

The New College (Autonomous), Chennai -14
M.Sc(C.S) Degree Course Structure
CBCS Pattern
(Effective from the year 2011 -2012)

Course Component	Title of Paper	Credits	Total Teaching Hours		Exam Duration	Continuous Assessment	End Semester	Maximum Marks
			Lecture Hours	Practical Hours				
SEMESTER - I								
Core-1	Mathematical Foundation	4	4		3 Hrs	25	75	100
Core-2	Advanced Java Programming	4	4		3 Hrs	25	75	100
Core-3	Advanced DS and Analysis of Algorithm	4	4		3 Hrs	25	75	100
Core-4	Lab 1: Advanced Java	3		4	3 Hrs	25	75	100
Core-5	Lab 2: Data Structures	3		4	3 Hrs	25	75	100
Elective-1		3	4		3 Hrs	25	75	100
Elective-2		3	4		3 Hrs	25	75	100
Soft Skills-1	Soft Skills for Carrer Prospects – Paper I		1					
Value Education-1			1					
SEMESTER – II								
Core-6	Windows Programming	4	4		3 Hrs	25	75	100
Core-7	Advanced Micro Computer Architecture	4	4		3 Hrs	25	75	100
Core-8	Network security and Cryptography	4	4		3 Hrs	25	75	100
Core-9	Lab 3: Windows Programming	3		4	3 Hrs	25	75	100
Core-10	Lab 4: 8086 Practical	3		4	3 Hrs	25	75	100
Elective-3		3	4		3 Hrs	25	75	100
ED-1	Essential Language Communication	2	4		3 Hrs	25	75	100
Soft Skills-2	Soft skills for Carrer Prospects – Paper II	2	2		3Hrs	25	75	100
SEMESTER – III								
Core-11	Compiler Design	4	4		3 Hrs	25	75	100
Core-12	RDBMS	4	4		3 Hrs	25	75	100
Core-13	Advanced Visual Programming	4	4		3 Hrs	25	75	100
Core-14	Lab 5: Visual Programming in .Net	3		4	3 Hrs	25	75	100
Elective-4		3	4		3 Hrs	25	75	100
Elective-5		3	4		3 Hrs	25	75	100
ED-2	Spoken English	2	4		3 Hrs	25	75	100
Value Education-1		1	1			25	75	100
Soft Skills-3	Soft Skills for Carrer Prospects – Paper III	1	1			25	75	100
SEMESTER – IV								
Soft Skills-4	Soft Skills for Carrer Prospects – Paper IV	2	2		3 Hrs	25	75	100
Project		14		14	3 Hrs	50	150	200
GRAND TOTAL		90	72	34	72	675	2025	2700

List of Electives

Course Component	Title of Paper	Credits	Total Teaching Hours		Exam Duration	Continuous Assessment	End Semester	Maximum Marks
			Lecture Hours	Practical Hours				
Elective-1	Operation Research	3	4		3 Hrs	25	75	100
Elective-2	Neural Networks	3	4		3 Hrs	25	75	100
Elective-3	Artificial Intelligence and Expert Systems	3	4		3 Hrs	25	75	100
Elective-4	Object Oriented Analysis and Design	3	4		3 Hrs	25	75	100
Elective-5	Software Testing	3	4		3 Hrs	25	75	100
Elective-6	Data Warehouse and Data Mining	3	4		3 Hrs	25	75	100
Elective-7	Distributed Operating system	3	4		3 Hrs	25	75	100
Elective-8	Mobile Computing	3	4		3 Hrs	25	75	100
Elective-9	Distributed Database	3	4		3 Hrs	25	75	100
Elective-10	Multimedia	3	4		3 Hrs	25	75	100
Elective-11	Digital Image Processing	3	4		3 Hrs	25	75	100
Elective-12	Advance Computer Architecture	3	4		3 Hrs	25	75	100
Elective-13	Parallel Computing	3	4		3 Hrs	25	75	100
Elective-14	E-Commerce	3	4		3 Hrs	25	75	100

CORE 1 : Mathematical Foundation

Subject Code :

Duration : 3 Hours

Max Marks : 100

Unit I

Proposition and Compound propositions – Logical operations – Truth tables – Tautologies and contradictions – Logical Equivalence – Algebra of Propositions – Conditional and Bi-conditional statements – Arguments – Logical implications Quantifiers – Negation of Quantified statements – Basic Counting Principles – Factorial – Binomial Coefficient – Permutations – Combinations – Pigeonhole principle – Ordered and unordered partitions.

Unit II

Order and Inequalities – Mathematical Induction – Division Algorithm – Divisibility – Euclidean Algorithm – Fundamental theorem of Arithmetic – Congruence Relation – congruence equations – semigroups – groups – subgroups – Normal subgroups – Homomorphisms – Rings – Integral Domains – Fields – Polynomials over a Field.

Unit III

Finite Automata and Regular Expressions – Finite State Systems – Basic definitions , Non-determinate Finite Automata – Finite automata with E-moves – Regular expressions Tway finite Automata – Finite automata with output.

Unit IV

Properties of Regular sets : Context Free grammars – Derivation trees – Simplifying context free grammars.

Unit V

Graph theory : Basic definitions – paths, Reactability and Connected nest – matrix Representation of graphs – trees.

Main Reading

1. J.P.tremblay & R.Monohar –Discrete Mathematical Structures with Application to Computer Science. Tata McGrawHill
2. Seymour Llipschuty & Marc Lipson– Discrete Mathematics . Tata McGrawHill

Supplementary Reading

1. John C.Martic– Theory of Computation. Tata McGrawHill
2. J.E. Hopcroft Jeffery Doullman – Introduction to Automata theory languages and Computation. . Tata McGrawHill

CORE 2 : Advanced Java Programming

Subject Code :

Duration : 3 Hours

Max Marks : 100

Unit I

_Servlet overview – the Java web server – your first servlet – servlet chaining – server side includes- Session management – security – HTML forms – using JDBC in servlets – applet to servlet communication.

Unit II

Java Beans: The software component assembly model- The java beans development kit- developing beans – notable beans – using infobus - Glasgow developments - Application Builder tool- JAR files-Introspection-Bound Properties-Persistence-customizers - java beans API.

Unit III

EJB: EJB architecture- EJB requirements – design and implementation – EJB session beans- EJB entity beans-EJB Clients – deployment tips, tricks and traps for building distributed and other systems – implementation and future directions of EJB-Variable in perl- perl control structures and operators – functions and scope.

Unit IV

RMI – Overview – Developing applications with RMI:Declaring & Implementing remote interfaces-stubs & skeletons,Registering remote objects,writing RMI clients –Pushing data from RMI Servlet – RMI over Inter- ORB Protocol.

Unit V

JSP –Introduction JSP-Examining MVC and JSP -JSP scripting elements & directives-Working with variables scopes-Error Pages - using Java Beans in JSP Working with Java Mail- Understanding Protocols in Javamail- Components-Javamail API-Integrating into J2EE- Understanding Java Messaging Services-Transactions.

Text Books:

1. J. McGovern,R. Adatia,Y. Fain, 2003, J2EE 1.4 Bible, Wiley-dreamtech India Pvt. Ltd, NewDelhi.
2. H. Schildt, 2002, Java 2 Complete Reference, 5th Edition, Tata McGraw-Hill, New Delhi.

Reference Books:

1. K. Moss, 1999, Java Servlets, Second edition, Tata McGraw Hill, New Delhi.
2. D.R.Callaway, 1999, Inside Servlets, Addison Wesley, Boston
3. Joseph O’Neil, 1998, Java Beans from the Ground Up, Tata McGraw Hill, New Delhi.
4. TomValesky, Enterprise JavaBeans, Addison Wesley.
5. Cay S Horstmann & Gary Cornell, Core Java Vol II Advanced Features, Addison Wesley.

CORE 3 : Advanced Data Structure and Analysis of Algorithms

Subject Code :

Duration : 3 Hours

Max Marks : 100

Unit – I

Introduction: Data structures – Operations – Arrays: Representation – Traversing, Inserting
Deleting – Sorting and Searching – Multidimensional arrays.

Unit – II

Stacks – Array representation – Operations – Quick sort, an application of stacks – Recursion –
Queues – Linked representation of queues – Operations.

Unit – III

Linked Lists – Representation – Garbage collection – Insertion and deletion from a linked list –
Two- way lists.

Unit – IV

Trees: Binary trees – Representation - Traversing binary trees – Heap – Heap sort. Graphs: Graph
theory terminology – Sequential representation of Graphs, Adjacency Matrix, Path matrix –
Traversing a graph – Hashing – Hash functions.

Unit – V

Algorithm: Definition – Specification – Performance analysis: Space complexity, Time
complexity and asymptotic notations. Divide and conquer: General method – Binary search –
Merge sort – Greedy method: General method – Knapsack problem – Minimum cost spanning
trees – Single source shortest paths – Backtracking: General method – The 8 – Queens problem.

Text Books:

1. Data structures by Seymour Lipschutz, Schaum's outlines – The McGraw- Hill companies.
2. Fundamentals of Computer Algorithms by Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, Galgotia.

Reference Book:

1. Data structures and Algorithms by G A V PAI, The Tata McGraw – Hill companies.

CORE 4 : Lab 1 – Advanced Java

Subject Code :

Duration : 3 Hours

Max Marks : 100

1. HTML to Servlet Applications.
2. Applet to Servlet Communication.
3. Designing online Application with JSP.
4. Working with Enterprise JavaBeans.
5. Performing Java Database Connectivity.
6. Creating Web services with RMI.
7. Creating and Sending Email with Java.
8. Building web applications.

CORE 5 : Lab 2 – Data Structures Lab

Subject Code :

Duration : 3 Hours

Max Marks : 100

1. Implementation of Arrays (Single and Multidimensional)
2. Polynomial Addition using Linked List.
3. Single Linked lists.
4. Circular Linked lists.
5. Doubly Linked lists.
6. General lists.
7. Implementation of Stack (Using Arrays and pointers).
8. Implementation of Queue (Using arrays and pointers).
9. Implementation of Circular Queue (Using array and pointers).
10. Evaluation of Expressions.
11. Binary Tree implementation an Traversals
12. Binary Search trees.
13. Inorder Threaded Binary trees.
14. Heap Tree
15. Splay Tree
16. Spanning Tree

CORE 6 : Windows Programming

Subject Code :

Duration : 3 Hours

Max Marks : 100

Unit-I

Windows Fundamentals-Programming Concepts and Vocabulary for Windows-Windows
Development Tools-Resource Information

Unit-II

Application Framework-Project utility-Writing Windows programming(Procedure Oriented)
-Pie Chart Application

Unit-III

MFC Library-MFC design Considerations-Key features of MFC Library-Cobject-Simple
Application and Template-Drawing in Client Area-Fourier Series application with Resources-Bar
Chart with Resources

Unit-IV

Graph Applications-Word Processor Application-OLE Features and Specifications-Container
Application

Unit-V

Active X Controls-Create Simple Active X controls with MFC-Customizing Controls-COM-
DHTML-ATL vs Active X

TextBook for Study

1. Lars Klander-Core Visual C++-Addison Wesley-First Indian Reprint-2000.

Reference Books for Study

1. C.H. Pappas and W.H. Murray -Visual C++6(The Complete Reference) TataMcGraw
Hill Edition-1999
2. Herbert Schildt-Windows 98 programming from the Ground up-TataMcGraw Hill
Edition-1999

CORE 7 : Advanced Micro Computer Architecture

Subject Code :

Duration : 3 Hours

Max Marks : 100

Unit – I

Microprocessor Evaluation and types – Overview of 8086 microprocessor – 8086 internal Architecture – Constructing the machine codes for 8086 instruction – The 8086 addressing modes.

Unit – II

Machine language and assembly language program- Data transfer Instruction- Arithmetic and logical instruction- Shift and Rotate Instruction – Compare Instructions- Jump and Loop instructions.

Unit – III

String Instruction – Stack related Instructions – Call and Return Instruction – 8086 Instruction Descriptions and Assembler Directives-Simple Assembly language programs.

Unit – IV

8086 Interrupt and Interrupt responses – Hardware interrupt applications – 8254 software programmable Timer/counter – 8259A Priority Interrupt Controller – Software Interrupt Application – Programmable Parallel Ports and Handshake input/output.

Unit - V

DMA – DRAMS – Cache Memories - CoProcessors and EDA Tools – Architecture of 80286.

Text Book:

1. Microprocessors and Interfacing , Douglas V HALL ,Tata McGraw-Hill Publishing Company Limited, New Delhi, Second Edition.

Reference Book:

1. A.K. Ray and K.M. Burchandi, Advanced Microprocessors and Peripherals, TMH, 2000
2. Yu-chengh Liu and Gibson , Micro Computer System 8086/8088 family – PrenticeHall Second Edition -1996

CORE 8 : Network Security and Cryptography

Subject Code :

Duration : 3 Hours

Max Marks : 100

UNIT I

Introduction -OSI Security Architecture, Security Attacks, Security Services, Security Mechanism, A model for Network Security; Classical Encryption techniques-Block Ciphers and data Encryption

Standards-Advanced Encryption standard-Multiple Encryption and Triple DES-Block Cipher Modes of Operation-Stream Cipher and RC4-Confidentiality Using Symmetric Encryption.

UNIT II

Introduction to Number Theory- Public-Key Cryptography and RSA-Key Management; Other Public-Key Cryptosystems.

UNIT III

Message Authentication and Hash Functions –Hash Functions and MAC Algorithms – Digital Signatures and Authentication Protocols.

UNIT IV

Authentication Applications – Electronic Mail Security - IP Security – Web Security.

UNIT V

Intruders-Malicious Software – Firewalls

TEXT BOOK

William Stallings, “Cryptography And Network Security – Principles and Practices”, Prentice Hall of India, Fourth Edition, 2006.

REFERENCES

Atul Kahate, “Cryptography and Network Security”, Tata McGraw-Hill, 2003.

CORE 9 : Lab 3 – Windows Programming

Subject Code :

Duration : 3 Hours

Max Marks : 100

1. SDK program for window creation and display
2. Window Creation using Cframe wind
3. Usage of Mouse Routines
4. Creating Menus for windows
5. Implementing Keyboard Accelerator
6. Checking/Unchecking and Enabling/Disabling Menus
7. Inserting and Removing Menus at Runtime
8. Floating Pop-up Menus
9. MDI With Cascaded and tiled windows
10. Creating modal and modeless Dialog box
11. Creating Status Bar.
12. Using List Box With CILstBox class
13. Using Edit Box with CEdit Class
14. Working of Spin Button controls
15. Creating Graphics Editor.

CORE 10 : Lab 4 - 8086

Subject Code :

Duration : 3 Hours

Max Marks : 100

1. Addition of 16-bit numbers.
2. Multiplication of 16-bit numbers.
3. Division of 32-bit number by a 16-bit number.
4. Multi-byte Addition.
5. Write a program to display ascending order of given number using bubble sort.
6. Block Transfer.
7. Matrix multiplication.
8. Factorial of number using recursion.
9. Display character string on the screen and read keyboard.
10. Linear search with screen message.

CORE 11 : Compiler Design

Subject Code :

Duration : 3 Hours

Max Marks : 100

Unit – I

Introduction to Compilers – Finite Automata and Lexical Analysis.

Unit – II

Syntax Analysis: Context free grammars – Derivations and parse trees – Basic parsing techniques – LR parsing.

Unit – III

Syntax directed translation – Symbol tables.

Unit – IV

Code optimization – More about code optimization.

Unit – V

Code generation – Error detection and recovery.

Text Book:

1. A.V. Aho, J.D. Ullman, principles of Compiler design, Narosa Publications house(1985)

Reference Book:

2. A.V. Aho, Rave Sethi and J.D.Ullman, Compilers principles, Techniques, and Tools, Addition

CORE 12 : RDBMS

Subject Code :

Duration : 3 Hours

Max Marks : 100

Unit I

Database concepts –E-R-model-Basic concepts-Constraints-Keys-E-R-Diagram-Reduction of E-R Schema-UML-Design of an E-R database Schema-Relational model-Relational Algebra—View-Tuple relational calculus-Domain relational calculus-Relational database-SQL-Basic structure-Set Quotation-Sub queries-join relation-DDL-DML-Embedded SQL,QBE.

Unit II

Integrity & Security-Domain constraints-Referential integrity-triggers-Authorization in SQL-Relational database design-1st,2nd,3rd,4th,BCNF normal forms-decomposition.

Unit III

Object relational data model-nested relation-complex types-Inheritances-reference types-Querying with complex types-functions & Procedures-object oriented verses Object relational-Introduction to XML concepts-Storage and file structure-Physical storage media-File organization storage, storage for Object Oriented Databases, Organization of records in files

Unit IV

Indexing and Hashing-basic concepts-Static Hashing-Dynamic- Multiple key access-Query processing-Selection operation-Sorting-Join operation transaction –state Atomicity & amiability-serializability-Transaction Definition in SQL-Concurrency control-Protocols-Deadlock handling

Unit V

Database system architecture-Centralized & Client server architecture-Server system architecture-parallel systems-network types-Distributed database- Homogeneous & Heterogeneous database-Distributed data storage-Case study-Oracle.

Reference

A.Silbersehatz,H.F.Korth and Sudharshan, Database System concepts-IV Edition,McGraw Hill international Edition.

C.J.Date –An Introduction to Database Systems-7th Edition-Addison Wesley-2000.

CORE 13 : Advanced Visual Programming

Subject Code :

Duration : 3 Hours

Max Marks : 100

Unit I: Visual Basic .NET Environment

Introduction to .NET framework – CLR - Introduction to VB.NET – Visual studio Environment –Writing first visual basic project – Finding and fixing errors – Project Debugging.

Unit II: Building the User Interface

Introducing More Controls – Working with multiple controls – coding for the controls- Variables – Constants – Calculation – Formatting Data – Handling Exceptions – Display messages in message boxes.

Unit III: Decision and Common Dialog Boxes

If statements – Conditions- Nested IF – Using If statements with radio check boxes – Input Validation – Event Procedure – Menus – Common Dialog boxes – Creating Context Menus and Writing General Procedures.

Unit IV: Object Oriented Programming

Object Oriented Programming – Classes – Creating a new Object using Class – constructors and destructors – Inheritance - List boxes and Combo boxes – Loops – Arrays.

Unit V: Data Base Development

Using ADO.NET and Visual Basic – Creating a Connection – Setting up a Data Adapter – Data Set – Binding data to Controls – Creating Database Application – Using Data bound labels- Populating combo boxes with data.

Text Book:

1. Julia Case Bradley, Anita C. Millsbaugh, “Programming in Visual Basic .NET”, Tata McGraw Hill Edition, New Delhi.

Reference Book:

1. Michael Halvorson, “Microsoft Visual Basic .NET Step by Step”, PHI, New Delhi.
2. Tony Gaddis, Kip Irvine, Bruce Denton, ”Visual Basic .NET Programming 2nd Edition.
3. Rebecca M.Riordan, “Microsoft ADO.NET Step by Step”.

CORE 14 : Lab 5 – Visual Programming in .Net

Subject Code :

Duration : 3 Hours

Max Marks : 100

1. Form Design – Keyboard & Mouse events, Control arrays, file system controls.
2. Write a program for Keyboard and Mouse events.
3. Write a simple program using standard tool box controls.
4. Write a program using formatting function.
5. Write a program to implement exception handling.
6. Write a simple program using control structures.
7. Write a simple program using input validation function.
8. Adding Menus in form.
9. Write a program using common dialog boxes.
10. Write a program using classes and objects.
11. Write a simple program to implement inheritance.
12. Database application using Data Adapter control for inventory report.
13. Create Database application to display data using Data Grid control for employee database.
14. Create Database application navigate through dataset using Data bound Labels for displaying book details.
15. Create Database application to populate Combo boxes using multiple Data Adapters for Students Mark list.

ELECTIVE-1 : Operation Research

Subject Code :

Duration : 3 Hours

Max Marks : 100

Unit-I

Linear programming – Formulation – Graphical solution (2 variables only) of LPP – Development of simplex method –Artificial variable techniques – Big-M method – Revised simplex method.

Unit –II

Duality in linear programming and its formulation -Dual simplex method –Bounded variables method –Applications of LPP –Transportation problem –Assignment problem –Traveling salesman problem.

Unit-III

Integer programming problem (IPP) –cutting plane algorithm – Branch and method of solving IPP –Dynamic programming problem and its characteristics –Deterministic dynamic programming problem.

Unit-IV

Sequencing problem –Processing n jobs through two machines and three machines –Processing 2 jobs through m machines –Project scheduling by PERT/CPM – difference between PERT and CPM –Constructing the network –critical path analysis –Float of an activity-three time estimated for PERT –project cost by CPM.

Unit-V

Stochastic process –Classification of stochastic processes – Discrete parameter Marko chains – continuous –queuing models and its characteristics –Classification of Queuing models – (M/M/1):(/ FCFS) (birth and death model).

BOOKS FOR STUDY:

1. H.A. TAHA Operations Research, 3rd edition, PHI-1995.
2. Sharma J.K. Mathematical models in operations research, tata McGraw hill pub company ltd., new Delhi (1989).
3. Trivedi K.S: Probability science applications, prentice hall of India- private limited, new Delhi (1994).

ELECTIVE - 2 : Neural Networks

Subject Code :

Duration : 3 Hours

Max Marks : 100

Unit 1

Introduction to Neural Networks – Basic Concepts of Neural Networks – Inference and Learning– Classification Models – Association Models – Optimization Models – Self Organization Models

Unit 2

Supervised and Unsupervised Learnings – Statistical Learning – AI Learning – Neural Networks Learning – Rule Based Neural Networks – Networks Training – Networks Revision – Issues – Theory of Revision – Decision Tree Based NN – Constraint based NN.

Unit 3

Incremental Learning – Mathematical and Modelling – Application of NN – Knowledge based Approaches

Unit 4

Heuristics – Hierarchical Models – Hybrid Models – Parallel Models – Different Models – Control Networks – Symbolic Methods – NN Methods.

Unit 5

Structure and Sequence – Spatio temporal NN – Learning Procedures – Knowledge based Approaches

Text Books

Limin Fu - Neural Networks in Computer Intelligence – McGraw Hill International Edition - 1994

Robert J Schalkoff – Artificial Neural Networks – McGraw Hill – 1997.

ELECTIVE-3: Artificial Intelligence and Expert Systems

Subject Code :

Duration : 3 Hours

Max Marks : 100

Unit – I : Problems and Search

AI Problems – AI Techniques – Level of the Model – criteria for success - Defining problem as a state space search – Production systems – Problem characteristics – production system characteristics – Heuristic search techniques : Simple hill climbing – best-first search – Problem reduction – constraint satisfaction – Means-end analysis.

Unit – II : Knowledge Representation

Representations and Mappings – Approaches to knowledge representation – issues in knowledge representation – Representing simple facts in logic – Resolution – Procedural versus declarative knowledge – forward and backward reasoning – conceptual dependency.

Unit – III : Game Playing

Minimax search procedure – alpha-beta cut-offs – additional refinements – iterative deepening – components of a planning system.

Unit – IV : Learning

Rote learning – learning by taking advice – learning in problem solving – induction – explanation based learning – Formal learning theory.

Unit -V: Expert systems

Representing and using domain knowledge – expert system shells – knowledge acquisition – real time search – perception – action -robot architectures.

Books for Reference :

1. “Artificial Intelligence” by Elaine Rich, Kevin Knight, Shivashankar B Nair, McGraw Hill Publications, Third Edition.

ELECTIVE-4: Object Oriented Analysis and Design

Subject Code :

Duration : 3 Hours

Max Marks : 100

Unit I

Object oriented system development, objects, classes, object behaviours and methods, Encapsulation and Information hiding, polymorphism, object oriented development life cycle

Unit II

Object oriented methodologies, Rumbaugh methodology, Booch methodology, Jacobson methodology, patterns, frameworks, The unified Approach, UML class diagrams, Use case diagrams

Unit III

Object Oriented Analysis, Use case models, Object Analysis, Object relationships, attributes, methods, class and object responsibilities, case studies

Unit IV

Object Oriented design process, Design Axioms, Corollaries, design patterns, designing classes, UML object constraint language, class visibility, designing methods and protocols

Unit V

Quality Assurance test, testing strategies, Object orientation on testing, Test cases, test plans, continuous testing, debugging, principles, system usability, measuring user satisfaction, case studies

Main Reading

1. Ali Bahrami Object Oriented system development Mc Rawhill International edition 99

Supplementary Reading

1. R S Pressman Software Engineering McRawhill International edition 99
2. Grady Booch Object oriented Analysis Design – Addison Wesley

ELECTIVE-5: Software Testing

Subject Code :

Duration : 3 Hours

Max Marks : 100

Unit – I

Introduction to testing - Role of Process in Software Quality, Testing as a Process, Basic Definitions, Software Testing Principles, The Tester's Role in a Software Development Organization, Origins of Defects, Defect Classes, The Defect Repository and Test Design, Defect Examples

Unit – II

Introduction to Testing Design Strategies, The Smarter Tester, Test Case Design Strategies, Using Black Box Approach to Test Case Design, Random Testing, Equivalence Class Partitioning, Boundary Value Analysis, Other Black-box Test Design Approaches, Black-box testing and COTS.

Unit – III

Using White-Box Approach to Test design, Test Adequacy Criteria, Coverage and Control Flow Graphs, Covering Code Logic, Paths: Their Role in White-box Based Test Design, Additional White Box Test Design Approaches, Evaluating Test Adequacy Criteria

Unit – IV

The Need for Levels of Testing, Unit Test, Unit Test Planning, Designing the Unit Tests. The Class as a Testable Unit, The Test Harness, Running the Unit tests and Recording results, Integration tests, Designing Integration Tests, Integration Test Planning, System Test – The Different Types, Regression Testing, Alpha, Beta and Acceptance Tests

Unit -V

Introductory Concepts, Testing and Debugging Goals and Policies, Test Planning, Test Plan Components, Test Plan Attachments, Locating Test Items, Reporting Test Results. Defining Terms, Measurements and Milestones for Controlling and Monitoring, Status Meetings, Reports and Control Issues, Criteria for Test Completion, SCM, Types of reviews, Components of Review Plans, Reporting review results

Text Book

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

References

1. Elfriede Dustin, "Effective Software Testing", Pearson Education, New Delhi, 2003
2. Renu Rajani and Pradeep Oak, "Software Testing – Effective Methods, Tools and Techniques", Tata McGraw-Hill, New Delhi, 2003

ELECTIVE-6: Data Warehousing and Data Mining

Subject Code :

Duration : 3 Hours

Max Marks : 100

Unit I

Data Warehouse Architecture: Data Warehousing architecture – System process – Architecture design – Database schema – Partitioning strategy – Aggregations – Data Marting – Metadata – Data warehouse process managers.

Unit II

Hardware & Operational Design: Hardware and Operational design of warehouses – Hardware architecture – Physical layout – Security – Backup and Recovery – Service level agreement – Operating the Data warehouse.

Unit III

Planning, Tuning & Testing: Capacity planning – Tuning the Data warehouse - Testing the Data warehouse.

Unit IV

Data Mining Introduction: Data Mining introduction – Data mining Vs Query pools – Data mining in marketing and Self-learning computing system – Concept learning – Data Mining and Data Warehousing.

Unit V

Knowledge Discovery Process: Data searching – Cleaning – Enrichment – Coding – Preliminary Analysis of Data Set using traditional Query pools – Visualization techniques – OLAP tools – Neural Networks – Genetic Algorithms – Knowledge Discovery Algorithm (KDA).

Main Reading

1. “Data Warehousing in the Real World” – Sam Anahory & Dennis Murray - Pearsoned Education
2. “Data Mining” – Dolf Zanting - Pearsoned Education

Supplementary Reading

1. “Data Mining Concepts and Techniques” – Jiawei Han and Micheline Kamber.
2. “Data Mining Techniques” – Arun K. Pujari, University Press.

ELECTIVE-7: Distributed Operating System

Subject Code :

Duration : 3 Hours

Max Marks : 100

Unit 1

Introduction – Client –Server Paradigm- mThreads in Distributed Systems – Remote Procedure call- Remote Object Invocation- Message Oriented Communication- Unicasting- Group Communication – Reliable and Unreliable Multicasting.

Unit 2

Issued in Distributed Operating System- Lamports Logical Clock- Vector Clock –Causal Ordering _ Global States-Election Algorithms- Distributed Mutual Exclusion _ Distributed Transactions – Distributed Deadlock – Agreement Protocol.

Unit 3

Introduction –Date –Centric Consistency Models- Client-Centric Consistency Models- Distribution Protocols = mConsistency Protocols –Ivy-Munin-Atomic Transaction.

Unit 4

Introduction to Fault tolerance –Distributed Commit Protocol-Distributed File System Architecture – Issued in Distributed File Systems-sun NFS.

Unit 5

Distributed Object Based Systems- CORBA-COM-Distributed coordination Based System-JINI.

Text Books

1. Geertje Couloruis , Jean Dollimore, Tim Kindberg, “Distributed Systems Concepts and Design” Third edition Pearson Education Asia 2002.
2. Mukesh Singhal, “Advanced Concepts in Operating System” Mc Graw Hill Series in Computer Science, 1994.

Reference:

1. A.S. Tanenbaum, M. Van Steen, “Distributed Systems” Pearson Education , 2004.
2. M.L. Liu, “Distributed Computing Principles and Applications “ Pearson Addison Wesley, 2004.

ELECTIVE-8: Mobile Computing

Subject Code :

Duration : 3 Hours

Max Marks : 100

Unit I : Introduction

Wireless Transmission – Signal Propagation - Spread Spectrum – Satellite Networks-Capacity Allocation – FAMA – DAMA –MAC.

Unit II : Mobile Networks

Cellular Wireless Networks – GSM – Architecture – Protocol – Connection Establishment – Frequency Allocation – Routing – Handover-Security – GPRS.

Unit III : Wireless Networks

WirelessLAN – IEEE 802.11 Standrd – Architecture – Services – AdHoc Networks – HiperLan – Blue Tooth.

Unit IV: Routing

Mobile IP – DHCP – AdHoc Networks- Proactive and Reactive Routing Protocols- Multicast Routing.

Unit V : Transport And Application Layers

TCP over Adhoc Networks – WAP – Architecture – WWW Programming model- WDP – WTLS – WTP – WSP – WAE – WTA Architecture – WML.

Text Books:

1. Jochen Schiller “ Mobile Communications” PHI/ Pearson, Second Edition,2003.
2. William Stalling “ Wireless Communication and Networks “ ,PHI/Pearson 2002.

References:

1. Kaveh Pahlavan, Prasanth Krishnamoorthy ,”Principals of Wireless Networks “,PHI/Pearson ,2003.
2. Uwe Hansmann, Lothar Merk,Martin S.Nicklons and Thomas Stober,”Principles of Mobile Computing “, New York ,2003.
3. Charles E.Perkins,”AdHoc Networking “,Addison Wesley ,2001.

ELECTIVE-9: Distributed Database

Subject Code :

Duration : 3 Hours

Max Marks : 100

Unit I

Features of Distributed Versus Centralized Database – Why Distributed Databases – Distributed Database Management Systems (DDBMSs) – Review of Computer Networks – Levels of Distribution Transparency – Reference Architecture for Distributed Database – Types of Data Fragmentation – Distributed Transparency for read – only Applications – Distribution transparency for Update Applications – Distributed Database Access Primitives – Integrity Constraints in Distributed Databases – A Framework for Distributed Database Design – The Design of Database Fragmentation – The Allocation of Fragments.

Unit II

Equivalence Transformations of Queries – Transforming Global queries into Fragment Queries – Distributed Grouping and Aggregate Function Evaluation – Parametric Queries – Optimization of Access Strategies – A Framework for Query optimization – join Queries – General Queries. A Framework for Transaction Management – Supporting Atomicity of Distributed Transactions – Architectural Aspects of Distributed Transactions

Unit III

Foundations of Distributed concurrency control – Distributed Deadlocks – Concurrency Control Based on Timestamps – Optimistic Methods for Distributed Concurrency Control – Reliability – Basic Concepts Nonblocking Commitment Protocols – Reliability and Concurrency Control – Determining a Consistent View of the Network – Detection and Resolution of Inconsistency – Checkpoints and cold Restart – Distributed Database Administrations – Catalog Management in Distributed Databases – Authorization and Protection.

Unit IV

Distributed object database management systems – Fundamental object concepts and Models – object – Abstract Data Types – Composition (Aggregation) – Class – Collection – Subtyping and Inheritance – Object Distribution Design – Horizontal Class Partitioning – Vertical Class Partitioning – Vertical Class Partitioning – Path Partitioning – Class Partitioning Algorithms – Allocation – Replication – Alternative Client / Server Architectures – Cache Consistency – Object Identifier Management – Pointer Swizzling object Migration – Distributed Object Storage – Object Query Processor Architectures – Query Processing Issues – Query Execution – Correctness Criteria – Transaction Models and object Structures – Transactions Management in Object DBMSs – Transactions as Objects – Conclusion – Bibliographic Notes – Exercises.

Unit V

Parallel Database Systems – Database Server Approach – Database Servers and Distributed Databases – Parallel System Architectures – Objectives – Functional Aspects – Parallel Data Processing – Parallel Query Optimization – Data Placement – Query Parallelism – Parallel Execution Problems – Initialization – Interferences and Convoy Effect – Load Balancing – Parallel Execution for Hierarchical Architecture – Problem Formulation – Basic Concepts – Load Balancing Strategy – Performance Evaluation – Conclusion – Bibliographic Notes – Exercises.

Reference

Stefano Ceri, Giuseppe Pelagatti – Distributed Databases Principles & Systems – McGraw – Hill.

M.Tamer Ozsü, Patrick Valduriez – Distributed database systems – Prentice Hall – Second Edition.

ELECTIVE-10: Multimedia

Subject Code :

Duration : 3 Hours

Max Marks : 100

Unit – I :

Definition – Multimedia highway – Multimedia applications – Need for multimedia project – Macintosh versus windows – Networking Macintosh and windows – connections – Memory and storage devices - Input devices – output hardware - communication devices.

Unit – II :

Text in multimedia – Font editing and design tools - Hyper media and hyper text – Multimedia sounds – digital audio – making MIDI audio – MIDI versus digital audio – adding sound to multimedia project. Images: bitmaps, vector drawings, 3D drawing and rendering – colours- principle of animation – animation by computer. Video: How video works – analog display standards – digital display standards – digital video – optimizing video files for CD ROM.

Unit – III :

Multimedia skills: Project manager, Multimedia designer, interface designer, writer, video specialist, audio specialist, multimedia programmer. Web server – web browsers – search engines – web page makers and site builders – plug-ins and delivery vehicles.

Unit – IV:

Working on the web – text, Images, sounds, animations for the web – making instant multimedia – types of authoring tools – card and page based authoring tools - icon and object based authoring tools - time based authoring tools – cross platform authoring tools.

Unit – V :

Planning and costing: Process of making multimedia – scheduling – Estimating – Designing – producing- testing – preparing for delivery – delivery on CD ROM – compact disc technology – delivery on world wide web.

Text book :

1. “Multimedia Making it works” by Tay Vaughan, Seventh edition, McGraw Hill Publications

References :

1. Creating Instructional Multimedia Solutions: Practical Guidelines for the Real World, Peter Fenrich, Informing Science Publication, 2005
2. Multimedia in Action, James E. Shuman, Course Technology Publication, 1997

ELECTIVE-11: Digital Image Processing

Subject Code :

Duration : 3 Hours

Max Marks : 100

Unit 1

Elements of Visual Perception – Image sampling and quantization Basic relationship between pixels- Basic geometric transformations-Introduction to Fourier Transform and DFT – Properties of 2D Fourier Transform –FFT- Separable Image Transform – Walsh Hadamard – Discrete Cosine Transform, Haar, Slant – Karhunen Loeve Transforms.

Unit 2

Spatial Domain methods: Basic grey level averaging – Spatial filtering: Smoothing, Sharpening filters – Laplacian filters – Frequency domain filters: Smoothing, Sharpening filters- Homomorphic filtering.

Unit 3

Model of Image Degradation/ restoration process – Noise models- Inverse Filtering- Least mean square filtering- Constrained least mean square filtering – Blind Image restoration – Pseudo inverse – Singular value decomposition.

Unit 4

Lossless compression: Variable length coding – LZW coding – Bit plane coding –predictive coding – DPCM. Lossy Compression: Transform coding – Wavelet coding – Basics of Image Compression standards: JPEG, MEG, Basics of Vector Quantization.

Unit 5

Edge detection – Thresholding – Region based segmentation- Boundary representation: chain codes – Polygonal approximation- Boundary segments – Boundary Descriptors: Simple Descriptors- Fourier Descriptors- Regional Descriptors- Simple Descriptors- Texture

Text Books

Rafael C Gonzalez, Richard E Woods 2nd Edition, Digital Image Processing – Pearson Education 2003

Reference

William K Pratt, Digital Image Processing John Willey (2001)
Image Processing Analysis and Machine Vision – Millman Sonka

ELECTIVE-12: Advanced Computer Architecture

Subject Code :

Duration : 3 Hours

Max Marks : 100

Unit 1

Overview of Von Neumann Architecture: Instruction set Architecture; The Arithmetic and Logic Unit, The Control Unit, Memory and I/O devices and their interfacing to the CPU; Measuring and reporting performance; CISC and /RISC processors

Unit 2

Pipelining : Basic Concepts of Pipelining, Data hazards, Control hazards and Structural hazards; Techniques for overcoming or reducing the effects of various hazards.

Unit 3

Instruction-level parallelism: Concepts of Instruction-level parallelism (ILP), Techniques for increasing ILP; Superscalar, Super pipelined and VLIW processor Architecture; Vector and Symbolic Processors; case studies of Contemporary Microprocessors

Unit 4

Multiprocessor Architecture: Taxonomy of parallel Architectures; Centralized Shared-Memory Architecture, Synchronization, Memory Consistency, Interconnection Networks; Distributed Shared-Memory Architecture, Cluster Computers.

Unit 5

Non Von Neumann Architecture: Data flow Computers, Reduction Computer Architectures, Systolic Architectures.

References

1. Computer Organization and Architecture: Designing for performance, W.Stallings, 4th Ed. PHI, 1996.
 2. Computer Architecture: A Quantitative Approach, J.H.Hemmessy and D.A.Patterson, 2nd Ed., Morgan Kaufmann, 1996
 3. Advanced Computer Architecture: Parallelism, Scalability and Programmability, Kai Hwang, McGraw-Hill Inc 1993.
- Parallel Computer Architecture: A Hardware / Software Approach, D.E.Culler, J.Pal Singh, and A.Gupta, HarcourtAsia Pvt Ltd., 1999.

ELECTIVE-13: Parallel Computing

Subject Code :

Duration : 3 Hours

Max Marks : 100

Unit 1

Introduction to Parallel Processing- Evolution of Computer Systems- Parallelism in Uniprocessor Systems- Parallel Computer Structures – Architectural Classification Schemes- Parallel Processing Applications.

Unit 2

Memory and Input-Output Subsystems- Hierarchical Memory Structure- Virtual Memory System- Memory Allocation and Management – Cache Memories and Management Input – Output Subsystem

Unit 3

Principles of Pipelining and Vector Processing- Pipelining : An Overlapped Parallelism- Instruction and Arithmetic Pipelines – Principles of Designing Pipelined Processors _ Vector Processing Requirements.

Unit 4

Vectorization and Optimization methods - Parallel Languages for Vector Processing- Design of Vectorising Compiler _ Optimization of Vector Functions- SIMD Array Processor-SIMD interconnection Networks- Associative Array Processing.

Unit 5

Multiprocessor Architecture and Programming –functional Structures – Interconnection Networks – Parallel Memory Organizations _ multiprocessor Operating Systems- Language Features to Exploit Parallelism- Multiprocessor Scheduling Strategies. ‘

Text Books.:

Kai Hwang and Faye A. Briggs- Computer Architecture and Parallel Processing- McGraw Hill International Edition- 1985.

Reference:

1. Richard Kain _ Advanced Computer Architecture – PHI -1999
2. V. Rajaraman and C. Silva Ram Murchy _ Parallel Computers, Architecture and Programming –PHI -2000

ELECTIVE-14: E-Commerce

Subject Code :

Duration : 3 Hours

Max Marks : 100

Unit – I

Overview of e- commerce: Introduction – Definition of e-commerce – Potential benefits of e- commerce – Internet and www as enablers of e- commerce – Impact of e- commerce on business models – E- commerce security – Organization of topics – Implication for the accounting. E- commerce and the role of independent third parties: Introduction – Consulting practices and accountants – Impact of Electronic commerce on the traditional assurance function – third party Assurance of web based electronic commerce – Implications for the accounting.

Unit– II

Edi electronic commerce and Internet: Introduction – Traditional Edi system – Data transfer and standards – financial Edi – Edi system and the internet – Impact of Edi Internet applications on the accounting profession. Risks of insecure system : Introduction – Overview of risks associated with internet transactions – Internet associated risk – Internet associated risk – risks associated with business transactions – Risks associated with confidentially maintained archival – master file and reference data – risks associated with virus and malicious – Implication of the accounting.

Unit – III

Internet security standards: Introductions – Standard setting issues and Committees – Security committees and organization- Security protocols and languages – Messaging protocols – Secure electronic payments and protocols – the role of accountants in internet related standard setting process. Cryptography and authentication: Introduction – Message security issues Encryption techniques – key management- Additional authentication methods – Additional non – repudiation techniques – implications of the accounting.

Unit – IV

Firewalls: Introduction – firewall defined – TCP/IP- Open system interconnect (OSI)- Components of firewall – typical functionality of firewalls 0 network topology – Commercial firewall software – Limitations of security prevention provided by firewall Implications of the accounting – Introduction – the set protocol – Magnetic strip cards – smart cards – Electronic check – Electronic cash – Implication of the accounting.

Unit – V

Intelligent Agent: Introduction – Definition of intelligent agent – Capabilities Of intelligent agent – intelligent agents and e-commerce – Online information Chain – limitations agents – implication of the accounting. Web based marketing: Introduction – the scope of marketing – business marketing and information technology – internet marketing techniques – Online adv Mechanisms – Web site design issues – intelligent agent and their impacts on marketing techniques – Implications of the accounting.

Books for Study :

1. MARILYN GREENSTEIN, TOOD.M.FEINMAN, “electronic Commerce”-TMH.
2. KALAKOTA & WINSTON, Frontiers of Electronic Commerce – Addison Wasley, fifth
3. BAJAJ & NAG , E-Commerce, The cutting Edge of Business – Tata McGraw Hill