(Calendar,Adrotator,Fileupload, Wizard,Multiview)--Designing website with Master pages –Designing Website with themes.

4. DATA ACCESS AND XML

About ADO.NET-Data objects-Simple Data access- Creating a Connection- The Connection String SQL- Data manipulation with connected Data access style(Datareader)-Data manipulation with disconnected data access style(Dataset)-Overview of SQL Server 2005

express-Installing SQL server express 2005-Features and working of SQL Server 2005-Using Data bound controls. Using XML - XML's Hidden Role in .NET - XML Basics - Attributes - Comments - The XML Classes - the XML TextWriter - The XML Text Reader - Working with XML Documents - Reading an XML Document - Searching an XML Document - XML Validation – CreatingXML Schema -XSD Documents - Validating an XML File.

5. CREATING AND CONSUMING WEB SERVICES

Web Service Basics - Web Service Ingredients - Web Service Description Language –SOAP Protocol-UDDI- Web Service Data Types- Creating Web Services -The StockQuote Web Service – XML Namespace - Testing Your Web Service - State Management in ASP.NET – Application State, Session State,Cookie,QueryString- Consuming a Web Service - Configuring a Web Service Client in Visual Studio .NET - Creating a Web Reference in Visual Studio .NET - The Proxy Class.

TEXT BOOKS

Mathew MacDonald, "ASP.NET: The Complete Reference", Tata McGraw Hill Publishing Company Ltd., New Delhi.

REFERENCES

Dino Eesposito,"Introducing Microsoft ASP .NET 2.0", Prentice Hall of India, New Delhi 2006.

Stephen Walther, "ASP.NET 2.0 Unleashed" Second Edition Pearson Education 2005.

WEB REFERENCE

www.asp.net, www.asp101.com, www.msdn.com, www.asp-net.blogspot.com

ADVANCED ENTERPRISE JAVA PROGRAMMING

1. INTEGRATING SERVLETS AND JSP: MVC ARCHITECTURE

Understanding the need for MVC – frameworks, implementing MVC with request dispatcher – defining Beans to represent the data, writing servlets to handle requests, populating Beans, storing the results, forwarding the requests, summarizing the MVC code, interpreting relative URL, three data sharing approaches, forwarding requests from JSP pages

2. JAVA SERVER FACES *(*JSF)

JSP Benefits, Framework roles, Simple JSF application, User Interface Component Model, Navigational Model, Life Cycle of JSF page, Using JSF in JSP Pages – Setting up a page, using core tags, using HTML tags, using localized messages, Using converters, Registering listeners on components, validators, binding component values to external data sources, referencing a backing Bean method, using custom objects, writing component properties, performing localization, creating custom converter, implementing event listener, creating custom validator, writing backing Bean methods

3. ENTERPRISE JAVA BEANS (EJB)

Introduction to Enterprise Beans, Session Bean, Entity Bean, Message driven Bean, defining clients access with interfaces, contents of an enterprise Bean, life cycle of enterprise Bean, creation of Enterprise Bean, application client, web client, other Enterprise Bean features, handling exceptions, mapping table relationships for Bean managed persistence, primary keys for bean managed persistence, container managed persistence – primary key for container managed persistence, Message driven Bean example – applicant client and message driven Bean class

4. QUERY LANGUAGE AND TRANSACTIONS

Terminology, Simplified Syntax, Example Queries, Full Syntax Transactions – Introduction, Container- Managed Transactions, Bean Managed Transactions – JDBC transactions, JTA transactions, Methods not allowed in Bean managed transactions, transaction timeouts, isolation levels, updating multiple databases, transaction in web components, JNDI Naming, Data source objects and connection pools, database connections, mail session connections, URL connections

5. JAVA MESSAGE SERVICE API

Basic JMS API concepts – architecture, messaging domains, consumption, JMS API programming model – administered objects, connections, sessions, message producers, consumers, messages, exception handling, JMS client applications, creating robust JMS applications, Using JMS API in J2EE application

TEXT BOOKS

Unit I Marty Hall, Larry Brown., "Core Servlets and Java Server Pages", 2nd Edition, Pearson Education, 2004. (Ch. 15)

Unit II, III, IV & V Stephanie Bodoff etl., "The J2EETM Tutorial", Pearson Education, 2005.

Unit II Ch 17, 18, 19

Unit III Ch 23, 24, 25, 26, 27, 28

Unit IV&V Ch 29, 30, 31, 33

REFERENCES

James McGovern etl., "Java Web Services Architecture", Elsiver, 2005.

Lame Pekowsky, "Java Server Pages", Pearson Education, 2004.

Paco Gomez and Peter Zadrozny, "Professional Java 2 Enterprise Edition with BAE WebLogic Server", Wrox Press, Feb 2001.

TECHNOLOGY LAB

WEB APPLICATIONS USING .NET

1. Sample Application
2. Web.Config File
3. HTML Control Classes
4. HTML Control Events
5. HTML Container and Input Control Classes
6. HTTP Request Classes
7. HTTP Response Classes
8. Web Control Classes
9. Web Control Tags
10. Validatation Controls
11. Rich Controls
12. Data Access
13. XML Classes
14. Creating Web Services
15. Using Web Services

ADVANCED ENTERPRISE JAVA PROGRAMMING

1. MVC ARCHITECTURE

Implementing MVC with Request Dispatcher

Data Sharing

Interpreting Relative URL‘s in the Destination Page

2. JAVA SERVER FACES *(*JSF)

Simple JSP Application

JSF in JSP Pages

Developing With JSF Technology

3. ENTERPRISE JAVA BEANS (EJB)

Creating Enterprise Bean

Creating Application Client

Creating Web Client

Using Session Bean

Bean Managed Persistence

Container Managed Persistence

4. QUERY LANGUAGE AND TRANSACTIONS

Using Queries

Understanding EJB QL Restrictions

Container Managed Transactions

Bean Managed Transactions

Understanding Resource Connections

5. JAVA MESSAGE SERVICE API

Creating Simple JMS Client Applications

Creating Robust JMS Applications

Using JMS API in J2EE Application

DOMAIN ELECTIVE – I

GAME PROGRAMMING

1. INTRODUCTION TO 2D GAMING

Why Java for Game Programming – An animation Framework – Animation loops – Double Buffering – user interaction – Active rendering – Animation control based on a user's requested FPS - The management of inaccuracies in the timer and sleep operations - Combining FPS and UPS - Game pausing and resumption.

2. WORMS IN WINDOWS AND APPLETS

UML for worm case application – Worm chase class – Worm panel class – User input – Animation loop – Statistics Gathering – Game-Specific behaviour – Worm class – The obastacle class - Growing a worm – Time for testing – Worm chase as an applet.

3. IMAGES, VISUAL EFFECTS AND ANIMATION

Image formats – AWT Imaging model – AWT Image processing – Java 2D and active rendering – The Buffered Image class – Managed Images – Java 2D speed – Image test overivew – Image loader class – Image test class – Image player class – Image based processing – RescaleOp processing – Packaging Image tests as JAR.

4. SOUND AUDIO AND MUSIC SYNTHESIS Applet playing – Audio clip class – Sound player application – The Java sound API – Mixer – MIDI concepts – Loader Test class – Audio effects on MIDI sequences – MIDI synthesis concepts.

5. SPRITES Defining a sprite – Sprite class – constructer – Sprite image – Bounding box – Drawing a sprite – Translate a Statechart to code – Statechart specification – Batsprite class – Textual specifications – Time-based reactions.

TEXTBOOKS

Andrew Davidson, “Killer Game programming in java”, O'Reilly Publications, May 2005 Edition.

REFERENCES

Jonathan S. Harbour, “Beginning Java Game Programming”, Second Edition.

CRYPTOGRAPHY AND NETWORK SECURITY

Unit I

Overview – Symmetric Ciphers: Classical Encryption Techniques

Unit II

Symmetric Ciphers: Block ciphers and Data Encryption Standards. Public-key encryption and Hash Functions: Public-Key Cryptography and RSA

Unit III

Network Security Practices: Authentication applications – Electronic Mail Security

Unit IV

Network Security Practices: IP Security – Web security

Unit V

System Security: Intruders – Malicious Software – Firewalls

TEXTBOOKS

William Stallings, "Cryptography and Network Security – Principles and Pracices", Prentice-Hall, Third edition, 2003

REFERENCES

Johannes A, Buchanan, "Introduction to cryptography", Springer-Verlag

Atul kahate, "Cryptography and Network Security". TMH

SOFTWARE TESTING AND QUALITY ASSURANCE

1. TESTING BASICS

Testing as an engineering activity – Role of Process in software quality – Testing as a process – Basic definitions – Software testing principles – The tester's role in a software development organization – Origins of defects – Defect classes – The defect repository and test design – Defect examples – Developer / tester support for developing a defect repository.

2. TEST CASE DESIGN

Introduction to testing design strategies – The smarter tester – Test case design strategies – Using black box approach to test case design – Random testing – Equivalence class partitioning – Boundary value analysis – Other black box test design approaches – Black box Testing and COTS – Using white box approach to test design – Test adequacy criteria – Coverage and control flow graphs – Covering code logic – Paths – Their role in white box based test design – Additional white box test design approaches – Evaluating test adequacy criteria.

3. LEVELS OF TESTING

The need for levels of testing – Unit test – Unit test planning – Designing the unit tests – The class as a testable unit – The test harness – Running the unit tests and recording results – Integration tests – Designing integration tests – Integration test planning – System test – The different types – Regression testing – Alpha, beta and acceptance tests.

4. FUNDAMENTALS OF SOFTWARE QUALITY & QUALITY ASSURANCE

Software quality - Hierarchical models of Boehm and McCall - Quality measurement - Metrics measurement and analysis - Gilb's approach - GQM Model-Quality tasks - SQA plan - Characteristics - Implementation - Documentation - Reviews and audits.

5. QUALITY CONTROL AND RELIABILITY

Defect prevention and removal - Reliability models - Rayleigh model - Reliability growth models for quality assessment.

CASE STUDY: Tools for quality - Ishikawa's basic tools - CASE tools

TEXT BOOKS

Ilene Burnstein, "Practical Software Testing", Springer International Edition, 2003.

Edward Kit, "Software Testing in the Real World – Improving the Process", Pearson Education, 1995.

Allan C. Gillies, "Software Quality: Theory and Management", Thomson Learning, 2003.

Stephen H. Kan, "Metrics and Models in Software Quality Engineering", Pearson Education (Singapore) Pvt. Ltd., 2002.

REFERENCES

Elfriede Dustin, "Effective Software Testing", Pearson Education, 2003.

Renu Rajani and Pradeep Oak, "Software Testing – Effective Methods, Tools and Techniques", Tata McGraw Hill, 2003.

Mordechai Ben, Menachem and Garry S.Marliss, "Software Quality", Thomson Asia Pvt. Ltd., 2003.

Kamna Malik and Praveen Choudry, "Software Quality : A Practitioner Approach", PHI, 2000.

DOMAIN ELECTIVE – II

GRID AND CLOUD COMPUTING

1. FUNDAMENTALS OF GRID COMPUTING

The Grid – Past, Present and Future – Applications of Grid Computing Organizations and their Roles.

2. GRID COMPUTING ARCHITURE

Grid Computing Anatomy – Next Generation of Grid Computing Initiatives – Merging the Grid Services Architecture with Web Services Architecture.

3. GRID COMPUTING TECHNOLOGIES

OGSA – Sample Use Cases that drive OGSA Platform Components – OGSI and WSRF– OGSA Basic Services – Security Standards for Grid Computing -. High Level Grid Services .

4. FUNDAMENTALS OF CLOUD COMPUTING

Fundamentals – Shot history of cloud computing – Cloud Architecture – Cloud Storage – Cloud Service – Pros and Cons of cloud computing – Benefits from cloud computing.

5. CLOUD SERVICES Need for Web-Based Application – The cloud Service Development – Cloud Service Development Types – Cloud Service development tools.

TEXT BOOKS

Joshy Joseph & Craig Fellenstein, “Grid Computing”, Pearson Education -2004.

Michael Miller, “Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online”, Que, 2008.

REFERENCES

Fran Berman, Geoffrey Fox, Anthony J. G. Hey, “Grid Computing : Making the Global Infrastructure a reality”, John Wiley & sons, 2003.

hmar Abbas, “Grid Computing:A Practical Guide to technology and Application”, Charles River media, 2003.

MOBILE COMPUTING

1. INTRODUCTION / FRAMEWORKS AND TOOLS

Introduction to Mobile Computing: Introduction- Dimensions of mobile Computing- Frameworks: Centralized Frameworks and Tools- N-Tier Client-Server Frameworks- Publishing Frameworks – Tools: J2ME, BREW, WAP, Windows CE, Symbian EPOC, XMLand UML basic – XForms.

2. USER INTERFACE DEVELOPMENT AND VUIs

Generic User Interface Development: Building Generic User Interfaces – Developing Mobile GUIs: MVC and PAC model – VUIs and Mobile Applications: Qualities of Speech - Voice Transcription-Voice Recognition-Text to Speech Technologies.

3. MULTIMODAL USER INTERFACES

Multichannel and Multimodal User Interfaces: Modeling Multichannel and Multimodal applications with UML - Multimodal Content-Software and System Architectures for Delivering Multimodality- Internationalization andLocalization- Evolving Definition of Multimodality - Mobile Development Process: Applying the wisdom methodology to mobile development- UML based development cycle for mobile applications.

4. J2ME ARCHITECTURE AND DEVELOPMENT ENVIRONMENT

J2ME Architecture - Small Computing Device Requirements- Run-Time Environment-Inside the Java Archive File - Inside the Java Application Descriptor File - MIDlet Programming - Java Language for J2ME - J2ME Software Development Kits - Hello World J2ME - J2ME Wireless Toolkit

5. J2ME BEST PRACTICES AND PATTERNS

The Reality of Working in a J2ME World - Best Practices. Keep Applications Simple . Keep Applications Small. Limit the Use of Memory. Off-Load Computations to the Server .Manage Your Application‘s Use of a Network Connection . . . Simplify the User Interface . Use Local Variables . . Don‘t Concatenate Strings . . Avoid Synchronization . . Thread Group Class Workaround . Upload Code from the Web Server . Reading Settings from JAD Files Populating Drop-down Boxes . Minimize Network Traffic . Dealing with Time . Automatic Data Synchronization . Updating Data that Has Changed . Be Careful of the Content of the startApp() Method

TEXT BOOKS Req B'Far, "Mobile Computing Principles – Designing and Developing Mobile Applications with UML and XML", Cambridge University Press, 2005.

Unit I Ch.1(1.1,1.2),Ch.2(2.1-2.9),Ch.3(3.4),Ch.5(5.5)

Unit II Ch.5(5.3), Ch.6(6.1), Ch.7(7.1-7.5)

Unit III Ch.8(8.1-8.6), Ch.15(15.3,15.4)

The Complete Reference: J2ME by James Keogh McGraw –Hills/Osborne. ISBN 0-07-222710-9

Unit IV Ch 3

Unit V Ch 4

REFERENCES

Ivo Salmre, "Writing Mobile Code: Essential Software Engineering for Building Mobile Applications", Addison-Wesley Professional, 2005.

Valentino Lee, Heather Schneider, Robbi Schell, "Mobile Applications: Architecture, Design, and Development", Prentice Hall PTR, 2004.

ALGORITHMS FOR BIO-INFORMATICS

1. MOLECULAR BIOLOGY PRIMER

Genetic Material, Function of Genes, Structure of DNA, transcription and translation, Protein structure, DNA analysis, Gene variation, Need of Bioinformatics

2. EXHAUSTIVE SEARCH Restriction Mapping, Impractical restriction mapping algorithm, A practical restriction mapping algorithm, Regulatory motifs in DNA Sequences, Profiles, The motif finding problem, Search trees, Finding trees, Finding median string. Greedy Algorithm: A greedy approach to Motif Finding.

3. DYNAMIC PROGRAMMING ALGORITHMS The power of DNA sequence comparison, Edit distance and alignments, Longest common sub sequences, Global sequence alignment, Scoring alignments, Local sequence alignments, Alignment with gap penalties, Multiple alignment, Gene prediction, Statistical approaches to gene prediction, Similarity based approaches to gene prediction, Spliced alignment.

4. GRAPH ALGORITHMS Graphs, Graphs and genetics, DNA sequencing, Shortest super string problem, DNA arrays as an Alternative sequencing technique, Sequencing by hybridization, SBH as an Hamiltonian path problem, SBH as an Eulerian path problem, Fragment assembly in DNA sequencing.

5. CLUSTERING AND TREES Gene expression analysis, Hierarchical clustering, k-means clustering, Clustering and corrupted cliques, Evolutionary trees, Distance based tree reconstruction, Reconstructing trees from additive matrices, Evolutionary trees and hierarchical clustering, Character based tree reconstruction, Small parsimony problem, Large parsimony problem.

TEXT BOOKS

N.C. Jones & P.A. Pevzner, "An Introduction to Bioinformatics Algorithms", The MIT Press – 2004.

REFERENCES

A. M. Lesk “Introduction to Bioinformatics” Oxford University Press.

D.E. Karne & M.L. Raymer , “Fundamental concepts of Bioinformatics”

SKILL DEVELOPMENT COURSES (Internal Assessment Only)

INFORMATION LITERACY COURSE

Purpose

Information literacy is a set of abilities requiring individuals to "recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information." Information is available through libraries, community resources, special interest organizations, media, and the Internet—and increasingly, information comes to individuals in unfiltered formats, raising questions about its authenticity, validity, and reliability. In addition, information is available through multiple media, including graphical, aural, and textual, and these pose new challenges for individuals in evaluating and understanding it. Information literacy forms the basis for lifelong learning. It enables learners to master content and extend their investigations, become more self-directed, and assume greater control over their own learning. An information literate individual is able to:

- Determine the extent of information needed
- Access the needed information effectively and efficiently
- Evaluate information and its sources critically
- Incorporate selected information into one's knowledge base
- Use information effectively to accomplish a specific purpose
- Understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally

Evaluation Scheme

1. Report

Topic Selection	05 Marks
Problem Definition	05 Marks
Paper Work Schema	10 Marks
Survey of Literature	20 Marks
Technical Exposition	10 Marks
Summary of Discourse	05 Marks
Bibliography & References	05 Marks

2. Presentation

Evaluation by the Supervisor	20 Marks
Evaluation by the Peers	20 Marks

Reference

Information Literacy Competency Standards for Higher Education, American Library Association, 2000. http://www.ala.org/acrl/ilcomstan.html.

SOFTWARE DOCUMENTATION

1. INTRODUCTION TO SOFTWARE DOCUMENTATION

Understanding Task orientation –Principles of Software Documentation –Theory Behind Task Orientation –Forms of Software Documentation –Processes of Software Documentation

2. FORMS OF SOFTWARE DOCUMENTATION

Writing to Teach (Tutorials) – Writing to Guide (Procedures) – Writing to Support (Reference)

3. PROCESS OF SOFTWARE DOCUMENTATION

Analyzing Your Users – Planning and Writing your Documents – Getting Useful Reviews – Conducting Usability Tests – Editing and Fine Tuning

4. TOOLS FOR SOFTWARE DOCUMENTATION

Designing for Task Orientation – Laying out Pages and Screens – Getting the Language Right – Using Graphics Effectively – Designing Indexes

5. SYSTEM DOCUMENTATION

Requirements Document - System Architecture – Description of Functionality and Interfaces - Program Source Code Listings - Validation Documents - System Maintenance Guide.

6. USER DOCUMENTATION

Functional Description - Installation Document - Introductory Manual - Reference Manual – System Administrator's Guide

7. CASE WORK

TEXT BOOK

Thomas T. Barker, "Writing Software Documentation - A Task-Oriented Approach", 2nd Edition, Pearson Education, 2004.

QUANTITATIVE APTITUDE DEVELOPMENT

Unit I

Averages – Problems on numbers – Problems on Ages – Percentages – Profit and Loss

Unit II

Ratio and Proportion – Partnership – Time and Work – Pipes and Distances – Time and distance

Unit III

Problems on Trains – Boats and Streams – Allegation – Simple Interest – Compound Interest

Unit IV

Calendar – Clocks – Permutation – Combination – Probability

Unit V

Direction sense test – Mathematical Operations – Logic – Problems on cubes – Problems on dice

TEXT AND REFERENCE BOOKS

R.S.Aggarwal, "Quantitative Aptitude for Competitive Examinations", 7th Revised Edition, S.Chand and Co. Ltd, New Delhi, 2005.

R.S.Aggarwal, "Verbal and Non Verbal Resanoning", S.Chand and Co. Ltd, New Delhi.

Barron's Guide for GMAT, Galgotia Publications, New Delhi, 2006.