

ANNA UNIVERSITY, CHENNAI

AFFILIATED INSTITUTIONS

CURRICULAM AND SYLLABI - REGULATIONS – 2010

B.Sc – SOFTWARE ENGINEERING (3 YEARS)

SEMESTER I

COURSE CODE	COURSE TITLE	L	T	P	C
Theory					
YEN001	<u>Technical English-I</u>	4	0	0	4
YMA001	<u>Applied Mathematics-I</u>	3	1	0	4
YCS911	<u>Digital Principles</u>	3	0	0	3
YCS912	<u>Computer Concepts & Problem Solving</u>	3	0	0	3
YCS913	<u>Programming in C</u>	3	0	0	3
Practicals					
YCS915	<u>Computer Concepts and Problem Solving Laboratory</u>	0	0	3	2
YCS916	<u>C Programming Laboratory</u>	0	0	3	2
YCS917	<u>Digital laboratory</u>	0	0	3	2
TOTAL CREDITS					23

SEMESTER II

COURSE CODE	COURSE TITLE	L	T	P	C
Theory					
YEN002	<u>Technical English-II</u>	4	0	0	4
YCS921	<u>Object Oriented Programming</u>	3	0	0	3
YSE921	<u>Introduction to Software Engineering</u>	3	0	0	3
YCS924	<u>Computer Architecture</u>	3	0	0	3
YCS923	<u>Data Structures</u>	3	0	0	3
Practicals					
YCT947	<u>Software Engineering Laboratory</u>	0	0	3	2
YCS926	<u>Object Oriented Programming Laboratory</u>	0	0	3	2
YCS927	<u>Data Structures Laboratory</u>	0	0	3	2
TOTAL CREDITS					21

SEMESTER III

COURSE CODE	COURSE TITLE	L	T	P	C
Theory					
YMA003	<u>Mathematical Structures</u>	3	1	0	4
YCS942	<u>Operating Systems</u>	3	0	0	3
YCS933	<u>Database Management Systems</u>	3	0	0	3
YSE931	<u>Design and Analysis of Algorithms</u>	3	0	0	3
YSE932	<u>Microprocessor and Interfacing</u>	3	0	0	3
Practicals					
YSE934	<u>Operating Systems Laboratory</u>	0	0	3	2
YCS937	<u>Database Management Systems Laboratory</u>	0	0	3	2
YSE935	<u>Microprocessors and Interfacing Lab</u>	0	0	3	2
TOTAL CREDITS					22

SEMESTER IV

Course Code	Course Title	L	T	P	C
Theory					
YMA004	<u>Probability and Statistics</u>	3	1	0	4
YSE941	<u>Java Programming</u>	3	0	0	3
YSE942	<u>Object Oriented Analysis and Design</u>	3	0	0	3
YCS951	<u>Computer Networks</u>	3	0	0	3
E1	Elective I	3	0	0	3
Practicals					
YSE944	<u>Java Programming Laboratory</u>	0	0	3	2
YSE945	<u>CASE Tools Laboratory</u>	0	0	3	2
YCS957	<u>Computer Networks Laboratory</u>	0	0	3	2
TOTAL CREDITS					22

SEMESTER V

COURSE CODE	COURSE TITLE	L	T	P	C
Theory					
YCT954	<u>Web Technology</u>	3	0	0	3
YSE951	<u>Software Testing</u>	3	0	0	3
YSE952	<u>Multimedia Systems</u>	3	0	0	3
E2	Elective II	3	0	0	3
E3	Elective III	3	0	0	3
Practicals					
YSE954	<u>Web Technology Lab</u>	0	0	3	2
YSE955	<u>Software Testing Lab</u>	0	0	3	2
YSE956	<u>Multimedia Systems Lab</u>	0	0	3	2
TOTAL CREDITS					21

SEMESTER VI

Course Code	Course Title	L	T	P	C
Theory					
YSE961	<u>Software Quality Assurance</u>	3	0	0	3
YSE962	<u>Software Project Management</u>	3	0	0	3
E4	Elective IV	3	0	0	3
E5	Elective V	3	0	0	3
E6	Elective VI	3	0	0	3
Practicals					
YSE965	Project Work	0	0	12	6
TOTAL CREDITS					21

TOTAL CREDITS TO BE EARNED FOR THE AWARD OF THE DEGREE =131

LIST OF ELECTIVES

SEMESTER IV

COURSE CODE	COURSE TITLE	L	T	P	C
YSE001	<u>Software Reuse</u>	3	0	0	3
YSE002	<u>Software Communication and Documentation</u>	3	0	0	3
YCS005	<u>Client Server Computing</u>	3	0	0	3
YSE003	<u>Personal Software Process and Team Software Process</u>	3	0	0	3

SEMESTER V

COURSE CODE	COURSE TITLE	L	T	P	C
YSE004	<u>Software Agents</u>	3	0	0	3
YSE005	<u>Real Time Systems</u>	3	0	0	3
YSE006	<u>Component Based Development</u>	3	0	0	3
YSE007	<u>User Interface Design</u>	3	0	0	3
YSE008	<u>Embedded Systems</u>	3	0	0	3
YSE009	<u>Open Source Computing</u>	3	0	0	3

SEMESTER VI

COURSE CODE	COURSE TITLE	L	T	P	C
YSE010	<u>Network Security And Cryptography</u>	3	0	0	3
YSE011	<u>Service Oriented Architecture</u>	3	0	0	3
YSE012	<u>Software Metrics</u>	3	0	0	3
YSE013	<u>Software Reliability</u>	3	0	0	3
YSE014	<u>Software Design</u>	3	0	0	3
YSE015	<u>Data Warehousing</u>	3	0	0	3
YCS016	<u>Distributed Operating Systems</u>	3	0	0	3
YCS014	<u>Advanced DBMS</u>	3	0	0	3
YSE016	<u>Extreme Programming</u>	3	0	0	3
YSE017	<u>Compiler Design</u>	3	0	0	3

UNIT I ENGLISH TODAY**12**

Modern English: varieties of discourse—regional variations—accent and dialects—social variations—occupational varieties and scientific English—medium and attitude; speaking and writing; formal and informal style—language change—newways of studying English.

UNIT II EXTENDING VOCABULARY: STRUCTURAL AND CONTENT WORDS**12**

Principles of word formation; abbreviations and acronyms; foreign words and phrases; idioms and phrases—everyday computer—related words; scientific and technical terms.

UNIT III GRAMMAR**12**

Referring to people and things with the help of noun phrases- describing people and things with the help of determiners- adjectives and modifiers- making a message varying the message: negation question exclamation inversion – expressing words referring to time, place and manner- reporting what people say or think – combining messages: coordination and subordination- making text- the structure of information.

UNIT IV RECEPTIVE SKILL 1—LISTENING**12**

Developing guided note taking from a lecture, recognizing and using descriptive words and phrases, completing information in a table, practicing dictation and checking spelling, developing accuracy in listening, imitating standard spoken English through native speakers' talk and presentation, listening for general and specific information, listening to news in the media and relating information to issues and locales around the world.

UNIT V RECEPTIVE SKILL 2—READING**12**

Predicting the content – skimming the text for gist- identifying the topic sentences –guessing the meaning of words from contexts – scanning for specific information –transfer of information – cloze reading.

TOTAL : 60 PERIODS**REFERENCE BOOKS:**

1. Adrian Doff & Christopher Jones, "Language in use – intermediate", Cambridge University Press, 2003.
2. Gail Ellis and Barbara Sinclair, "Learning to learn English: A course in learner training", Cambridge University Press, 1989.

UNIT III **9**
 Synchronous Sequential Logic: Sequential Circutes - Latches, Flip-Flops, Analysis of Clocked Sequential Circuits, State Reduction – Applications of flip - flops.

UNIT IV **9**
 Registers and Counters: Registers, Shift Registers, Ripple Counters, Synchronous Counters, Ring Counters-Johnson Counter.

UNIT V **9**
 Asynchronous Sequential Circuit : Introduction, Analysis Procedure, Circuits with Latches, Design Procedure, Reduction of State and Flow Tables. Digital Integrated circuits: Introduction – special characteristics Bipolar – Transistor Characteristics.

TOTAL : 45 PERIODS

REFERENCE BOOKS :

1. M.Morris Mano, “Digital Design”, 3rd edition, Pearson Education, Delhi, 2007.
2. Donald P Leech, Albert Paul Malvino and Goutam Saha, “Digital Principles and Applications”, Tata Mc Graw Hill, 2007.

YCS912	COMPUTER CONCEPTS & PROBLEM SOLVING	L	T	P	C
		3	0	0	3

UNIT I FUNDAMENTALS OF COMPUTERS **9**
 Evolution of Computers – Inputs/Outputs – Organization of Modern Digital Computers - Processor and memory – Operating System – Network Topologies – Graphical user Interface.

UNIT II WORD PROCESSING **9**
 Word Processing Programs and Their Uses – Word Processor’s Interface – Editing Text – Formatting Text –Macro- Special Features of Word – Desktop Publishing Service – Converting doc into www pages

UNIT III SPREADSHEET SOFTWARE **9**
 Spreadsheet Programs – applications – Spreadsheet package features, attributes -structure, label, data, importing data, formula, functions – data handling – Managing Workbooks.

UNIT IV INTRODUCTION TO COMPUTER PROBLEM SOLVING **9**
 Introduction – Problem Solving aspects-Top-Down Design-Implementation of Algorithms – Program Verification. Verification of program segments - Efficiency of Algorithms-Analysis of Algorithm fundamental Algorithm - factorial computation-generation of Fibonacci sequence.

UNIT V FACTORING AND ARRAY TECHNIQUES **9**
 Factoring Methods-finding the square root of a number-generating prime numbers- Array techniques-array order reversal-Finding the maximum number in a set- Removal of duplicates from an ordered Array-finding the kth smallest element.

TOTAL: 45 PERIODS

REFERENCE BOOKS:

1. Peter Norton, "Introduction to Computers", 3rd Edition, TMH Ltd, New Delhi, 2001.
2. R.G. Dromey, "How to solve it by Computers", Pearson Publishers, New Delhi, 2007.

YCS913

PROGRAMMING IN C

L	T	P	C
3	0	0	3

UNIT I INTRODUCTION TO C LANGUAGE 9

Overview of 'C' language – Constants, Variables and Data Types – Operators, Expressions and Assignment statements – Managing Input/Output Operations – Formatted I/O – Decision Making - Branching – IF, Nested IF – Switch – go to -Looping- While, do, for statements.

UNIT II ARRAYS AND FUNCTIONS 9

Arrays – dynamic and multi-dimensional arrays - Character arrays and Strings –String handling Functions - User defined Functions – Categories of Functions –Recursion.

UNIT III STRUCTURES AND UNIONS 9

Basics of Structures-Declaring a Structure – Array of Structures –Passing Structure elements to Functions- Passing entire Structure to Function – Structures within Structures - Union – Union of Structures – Enumerated Data Types – type of Statement.

UNIT IV POINTERS 9

Pointers – Declaration, Accessing a variable, dynamic memory allocation, Pointers versus Arrays, Array of pointers, Pointers to functions and structure Pointers.

UNIT V FILE MANAGEMENT 9

File Management in C – Data hierarchy- Files and Streams – Sequential access file-Random access file - Preprocessors.

TOTAL : 45 PERIODS

REFERENCE BOOKS :

1. V.Rajaraman "Computer Programming in C" PHI, New Delhi, 2001
2. Kamthane, A.N., "Programming with ANSI and Turbo C", Pearson Education, Delhi, 2006.
3. Yashavant P. Kanetkar " Pointers In C" , BPB Publications, New Delhi, 2002
4. E.Balagurusamy " Programming in ANSI C " , Tata McGraw Hill, 2004
5. Deitel and Deitel " C How to Program " , Addison Wesley , 2001

YCS915	COMPUTER CONCEPTS AND PROBLEM SOLVING LABORATORY	L	T	P	C
		0	0	3	2

LIST OF EXERCISES:

1. Word Processing
2. Spreadsheet
3. Power point
4. Factorial
5. Fibonacci
6. Prime Generation
7. Removal of duplicates from an ordered Array
8. Finding the kth smallest element.

TOTAL : 45 PERIODS

YCS916	C PROGRAMMING LABORATORY	L	T	P	C
		0	0	3	2

LIST OF EXERCISES:

Implementation of

1. Input / output function
2. Control Functions
3. Functions
4. Arrays
5. Pointers
6. Structures and Unions
7. Files
8. Using case studies on: Roots of a quadratic equation, Measures of location –
9. Matrix Operations – Evaluation of trigonometric functions – Pay roll problems.
10. String operations like substring, concatenation, finding a string from a given
11. Paragraph, finding the number of words in a paragraph.

TOTAL : 45 PERIODS

YCS917

DIGITAL LABORATORY

L	T	P	C
0	0	3	2

LIST OF EXERCISES:

1. Binary and BCD counter
2. Verification of NAND, NOR, XOR, AND, OR Gate Logic
3. Parity Generator
4. Multiplexer / Demultiplexers
5. Adder / Subtractor
6. Code Converters
7. Up / Down 4 bit Binary Counter
8. Up / Down 4 bit Decimal Counter
9. Shift Register
10. Ring Counter

TOTAL : 45 PERIODS

YEN002

TECHNICAL ENGLISH - II

L	T	P	C
4	0	0	4

UNIT I ENGLISH TODAY 12

Communicating across cultures - Dealing with Discrimination – non verbal communication – values, beliefs & practices, Body language, The importance of Listening, Speaking and Interpersonal communication – purpose of Messages in Organization.

UNIT II GRAMMAR (FOCUS ON LANGUAGE) 12

Expanding nominal compounds – framing of questions ('Wh' pattern, yes/no questions, tag questions) Subject – verb agreement, use of articles, preposition and conditionals – gerund and infinitive .

UNIT III RECEPTIVE SKILLS 1 & 2 – LISTENING AND READING 12

Gap filling activity while listening - intensive listening – listening to a discourse and filling up gaps in a worksheet – comprehension tasks based on listening. Reading the gist to identify the topic sentence – its role – sequencing of sentences – transcoding diagrams – understanding discourse coherence and cohesion.

UNIT IV PRODUCTIVE SKILL 1 – SPEAKING 12

Making Oral presentations – planning, kinds of presentation – adapting your ideas to audience, planning visual and other device to involve the audience – conducting language games to enrich spoken skills – facing interviews and negotiating benefits.

UNIT V PRODUCTIVE SKILL 2 – WRITING 12

Paragraph writing, process description, check list, job application & resume, business letters (Calling for quotation, placing orders, enquiry etc) – Instruction and recommendation.

REFERENCE BOOKS:

1. Kitty O Locker, "Business Communication – Building critical Skills", Mc-Graw Hill, Third Edition 2007
2. Bridha Prabhakar, G. Subramanian, "Technical English for Engineering Students", Gems Publications, 2006.
3. Aysha Viswamohan, "English for Technical Communication", Tata McGraw Hill, 2007

YCS921	OBJECT ORIENTED PROGRAMMING	L	T	P	C
		3	0	0	3

UNIT I **9**

PRINCIPLES OF OOP: Software Crisis. Software Evolution .Programming Paradigms. Object Oriented Technology – Basic concepts and benefits of OOP . Application of OOP, OOP languages.

INTRODUCTION TO C++: History of C++ , structure of C++, application of C++ ,tokens, keywords, identifiers, basic data types, derived data types, derived data types, symbolic constant, dynamic initialization, reference variables, scope resolution oprator,type modifiers, type casting operators and control statements, input and output statements in C++, function prototyping, function components, passing parameters call by reference, return by reference, inline function, default arguments, over loaded function introduction friend function .

UNIT II **9**

CLASSES AND OBJECTS: Class specification, Member function definition, nested member function, access qualifiers, static data members and, member functions. Instance creation. Array of objects. Dynamic objects, Static Objects, Objects as arguments. Returning objects.

CONSTRUCTORS AND DESTRUCTORS: Constructors- Parameterized constructors, Overloaded Constructors, Constructors with default arguments, copy constructors, Dynamic Constructors, dynamic initialization using Constructors. Destructors.

UNIT III **9**

OPERATOR OVERLOADING: Operator function-overloading unary and binary operators, overloading the operator using Friend function, Stream operator overloading, Data conversion.

INHERITANCE: Defining derived classes. Single Inheritance-Protected data with private inheritance. Multiple Inheritance. Multi Level Inheritance. Hierarchical Inheritance. Hybrid Inheritance. Multipath Inheritance .Constructors in derived and base Class. Template in Inheritance. Abstract classes. Virtual function and Dynamic polymorphism. Virtual destructor. Nested Classes.

UNIT IV **FUNCTIONS IN C++ :** **9**

Virtual functions- need for Virtual function, Pointer to derived class objects, Definition of Virtual functions, Array of Pointer to base class objects, Pure Virtual functions , Abstract classes , Virtual Destructors, Generic Programming with Templates. Introduction, function templates, overloaded function templates, user defined templates arguments, class templates, Inheritance of class templates.

UNIT V STREAM

9

Streams in C++, Stream classes, formatted and unformatted data, Manipulators, User defined Manipulators, file stream, file pointer and manipulation, file open and close, sequential and random access.

EXCEPTION HANDLING: Principle of Exception handling, Exception handling mechanism, Multiple catch, Nested try, rethrowing the Exception.

TOTAL: 45 PERIODS

REFERENCE BOOKS :

1. Robert Lafore, "Object Oriented Programming in C++", Galgotia Publication Pvt. Ltd, 4th edition, New Delhi, 2002
2. Herbert Schildt, "C++ : The Complete Reference", TMH, New Delhi, 2003.
3. Ashok N Kamathane, "Object Oriented Programming with ANSI & Turbo C++", Pearson Education, New Delhi, 2003.
4. Bjarne Stroustrup, "C++ Programming language", Pearson Education, New Delhi, 2001.
5. Stanley B Lippman and Josee Lajoie, "C++ Primer", Pearson Education, ND, 2001.
6. Venugopal K R, Rajkumar Buyya and Ravishankar T, "Mastering C++", TMH, ND, 2006.

YSE921	INTRODUCTION TO SOFTWARE ENGINEERING	L	T	P	C
		3	0	0	3

UNIT I PRODUCT AND THE PROCESS 9

The evolving role of software-Software Characteristics-Software Applications-Software Engineering: A layered technology process models-The linear sequential Models-Incremental model-Evolutionary Software Process Models-Formal Methods Model.

UNIT II ANALYSIS MODELING 9

The elements of the analysis model-Data modeling-Data objects, attributes and relationships-cardinality and modality-Entity/Relationship diagram-Data flow diagrams-The data dictionary – Metrics for analysis model

UNIT III MANAGING SOFTWARE PROJECTS AND PLANNING 9

The Management spectrum-People-Product-Process-Project-Metrics in the process and project domain-Software Measurement-Metrics for software quality. Objective- Software Scope-Resources-Software Project Estimation-Decomposition Technique-Empirical Estimation Model

UNIT IV RISK MANAGEMENT AND PROJECT SCHEDULING 9

Introduction to Software RISK-Software Risk Management-RISK mitigation through RMMM plan-Analysis of SEI software RISK taxonomy-Project Scheduling and Tracking-Defining a task set for the software project

UNIT V SOFTWARE TESTING TECHNIQUES 9

Software Testing Fundamentals-Test Case Design-White Box Testing-Basis Path Testing-Loop Testing-Black Box Testing-Testing Strategies-Unit Testing-Integration Testing-Validation Testing-System Testing

TOTAL : 45 PERIODS

REFERENCE BOOKS:

1. Roger. S. Pressman, "Software Engineering – A Practitioner’s Approach", McGraw Hill, 6th edition, New Delhi, 2005.
2. Pankaj Jalote, "An Integrated Approach to Software Engineering", Narosa Publishing House, 3rd edition, New Delhi, 2005
3. Ian Sommerville, "Software Engineering", Pearson Education Asia, 6th edition, New Delhi, 2006.
4. Waman.S.Jawadekar,"Software Engineering Principles & Practice", TMH, 1st edition, New Delhi, 2004.

YCS924

COMPUTER ARCHITECTURE

L	T	P	C
3	0	0	3

UNIT I BASIC STRUCTURE OF COMPUTERS 9

Functional units - Basic operational concepts - Bus structures – Software performance – Memory locations and addresses – Memory operations – Instruction and instruction sequencing – Addressing modes – Assembly language – Basic I/O operations – Stacks and queues.

UNIT II ARITHMETIC UNIT 9

Addition and subtraction of signed numbers – Design of fast adders – Multiplication of positive numbers - Signed operand multiplication and fast multiplication – Integer division – Floating point numbers and operations.

UNIT III BASIC PROCESSING UNIT 9

Fundamental concepts – Execution of a complete instruction – Multiple bus organization – Hardwired control – Micro programmed control - Pipelining – Basic concepts – Data hazards – Instruction hazards – Influence on Instruction sets – Data path and control consideration – Superscalar operation.

UNIT IV MEMORY SYSTEM 9

Basic concepts – Semiconductor RAMs - ROMs – Speed - size and cost – Cache memories - Performance consideration – Virtual memory- Memory Management requirements – Secondary storage.

UNIT V I/O ORGANIZATION 9

Accessing I/O devices – Interrupts – Direct Memory Access – Buses – Interface circuits – Standard I/O Interfaces (PCI, SCSI, USB).

TOTAL : 45 PERIODS

REFERENCE BOOKS:

1. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, 5th Edition "Computer Organization", McGraw-Hill, 2002.
2. William Stallings, "Computer Organization and Architecture – Designing for Performance", 6th Edition, Pearson Education, 2003.

3. David A.Patterson and John L.Hennessy, "Computer Organization and Design: The hardware / software interface", 2nd Edition, Morgan Kaufmann, 2002.
4. John P.Hayes, "Computer Architecture and Organization", 3rd Edition, McGraw Hill, 1998.

YCS923 **DATA STRUCTURES** **L T P C**
3 0 0 3

UNIT I PROBLEM SOLVING **9**

Problem solving – Top-down Design – Implementation – Verification – Efficiency Analysis – Sample algorithms.

UNIT II LISTS, STACKS AND QUEUES **9**

Abstract Data Type (ADT) – The List ADT – The Stack ADT – The Queue ADT

UNIT III TREES **9**

Preliminaries – Binary Trees – The Search Tree ADT – Binary Search Trees – AVL Trees – Tree Traversals – Hashing – General Idea – Hash Function – Separate Chaining – Open Addressing – Linear Probing – Priority Queues (Heaps) – Model – Simple implementations – Binary Heap

UNIT IV SORTING **9**

Preliminaries – Insertion Sort – Shellsort – Heapsort – Mergesort – Quicksort – External Sorting

UNIT V GRAPHS **9**

Definitions – Topological Sort – Shortest-Path Algorithms – Unweighted Shortest Paths – Dijkstra's Algorithm – Minimum Spanning Tree – Prim's Algorithm – Applications of Depth-First Search – Undirected Graphs – Biconnectivity – Introduction to NP-Completeness

TOTAL : 45 PERIODS

REFERENCE BOOKS:

1. R. G. Dromey, "How to Solve it by Computer" (Chaps 1-2), Prentice-Hall of India, 2002.
2. M. A. Weiss, "Data Structures and Algorithm Analysis in C", 2nd ed, Pearson Education Asia, 2002.
3. ISRD Group, "Data Structures using C", Tata McGraw Hill, 2007
4. Richard F. Gilberg, Behrouz A. Forouzan, "Data Structures – A Pseudocode Approach with C", ThomsonBrooks / COLE, 1998.

YCT947 **SOFTWARE ENGINEERING LABORATORY** **L T P C**
0 0 3 2

LIST OF EXERCISES:

1. Practice requirements elicitation
2. Practice requirement analysis and project plan
3. SRS Documentation
4. Cost estimation models
5. Practice design techniques using case tools.
6. Simulate Software architectural components.
7. Generation of test cases for testing

8. Unit testing
9. Integration testing
10. Creating software documentation for all the phases of software life cycle
11. development.
12. Note: All the above exercises are to be carried out by using any real time
13. application such as Library Management System, Payroll processing, Hospital
14. management system, Inventory management etc.,. Any other application
15. indicated by the Instructor can also be used.

TOTAL : 45

YCS926	OBJECT ORIENTED PROGRAMMING LABORATORY	L	T	P	C
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LIST OF EXERCISES:

1. Implementation of Classes and Objects
2. Implementation of Function Overloading
3. Implementation of Inline function
4. Implementation of Call by Value and Call by reference
5. Implementation of Function Overloading
6. Implementation of Static data and member function
7. Implementation of Objects as arguments
8. Implementation of Array of Objects
9. Implementation of Static and Dynamic Objects
10. Implementation of Constructor and Destructor
11. Implementation of Overloading Unary operators
12. Implementation of Overloading Binary operators
13. Implementation of Operator Overloading using friend function
14. Implementation of Data conversion
15. Implementation of all types of Inheritance
16. Implementation of Virtual functions
17. Implementation of Template functions and template class
18. Implementation of Sequential and Random accessing of Files
19. Implementation of Exception Handling mechanism

TOTAL : 45

YCS927	DATA STRUCTURES LABORATORY	L	T	P	C
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		0	0	3	2
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LIST OF EXERCISES:

Implement the following exercises using C:

- 1 Array implementation of List Abstract Data Type (ADT)
- 2 Linked list implementation of List ADT
- 3 Cursor implementation of List ADT
- 4 Array implementations of Stack ADT
- 5 Linked list implementations of Stack ADT

The following three exercises are to be done by implementing the following source files

- (a) Program for 'Balanced Paranthesis'
 - (b) Array implementation of Stack ADT
 - (c) Linked list implementation of Stack ADT
 - (d) Program for 'Evaluating Postfix Expressions'
- An appropriate header file for the Stack ADT should be #included in (a) and (d)
- 6 Implement the application for checking 'Balanced Paranthesis' using array implementation of Stack ADT (by implementing files (a) and (b) given above)
 - 7 Implement the application for checking 'Balanced Paranthesis' using linked list implementation of Stack ADT (by using file (a) from experiment 6 and implementing file (c))
 - 8 Implement the application for 'Evaluating Postfix Expressions' using array and linked list implementations of Stack ADT (by implementing file (d) and using file (b), and then by using files (d) and (c))
 - 9 Queue ADT
 - 10 Search Tree ADT - Binary Search Tree
 - 11 Heap Sort
 - 12 Quick Sort

TOTAL: 45

YMA003	MATHEMATICAL STRUCTURES	L	T	P	C
		3	1	0	4

UNIT I SET THEORY 12
 Set theory: set notations basic set operations - Venn diagram - laws of set theory principles of inclusion and exclusion - partition - minsets – mathematical induction.

UNIT II PROPOSITIONAL CALCULUS 12
 Propositions - Truth table-logical operators – Tautologies and contradiction- Logical equivalences and implications- laws of logic - normal forms- proofs in propositional calculus- Direct proof- conditional conclusion – indirect proof- Inconsistent set of premises.

UNIT III PREDICATE CALCULUS 12
 Predicates- statement function – variables and quantifiers- Prdicate formulae- Free and bound variables- The Universe of discourse- logical implications and equivalence for quantified statements- Theory of inference of predicate calculus.

UNIT IV RELATIONS AND FUNCTIONS 12
 Relations- Properties of relations- Equivalence relation- composition of relations- closure operations on relations- Fuctions-Injective, surjective, bijective functions- composition of functions – inverse functions.

UNIT V FORMAL LANGUAGES AND AUTOMATA 12
 Four classes of gammars- Types of grammars-normal forms-Derivation trees- ambiguous and unambiguous grammars- finite state automata(FSA)- nondeterministic finite state automata(NFSA)- conversion of non-deterministic automata to deterministic finite state automata. acceptance of a regular set by an FSA construction of a right linear grammar from a finite automata.

REFERENCE BOOKS:

1. Kenneth H.Rosen, " Discrete Mathematics and its Applications", Tata Mc Graw Hill, Fourth Edition, 2002.
2. J.P.Tremblay and Manohar , " Discrete Mathematical Structures with Applications to computer Science ", TMH ,1997.

YCS942	OPERATING SYSTEMS	L	T	P	C
		3	0	0	3

UNIT I INTRODUCTION 9

Introduction - Mainframe systems – Desktop Systems – Multiprocessor Systems – Distributed Systems – Clustered Systems – Real Time Systems – Handheld Systems - Hardware Protection - System Components – Operating System Services – System Calls – System Programs - Process Concept – Process Scheduling – Operations on Processes – Cooperating Processes – Inter-process Communication.

UNIT II THREADS 9

Threads – Overview – Threading issues - CPU Scheduling – Basic Concepts – Scheduling Criteria – Scheduling Algorithms – Multiple-Processor Scheduling – Real Time Scheduling - The Critical-Section Problem – Synchronization Hardware – Semaphores – Classic problems of Synchronization – Critical regions – Monitors.

UNIT III SYSTEM MODEL 9

System Model – Deadlock Characterization – Methods for handling Deadlocks -Deadlock Prevention – Deadlock avoidance – Deadlock detection – Recovery from Deadlocks - Storage Management – Swapping – Contiguous Memory allocation – Paging – Segmentation – Segmentation with Paging.

UNIT IV VIRTUAL MEMORY 9

Virtual Memory – Demand Paging – Process creation – Page Replacement – Allocation of frames – Thrashing - File Concept – Access Methods – Directory Structure – File System Mounting – File Sharing – Protection

UNIT V FILE SYSTEM STRUCTURE 9

File System Structure – File System Implementation – Directory Implementation – Allocation Methods – Free-space Management. Kernel I/O Subsystems - Disk Structure – Disk Scheduling – Disk Management – Swap-Space Management. Case Study: The Linux System, Windows

TOTAL : 60

REFERENCE BOOKS:

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, "Operating System Concepts", Sixth Edition, John Wiley & Sons (ASIA) Pvt. Ltd, 2003.
2. Harvey M. Deitel, "Operating Systems", Second Edition, Pearson Education Pvt. Ltd, 2002.
3. William Stallings, "Operating System", Prentice Hall of India, 4th Edition, 2003.

4. Pramod Chandra P. Bhatt – “An Introduction to Operating Systems, Concepts and Practice”, PHI, 2003.

YCS933	DATABASE MANAGEMENT SYSTEMS	L	T	P	C
		3	0	0	3
UNIT I	INTRODUCTION AND CONCEPTUAL MODELING				9
Introduction to File and Database systems- Database system structure – Data Models – Introduction to Network and Hierarchical Models – ER model – Relational Model – Relational Algebra and Calculus.					
UNIT II	RELATIONAL MODEL				9
SQL – Data definition- Queries in SQL- Updates- Views – Integrity and Security – Relational Database design – Functional dependences and Normalization for Relational Databases (up to BCNF).					
UNIT III	DATA STORAGE AND QUERY PROCESSING				9
Record storage and Primary file organization- Secondary storage Devices- Operations on Files- Heap File- Sorted Files- Hashing Techniques – Index Structure for files –Different types of Indexes- B-Tree - B+Tree – Query Processing.					
UNIT IV	TRANSACTION MANAGEMENT				9
Transaction Processing – Introduction- Need for Concurrency control- Desirable properties of Transaction- Schedule and Recoverability- Serializability and Schedules – Concurrency Control – Types of Locks- Two Phases locking- Deadlock- Time stamp based concurrency control – Recovery Techniques – Concepts- Immediate Update- Deferred Update - Shadow Paging.					
UNIT V	CURRENT TRENDS				9
Object Oriented Databases – Need for Complex Data types- OO data Model- Nested relations- Complex Types- Inheritance Reference Types - Distributed databases- Homogenous and Heterogenous- Distributed data Storage – XML – Structure of XML- Data- XML Document- Schema- Querying and Transformation. – Data Mining and Data Warehousing.					
TOTAL : 45 PERIODS					

REFERENCE BOOKS:

1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan- “Database System Concepts”, Fourth Edition, McGraw-Hill, 2002.
2. Ramez Elmasri and Shamkant B. Navathe, “Fundamental Database Systems”, Third Edition, Pearson Education, 2003.
3. Raghu Ramakrishnan, “Database Management System”, Tata McGraw-Hill Publishing Company, 2003.
4. Hector Garcia–Molina, Jeffrey D.Ullman and Jennifer Widom- “Database System Implementation”- Pearson Education- 2000.

YSE931	DESIGN AND ANALYSIS OF ALGORITHMS	L	T	P	C
		3	0	0	3

UNIT I INTRODUCTION 9
 Fundamentals of algorithmic problem solving – important problem types – Fundamentals of the analysis of algorithm efficiency – analysis frame work – Asymptotic NOTATIONS – Mathematical analysis for recursive and non-recursive algorithms.

UNIT – II DIVIDE AND CONQUER METHOD AND GREEDY METHOD 9
 Divide and conquer methodology – Merge Sort – Quick Sort – Binary search – Binary Tree Traversal – Multiplication of large integers- Strassen’s matrix multiplication Greedy method – Prim’s algorithm – Kruskal’s algorithm – Dijkstra’s Algorithm.

UNIT – III DYNAMIC PROGRAMMING 9
 Computing a binomial coefficient – Warshall’s and Floyd’s algorithm – Optimal binary search tree – Knapsack problem – Memory functions.

UNIT – IV BACKTRACKING AND BRANCH AND BOUND 9
 Backtracking – N-Queens problem – Hamiltonian circuit problem – subset sum problem- branch and bound – Assignment problem – Knapsack problem – Traveling salesman problem.

UNIT – V NP-HARD AND NP-COMPLETE PROBLEMS 9
 P & NP, problems – NP- complete problems – Approximation algorithms for NP-hard problems traveling salesman problem – Knapsack problem.

TOTAL 45 PERIODS

REFERENCE BOOKS:

1. Anany Levitin “Introduction to the design and Analysis of Algorithms” Pearson Edition 2003.
2. Thomas H. Cormen, Charles E. Leiscrson, Ronald L. Rivest, “Introduction to algorithms” Prentice Hall 1990.

YSE932	MICROPROCESSOR AND INTERFACING	L	T	P	C
		3	0	0	3

UNIT I 8-BIT MICROPROCESSOR 9
 8085 Architecture and Memory interfacing, interfacing I/O devices, Instruction set, Addressing Modes, Assembly language programming, counters and time delays, interrupts, timing diagram, Microprocessor applications.

UNIT II MICROCONTROLLER 9
 Intel 8031/8051 Architecture, Special Function Registers (SFR), I/O pins, ports and circuits, Instruction set, Addressing Modes, Assembly Language Programming, Timer and Counter Programming, Serial Communication, Connection to RS 232, Interrupts Programming, External Memory interfacing, Introduction to 16 bit Microcontroller

UNIT III 80X86 PROCESSORS**9**

8086 Architecture, Pin Configuration, 8086 Minimum and Maximum mode configurations, Addressing modes, Basic Instructions, 8086 Interrupts, Assembly levels programming. Introduction to 80186, 80286, 80386, 80486 and Pentium processors.

UNIT IV PERIPHERALS AND INTERFACING**9**

Serial and parallel I/O (8251 and 8255), Programmable DMA Controller (8257), Programmable interrupt controller (8259), keyboard display controller (8279), ADC/DAC interfacing. Inter integrated circuits interfacing (I²C standard).

UNIT V UNIT MICROPROCESSOR BASED SYSTEMS DESIGN, DIGITAL INTERFACING**9**

Interfacing to alpha numeric displays, interfacing to liquid crystal display (LCD 16 x 2 line), high power Devices and Optical motor shaft encoders, stepper motor interfacing, Analog interfacing and industrial control, microcomputer based smart scale, industrial process control system, Robotics and Embedded control, DSP and Digital Filters.

TOTAL 45 PERIODS**REFERENCE BOOKS:**

1. Ramesh S. Gaonkar, Microprocessor Architecture Programming and Applications with 8085. Fourth edition, Penram International Publishing 2000.
2. Muhammad Ali Mazidi, Janice Gillispie Mazidi, The 8051 Microcontroller, and Embedded Systems, Prentice Hall 2000.
3. Douglas V.Hall, Microprocessor and Interfacing, Programming and Hardware. Tata McGraw Hill, Second Edition. 1999.
4. Kenneth J.Ayala., "The 8051 Microcontroller Architecture Programming and Applications", Penram International Publishing (India). 1996.
5. Kenneth J.Ayala "The 8086 Microprocessor, Programming and Interfacing the PC", Penram International Publishing. 1995.

YSE934**OPERATING SYSTEMS LABORATORY**

L	T	P	C
0	0	3	2

1. Concurrency in Unix/ C
 - a. creating child processes using fork, exec
2. Implementation of Interprocess communication
3. Implementation of Process Scheduling Algorithms
4. Implementation of Process Synchronization
5. Design and Implementation of Deadlock algorithms
6. Implementation of Memory Management Algorithms
7. Implementation of Page replacement Algorithms
8. File system implementation
9. Directory implementation
10. Implementation of Disk Scheduling Algorithms

UNIT III CORRELATION AND REGRESSION 12
 Karl Pearson's Coefficient of correlation – Spearman's Rank correlation – Regression lines and co-efficients.

UNIT IV PROBABILITY & DISTRIBUTIONS 12
 Basic concepts - Conditional Probability- Addition and multiplication theorem – Random variables - Characteristics and applications of Binomial, Poisson and Normal distributions - simple problems.

UNIT V TESTING OF HYPOTHESIS 12
 Concept of hypothesis – level of significance – testing difference between mean, proportions (Large and Small)- Chi-square distribution- Applications of test of independence of attributes and Goodness of fit – Testing of population variance. Statistical Quality Control: Introduction- Control charts for variables and attributes: - \bar{X} , R, np, p & c charts.

TOTAL : 60 PERIODS

REFERENCE BOOKS:

1. S.C. Gupta & V.K. Kapoor, "Fundamentals of Mathematical Statistics", Sultan Chand and Sons, New Delhi, 2002
2. Veerarajan T., "Probability, Statistics and Random Processes", Tata McGraw-Hill, New Delhi, 2002.
3. Ronald E. Walpole et al "Probability & Statistics for Engineers & Scientists", Pearson Education, 2002.
4. Jay L.Devore, "Probability and Statistics for Engineering and the Sciences", Thomson Asia Pvt Ltd., Singapore, 2002.

YSE941	JAVA PROGRAMMING	L	T	P	C
		3	0	0	3

UNIT I JAVA BASICS-REVIEW 9
 Java Streaming – Components and events handling – Threading concepts – Networking-features – Byte code interpretation – Media Techniques.

UNIT II JAVA DATA STRUCTURES 9
 Lists – Linear Structures – Ordered Structures – Sorting – Trees.

UNIT III ADVANCED NETWORKING AND BEANS 9
 Client-Sever computing – Sockets – Content and Protocols handlers – Developing distributed applications – RMI – Remote objects – Object serialization – Bean Concepts – Events in Bean Box – Bean customization and persistence

UNIT IV JAVA DATABASE PROGRAMMING 9
 Connecting to Databases – JDBC principles – Databases access – Interacting – Database search – Accessing Multimedia databases – Database support in Web applications.

UNIT V RELATED JAVA TECHNIQUES 9
 3D graphics – JAR file format and creation – Internationalization – Swing Programming –
 Advanced Java Scripting Techniques

TOTAL 45 PERIODS

REFERENCE BOOKS:

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. Patrick Naughton, "Complete Reference: Java2", 7th edition, Tata Mc-Graw Hill, 2003
4. H.M.Deitel, P.J.Deitel, "Java : how to program", Fifth edition, Prentice Hall of India private limited.2005

YSE942	OBJECT ORIENTED ANALYSIS AND DESIGN	L	T	P	C
		3	0	0	3

UNIT I INTRODUCTION 9
 Object model – Elements – Class and object – Nature of object/class – Relationship among objects – Relationship among classes – Quality classes and objects. Classification and Process - Classification – classical categorization –Conceptual clustering.

UNIT II ANALYSIS AND DESIGN 9
 Prototype theory – Analysis and design – Activities – Classical approaches – First principles – The Micro development process – The Macro Development process. UML Notations – UML model – Introduction –Use case – Usage –Class diagrams – Perspectives.

UNIT III UML MODELS 9
 Perspectives – Associations – Attributes – Operations – CRC cards – Usage – Interaction diagrams – Sequence diagrams – Collaboration diagrams – Package diagrams – Concurrent state diagram – Activity diagram – Decomposing and activity – Domain model – Specification model – System design – Detailed design – Coding

UNIT IV OBJECT ORIENTED TECHNIQUES 9
 Object Oriented model traditional techniques - Current techniques - Approach to identify attribute – Service – Method. Behaviour Specifications – Static behaviour specification techniques Control – Documenting control.

UNIT V STATIC AND DYNAMIC BEHAVIOR 9
 Documenting static behaviour - Dynamic behaviour identification - Specification techniques - Documenting - Event specifications - Identifying relationships.

TOTAL 45 PERIODS

REFERENCE BOOKS:

1. Martin Fowler, Kendall Scott, "UML Distilled - Applying the standard object modeling language", Addison Wesley, 1997.

- Richard C Lee, William M Tepfenhart, "UML and C++ - A practical guide to object oriented development", PH, 1997.
- Grady Booch, "Object Oriented Analysis and Design with applications" II Edition Addison Wesley, 1994.
- James Martin & James J. Odell, "Object Oriented Methods - A foundation", Prentice Hall, 1997.

YCS951	COMPUTER NETWORKS	L	T	P	C
		3	0	0	3

UNIT I DATA COMMUNICATIONS 9

Components – Direction of Data flow – networks – Components and Categories – types of Connections – Topologies –Protocols and Standards – ISO / OSI model – Transmission Media – Coaxial Cable – Fiber Optics – Line Coding – Modems – RS232 Interfacing sequences.

UNIT II DATA LINK LAYER 9

Error – detection and correction – Parity – LRC – CRC – Hamming code – low Control and Error control - stop and wait – go back-N ARQ – selective repeat ARQ- sliding window – HDLC. - LAN - Ethernet IEEE 802.3 - IEEE 802.4 - IEEE 802.5 - IEEE 802.11 – FDDI - SONET – Bridges.

UNIT III NETWORK LAYER 9

Internetworks – Packet Switching and Datagram approach – IP addressing methods – Subnetting – Routing – Distance Vector Routing – Link State Routing – Routers.

UNIT IV TRANSPORT LAYER 9

Duties of transport layer – Multiplexing – Demultiplexing – Sockets – User Datagram Protocol (UDP) – Transmission Control Protocol (TCP) – Congestion Control – Quality of services (QOS) – Integrated Services.

UNIT V APPLICATION LAYER 9

Domain Name Space (DNS) – SMTP – FTP – HTTP - WWW – Security – Cryptography.

TOTAL : 60

REFERENCE BOOKS:

- Behrouz A. Forouzan, "Data communication and Networking", Tata McGraw-Hill, 2004.
- James F. Kurose and Keith W. Ross, "Computer Networking: A Top-Down Approach Featuring the Internet", Pearson Education, 2003.
- Andrew S. Tanenbaum, "Computer Networks", PHI, Fourth Edition, 2003.
- William Stallings, "Data and Computer Communication", Sixth Edition, Pearson Education, 2000.

YSE944	JAVA PROGRAMMING LABORATORY	L	T	P	C
		0	0	3	2

1. Implementation of Interfaces and packages.
2. Implementation of Multithreading and Exception Handling concepts.
3. Implementation of Applets.
4. Front End Development using swing and AWT.
5. Message transfer using TCP/IP Protocol.
6. Developing a simple Application using Servlets.
7. Developing a simple Application using JSP.
8. Developing a simple Application using JDBC.

TOTAL :45

YSE945	CASE TOOLS LABORTORY	L	T	P	C
		0	0	3	2

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.

YCS957	COMPUTER NETWORKS LABORATORY	L	T	P	C
		0	0	3	2

(All the programs are to be written using C)

1. Simulation of ARP / RARP.
2. Write a program that takes a binary file as input and performs bit stuffing and CRC Computation.
3. Develop an application for transferring files over RS232.
4. Simulation of Sliding-Window protocol.
5. Simulation of BGP / OSPF routing protocol.
6. Develop a Client – Server application for chat.
7. Develop a Client that contacts a given DNS Server to resolve a given host name.
8. Write a Client to download a file from a HTTP Server.
- 9 &10 Study of Network Simulators like NS2/Glomosim / OPNET

TOTAL : 45

UNIT I INTRODUCTION 9

Internet Principles – Basic Web Concepts – Client/Server model – Retrieving data from Internet – HTML and Scripting Languages – Standard Generalized Mark-up Language –Next Generation Internet – Protocols and applications.

UNIT II COMMON GATEWAY INTERFACE PROGRAMMING 9

HTML forms – CGI Concepts – HTML tags Emulation – Server-Browser communication – E-mail generation – CGI Client side Applets – CGI Server Side Applets – Authorization and security.

UNIT III SOCKET PROGRAMMING 9

Streaming – Networking principles – sockets – protocol handlers – content handlers – multicasting – Remote Method Invocation – activation – Serialization - Marshal Streams.

UNIT IV SERVER SIDE PROGRAMMING 9

Dynamic web content – cascading style sheets – DHTML – XML - Server side includes - communication – Active and Java Server Pages - Firewalls – proxy servers.

UNIT V ONLINE APPLICATIONS 9

Simple applications – On-line databases – monitoring user events – plug-ins – database connectivity – Internet Information Systems - EDI application in business – Internet commerce – Customization of Internet commerce

TOTAL : 45 PERIODS**REFERENCE BOOKS:**

1. Rashim Mogha, Preetham.V.V., “ Java Web Services Programming”, Wiley Dreamtech, New Delhi, 2002.
2. Deitel ,“ XML How to Program”, first edition, Pearson Education, USA, 2002.
3. Jason Hunter, William Crawford, “Java Servlet Programming”, O’ Reilly Publications, USA, 1998.
4. Bhanu Pradhap, “ Understanding Active Server Pages “, Cyber Tech Publications ,New Delhi, 2001.
5. James Conard,Patrick Dengler,Brain Franics Et Al, “ Introducing .NET “, Shroff Publishers, New Delhi, 2001.

UNIT I INTRODUCTION 9

Testing as an Engineering Activity – Testing as a Process – testing axioms - Basic Definitions – Software Testing Principles – The Tester’s Role in a Software Development Organization – Origins of Defects – cost of defects - Defect Classes – The Defect Repository and Test Design – Defect Examples – Developer/Tester Support for Developing a Defect Repository – Defect Prevention Strategies

UNIT II TEST CASE DESIGN 9

Test Case Design Strategies – Using Black Box Approach to Test Case Design - Random Testing – Requirements based testing – Boundary Value Analysis – Decision tables - Equivalence Class Partitioning - State-based testing – Cause-effect graphing – Error guessing - Compatibility testing – User documentation testing – Domain testing. Using White Box Approach to Test design – Test Adequacy Criteria – static testing vs. structural testing – code functional testing - Coverage and Control Flow Graphs – Covering Code Logic – Paths – Their Role in White-box Based Test Design – code complexity testing – Evaluating Test Adequacy Criteria.

UNIT III LEVELS OF TESTING 9

The Need for Levels of Testing – Unit Test – Unit Test Planning –Designing the Unit Tests - The Test Harness – Running the Unit tests and Recording results – Integration tests – Designing Integration Tests – Integration Test Planning – Scenario testing – Defect bash elimination. System Testing – Acceptance testing – Performance testing - Regression Testing – Internationalization testing – Ad-hoc testing - Alpha ,Beta Tests – testing OO systems – Usability and Accessibility testing – Configuration testing - Compatibility testing – Testing the documentation – Website testing

UNIT IV TEST MANAGEMENT 9

People and organizational issues in testing – organization structures for testing teams – testing services - Test Planning – Test Plan Components – Test Plan Attachments – Locating Test Items – test management – test process - Reporting Test Results – The role of three groups in Test Planning and Policy Development – Introducing the test specialist – Skills needed by a test specialist – Building a Testing Group.

UNIT V TEST AUTOMATION 9

Software test automation – skills needed for automation – scope of automation – design and architecture for automation – requirements for a test tool – challenges in automation - Test metrics and measurements –project, progress and productivity metrics

TOTAL :45 PERIODS**REFERENCE BOOKS:**

1. Srinivasan Desikan and Gopaldaswamy Ramesh, “ Software Testing – Principles and Practices”, Pearson education, 2006.
2. Ilene Burnstein, “Practical Software Testing”, Springer International Edition, 2003.
3. Ron Patton, “ Software Testing”, Second Edition, Sams Publishing, Pearson education, 2007
4. Renu Rajani, Pradeep Oak, “Software Testing – Effective Methods, Tools and Techniques”, Tata McGraw Hill, 2004.
5. Aditya P. Mathur, “Foundations of Software Testing – Fundamental algorithms and techniques”, Dorling Kindersley (India) Pvt. Ltd., Pearson Education, 2008

YSE954

WEB TECHNOLOGY LAB

L	T	P	C
0	0	3	2

Creating applications using web development tools

1. HTML
2. HTML & VB Script
3. XML
4. XML , CSS
5. XML , XSL
6. XML , DTD
7. Active Server Pages
8. ASP with scripts
9. Java Server Pages
10. .NET platform

YSE955

SOFTWARE TESTING LAB

L	T	P	C
0	0	3	2

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

YSE956

MULTIMEDIA SYSTEMS LAB

L	T	P	C
0	0	3	2

1. Image Editing Using Adobe Photoshop and ImageReady
2. Animation using Macromedia Flash
3. Video Editing using I-Movie
4. Video synchronization with audio using I-Movie
5. Video and audio editing with synchronization using Final Cut

YSE961	SOFTWARE QUALITY ASSURANCE	L	T	P	C
		3	0	0	3

UNIT I CONCEPTS 9
 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 9
 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 9
 Models for Quality Assurance-ISO-9000 - Series, CMM, SPICE, Malcolm Baldrige Award.

UNIT IV SOFTWARE QUALITY ASSURANCE RELATED TOPICS 9
 Software Process - Definition and implementation; internal Auditing and Assessments; Software testing -Concepts, Tools, Reviews, Inspections & Walkthroughs; P-CMM.

UNIT V FUTURE TRENDS 9
 PSP and TSP, CMMI, OO Methodology, Clean-room software engineering, Defect injection and prevention.

TOTAL: 45

REFERENCE BOOKS:

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.

YSE962	SOFTWARE PROJECT MANAGEMENT	L	T	P	C
		3	0	0	3

UNIT I INTRODUCTION 9
 Introduction – Product Life – Project life cycle models - water fall model – Prototyping model – RAD model – Spiral Model – Process Models – Matrics.

UNIT II CONFIGURATION MANAGEMENT 9
 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 9

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 9

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

UNIT V TESTING 9

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

TOTAL : 45 PERIODS

REFERENCE BOOKS:

1. Gopaldaswamy Ramesh, "Managing Global 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

YSE965

PROJECT WORK

**L T P C
0 0 12 6**

The project will be of one semester duration. The students will be sent to different organizations involved in science communication activities as per interest and specialization of students, mostly located in the place of the study they will have to carry out a project work related to the area of interest and submit a research project report at the end of the semester. The students shall defend their dissertation in front of experts during viva-voce Examination.

YSE001

SOFTWARE REUSE

L	T	P	C
3	0	0	3

UNIT I INTRODUCTION 9

Organizing Reuse – Introduction – Motivation for Reuse – Reuse driven organizations – Managing a reuse project – the characteristics of reuse of projects – Roles in reuse projects – Adopting a project to reuse – Reuse tools.

UNIT II REUSE METRICS 9

Managing a repository – The REBOOT component model – Classification – Configuration management of the repository – Managing the repository – Computer supported cooperative working – Process metrics for reuse – Product metrics – Cost estimation – Forming a reuse strategy – Assessing reuse maturity.

UNIT III REUSABLE COMPONENTS 9

Practicing reuse – Generic reuse development process – Develop for reuse – Develop with reuse – Testing reusable components – Object oriented components – Technique and life cycles – Object oriented development for reuse – Architectural design for reuse – Detailed design for reuse – Implementation for reuse – Verification, test and validation.

UNIT IV REUSE PHASES 9

Development with reuse – with reuse specific activities – Common reuse processes – Phases of development with reuse – Impact of reuse on development cycle.

UNIT-V CLEAN ROOM SOFTWARE ENGINEERING 9

Re-engineering for reuse – Methodology – Retrieving objects in non-object oriented code – Measurements – Tools support for reengineering - Over view of clean room software engineering – Phases in clean room method – Box structures algorithms – Adapting the box structures.

TOTAL : 45 PERIODS

REFERENCE BOOKS:

1. Even-Andre'Karisson, "Software Reuse – A Holistic Approach, John Wiley and Sons, 1996.
2. Karma McClure, "Software Reuse Techniques – Additional reuse to the systems development", Prentice Hall, 1997.
3. Irar Jacobson, Martin Griss and Patrick Johnson, "Software Reuse; Architecture, Process and Organization for Business Success", Aem PRSS / Addison Wesley, New York, 1992.

YSE002	SOFTWARE COMMUNICATION AND DOCUMENTATION	L	T	P	C
		3	0	0	3

UNIT I BASIC CONCEPTS 9
 Importance of communication and documentation ; Different types of communications ; Spoken communication ; written communication ; Different types of documentation.

UNIT II SPOKEN INDIVIDUAL SPOKEN COMMUNICATION 9
 Elements of good individual communication – getting over nervousness – organizing one self – characteristics of effective communication – augmenting spoken words by actions and other means – other aspects of spoken communication like speeches; presentation; use of visual aids.

UNIT III GROUP COMMUNICATION 9
 Meeting – Effective participation – effective management of meetings – preparing minutes – “Virtual” meetings – audio conference – video conference – use of collaboration tools.

UNIT IV DIFFERENT TYPES OF WRITTEN COMMUNICATION 9
 Principles of effective written communication – differences between written communication and spoken communication – resume writing – email; effective email techniques – proposals – contracts – user guides – external technical documentation for software – internal software technical documentation – users guides – letters and different types of letters – legal issue.

UNIT V TECHNOLOGY AND STANDARDS 9
 Use of various tools and technologies – need for standardization – role of processes and standards in documentation – on-line help – Impact of internet on documentation – common challenges in the harnessing of technology ; course summary.

TOTAL:45 PERIODS

REFERENCE BOOKS:

1. Huckin, et al, Technical Writing and Professional Communication, McGraw Hill, 2001.
2. Ron Ludlow and Fergus Panton, The Essence of Effective Communication, PHI (P) Ltd., New Delhi, 2005.

YCS005	CLIENT SERVER COMPUTING	L	T	P	C
		3	0	0	3

UNIT I INTRODUCTION 9
 Client Server Computing era, Real Client/Server, Fat Servers or fat clients, 2 tier Vs 3 tier, Intergalactic client server, client server for different models, building blocks

UNIT II CLIENT/SERVER OPERATING SYSTEMS 9
 Anatomy of Server programs, Server needs from OS, Server scalability, Client anatomy, Client needs from OS, Client OS trends , MAC OS, Linux OS, Win OS, Server OS trends , NetWare, Win 2000 Server, OS/2 warp server

UNIT III CLIENT SERVER MIDDLEWARE 9

NOS Middleware, global directory services, X.500, LDAP, distributed time services, distributed security services, RPC messaging and peer to peer , Sockets, NetWare, NetBIOS, remote procedure call, messaging and queuing, MOM Vs RPC, Evolution of the NOS, DCE , The enterprise NOS, the internet as NOS

UNIT IV CLIENT SERVER TRANSACTION PROCESSING 9

ACID Properties, Transaction Models, TP Monitor, TP Monitor and OS, TP Monitor and Transaction Management, TP Monitor Client/ Server Interaction types, Transactional RPC, Queues, TP Lite or TP Heavy, TP Lite versus TP Heavy – Managing Heterogeneous networks, Process Management, client/server invocations, Performance

UNIT V CLIENT SERVER AND INTERNET 9

Client server and internet, Web client server, 3 tier client server web style, CGI , the server side of web, CGI and State, SQL database servers, Middleware and federated databases, data warehouses, EIS/DSS to data mining, GroupWare Server , what is GroupWare, components of GroupWare

TOTAL : 45 PERIODS

REFERENCE BOOKS:

1. Robert Orfali, Dan Harkey & Jeri Edwards, “Essential Client/Server Survival Guide”, second edition, John Wiley & Sons, Singapore, 2003.
2. James E. Goldman, Phillip T. Rawles, Julie R. Mariga, “Client/Server Information Systems, A Business Oriented Approach”, John Wiley & Sons, Singapore, 2000.
3. Eric J Johnson, “A complete guide to Client / Server Computing”, first edition, Prentice Hall, New Delhi, 2001.
4. Smith & Guengerich, “Client /Server Computing”, Prentice Hall, New Delhi, 2002

YSE003	PERSONAL SOFTWARE PROCESS AND TEAM SOFTWARE PROCESS	L	T	P	C
		3	0	0	3

UNIT I INTRODUCTION 9
 Software Engineering – Time Management – Tracking Time – Period & Product Planning – Product Size – Managing Your Time – Managing Commitments – Managing Schedules

UNIT II MANAGING YOUR TIME 9
 Elements of Time Management - Managing Commitments - Managing Scheduler - Project Plan - The Project Plan Summary.

UNIT III SOFTWARE DEVELOPEMNT PROCESS 9
 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 9
 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 9
 The Team Leader Role – Development Manager Role – The Planning Manger Role – The Quality – Process Manager Role – The Support Manager Role, Case Study

TOTAL:45 PERIODS

REFERENCE BOOKS:

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, 2000.
3. Pankaj Jalote , “ CMM in Practice”, Pearson Education, 1st edition, New Delhi, 2002.
4. Darrel Ince, "ISO 9001 and S/W Quality Assurance", Tata Mc-Graw Hill 1st edition, New Delhi, 1994.

YSE004

SOFTWARE AGENTS

L	T	P	C
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UNIT I INTRODUCTION

9

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

UNIT II JAVA AGENTS

9

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

9

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

9

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

UNIT V AGENTS & SECURITY

9

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

TOTAL:45

REFERENCE BOOKS:

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.

UNIT I INTRODUCTION**9**

Introduction – Characterizing real time system and task performance measures real time systems – Estimating program run time – Task assignment and schedule classical Uni-processor scheduling algorithm, Uni-processor scheduling of IRTS task, Task assignment, mode changes.

UNIT II TOOLS AND LANGUAGES**9**

Programming Languages and tools – Desired Language characteristics, Data type control structures, facilitating hierarchical decomposition packages, Run time error handling, Overloading and generics, Multitasking, Low level programming, Task Scheduling, Time specification Programming, Environmental, Run time supports.

UNIT III REAL TIME DATABASES**9**

Real Time databases – basic definition, Real time Vs General purpose Database, main memory database, Transaction priorities, Transaction aborts concurrency control issues, Disk scheduling algorithms, Improving predictability, maintaining serialization consistency, Databases for hand real time systems.

UNIT IV REAL TIME COMMUNICATION**9**

Real time communication – Introduction, Network topologies, Protocols, Fault tolerance – introduction, Fault Types, Fault detection, Fault and error containment, Redundancy, Data diversity, Reversal checks, Integrated failure handing.

UNIT V EVALUATION TECHNIQUES**9**

Reliability evaluation techniques – Obtaining parameter values, Reliability models for hardware redundancy, Software error models, tasking time into account. Clock synchronization : Clocks, A non-fault tolerant synchronization algorithms, impact of faults, fault tolerance synchronization hardware, synchronization in software.

TOTAL : 45 PERIODS**REFERENCE BOOKS:**

1. C.M.Krishna and Kang G.Shin, “Real Time Systems”, McGraw Hill International Edition, 1997.
2. Stuart Bennett, “ Real Time Computer Control, An Introduction”, Prentice Hall Internation Edition, 1988.
3. Peter D.Lawrence, “Real Time Micro-Computer System Design, An Introduction”, Konrad Manch, McGraw Hill, 1988.
4. S.T.Allworth and R.N.Zobel, “Introduction to Real Time Software Design”, Macmillan Education, Second edition, 1987.

YSE006	COMPONENT BASED DEVELOPMENT	L	T	P	C
		3	0	0	3

UNIT I INTRODUCTION 9

What is CBD? – Industrialization of software development, CBD drivers and benefits, technology evolution, components and network computing.

UNIT II FUNDAMENTALS 9

Basic concepts of CBD Scenarios for CBD, evolution or revolution?, build, find and use components and objects.

UNIT III MODELS 9

Basic concepts of object models Components and interfaces, working with interfaces, component and interface modeling, specification models, domain modeling, describing classes, patterns and frameworks.

UNIT IV USING CBD 9

Categorizing & deploying components, CORBA, DCOM.

UNIT V FRAMEWORKS 9

Class libraries, encapsulated components, software frameworks, pre-built applications.

TOTAL : 45 PERIODS

REFERENCE BOOKS:

1. Clemens Szyperski, Component Software – Beyond object – oriented programming, Addison – Wesley, 1998.
2. Kuth Short, Component Based Development and Object Modeling, Sterling Software, 1997.
3. Robert Ortali and Dam Harkly, Client / Server Programming with Java and Corba, John Wiley & Sons, 1998.

UNIT I INTRODUCTION 9

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 USER INTERFACE 9

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 INTERACTIONS 9

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 TOOLS 9

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

UNIT V SPECIAL FUNCTIONS AND COMMANDS 9

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

TOTAL :60**REFERENCE BOOKS:**

1. Alan Cooper, “The Essentials of User Interface Design”, IDG Books, 1995.
2. Ben Schneider Man, “Designing the User Interface”, Addison Wesley, 2000.
3. Jacob Nielson, “Usability Engineering”, Academic Press, 1993.
4. Alan Dix Janet Finlang, Gregory Aboard and Russel Seale, Human, “Computer Interaction”, Prentice Hall, 1993.

YSE008

EMBEDDED SYSTEMS

L	T	P	C
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UNIT I INTRODUCTION 9

Introduction – Challenges in embedded system design – Design process - Requirements - Specifications - Architecture design - Designing Hardware and Software Components – System Integration Design examples / Applications.

UNIT II EMBEDDED COMPUTING PLATFORM 9

CPU bus - Memory devices - I/O Devices - Component interfacing - Designing with microprocessor - Development and Debugging -Manufacturing & testing.

UNIT III PROGRAM DESIGN AND ANALYSIS 9

Program design - Models of programs - Assembly and linking - Basic compilation techniques - Analysis and optimization of execution time – Energy and power - Program size - Program validation and testing.

UNIT IV OS FOR EMBEDDED SYSTEMS 9

Multirate systems - Co-routine - Context switching - Scheduling policies - Inter-process communication mechanisms - Performance evaluation - Power optimization strategies for processes

UNIT V HARDWARE ACCELERATOR 9

CPUs and accelerators, Accelerated system design Distributed Embedded architecture – Networks for embedded systems - Network based design – Internet enabled systems.

TOTAL :60

REFERENCE BOOKS:

1. Wayne Wolf, “Computer as Components: Principles of Embedded Computing System Design”, Morgan Kaufmann Publishers, USA, 2005.
2. Jonathan W Valvano, “Embedded Microcomputer Systems: Real Time Interfacing”, Thomson Learning, New York, 2006.
3. David E Simon “An Embedded Software Primer”, Pearson Education, New Delhi, 1999.

YSE009

OPEN SOURCE COMPUTING

L	T	P	C
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UNIT I INTRODUCTION

9

Introduction of Open Sources – Need of Open Sources – Advantages and applications of Open sources – Commercial aspects of Open source movement Introduction – General Overview – Kernel Mode and user mode – Process – Advanced concepts – Scheduling – Cloning – Signals

UNIT II SOLARIS

9

Fundamentals - The Solaris 8 Operating Environment Components - Accessing Directories and Files - Using File Security - Creating Archive Files - Connecting Remotely - Managing System Processes - Using the Korn Shell and the CDE

UNIT III OPEN SOURCE DATABASE: MySQL

9

Introduction – SQL programs – Selection – Strings – Date and Time – Working with metadata – Sequences – MySQL and web

UNIT IV OPEN SOURCE PROGRAMMING LANGUAGES: PHP:

9

Introduction – Programming in web environment – Variables – Constants – Datatypes – Operators – Statements – Functions – Arrays – OOP – String manipulation – File handling and data storage – PHP and SQL database – PHP connectivity – Debugging and error handling – Security – Templates

UNIT V OPEN SOURCE TOOLS AND TECHNIQUES: WEB SERVER:

9

Apache web server – Working with Web Server – Configuring and using apache web services – Eclipse IDE platform

TOTAL 45 PERIODS

REFERENCE BOOKS:

1. Remy Card, Eric Dumas, Frank Mevel, "The Linux Kernel Book", second edition, John Wiley Publications, New York, 2003.
2. Darry, Gove, " Solaris Application Programming", first edition, Prentice Hall, New Delhi, 2007.
3. Steve Suehring, "MySQL Bible", first edition, John Wiley & Sons, New York, 2002.
4. Rasmus Lerdorf, Levtin Tatroe, "Programming PHP", second edition, O'Reilly Publications, USA, 2002.
5. Peter Wainwright, "Professional Apache", third edition, Wrox Press, USA, 2002.

YSE010	NETWORK SECURITY AND CRYPTOGRAPHY	L	T	P	C
		3	0	0	3

UNIT I CONVENTIONAL AND MODERN ENCRYPTION 9

Services – Attacks – Steganography - Classical Encryption Techniques – DES – Differential and Linear Cryptanalysis – Modes of operation – Encryption Algorithms – Triple DES – Blowfish – CAST128

UNIT II PUBLIC KEY ENCRYPTION 9

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

UNIT III AUTHENTICATION AND SECURITY PRACTICE 9

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 9

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

UNIT V SYSTEM SECURITY & STANDARDS 9

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:45 PERIODS

REFERENCE BOOKS:

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 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.

YSE011	SERVICE ORIENTED ARCHITECTURE	L	T	P	C
		3	0	0	3

UNIT I THE TECHNOLOGY OF ENTERPRISE SOA 9
 The goal of loose coupling-Web services overview-Introducing Service oriented Architecture: Enterprise architecture-The service oriented architecture

UNIT II ENTERPRISE APPLICATION INTEGRATION AND B2B COMMERCE 9
 EAI-web services in portals and software development-managing the supply chain-Building hubs-Partner to Partner-Government and scientific SOA

UNIT III REAL TIME OPERATIONS AND SECURITY: REAL TIME OPERATIONS 9
 Goal of the real time enterprise-Delivering real time with the SOA –Real time virtual data warehouse-business level agreements. SECURITY: Risk of loose coupling-layers of SOA security-Solutions to SOA security

UNIT IV SOA MANAGEMENT SOLUTION AND SOA NETWORKS 9
 Problems in the unmanaged SOA-web services management solutions-Managing the SOA network-Securing the SOA network and solutions-SOA network management-Utility computing in the SOA

UNIT V PEOPLE AND PROCESS OF ENTERPRISE SOA 9
 Exploring an SOA for titan-achieving consensus at titan-Grouping for SOA Training success Services discovery-Service creation-Selecting a platform-Forming an SOA plan and proceed

TOTAL :45 PERIODS

REFERENCE BOOKS:

1. Eric Pulier,Hugh Taylor, “ Understanding Enterprise SOA”, Dreamtech press, New Delhi, 2005.
2. Chris Peiris and Dennis Mulder, ”Pro WCF Practical Microsoft SOA implementation”, Apress, Berkeley, CA, USA, 2007.
3. Greg Lomow, Eric Newcomer, “Understanding SOA with Web Services”, Pearson Education, New Delhi, 2005.
4. Dan Woods, Thomas Mattern, “Enterprise SOA: Designing it for Business Innovation”, Shroff publishers, 2006.

YSE012	SOFTWARE METRICS	L	T	P	C
		3	0	0	3

UNIT I MEASUREMENT THEORY 9

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 9

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

UNIT III PRODUCT METRICS 9

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

UNIT IV QUALITY METRICS 9

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

UNIT V MANAGEMENT METRICS 9

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

TOTAL : 45 PERIODS

REFERENCE BOOKS:

1. Normal. E – Fentor Shari Lawrence Pfllegar, “Software Metrics”, International Thomson Computer Press, 1997.
2. Fentor Mrman E., “Software Metrics: A Regimes Approach”, Chapman & Hall, London, 1991.

YSE013	SOFTWARE RELIABILITY	L	T	P	C
		3	0	0	3

UNIT I INTRODUCTION TO SOFTWARE RELIABILITY 9

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 9

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 9

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 9

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 9

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 : 45 PERIODS

REFERENCE BOOKS:

1. Michael R. Lyer, Handbook of Software Reliability Engineering, McGraw Hill, 1995.
2. Xie, M., Software Reliability Modelling, World Scientific, London, 1991.

YSE014	SOFTWARE DESIGN	L	T	P	C
		3	0	0	3

UNIT I DESIGN FUNDAMENTALS 9

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

UNIT II DESIGN METHODOLOGIES 9

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 9

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

UNIT IV DETAILED DESIGN 9

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

UNIT V OBJECT ORIENTED DESIGN 9

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

TOTAL :45 PERIODS

REFERENCE BOOKS:

1. Pressman R.S., “Software Engineering”, 4th Edition, McGraw Hill Inc., 1996.
2. David Budgen, “Software Design”, Addison – Wesley, 1994.
3. Steve McConnell, “Code Complete”, Microsoft Press, 1996.
4. A.G.Suteliffe, “Human Computer Interface Design”, 2nd Edition, MacMillan, 1995.

YSE015

DATA WAREHOUSING

L	T	P	C
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UNIT I INTRODUCTION TO DATA WAREHOUSING 9

Introduction , Definition and description , Need for Data Ware Housing, Need for strategic information , Failures of past Decision Support Systems , OLTP vs DWH – DWH Requirements – Trends in DWH – DWH Framework, Information Systems Framework (Zachman Framework) – Applications of DWH.

UNIT II DATA WAREHOUSING ARCHITECTURE & DESIGN 9

Reference Architecture , Components of Reference Architecture – Data Ware House Building Blocks – Implementation , Physical Design Process, DWH Deployment Process.
DATABASE DESIGN : Dimensional Modeling , Basics , STAR Schema, Star Schema keys , Advantages of STAR Schema.

UNIT III INTRODUCTION TO DATA MINING 9

Data Mining Tasks – Data Mining Vs KDD – Issues in Data Mining – DM Metrics – Data Mining and Databases – Data Mining Architecture – Future Trends. Data Cleaning – Data Transformation – Data education.

UNIT IV DATA MINING PRIMITIVES & LANGUAGES 9

Data Mining primitives – Data Mining Query Languages. Association Rules – Mining Single Dimensional Boolean Association Rules from Transactional Databases – Mining Multi Dimensional Association from Data Ware Houses.

UNIT V CLASSIFICATION, PREDICTION & CLUSTER ANALYSIS 9

Issues regarding classification and prediction – Decision Tree – Bayesian Classification – Classifier Accuracy. Types of Data – Partitioning Methods – Hierarchical Methods. Mining Event Sequences – Visual DM – Text Mining – Web Mining.

TOTAL :45 PERIODS

REFERENCE BOOKS:

1. Paulraj Ponniah, "Data Warehousing Fundamentals ", John Wiley & Sons, 1st edition, 2003.
2. M.H.Dunham , "Data Mining : Introductory and Advanced Topics", Prentice Hall , 2003
3. Arun k Pujari , "Data Mining Techniques", University Press, 1st edition, New Delhi, 2003.
4. Mehmed Kantardzic, "Data Mining Concepts , Methods and Algorithms ", John Wiley & Sons , 1st edition, New Delhi, 2003.

YCS016

DISTRIBUTED OPERATING SYSTEMS

L	T	P	C
3	0	0	3

UNIT I INTRODUCTION 9

Fundamentals – evolution – System Models – Distributed operating System – Issues – Distributed Computing environment Message passing – Introduction – Features – Issues – Synchronization – Buffering – Message – Encoding – Decoding – Process addressing – Failure Handling.

UNIT II REMOTE PROCEDURE CALL 9

Introduction – Model – Transparency – Implementation – Stub Generation – Messages – Marshaling Arguments and results –server Management – Parameter passing Semantics - Call Semantics – Communication Protocols – Complicated RPC's – Client – Server Binding – Exception handling – Security Distributed shared Memory – Introduction – Architecture – Issues – Granularity Structure – Consistency Models – Replacement Strategy – Thrashing.

UNIT III SYNCHRONIZATION 9

Introduction – Clock Synchronization – Event ordering – Mutual Exclusion – Deadlock – Election Algorithms.

UNIT IV RESOURCE MANAGEMENT 9

Introduction – Features – Task Assignment approach – Load-Balancing Approach - Load - Sharing Approach Process Management – Introduction – Process Migration – Threads.

UNIT V DISTRIBUTED FILE SYSTEMS 9

Introduction – Features – File Models – Accessing Models – Sharing Semantics – Caching Schemes – File Replication – Fault Tolerance – Atomic Transactions – Design Principles Naming – Introduction – Features – Terminologies – Concepts.

TOTAL : 45 PERIODS

REFERENCE BOOKS:

1. Pradeep K. Sinha, "Distributed Operating Systems, Concepts and Design" Prentice Hall of India, New Delhi, 2001.
2. Andrew S. Tanenbaum "Distributed Operating Systems", Pearson Education, New Delhi, 2002
3. Mukesh Singhal and Nirajan G.Shivaratri "Advanced Concepts in Operating Systems", Tata McGraw Hill Publishing Company Ltd., New Delhi, 2001

YCS014	ADVANCED DBMS	L	T	P	C
		3	0	0	3

UNIT I DATABASE MANAGEMENT 9

Relational Data Model – SQL - Database Design - Entity-Relationship Model – Relational Normalization – Embedded SQL – Dynamic SQL – JDBC – ODBC.

UNIT II ADVANCED DATABASES 9

Object Databases - Conceptual Object Data Model – XML and Web Data – XML Schema – Distributed Data bases – OLAP and Data Mining – ROLAP and MOLAP

UNIT III QUERY AND TRANSACTION PROCESSING 9

Query Processing Basics – Heuristic Optimization – Cost, Size Estimation - Models of Transactions – Architecture – Transaction Processing in a Centralized and Distributed System – TP Monitor.

UNIT IV IMPLEMENTING AND ISOLATION 9

Schedules – Concurrency Control – Objects and Semantic Commutativity – Locking – Crash, Abort and Media Failure – Recovery – Atomic Termination – Distributed Deadlock – Global Serialization – Replicated Databases – Distributed Transactions in Real World.

UNIT V DATABASE DESIGN ISSUES 9

Security – Encryption – Digital Signatures – Authorization – Authenticated RPC - Integrity - Consistency - Database Tuning - Optimization and Research Issues.

TOTAL : 45 PERIODS

REFERENCE BOOKS:

1. Philip M. Lewis, Arthur Bernstein, Michael Kifer, “Databases and Transaction Processing: An Application-Oriented Approach”, Addison-Wesley, 2002
2. R. Elmasri and S.B. Navathe, Fundamentals of Database Systems, 3rd Edition, Addison Wesley, 2004
3. Abraham Silberschatz, Henry. F. Korth, S.Sudharsan, Database System Concepts, 4th Edition., Tata McGraw Hill, 2004
4. Raghu Ramakrishnan & Johannes Gehrke, “Database Management Systems”, 3rd Edition, TMH, 2003

YSE016	EXTREME PROGRAMMING	L	T	P	C
		3	0	0	3

UNIT I INTRODUCTION 9

Introducing C# - Understanding .Net: The C# environment – Overview of C# - Literals, Variables and Data Types – Operators and Expressions.

UNIT II DECISION MAKING 9

Decision Making, Branching and Looping – if, if...else, switch, ...? : operators, while, do, for, foreach and jump in loops, Methods in C# - declaring methods, the main method, invoking methods, nesting methods, method parameters, pass by value and pass by reference, output parameters, Variable argument lists – Overloading methods.

UNIT III	ARRAYS	9
Arrays – Creating an array, Variable size arrays, Array list class – Manipulating Strings – Structures, Nested Structures – Enumerations, Initialization, base types and type conversion.		
UNIT IV	CLASSES AND OBJECTS	9
Classes and Objects – Definition, Creating objects, Constructors and destructors, Nesting, Overloaded constructors, Inheritance and Polymorphism – classical, multilevel, hierarchical inheritances, Subclass, Subclass constructors, Overriding methods, Abstract Classes and Methods, Interfaces, Interfaces and Inheritance – Operator Overloading.		
UNIT V	DELEGATES AND DECLARATION METHODS	9
Delegates – Declaration Methods, Initialization and Invocation, Multicast delegates, I/O operations – Console Input/Output, Formatting, Errors and Exceptions, Type of Errors – Exceptions – Exception for debugging.		
TOTAL : 45 PERIODS		

REFERENCE BOOKS:

1. E. Balagurusamy, Programming in C#, Tata Mc-Graw Hill Publishing Company, New Delhi, 2002.
2. Selvi, T. A Text book on C# : A Systematic approach to object oriented programming, Pearson Education, Delhi, 2003.
3. Lippman, C# Primer, 3rd Edition, Pearson Education, Delhi, 2002
4. Liberty, J. Programming C#, Second Edition, O'Reilly & Associates Inc., California, 2002.
5. Albahari, B. Prayton, P. and Marill, B. C# Essentials, O'Reilly & Associates Inc., California, 2002.

YSE017	COMPILER DESIGN	L	T	P	C
		3	0	0	3
UNIT I	INTRODUCTION TO COMPILERS	9			
Compilers, Analysis of the Source Program, The Phases of a Compiler, Cousins of the Compiler, The Grouping of Phases, Compiler-Construction Tools, Translators-Compilation and Interpretation, A simple one-pass compiler					
UNIT II	LEXICAL ANALYSIS	9			
Need and role of lexical analyzer-Lexical errors, Input Buffering - Specification of Tokens, Recognition of Tokens, A Language for Specifying Lexical Analyzers, Finite Automata, From a Regular Expression to an NFA, Design of a Lexical Analyzer Generator					
UNIT III	SYNTAX ANALYSIS	9			
Need and role of the parser- Context Free Grammars-Top Down parsing - Recursive Descent Parser - Predictive Parser - LL(1) Parser -Shift Reduce Parser - LR Parser - LR (0) item - Construction of SLR Parsing table -Introduction to LALR Parser, YACC- Design of a syntax analyzer for a sample language					

UNIT IV SYNTAX DIRECTED TRANSLATION AND TYPE CHECKING 9

Syntax-Directed Definitions, Construction of Syntax Trees, Bottom-Up Evaluation of S-Attributed Definitions, L-Attributed Definitions, Top Down Translation, Bottom-Up Evaluation of Inherited Attributes, Forms of intermediate code -Translation of Assignment, Boolean Expression and Control statements - Back patching type systems - Specification of a simple type checker - equivalence of type expressions - type conversions

UNIT V RUN-TIME ENVIRONMENT AND ERROR HANDLING 9

Source language issues-Storage organization-Storage allocation-parameter passing-Symbol tables-Dynamic storage allocation-Storage allocation in FORTRAN, Error handling and recovery in different phases Principal sources of Optimization – DAG - Optimization of basic blocks-Global data flow analysis - Efficient data flow algorithms - Issues in design of a code generator-a simple code generator algorithm

TOTAL :45 PERIODS

REFERENCE BOOKS:

1. Alfred V.Aho, Ravi Sethi and Jeffrey D.Ullman, "Compilers – Principles, Techniques and Tools", second edition, Pearson Education, New Delhi, 2006.
2. Dhamdhare D M, "Compiler Construction Principles and Practice", second edition, Macmillan India Ltd., New Delhi, 2001.
3. Jean Paul Tremblay, Paul G Serenson, "The Theory and Practice of Compiler Writing", McGraw Hill, New Delhi, 2001.
4. Dick Grone, Henri E Bal, Cerial J H Jacobs and Koen G Langendoen, "Modern Compiler Design", John Wiley, New Delhi, 2000.