ANNA UNIVERSITY OF TECHNOLOGY, COIMBATORE

CURRICULAM AND SYLLABI - REGULATIONS – 2007

M.Sc – SOFTWARE ENGINEERING

SEMESTER - I

Course code	Course Title	L	T	P	C
THEORY					
074030002	Resource Management Techniques	5	0	0	5
074230032	Object Oriented Software Engineering	5	0	0	5
074250011	Internet & Java Programming	5	0	0	5
074250015	Advanced Database Management Systems	5	0	0	5
074230033	Software Architecture	5	0	0	5
PRACTICALS					
074230034	CASE Tools and UML Lab	0	0	3	1.5
074250014	Internet and Java Programming Lab	0	0	3	1.5
074250013	RDBMS Lab	0	0	3	1.5
	TOTAL CREDITS				**29.5**

SEMESTER - II

Course code	Course Title	L	T	P	C
THEORY					
074230035	Software Design	4	0	0	4
074230036	Software Testing	4	0	0	4
074530001	Software Metrics	4	0	0	4
074530001	Windows Programming	4	0	0	4
	Elective I	5	0	0	5
PRACTICALS					
074230038	Software Design and Testing Lab	0	0	3	2
074230039	Windows Programming Lab	0	0	3	1.5
074230030	Software Laboratory	0	0	3	1.5
074230041	Communication Lab	0	0	0	0
	TOTAL CREDITS				**26**

SEMESTER - III

Course code	Course Title	L	T	P	C
THEORY					
074230018	Advanced Java Programming	5	0	0	5
074250001	Software Project Management	5	0	0	5
074230020	User Interface Design	5	0	0	5
074230021	Service Oriented Architecture	5	0	0	5
	Elective II	5	0	0	5
PRACTICALS					
074230019	Advanced Java Programming Laboratory	0	0	3	1.5
074230022	SOA Lab	0	0	3	1.5
074230031	Mini Project and Seminar	0	0	3	1.5
	TOTAL CREDITS				**29.5**

SEMESTER - IV

Course code	Course Title	L	T	P	C
074580005	Project Work	0	0	24	12
	TOTAL CREDITS				**12**

TOTAL CREDITS EARNED TO BE AWARD FOR THE DEGREE = 97

LIST OF ELECTIVES

Course code	Course Title	L	T	P	C
SEMESTER II					
074580002	Software Agents	5	0	0	5
074230026	Network Security	5	0	0	5
074580003	Personal Software Process and Team Software Process	5	0	0	5
074230050	UNIX and Network Programming	5	0	0	5
074230051	Design and Analysis of Algorithms	5	0	0	5
SEMESTER III					
074580001	Software Reliability	5	0	0	5
074230023	Extreme Programming	5	0	0	5
074250008	MiddleWare Technologies	5	0	0	5
074230052	Computer Graphics and Multimedia Systems	5	0	0	5
074580004	Software Quality Assurance	5	0	0	5

SEMESTER - I

		L	T	P	C
074030002	**RESOURCE MANAGEMENT TECHNIQUES**	**5**	**0**	**0**	**5**

UNIT I LINEAR PROGRAMMING MODELS **(15)**

Mathematical Formulation - Graphical Solution of linear programming models – Simplex method – Artificial variable Techniques- Variants of Simplex method

UNIT II TRANSPORTATION AND ASSIGNMENT MODELS **(15)**

Mathematical formulation of transportation problem- Methods for finding initial basic feasible solution – optimum solution - degeneracy – Mathematical formulation of assignment models – Hungarian Algorithm – Variants of the Assignment problem

UNIT III INTEGER PROGRAMMING MODELS **(15)**

Formulation – Gomory's IPP method – Gomory's mixed integer method – Branch and bound technique.

UNIT IV SCHEDULING BY PERT AND CPM **(15)**

Network Construction – Critical Path Method – Project Evaluation and Review Technique – Resource Analysis in Network Scheduling

UNIT V QUEUEING MODELS **(15)**

Characteristics of Queuing Models – Poisson Queues - (M / M / 1) : (FIFO / ∞ /∞), (M / M / 1) : (FIFO / N / ∞), (M / M / C) : (FIFO / ∞ / ∞), (M / M / C) : (FIFO / N / ∞) models.

TOTAL : 75

REFERENCE BOOKS :

1. A.M.Natarajan, P.Balasubramani, A.Tamilarasi, "Operations Research", Pearson Education, Asia, 2005.
2. Prem Kumar Gupta, D.S. Hira, "Operations Research", S.Chand & Company Ltd, New Delhi, 3rd Edition , 2003.

074230032	OBJECT ORIENTED SOFTWARE ENGINEERING	L	T	P	C
		5	0	0	5

UNIT I **(15)**

System Development as industrial process – System life cycle – Object Orientations - Object Oriented System Development – Object Oriented Programming.

UNIT II **(15)**

Architecture – Model building – Model architecture – requirements model – analysis model – Design Model – Implementation Model – Test Model.

UNIT III **(15)**

Analysis – Requirements Model – Analysis Model.

UNIT IV **(15)**

Construction – Design Model – Block Design – Working with construction.

UNIT V **(15)**

Real Time Specialization – Classification – Analysis – Construction – Testing – Verification – Data specilization – ODBMS – Components Definition – Use – Management – Testing unit testing – integration testing – system testing – process.

TOTAL : 75

REFERENCE BOOKS :

1. Ivar Jacobson, "Object –Oriented Software Engineering", Pearson Education, 2002.
2. Roger S. Pressman, "Software Engineering", 5th Edition, McGraw-Hill International Edition, 2001.

074250011	INTERNET AND JAVA PROGRAMMING	L	T	P	C
		5	0	0	5

UNIT I INTRODUCTION (15)

Java Features – comparison of Java with C and C++ - Java and Internet – Java Environment – Java Program structure – Java Tokens – Implementing a Java Program – Java Virtual Machine – Constants – Variables – Data Types – Scope of Variables – Type casting – Operators and expressions – Decision Making, Branching and Looping.

UNIT II CLASSES AND ARRAYS (15)

Defining a class – Constructors – Methods – overloading – static Members – Nesting of Methods – Overriding methods – Final Classes – Abstract Class – Visibility control – Arrays – creating an array – Two Dimensional arrays – Strings – String Arrays – String Methods – String Buffer Class – Vectors – Wrapper Classes.

UNIT III INHERITANCE, INTERFACES AND PACKAGES (15)

Defining a subclass – Subclass constructor – Multilevel inheritance – Hierarchical Inheritance – Defining Interfaces – Extending Interfaces – Implementing Interfaces – Java APF Packages – creating a package – Accessing and Using a package – Adding a class to a package – Hiding Classes.

UNIT IV MULTITHREADING EXCEPTION HANDLING AND FILES CREATING THREADS (15)

Extending the Thread class – Thread Life cycle – Thread Exception – Thread priority – Synchronization – Runnable Interface – Exceptions – Throwing own Exceptions – Concepts of streams – stream classes – Byte Stream Classes – Character stream Classes – Using Streams – Using file Class –Other Stream Classes.

UNIT V APPLET PROGRAMMING (15)

Difference between Application and Applets – Applet Life cycle – creating an Executable Applet – Designing a Web Page – Adding Applet to HTML File – Passing Parameters to Applets.

TOTAL : 75

REFERENCE BOOKS :

1. E. Balagurusamy, “Programming with Java – A primer”, Second Edition, Tata McGraw Hill Publishing Company, Delhi, 2002
2. Herbert Schildt, “The complete Reference – Java 2”, Fifth Edition, Tata McGraw Hill Publishing Company, Delhi, 2002.
3. Deitel , “ Java How to pogram “, 6th edition, Pearson Education, 2006.

074250015	ADVANCED DATABASE MANAGEMENT SYSTEMS	L	T	P	C
		5	0	0	5

UNIT I **(15)**

Introduction -Relational Database Concepts – Query Processing – Query Optimization – Transaction Concepts - Properties of Transactions – Serializability – Concurrency Control – Lock Based Protocols – Time Stamp Based Protocols – Recovery Systems – Log Based Recovery – Advanced Recovery Techniques.

UNIT II **(15)**

Distributed And Parallel Databases - Homogeneous and Hetrogeneous Databases – Distributed Data Storage – Distributed Transactions – Commit Protocols – Concurrency Control.

UNIT III **(15)**

Distributed Query Processing – Parallel Databases – I/O Parallelism – Inter Query and Intra Query Parallelism – Inter and Intera Operation Parallelism – Design of Parallel Systems.

UNIT IV **(15)**

Object-Based Databases And XML - Object Oriented Databases – Complex Data Types – 00 Data Model – 00 Languages – Persistence – Object Relational Databases – Nested Relations – Inheritance – Reference Types – Querying with Complex Types – Functions and Procedures – XML – Structure of XML - Data XML Document Schema – Querying and Transformation – Application Program Interface – Storage of XML Data – XML applications.

UNIT V **(15)**

Administration advanced Querying and retrieval - Performance Turing – performance Benchmarks – Decision support Systems – Data Analysis and OLAP – Data Mining – Data Warehousing – Information Retrieval Systems

TOTAL : 75

REFERENCE BOOKS :

1. Abraham Silberschatz, Henry F.Korth and S.Sudarshan, “Database System Concepts”, 4th Edition, McGraw Hill, 2002.
2. Ramez Elmasri and Shamkant B.Navathe, “Fundamentals of Database Systems”, Pearson Education Asia, 2005.
3. Raghu Ramakrishnan and Johannes Gehrke, “Database Management Systems”, McGraw Hill, 2000.

074230033	SOFTWARE ARCHITECTURE	L	T	P	C
		5	0	0	5

UNIT I **(15)**

Introduction – Software Architecture – Engineering Discipline for Software – Status of Software Architecture. Architectural Styles – Pipes and Filters – Data Abstraction and Object Oriented Organisation – Event Based Implicit Invocation – Layered Systems – Repositories – Interpreters – Process Control – Other Architectures – Hetero Generous Architecture - Case Studies.

UNIT II **(15)**

Shared Information Systems – Database Integration – Integration in Software Development Environments – Integration in the Design of Build – Architectural Structures for Shared Information Systems – Conclusions.

UNIT III **(15)**

Architectural Design Guidance – Guidance for User-Interface Architectures – The Quantified Design Phase.

UNIT IV **(15)**

Formal Model and Specification – The Value of Architectural Formalism – Formalizing the Architecture of a Specific System – Formalizing an Architectural Style – Formalizing and Architectural Design Space – Theory of Software Architecture – Notation Linguistic Issues – Requirement for Architecture – Description Languages – First Class Connectors – Adding Implicit Invocation to Traditional Programming Languages.

UNIT V **(15)**

Tools for Architectural Design – Unicon – Exploiting Style in Architectural Design Environments – Beyond Definition / Use.

TOTAL : 75

REFERENCE BOOKS :

1. Mary Shaw and David Garlan , “Software Architecture : Perspectives on an Emerging Discipline”, Prentice – Hall of India Pvt. Ltd, New Delhi, 2000.

PRACTICALS

		L	T	P	C
074230034	**CASE TOOLS AND UML LAB**	**0**	**0**	**3**	**1.5**

LIST OF EXERCISES

1 Familiarization of features of any one of the standard UML case tool.
2 Capturing key functional requirements as Use cases and class diagram for online ticket / hotel reservation systems, student information system, sales and marketing system, banking system and inventory tracking system.
3 Interacting diagrams, state chart diagrams etc for systems in 2.
4 Implementation using any one of object oriented languages like Java, C++ for systems in 2.
5 Component diagrams, deployment diagrams for system in 2.
6 Unit test case, integration test case for systems in 2

TOTAL : 45

		L	T	P	C
074250014	**INTERNET AND JAVA PROGRAMMING LAB**	**0**	**0**	**3**	**1.5**

LIST OF EXERCISES (2 EXPERIMENTS UNDER EACH OF THE FOLLOWING)

1. Classes and Objects
2. Inheritance and Polymorphism
3. Multithreading
4. Exception handling
5. Applet programming
6. Client side / Server side scripting programs for the Web Pages.
7. Experiments with Active / JAVA server pages.
8. Socket Programming.
9. JAVA Servlets.
10. On-line Transactions – Database connectivity.

TOTAL : 45

		L	T	P	C
074250013	**RDBMS LAB**	**0**	**0**	**3**	**1.5**

LIST OF EXERCISES

1. Library Information Processing
2. Students Mark sheet processingS
3. Telephone Directory maintenance
4. Gas booking and delivering system
5. Electricity Bill Processing
6. Bank Transactions.
7. Pay roll processing
8. Personal Information System
9. Question Database and Conducting quiz.

TOTAL : 45

SEMESTER II

074230035	**SOFTWARE DESIGN**	**L**	**T**	**P**	**C**
		4	**0**	**0**	**4**

UNIT I DESIGN FUNDAMENTALS

The nature of design process – Objectives – Design qualities, assessing the design process, Design view points for software.

UNIT II DESIGN METHODOLOGIES

Design practices, Design strategies – Top down and bottom up – Coupling and cohesion – Popular design methodologies – Function oriented and object oriented design, Design documentation.

UNIT III DESIGN MODELS

Structural analysis and design technique, SSADM and real time design. Data design, mappings requirements into a software Architecture.

UNIT IV DETAILED DESIGN

User interface Design – Task analysis and modeling – Interface design activities, implementation tools, comparison of design notations, structural programming.

UNIT V OBJECT ORIENTED DESIGN

Object oriented concepts, object oriented analysis – OOA process, object – relationship model, system and object design process – Design patterns.

TOTAL : 60

REFERENCE BOOKS :

1. Pressman R.S., “Software Engineering”, 4th Edition, McGraw Hill Inc., 1996.
2. David Budgen, “Software Design”, Addison – Wesley, 1994

074230036	SOFTWARE TESTING	L	T	P	C
		4	0	0	4

UNIT I

Assessing Software Testing Capabilities and Staff competencies – Staff – Roles-Defects – Business Perspective – Quality of Test Process and Testers. Building a Software Testing Environment – Building a Software Testing Strategy – Strategic Risks – Economics – Problems – Economics of System Development Life Cycle Testing – Organizational Issue – Policy – Structured Approach – Strategy – Methodology – Status – Summary.

UNIT II

Establishing a Software Testing Methodology – Defects – Reduce the Cost – Verification and Validation – Functional and Structural – Workbench Concept – Considerations in Developing Testing Methodologies – Tactics Checklist. Determining Software Testing Techniques – Tool Selection Process – Selecting Techniques / Tools – Structured System Testing Techniques.

UNIT III

Functional System Testing Techniques – Unit Testing Techniques – Functional Testing and Analysis – Functional Testing – Test Factor / Test Technique Matrix – Summary Selecting and Installing Software Testing Tools – Testing Tools – Selecting and Using the Tools – Managers – Summary.

UNIT IV

The Eleven–Step Testing Process Overview – Cost of Computer Testing – Life Cycle Testing-concept – Verification and Validation – Introducing the Eleven-Step Process – Workbench requirement Skills. Assess Project Management Development Estimate and Status – Overview – Objective – Concerns – Workbench – Develop Test Plan - Overview – Objective – Concerns – Workbench – Requirement Phase Testing -Overview – Objective – Concerns – Workbench – Design Phase Testing - Overview – Objective – Concerns – Workbench – Program Phase Testing - Overview – Objective – Concerns – Workbench – Execute Test and Record Results - Overview – Objective – Concerns – Workbench – Acceptance Test - Overview – Objective – Concerns – Workbench – Report Test Results - Overview – Objective – Concerns – Workbench – Testing Software Installation - Overview – Objective – Concerns – Workbench – Test Software Changes - Overview – Objective – Concerns – Workbench – Evaluate Test Effectiveness - Overview – Objective – Concerns –Workbench.

UNIT V

Testing Specialized Systems and Application – Client / Server Systems - Overview – Objective – Concerns – Workbench – Rapid Application Development - Overview – Objective – Concerns – Workbench – Adequacy of System Documentation - Overview – Objective – Concerns – Workbench – Web Based Systems - Overview – Objective – Concerns – Workbench – Off-the Shelf Software - Overview – Objective – Concerns – Workbench – Multi platform Environment - Overview – Objective – Concerns – Workbench – Security - Overview – Objective – Concerns – Workbench – Data Warehouse – Overview –Objective – Concerns – Workbench.

TOTAL : 60

REFERENCE BOOKS :

1. William E.Perry, “Effective Methods for Software Testing”, John Wiley and Sons, Inc., 2000.
2. P.C. Jorgensen, “Software Testing A craft Man’s Approach”, CRC Press, 1999

074530001	SOFTWARE METRICS	L	T	P	C
		4	0	0	4

UNIT I MEASUREMENT THEORY

Fundamentals of measurement – Measurements in Software Engineering – Scope of Software metrics – Measurement theory – Goal based framework – Software measurement validation.

UNIT II DATA COLLECTION AND ANALYSIS

Empirical investigation – Planning experiments – Software metrics data collection – Analysis methods – Statistical methods.

UNIT III PRODUCT METRICS

Measurement of internal product attributes – Size and structure – External product attributes – Measurement of quality.

UNIT IV QUALITY METRICS

Software quality metrics – Product quality – Process quality – Metrics for software maintenance – Case studies of Metrics Program – Motorola – HP and IBM.

UNIT V MANAGEMENT METRICS

Quality management models – Rayleigh Model – Problem Tracking report (PTR) model – Reliability growth model – Model evaluation – Orthogonal defect classification.

TOTAL : 75

REFERENCE BOOKS :

1. Normal. E – Fentor Shari Lawrence Pfleeger, "Software Metrics", International Thomson Computer Press, 1997.
2. Fentor Mrman E., "Software Metrics: A Regimes Approach", Chapmen & Hall, London, 1991.

074530001	WINDOWS PROGRAMMING	L	T	P	C
		4	0	0	4

UNIT I

Introduction to Widows Programming – Event Driven Programming – Data Types – Resources – Window Message – Device Context – Document Interfaces.

UNIT II

Software Development Kit (SDK) Tools – Context Help – Dialog boxes – Dynamic Linking Libraries

UNIT III

Visual C++ Programming – Frame Work Classes – VC++ Components – Resources – Event Handling – Message Dispatch System – Model and Modeless Dialogs – Important VBX Controls – Document view Architecture – Serialization – Multiple Document Interface – Splitter Windows – Coordination Between Controls.

UNIT IV

Database Connectivity – Min Database Applications – Embedding Controls in View – Creating user defined DLL's – Dialog Based Applications – Dynamic Data Transfer Functions – Data Base Management with ODBC – Communicating with other applications – Object Linking and Embedding.

UNIT V

Basics of GUI Design – Visual Interface Design – File System – Storage and Retrieval System – Simultaneous Multi Platform Development.

TOTAL : 75

REFERENCE BOOKS :

1. Petzold, "Windows Programming", Microsoft Press, 1995.
2. Kate Gregory, "Using Visual C++", Prentice Hall of India Pvt. Ltd. 1999.
3. Pappar and Murray, "Visual C++ : The Complete Reference", TMH, 2000.

PRACTICALS

		L	T	P	C
074230038	**SOFTWARE DESIGN AND TESTING LAB**	**0**	**0**	**3**	**2**

LIST OF EXERCISES

1 Practice structural analysis and design techniques using case tools.
2 Simulate Software architectural components.
3 Practice user interface design for real time applications.
4 Practice object oriented analysis and design using case tools.
5 Implement real time applications using design patterns.
6 Case study on different software testing tools.
7 Simulate verification and validation environment
8 Implement the structured system Testing techniques.
9 Simulate a software testing suite which performs the functionalities of different phase testing of software development life cycle.

TOTAL : 45

		L	T	P	C
074230039	**WINDOWS PROGRAMMING LAB**	**0**	**0**	**3**	**1.5**

LIST OF EXERCISES

1. Building Simple Applications.
2. Window creation
3. Drawing Tools
4. DLL file creation
5. Event Handling
6. Database Connectivity
7. Application with Dialogs.
8. Application with Menus.
9. Application with Data Controls.
10. Application using Common Dialogs.

TOTAL : 45

		L	T	P	C
074230030	**SOFTWARE LABORATORY**	**0**	**0**	**3**	**1.5**

LIST OF EXERCISES

1 Preparation of Project Management Plan.
2 Using any of the CASE tools, Practice requirement analysis and specification for different firms.
3 Case study of cost estimation models.
4 Practice object oriented design principles for implementation.
5 Practice function oriented design.
6 Practice creating software documentation for all the phases of software development life cycle with respect to any real time application.
7 Simulate a tool for path testing principles.
8 Simulate a tool for testing based on control structures.
9 Simulate a tool that reflects black box testing concepts.

TOTAL : 45

SEMESTER - III

074230018	ADVANCED JAVA PROGRAMMING	L	T	P	C
		5	0	0	5

UNIT I JAVA FUNDAMENTALS **15**

Java I/O streaming – filter and pipe streams – Byte Code interpretation - reflection – Dynamic Reflexive Classes – Threading – Java Native Interfaces- Swing. Java I/O streaming – filter and pipe streams – Byte Code interpretation - reflection

UNIT II NETWORK PROGRAMMING IN JAVA **15**

Dynamic Reflexive Classes – Threading – Java Native Interfaces- Swing.Sockets – secure sockets – custom sockets – UDP datagrams – multicast sockets – URL classes – Reading Data from the server – writing data – configuring the connection – Reading the header – telnet application – Java Messaging services

UNIT III APPLICATIONS IN DISTRIBUTED ENVIRONMENT **15**

Remote method Invocation – activation models – RMI custom sockets – Object Serialization – RMI – IIOP implementation – CORBA – IDL technology – Naming Services – CORBA programming Models - JAR file creation

UNIT IV MULTI-TIER APPLICATION DEVELOPMENT **15**

Server side programming – servlets – Java Server Pages - Applet to Applet communication – applet to Servlet communication - JDBC – Using BLOB and CLOB objects – storing Multimedia data into databases – Multimedia streaming applications – Java Media Framework.

UNIT V ENTERPRISE APPLICATIONS **15**

Server Side Component Architecture – Introduction to J2EE – Session Beans – Entity Beans – Persistent Entity Beans – Transactions.

TOTAL : 75

REFERENCES

1. Ken Arnold, James Gosling and David Holmes, “The JAVA Programming Language”, 3rd edition, Tata Mc-Graw Hill, 2007
2. Elliotte Rusty Harold, “ Java Network Programming”, O’Reilly publishers, 2000
3. Ed Roman, “Mastering Enterprise Java Beans”, John Wiley & Sons Inc., 1999.
4. Hortsmann & Cornell, “Core Java 2 Advanced Features, VOL II”, Pearson Education, 2002.
5. Patrick Naughton, “Complete Reference: Java2”, 7th edition, Tata Mc-Graw Hill, 2003

074250001	SOFTWARE PROJECT MANAGEMENT	L	T	P	C
		5	0	0	5

UNIT I INTRODUCTION **15**

Introduction – Product Life – Project life cycle models - water fall model – Prototyping model – RAD model – Spiral Model – Process Models – Matrics.

UNIT II CONFIGURATION MANAGEMENT **15**

Software Configuration Management – Definitions and terminology – processes and activities – Configuration audit – Matrics – Software Quality assurance – definitions – quality control and assurance – SQA Tools – Organisation of Structures – Risk Management – Risk Identification, quantification Monitoring – Mitigation.

UNIT III PROJECT PLANNING **15**

Project initiation – Project Planning and tracking – what, cost, when and how –organisational processes – assigning resources – project tracking – project closure – when and how.

UNIT IV SOFTWARE REQUIREMENTS **15**

Software requirements gathering – steps to be followed – skills sets required – challenges – matrics – Estimation 3 phases of estimation – formal models for size estimation – translating size estimate to effort schedule estimate, matrics – Design and Development phases – reusability, Technology choices, Standards, Portability user interface – testability – diagonosability etc.

UNIT V TESTING **15**

Project Management in testing phase – in the maintenance phase – Impact on internet on project Management.

TOTAL : 75

REFERENCES

1. Gopalaswamy Ramesh, “Managing Globle Software Projects” Tata McGraw Hill Publishing Company Ltd, New Delhi, 2002
2. Bob Hughes and Mike Cotterell “Software Project Management”2nd edition, Tata McGraw Hill Publishing Company Ltd., New Delhi, 2002.
3. Pressman, Roger, “Software Engineering ", A Practitioner's approach, 7th edition, Tata Mc-Graw Hill, 2006

074230020	USER INTERFACE DESIGN	L	T	P	C
		5	0	0	5

UNIT I INTRODUCTION **15**

Introduction – A taxonomy of software design – Goal Directed design – User's Goal – The essence of user interface design. The three models – manifest model – visual interface design – visual processing – visual patterns – restricting the vocabulary – canonical vocabulary and domain knowledge. Form – Idioms and affordances – history of rectangles on the screen – windows with a small w – lord of the files – storage and retrieval systems – choosing platforms.

UNIT II BEHAVIOR OF PRESENTATION **15**

Behavior of Presentation – orchestration and flow – Techniques for inducing and maintaining flow – characteristic of good user interfaces – postures and types – states of windows – different types of tasks – idiocy – The weapon of Interface Design – task coherence.

UNIT III INTERACTION **15**

The Interaction – pointing and clicking – mouse operations – Selection – object verb – concrete and discrete data – insertion and replacement – mutual exclusion – additive and group selection – visual indications. Direct manipulation manipulating Gizmos – repositioning – resizing and reshaping – arrowing – direct – manipulation visual feedback – drag and drop.

UNIT IV CAST EFFECTS **15**

Cast effects – menus meaning – menus and dialog boxes – dialog box etiquette – toolbars – Gizmos – Types of Gizmos – Entry and display Gizmos – New Gizmos.

UNIT V CONFIGURATION **15**

Protecting user – eliminating dialog and error boxes – managing exceptions – alerts – audible feedback – undo – troubles – redo – special undo functions. Command vectors – installation – configuration – personalization.

TOTAL : 75

REFERENCES :

1. Wilbent. O. Galitz ,"The Essential Guide to User Interface Design", John Wiley& Sons, 2001.
2. Ben Sheiderman, "Designing the User Interface", Pearson Education, 2000.
3. Alan Cooper, "The Essential of User Interface Design", Wiley – Dream Tech Ltd., 2002

074230021	SERVICE ORIENTED ARCHITECTURE	L	T	P	C
		5	0	0	5

UNIT I INTRODUCTION **15**

Introduction – Service Oriented Enterprise – Service Oriented Architecture (SOA) – SOA and Web Services – Multi-Channel Access – Business Process management – Extended Web Services Specifications – Overview of SOA – Concepts – Key Service Characteristics – Technical Benefits – Business Benefits

UNIT II SOA AND WEB SERVICES **15**

SOA and Web Services – Web Services Platform – Service Contracts – Service-Level Data Model – Service Discovery – Service-Level Security – Service-Level Interaction patterns – Atomic Services and Composite Services – Proxies and Skeletons – Communication – Integration Overview – XML and Web Services - .NET and J2EE Interoperability – Service-Enabling Legacy Systems – Enterprise Service Bus Pattern

UNIT III MULTI-CHANNEL ACCESS **15**

Multi-Channel Access – Business Benefits – SOA for Multi Channel Access – Tiers – Business Process Management – Concepts – BPM, SOA and Web Services – WS-BPEL – Web Services Composition

UNIT IV JAVA WEB SERVICES **15**

Java Web Services – JAX APIs – JAXP – JAX-RPC – JAXM – JAXR – JAXB

UNIT V MANAGEMENT **15**

Metadata Management – Web Services Security – Advanced Messaging – Transaction Management

TOTAL : 75

REFERENCES :

1. Eric Newcomer, Greg Lomow, “Understanding SOA with Web Services”, Pearson Education, 2005
2. James McGovern, Sameer Tyagi, Michael E Stevens, Sunil Mathew, “Java Web Services Architecture”, Elsevier, 2003.
3. Thomas Erl, “Service Oriented Architecture”, Pearson Education, 2005
4. Frank Cohen, “Fast SOA”, Elsevier, 2007.
5. Jeff Davies, “The Definitive Guide to SOA”, Apress, 2007.
6. Sandeep Chatterjee, James Webber, “Developing Enterprise Web Services”, Pearson Education, 2004.

PRACTICALS

074230019	ADVANCED JAVA PROGRAMMING LABORATORY	L	T	P	C
		0	0	3	1.5

1. Multithreaded Messaging Application using Java Sockets
2. Multicast Communication using Java Multicast class
3. Distributed Programming with Java RMI
4. Database Programming using JDBC and Java Swing
5. Web Programming using JSP and EJB

074230022	SERVICE ORIENTED ARCHITECTURE LAB	L	T	P	C
		0	0	3	1.5

1. Client side / Server side scripting programs for the Web Pages.
2. Experiments with Active / JAVA server pages.
3. Socket Programming.
4. JAVA Servlets.
5. On-line Transactions – Database connectivity

ELECTIVES

		L	T	P	C
074580002	**SOFTWARE AGENTS**	**5**	**0**	**0**	**5**

UNIT I INTRODUCTION **(15)**

Agent definition – agent programming paradigms – Agents Vs objects – aglets – mobile agents – agent frame works – agent reasoning

UNIT II JAVA AGENTS **(15)**

Processes – threads – daemons – components – Java Beans – ActiveX – Sockets, RPCs – distributed computing – aglets programming – Jini architecture – actors and agents –typed and proactive messages

UNIT III MULTIAGENT SYSTEMS **(15)**

Interaction between agents – reactive agents – cognitive agents – interaction protocols – agent coordination – agent negotiation – agent cooperation – agent organization – self – interested agents in electronic commerce applications

UNIT IV INTELLIGENT SOFTWARE AGENTS **(15)**

Interface Agents – Agent Communication Languages – Agent Knowledge Representation – Agent Adaptability – Belief Desire Intension – Mobile Agent Applications

UNIT V AGENTS & SECURITY **(15)**

Agent Security Issues – Mobile Agents Security – Protecting Agents Malicious Hosts – Un trusted Agents – Black box Security – Authentication for Agents – Security issues for Aglets.

TOTAL : 75

REFERENCES :

1. Joseph P. Bigus, Jennifer Bigus, " Constructing intelligent agents with Java: A Programmers Guide to Smarter Applications", John Wiley & Sons Inc , 1st edition, New Delhi, 2000
2. Bradshaw Jeffrey M, "Software Agents", MIT Press, 1st edition, New Delhi, 2000
3. Russel S. and Norvig P, "Artificial Intelligence: A Modern Approach", Prentice Hall, 2nd edition, New Delhi, 2002
4. Richard Murch, Tony Johnson, "Intelligent Software Agents", Prentice Hall, 1st edition, New Delhi, 2000.

074230026	NETWORK SECURITY	L	T	P	C
		5	0	0	5

UNIT I CONVENTIONAL AND MODERN ENCRYPTION (15)

Services – Attacks – Steganography - Classical Encryption Techniques – DES – Differential and Linear Cryptanalysis – Modes of operation – Encryption Algorithms – Triple DES – Blowfish – CAST158

UNIT II PUBLIC KEY ENCRYPTION (15)

Uniqueness – Number Theory concepts – Primality – Modular Arithmetic – Fermat & Euler Theorem – Euclid Algorithm – RSA Algorithm – Elliptic Curve Cryptography – DiffieHellmanKeyExchange

UNIT III AUTHENTICATION AND SECURITY PRACTICE (15)

Digests – Requirements – MAC – Hash function – Security of Hash and MAC – Birthday Attack – MD5 – SHA – RIPEMD – Digital Signature Standard – Authentication applications – Kerberos – Kerberos Encryption Techniques – PGP– IP Security Architecture– Web security – SSL – TLS – SET

UNIT IV PUBLIC- KEY INFRASTRUCTURE (15)

Legislation - Regulation and Guidelines, Non-repudiation - Certification Policies and Practices- Public-Key Infrastructure Assessment and Accreditation

UNIT V SYSTEM SECURITY & STANDARDS (15)

Intruders and Intrusion – Viruses and Worms – OS Security – Firewalls – Design Principles – Packet Filtering – Application gateways – Trusted systems – Counter Measures. Blueprint for Security – Information Security Policy – Standards and Practices – ISO 17799/BS 7799 – NIST Models – VISA International Security Model – Design of Security Architecture – Planning for Continuity.

TOTAL : 75

REFERENCES

1. William Stallings, “Cryptography & Network Security”, Pearson Education, 5th edition. New Delhi 2005.
2. Charlie Kaufman, Radia Perlman, Mike Speciner, “Network Security, Private Communication in a Public World”, Prentice Hall of India, 1st edition, New Delhi, 2002.
3. Bruce Schneier, Niels Ferguson, “Practical Cryptography”, Wiley Dreamtech India Pvt Ltd, 1st edition, New Delhi, 2003.

074580003	PERSONAL SOFTWARE PROCESS AND TEAM SOFTWARE PROCESS	L	T	P	C
		5	0	0	5

UNIT I INTRODUCTION **(15)**

Software Engineering – Time Management – Tracking Time – Period & Product Planning – Product Size – Managing Your Time – Managing Commitments – Managing Schedules

UNIT II MANAGING YOUR TIME **(15)**

Elements of Time Management - Managing Commitments - Managing Scheduler - Project Plan - The Project Plan Summary.

UNIT III SOFTWARE DEVELOPEMNT PROCESS **(15)**

Defects - Software quality the updated Personal Software Process - Finding Defects - Code Review Checklist - Building a Personal Checklist - Coding Standards – Projecting Defects - Updated Project Plan.

UNIT IV PRODUCT IMPLEMENTATION **(15)**

Designing with Teams – Product Implementation – Integration & System Testing – The Postmortem. CAPABILITY MATURITY MODEL: Structure - Interpretation - Usage - Key process areas for various levels. ISO 9001: Elements of ISO 9001 – Improving Quality System - Case

UNIT V TEAM SOFTWARE PROCESS **(15)**

The Team Leader Role – Development Manager Role – The Planning Manger Role – The Quality – Process Manager Role – The Support Manager Role, Case Study

TOTAL : 75

REFERENCES

1. Watt S Humphery, " Introduction to Personal Software Process ", Addison Wesley, 1st edition, New Delhi, 2000.
2. Watt S Humphery, " Introduction to Team Software Process ", Addison Wesley, 1st edition, New Delhi, 2003.
3. Pankaj Jalote , " CMM in Practice", Pearson Education, 1st edition, New Delhi, 2002.
4. Darrel Ince, "ISO 9001 and Software Quality Assurance", Tata Mc-Graw Hill 2nd edition, New Delhi, 2003

074230050	UNIX AND NETWORK PROGRAMMING	L	T	P	C
		5	0	0	5

UNIT I INTRODUCTION TO UNIX (15)

File System - General Purpose Utilities - Bourne Shell - Simple Filters - Line Editing with ex - The vi Editor - Advanced filters - Process - Communication and Scheduling - Programming with Shell

UNIT II SYSTEM STRUCTURE (15)

Kernel architecture - Kernel data structure - Buffer Cache - Structure of Buffer pool - Scenarios for buffer retrieval - Reading and Writing disk blocks - Advantages and Disadvantages of buffer cache - Inode - Structure of regular file - Conversion of a pathname to an inode - Inode assignment to a new file - allocation of disk blocks.

UNIT III INTRODUCTION TO SYSTEM CALLS (15)

Process states and transitions - Context of a process - Saving the context of a process - Manipulating Process address space - Process creation and termination - System Boot and INIT process - Process Scheduling - Multithreads - Concurrency and parallelism.

UNIT IV UNIX FILES (15)

Unix file structure, directories, files and devices, System calls, library functions, low level file access, usage of open, creat, read, write, close, lseek, stat, fstat, octl, umask, dup, dup2. The standard I/O, formatted I/O, stream errors, streams and file descriptors, file and directory maintenance. Directory handling system calls

UNIT V INTERPROCESS COMMUNICATION (15)

Introduction to IPC,IPC between processes on a single computer system, IPC between processes on different systems, file and record locking, other unix locking techniques, pipes, FIFOs, streams and messages, namespaces, introduction to three types of IPCmessage queues, semaphores and shared memory.

TOTAL : 75

REFERENCES :

1. Maurice J. Bach, "Design of the UNIX Operating System", Prentice Hall of India, 3rd Edition, New Delhi, 2004.
2. W. Richard Stevens, UNIX Network Programming, , 4th edition,2002.
3. Stephen G. Kochan, "Exploring The Unix", SAMS Publications, 3rd edition, New Delhi, 2002.

074230051	DESIGN AND ANALYSIS OF ALGORITHMS	L	T	P	C
		5	0	0	5

UNIT I INTRODUCTION **(15)**

Introduction: Algorithms – profiling – analyzing algorithms – designing algorithms - Asymptotic notations – Standard notations and common functions – Summation – recurrences – Introduction to sets, relations, functions, graphs and trees

UNIT II SORTING **(15)**

Heaps – Building and maintaining an Heap – Heap sort – Priority Queues – Quick Sort – Description – performance – randomized version – Analysis of Quick Sort – Counting sort – Radix sort – Bucket sort

UNIT III DYNAMIC PROGRAMMING **(15)**

Introduction to Dynamic programming – Matrix chain multiplication – Elements of dynamic programming – Greedy Algorithms – Activity selection problem – elements of greedy strategy – Huffman coding – Task scheduling problems – Amortized analysis – aggregate method – accounting method – potential method – Dynamic tables.

UNIT IV UNIX FILES **(15)**

Unix file structure, directories, files and devices, System calls, library functions, low level file access, usage of open, creat, read, write, close, lseek, stat, fstat, octl, umask, dup, dup2. The standard I/O, formatted I/O, stream errors, streams and file descriptors, file and directory maintenance, Directory handling system calls

UNIT V PARALLEL ALGORITHMS **(15)**

Introduction to Parallel Algorithms-Parallelism-PRAM and other models PRAM and other models-PRAM algorithms handling write conflicts- merging and sorting-parallel connected component algorithm lower bounds.

TOTAL : 75

REFERENCES :

1. Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, “Fundamentals of Computer Algorithms”, Galgotia Publications, 2nd edition, New Delhi, 2007.
2. Aho A V, Hopcroft J E, Ullman J D, “Design and Analysis of Algorithms” , Pearson Education, 2nd edition, Singapore, 2000.
3. S.E. Goodman and S.T. Hedetniemi, “Introduction to the Design and Analysis of Algorithms”, Tata McGraw Hill, 1st edition, New Delhi, 2000.

074580001	SOFTWARE RELIABILITY	L	T	P	C
		5	0	0	5

UNIT I INTRODUCTION TO SOFTWARE RELIABILITY (15)

Software Reliability Definitions - software disasters - Errors - faults - failures – different views of software reliability – software requirements specification - Causes of unreliability in software - Dependable systems: reliable, safe, secure, maintainable, and available - Software maintenance.

UNIT II SOFTWARE RELIABILITY IMPROVEMENT (15)

The phases of a Software Project - Monitoring the development process – The software life cycle models - software engineering - Structured Analysis and structured Design - Fault tolerance - Inspection - Software cost and schedule.

UNIT III SOFTWARE QUALITY MANAGEMENT (15)

Software quality modeling - Diverse approaches and sources of information – Fault avoidance, removal and tolerance - Process maturity levels (CMM) - Software quality assurance (SQA) - Monitoring the quality of software - Total quality management (TQA) - Measuring Software Reliability - The statistical approach - Software reliability metrics.

UNIT IV SOFTWARE RELIABILITY TECHNIQUES AND TOOLS (15)

Data Trends - Complete prediction Systems - overview of some software reliability models - The recalibration of the models - Analysis of model accuracy – Reliability growth models and trend analysis - Software Costs Models - Super models.

UNIT V SOFTWARE RELIABILITY ENGINEERING PRACTICE (15)

Testing and maintaining more reliable software –logical testing – functional testing – algorithm testing – regression testing - fault tree analysis – failure mode effects and critical analysis – reusability - case studies.

TOTAL : 75

REFERENCES

1. Michael.R.Lyu, Handbook of Software Reliability Engineering, 2nd edition, 2004.
2. J.D. Musa, A. Iannino and K.Okumoto, Software Reliability, Measurement, Prediction, Application, McGraw Hill, 2000.
3. J.D. Musa, Software Reliability Engineering, McGraw Hill, 2000.

074230023	EXTREME PROGRAMMING	L	T	P	C
		5	0	0	5

UNIT 1 INTRODUCTION TO C# (15)

Introducing C#, Understanding .NET, Overview of C#, Literals, Variables, Data Types, Operators, Expressions, Branching, Looping, Methods, Arrays, Strings, Structures, Enumerations.

UNIT II OBJECT ORIENTED ASPECTS OF C# (15)

Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator Overloading, Delegates, Events, Errors and Exceptions.

UNIT III APPLICATION DEVELOPMENT ON .NET (15)

Building Windows Applications, Accessing Data with ADO.NET.

UNIT IV WEB BASED APPLICATION DEVELOPMENT ON .NET (15)

Programming Web Applications with Web Forms, Programming Web Services.

UNIT V THE CLR AND THE .NET FRAMEWORK (15)

Assemblies, Versioning, Attributes, Reflection, Viewing MetaData, Type Discovery, Reflecting on a Type, Marshaling, Remoting, Understanding Server Object Types, Specifying a Server with an Interface, Building a Server, Building the Client, Using SingleCall, Threads.

TOTAL : 75

REFERENCES

1. E. Balagurusamy, “Programming in C#”, Tata McGraw-Hill, 2004. (Unit I, II)
2. J. Liberty, “Programming C#”, 2nd ed., O’Reilly, 2002. (Unit III, IV, V)
3. Herbert Schildt, “The Complete Reference: C#”, Tata McGraw-Hill, 2004.
4. Robinson et al, “Professional C#”, 2nd ed., Wrox Press, 2002.
5. Andrew Troelsen, “C# and the .NET Platform”, A! Press, 2003.
6. S. Thamarai Selvi, R. Murugesan, “A Textbook on C#”, Pearson Education, 2003.

074250008	MIDDLEWARE TECHNOLOGIES	L	T	P	C
		5	0	0	5

UNIT I INTRODUCTION (15)

Software Components – objects – fundamental properties of Component technology – modules – interfaces – callbacks – directory services – component architecture – components and middleware.

UNIT II JAVA COMPONENT TECHNOLOGIES (15)

Threads – Java Beans – Events and connections – properties – introspection – JAR files – reflection – object serialization – Enterprise Java Beans – Distributed Object models – RMI and RMI-IIOP.

UNIT III CORBA TECHNOLOGIES (15)

Java and CORBA – Interface Definition language – Object Request Broker – system object model – portable object adapter – CORBA services – CORBA component model – containers – Application server – model driven architecture.

UNIT IV COM AND .NET TECHNOLOGIES (15)

COM – Distributed COM – object reuse – interfaces and versioning – dispatch interfaces – connectable objects – OLE containers and servers – Active X controls – .NET components - assemblies – appdomains – contexts – reflection – remoting.

UNIT V COMPONENT FRAMEWORKS AND DEVELOPMENT (15)

Connectors – contexts – EJB containers – CLR contexts and channels – Black Box component framework – directory objects – cross-development environment – component-oriented programming – Component design and implementation tools – testing tools - assembly tools.

TOTAL: 75

REFERENCES :

1. Clemens Szyperski, “Component Software: Beyond Object-Oriented Programming”, Addison Wesley, 2nd Edition 2002.
2. Ed Roman, “Enterprise Java Beans”,3rd Edition, Wiley, 2004.
3. Andreas Vogel, Keith Duddy, “Java Programming with CORBA”, John Wiley & Sons 1998
4. Corry, Mayfield, Cadman, “COM/DCOM Primer Plus”, Tec media, 1st Edition, 1999

074230052	COMPUTER GRAPHICS AND MULTIMEDIA SYSTEMS	L	T	P	C
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UNIT I OUTPUT PRIMITIVES (15)

Introduction - Line - Curve and Ellipse Drawing Algorithms – Attributes – Two- Dimensional Geometric Transformations – Two-Dimensional Clipping and Viewing.

UNIT II THREE-DIMENSIONALCONCEPTS (15)

Three-Dimensional Object Representations – Three-Dimensional Geometric and Modeling Transformations – Three-Dimensional Viewing – Color models – Animation.

UNIT III MULTIMEDIA SYSTEMS DESIGN (15)

Introduction – Multimedia applications – Multimedia System Architecture – Evolving technologies for Multimedia – Defining objects for Multimedia systems – Multimedia Data interface standards – Multimedia Databases.

UNIT IV MULTIMEDIA FILE HANDLING (15)

Compression & Decompression – Data & File Format standards – Multimedia I/O technologies - Digital voice and audio – Video image and animation – Full motion video – Storage and retrieval Technologies.

UNIT V HYPERMEDIA (15)

Multimedia Authoring & User Interface – Hypermedia messaging - Mobile Messaging – Hypermedia message component – Creating Hypermedia message – Integrated multimedia message standards – Integrated Document management – Distributed Multimedia Systems.

TOTAL :75

REFERENCES:

1. Donald Hearn and M.Pauline Baker, “Computer Graphics C Version”, Pearson Education, Asia, 2003
2. Prabat K Andleigh and Kiran Thakrar, “Multimedia Systems and Design”, Prentice Hall of India, New Delhi 2003
3. Judith Jeffcoate, “Multimedia in practice technology and Applications”, Prentice Hall of India, New Delhi,1998.
4. Foley, Vandam, Feiner and Huges, “Computer Graphics: Principles & Practice”, Pearson Education, Asia, Second edition 2003.

074580004	SOFTWARE QUALITY ASSURANCE	L	T	P	C
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UNIT I CONCEPTS **15**

Concepts of Quality Control, Quality Assurance, Quality Management - Total Quality Management; Cost of Quality; QC tools - 7 QC Tools and Modern Tools; Other related topics - Business Process Re-engineering –Zero Defect, Six Sigma, Quality Function Deployment, Benchmarking, Statistical process control.

UNIT II SOFTWARE ENGINEERING CONCEPTS **15**

Software Engineering Principles, Software Project Management, Software Process, Project and Product Metrics, Risk Management, Software Quality Assurance; Statistical Quality Assurance - Software Reliability, Muse Model; Software Configuration Management; Software Testing; CASE (Computer Aided Software Engineering).

UNIT III QUALITY ASSURANCE MODELS **15**

Models for Quality Assurance-ISO-9000 - Series, CMM, SPICE, Malcolm Baldrige Award.

UNIT IV SOFTWARE QUALITY ASSURANCE RELATED TOPICS **15**

Software Process - Definition and implementation; internal Auditing and Assessments; Software testing - Concepts, Tools, Reviews, Inspections & Walkthroughs; P-CMM.

UNIT V FUTURE TRENDS **15**

PSP and TSP, CMMI, OO Methodology, Clean-room software engineering, Defect injection and prevention.

TOTAL: 75

REFERENCES:

1. Watts Humphery, “Managing Software Process ", Addison - Wesley, 2000.
2. Philip B Crosby, " Quality is Free: The Art of Making Quality Certain ", Mass Market, 2004.
3. Roger Pressman, “Software Engineering ", Sixth Edition, McGraw Hill, 2006