BHARATHIDASAN UNIVERSITY, TIRUCHIRAPPALLI – 620 024.
Master of Computer Application (M.C.A) - Course Structure under CBCS
(Applicable to the candidates admitted from the academic year 2011-2012 onwards)

Eligibility: A candidate who is a graduate in Mathematics or Physics or Chemistry or Statistics or Computer Science or Information Technology or Industrial Electronics or Applied Science (with Mathematics as an allied subject / major subject) or B.Com. or B.B.A. or B.E. / B. Tech. (except Computer Science Engineering Branch) / AMIE of this University or from a recognized University or a Examination accepted by the syndicate as equivalent thereto

Lateral entry: PGDCA OR B.Sc. Computer Science OR B.Sc. Information Technology OR BCA

Semester	Course	Course Title	Ins. Hrs / Week	Credit	Exam Hrs	Marks Int.	Marks Extn.	Total
I	Core Course – I (CC)	Digital Electronics and Computer Organization	5	4	3	25	75	100
	Core Course – II (CC)	Data Structures and Algorithms	5	4	3	25	75	100
	Core Course – III (CC)	Operating Systems	4	4	3	25	75	100
	Core Course – IV (CC)	Programming with C++	5	4	3	25	75	100
	Core Course – V (CC)	OOAD and UML	5	4	3	25	75	100
	Core Course – VI (CC)	C++ Programming Lab (Applied to Data Structures and Algorithms)	3	2	3	40	60	100
	Core Course – VII (CC)	Operating Systems Lab (DOS and UNIX)	3	2	3	40	60	100
		Total	**30**	**24**	**-**	**-**	**-**	**700**
II	Core Course – VIII (CC)	Computer Networks	5	4	3	25	75	100
	Core Course – IX (CC)	Data Base Systems	5	4	3	25	75	100
	Core Course – X (CC)	Software Engineering	4	4	3	25	75	100
	Core Course – XI (CC)	Programming with Java	5	4	3	25	75	100
	Core Course – XII (CC)	Java Programming Lab	3	2	3	40	60	100
	Core Course – XIII (CC)	RDBMS Lab (Oracle 9i with SQL)	3	2	3	40	60	100
	Elective – I(EC)	Any one from the Given List	5	4	3	25	75	100
		Total	**30**	**24**	**-**	**-**	**-**	**700**
III	Core Course –XIV(CC)	J2EE Technologies	5	4	3	25	75	100
	Core Course –XV(CC)	Web Technologies	5	4	3	25	75	100
	Core Course – XVI(CC)	Organizational Behavior	4	4	3	25	75	100
	Core Course – XVII(CC)	Discrete Mathematics	5	4	3	25	75	100
	Core Course – XVIII(CC)	J2EE Technology Lab	3	2	3	40	60	100
	Core Course –XIX(CC)	Web Design Lab (Ruby, Photoshop, Flash and PHP)	3	2	3	40	60	100
	Elective Course II(EC)	Any one from the Given List	5	4	3	25	75	100
	Professional Skills – I Practical / Hands-on	System Assembly and Maintenance	-	2		100	N/A	100
		Total	**30**	**26**	**-**	**-**	**-**	**800**

	Core Course – XX(CC)	.NET Technologies	4	4	3	25	75	100
	Core Course – XXI(CC)	Data Mining and Warehousing	4	4	3	25	75	100
	Core Course – XXII(CC)	Accounting and Financial Management	5	4	3	25	75	100
IV	Core Course – XXIII(CC)	Probability and Statistics	5	4	3	25	75	100
	Core Course – XXIV(CC)	.NET Technologies Lab	3	2	3	40	60	100
	Core Course – XXV(CC)	Accounting and Financial Management Lab	3	2	3	40	60	100
	Elective Course III (EC)	Any one from the given list	4	4	3	25	75	100
	Skill Development	Skill Development Course	2	2	3	25	75	100
		Total	**30**	**26**	**-**	**-**	**-**	**800**
	Core Course – XXVI(CC)	Network Security	5	4	3	25	75	100
	Core Course – XXVII(CC)	Mobile Computing	5	4	3	25	75	100
	Core Course –XXVIII(CC)	Optimization Techniques	5	4	3	25	75	100
V	Core Course – XXIX(CC)	Network Security Lab	3	2	3	40	60	100
	Core Course – XXX(CC)	Mobile Computing Lab	3	2	3	40	60	100
	Elective IV (EC)	Any one from the given list	4	4	3	25	75	100
	Elective V (EC)	Any one from the given list	5	4	3	25	75	100
		Total	**30**	**24**	**-**	**-**	**-**	**700**
VI	Major Project	Dissertation=100 Marks [2 reviews –20+20=40 marks Report Valuation = 40 marks] Viva = 20 Marks	-	16	-	-	-	100
		Total	**-**	**13**	**-**	**-**	**-**	**100**
		Grand Total	**150**	**140**	**-**	**-**	**-**	**3800**

Recommended Credits Distribution: (Total should not be less than 140 Credits)

Course Type	Course	Credits	Total Credits
Core (Theory)	20	4	80
Core (Practical)	10	2	20
Core (Major Project)	1	16	16
Elective	5	4	20
Professional Skill	1	2	2
Skill Development	1	2	2
Total	**38**		**140**

The Internal and External Marks to be awarded for any **Practical Course** is **40 & 60** respectively and for **Theory course**, it is **25 & 75** respectively for MCA, M.Sc (CS), M.Sc (IT) & PGDCA.

Professional Skill Course:

This course is intended to make the students to learn Hardware Assembly, Trouble Shooting a Computer System and Peripherals, configuration Management, System Maintenance, Installation of Software Tools & Packages, Network Fundamentals, System Administration, etc.,

- No Theory Examination will be conducted.
- Students must learn the required things by themselves.
- The College may arrange for a workshop or invite Experts from the Industry to demonstrate the essential methods, tools and techniques to the students.
- An internal assessment of the knowledge acquired by the students should be evaluated at the End of the Semester and marks (Max: 100) awarded to each student to be communicated to the University.

List of Elective Courses (For 2011 – 2012) :

Elective I		**Elective II**	
1	Computer System Architecture	1	Systems Programming and System Software
2	Distributed Operating Systems	2	Mobile Communications
3	Computer Graphics	3	Multimedia and WAP
4	Principles of Programming Languages	4	Artificial Intelligence and Expert Systems
Elective III		**Elective IV**	
1	Microprocessor Architecture and Applications	1	Parallel Processing
2	Enterprise Resource Planning	2	Pervasive Computing
3	e-Commerce	3	Image Processing
4	System Modeling and Simulation	4	Human Computer Interaction
Elective V			
1	Grid Computing		
2	Cloud Computing		
3	Compiler Design		
4	Soft Computing		

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CORE COURSE I
DIGITAL ELECTRONICS AND COMPUTER ORGANIZATION

UNIT: I

Number Systems and Codes: Binary, Octal and Hexadecimal number systems – conversion between number systems – binary arithmetic- Binary codes – BCD arithmetic.

Boolean Algebra and Logic Gates: AND, OR, NOT, NAND, NOR, XOR and XNOR gates – Truth tables Applications of XOR Gate Fundamentals of Boolean Algebra – Boolean Functions Minterms and Maxterms – Laws and theorems of Boolean Algebra – Demorgan's theorems – The Universal Building blocks – NAND & NOR gates as universal Building Blocks.

UNIT: II

Simplification of Boolean Expressions : Canonical SOP and POS forms – Algebraic Simplification – Karnaugh Maps – SOP & POS Simplification – NAND / NOR implementation of Boolean expressions – Don't care, conditions – Overlapping groups, eliminating redundant groups. Combinational Logic circuits : Half and Full Adders – Half and Full subtractors – BCD adder – parallel binary adder – Multiplexer & Demultiplexer – Encoder & Decoder.

UNIT: III

Sequential Logic circuits: NAND latch – SR, flipflop – JK flipflop – Edge triggering – PRESET and CLEAR inputs, Shift Register, Universal Shift register – Asynchronous and Synchronous counters – BCD counter.

Unit: IV

Parallel Computer Models: Introduction - Flynn's Classifications - Parallel & Vector Computer System - Attributes to performance - implicit and explicit parallelism - shared memory – multiprocessors – Uniform and Non-Uniform Memory Access and Cache only Memory Access Models – Distributed Memory Multicomputers – Multivector & SIMD Computers – PRAM and VLSI Module

UNIT: V

Processors and Memory Hierarchy: CISC & RISC Architectures – CISC Family – RISC Scalar processors – Super Scalar Processors and their features – Very Long Instruction word Architecture vector & symbolic processors, Memory hierarchy

TEXT BOOK(S)

1. Meena K, "Principles of Digital Electronics", PMI, I Edition.
2. Thomas Bartee C, Digital Computer Fundamentals, TMH, 3rd Edition
3. Moris Mano, Computer Architecture and Logic Design, TMH Publications
4. Liu and Gibson " Microcomputer Systems" PHI

REFERENCE(S)

1. Malvino and Leech " Digital Principles and Applications" , TMH
2. Malvino and Brown, Digital Computer Electronics, TMH, III rd Edition

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CORE COURSE II - DATA STRUCTURES AND ALGORITHMS

Unit: I

Introduction to data structures, Records, Arrays, Stacks, Queues, Recursion, Linked list, Binary tree and traversing.

Unit: II

Sorting and Searching Techniques: Introduction, Internal and External Sorting, Insertion, Selection, Merging, Radix, Quick sort, Heap sort and Bubble sort. Searching: Introduction, Sequential search, Binary search, Binary Tree search.

Unit: III

Graphs and Their applications: Introduction, Graph Theory, Terminology, Representation of graphs, Tree & Binary tree, operations on graphs, shortest path Algorithms, Topological sorting.

Unit: IV

Algorithms, Development of Algorithms, basic concepts, Structured Program Concepts, Top down development of algorithms, Principle of analyzing Algorithms, Algorithms design methods, Sub goals, Hill climbing.

Unit: V

Algorithms Design Techniques: Divide and Conquer algorithms, Dynamic Programming, Greedy algorithms, Backtracking and Branch & bound.

Text Books

1. Seymour Lipschitz "Data Structures, Tata McGraw-Hill
2. Ellis Horowitz & S. Sahni, Fundamentals of Data Structures, Galgotia Pub.

References

1. Data Structures Using C - Langsam, Augenstien, Tenenbaum, PHI
2. Data structures and Algorithms, V.Aho, Hopcropft, Ullman , LPE
3. Introduction to design and Analysis of Algorithms - S.E. Goodman, ST. Hedetniem- TMH

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CORE COURSE III – OPERATING SYSTEMS

Unit: I

Operating Systems Objectives and functions – Operating System and User /Computer Interface, Operating System as a Resource Manager: Evaluation of Operating Systems – Serial Processing, Sample Batch Systems, Time Sharing Systems.

Unit: II

Process Description, Process Control – Processes and Threads. Concurrency – Principles of Concurrency, Mutual Exclusion – Software support, Dekker's Algorithm – Mutual Exclusion – Hardware support, Mutual Messages – Deadlock – Deadlock prevention, Deadlock Detection, Deadlock Avoidance – An Integrated deadlock Strategy.

Unit: III

Memory Management – Memory Management Requirements – Fixed Partitioning, Placement Algorithm, Relocation in a Paging System – Sample Segmentation. Virtual Memory – Paging – Address Translation in a Paging System. Segmentation – Organization, Address Translation in a Segmentation System – Combined Paging and Segmentation – Virtual Memory – Operating System Software – Fetch Policy, Placement Policy and replacement Policy, Page buffering resident set
Management.

Unit: IV

Scheduling – Types of Scheduling, scheduling Algorithms, scheduling criteria, FIFO, Round Robin, Shortest Process next, Shortest Remaining Time, Highest response ratio and Feedback scheduling Performance comparison – Fair – Share Scheduling. I/O Management and disk scheduling – Organization of the I/O function – the Evaluation of the I/O function, Logical structure of the I/O function, I/O Buffering, Disk Cache.

Unit: V

File Management – Files, File Management Systems, File System Architecture, Functions of File Management File Directories – File Sharing – Secondary Storage Management – File allocation.

Text Books

1. William Stallings, "Operating Systems", Second edition, Maxwell McMillan, International Editions, 1997.
2. Charles Crowley, "Operating Systems-A Design Oriented Approach", IRWIN Publications Chicago, 1997.

References

1. Dental H.M. "An Introduction to Operating Systems", Addison Wesley Publishing Co., 1998.
2. Silberchatz A., Peterson J.L., Galvan P. "Operating System Concepts", Third Edition, Addison Wesley Publishing Co., 1992.

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Core Course IV – Programming with C++

Unit I

What is Object Oriented Programming? – C++ Console I/O- C++ comments- Classes: Some difference between C and C++ - Introducing Function Overloading - Constructor and Destructor Functions- Constructors take parameters- Introducing Inheritance – Object Pointers – In line Functions – Automatic in lining.

Unit II

Assigning Objects – Passing Object to Functions – Returning Object from Functions- An Introduction to friend functions- Arrays of objects – Using Pointers to Objects – Using new & delete – More about new & delete – references – Passing references to objects - Returning references- Independent References and restrictions.

Unit III

Overloading Constructor Functions- Creating and Using a Copy constructor- Using default arguments- Overloading and ambiguity – Finding the address of an overload function- the basics of operator overloading- overloading binary operators-overloading the relational and logical operators- overloading a Unary operator – using friend operator functions- a closer at the assignment operator- overloading the subscript() operator.

Unit IV

Base class access control –using protected members- Constructors, destructors and inheritance - multiple inheritance- virtual bas classes- Some C++ I/O basics- formatted I/O using width(), precision () and fill() – using I/O manipulators- Creating your own inserters- creating extractors.

Unit V

Creating your own manipulators- File I/O basics- unformatted, binary I/O- more unformatted I/O functions- random access- checking the I/O status- customized I/O and files- Pointers and derived classes- Introduction to virtual functions- more about virtual functions- applying polymorphism- Exception handling.

Text Book(s)

Herbert Schildt, "Teach Yourself C++", III edition, Tata McGraw Hill 5th Reprint 2000.

Reference(s)

1. Robert Lafore, "Object Oriented Programming in Turbo C++", Galgotia 2001
2. E. Balagurusamy "Object Oriented Programming with C++ ", TMH New Delhi

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Core Course V – OOAD and UML

UNIT-I

Structured approach to system construction : SSADM/SADT - An overview of object oriented systems development & Life cycle

UNIT-II

Various object oriented methodologies – Introduction to UML

UNIT-III

Object oriented analysis – Use cases- Object classification, relationships, attributes, methods

UNIT-IV

Object oriented design – Design axioms – Designing classes – Layering the software design :- data access layer, User interface layer, Control/business logic layer

UNIT-V

UML - Examples on : Behavioral models – Structural models – Architectural models from real world problems.

TEXT BOOK:

1. **Bahrami Ali**, Object oriented systems development, Irwin McGrawHill, 2005 (First 4 units covered here).
2. **Booch Grady, Rumbaugh James, Jacobson Ivar**, The Unified modeling language – User Guide, Pearson education, 2006 (ISBN 81-7758-372-7) (UNIT -5 covered here).

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Core Course – VI
C++ Programming Lab (Applied to Data Structures and Algorithms)

1. Implement Array Merging, sorting of array elements [Integer elements & character Elements]

2. Implement sorting of array of English words (in Dictionary order)

3. Implement Stack Data Structures and Operations on it (push, pop)

4. Implement Singly linked list Data structure and operations on it (insert, delete, print, navigate, search)

5. Implement sorting operation on a singly linked list data structure

6. Implement doubly linked list data structure and operations on it (insert, delete, print, navigate, search)

7. Implement Sorting operation on a doubly linked Data Structure

8. Implement Queue Data Structure and operations on it

9. Implement table Data structure and operations on it (insert, delete, print, navigate, search)

10. Implement binary tree data structure and operations on it (node insertion, deletion)

11. Implement pre-order, in-order, post-order traversal of binary tree and print node contents

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Core Course VII – Operating Systems Lab (DOS and UNIX)

Write Shell Programming to implement the following:

1. Mark list preparation
2. Menu Creation
3. Login Greetings Script
4. Copying files
5. Searching a word in a file
6. Compression techniques
7. Paragraph formatting
8. User Creation
9. Group Creation
10. Cron Scheduling
11. All DOS Commands & Batch File Creation

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CORE COURSE VIII – COMPUTER NETWORKS

Unit I

Computer Networks - Applications - Line configuration - Topology - Transmission Modes - Categories of Network: LAN, MAN, WAN - OSI Layer. Physical Layer: Signals - spectrum - bandwidth of analog/digital signals – signal encoding - DTE-DCE interface - Transmission Media - Multiplexing : FDM, TDM.

Unit II

Data Link Layer: Error Detection - Error correction - Line discipline Flow Control: stop - wait protocol and sliding window protocol Error control: ARQ, Go-back-n ARQ, selective - repeat ARQ. Data Link Protocols: Asynchronous protocols – synchronous protocol: character oriented - bit oriented protocols - HDLC. LLC, MAC, PDU. MAN: DQDB - SMDS.

Unit III

Network Layer: Circuit switching - packet switching - message switching - Connection oriented and connectionless services. Routing Algorithms – congestion control Algorithms - internetworking - Routers and Switches - Introduction to firewalls- Wide Area Network - X.25 - Frame Relay - Frame relay - Protocol Architecture - Frame relay call control - User Data Transfer Network Function – Congestion Control.

Unit IV

LAN Protocols: Ethernet - Token Ring - Token Bus - FDDI - Addressing and Frame format – Bridges - LAN Security: Types of threats - Levels of security Case Study: Novell Netware - Wireless LAN: need - components - Receiving Devices - advantages &disadvantages

Unit V

TCP/IP Networking : TCE/IP Architecture - Structural overview – Inter networking model - Protocol evolution - Division of functions - Network characteristics - implementation characteristics - Network addressing and Routing: Datagram Header - IP address space - Basic routing consideration -Hardware addressing – Common interior Gateway Protocols - Internet control Message Protocol. Transport Layer: Data flow, ports, sockets - user Data gram protocol - Transmission control protocol - TCP Header - connection establishment and termination - TCP Reliable Delivery & Flow control - Applications and services: Domain name system - Remote Logon – Mail Exchange - File Transfer - Remote Procedure Call - Remote File Access - Security - Window system.

Text Book(s)

Data Communication and Networking, Behruz A. Ferouzon, Tata McGraw, 2004.

References

1. Computer Networks - III edition - Andrew S. Tanenbaum - Pearson Edun. 1998.
2. Data and Computer Communication – William Stallings, Pearson Education, 5thEdition, September 2000

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CORE COURSE IX – DATA BASE SYSTEMS

Unit I

Introduction – purpose of database systems – Data Abstraction – Data models – Instances and schemes – Data independence – DDL – DML – Database users – ER model – Entity sets – Keys – ER diagram – relational model – Structure – Relations Algebra – Relational Calculus – Views.

Unit II

SQL – QBE – QUEL – Basic structure – various Operations – Relational database design problems in the relational data base design – Normalisation – normalization using functional, Multi value and join dependencies.

Unit III

File and system structure – overall system structure – file Organization – data dictionary – Indexing and hashing – basic concept B and B+ tree indices – Static and Dynamic hash functions.

Unit IV

Recovery and atomicity – failures classification and types – Transaction model and Log based recovery, schedules – serial and non-serial types – Serialization of schedules and views – testing for seriability – lock based protocols – time based protocols – validation techniques – multiple Granularity – multiversion schemes – insert and delete Operations.

Unit V

Distributed data bases – structure of distributed databases – Trade offs in Distributing the database – Transparency and autonomy – distributed query processing – recovery in distributed systems – commit protocols – security and integrity violations – authorization and views – security specification – encryption – Statistical databases.

Text Book(s):

Henry F.Korth, and Abraham Silberschatz,, Sudarshan "Database system Concepts", McGraw Hill, 4th Edition, 2002

References:

1. Pipin C. Desai, "An Introduction to data base systems", Galgotia Publications Private Limited, 1991.
2. C.J. Date, "An Introduction to Database Systems", 3rd Edition, Addison Wesley 1983.

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CORE COURSE X – SOFTWARE ENGINEERING

UNIT 1: SOFTWARE PROCESS

Introduction –S/W Engineering Paradigm – life cycle models (water fall, incremental, spiral, WINWIN spiral, evolutionary, prototyping, object oriented) – system engineering – computer based system – verification – validation – life cycle process – development process –system engineering hierarchy.

UNIT 2: SOFTWARE REQUIREMENTS

Functional and non-functional – user – system –requirement engineering process – feasibility studies – requirements – elicitation – validation and management – software prototyping – prototyping in the software process – rapid prototyping techniques – user interface prototyping –S/W document. Analysis and modeling – data, functional and behavioral models – structured analysis and data dictionary.

UNIT 3: DESIGN CONCEPTS AND PRINCIPLES

Design process and concepts – modular design – design heuristic – design model and document. Architectural design – software architecture – data design – architectural design – transform and transaction mapping – user interface design – user interface design principles. Real time systems – Real time software design – system design – real time executives – data acquisition system – monitoring and control system. SCM – Need for SCM–Version control – Introduction to SCM process – Software configuration items.

UNIT 4: TESTING

Taxonomy of software testing – levels – test activities – types of s/w test – black box testing – testing boundary conditions – structural testing – test coverage criteria based on data flow mechanisms – regression testing – testing in the large. S/W testing strategies – strategic approach and issues – unit testing – integration testing – validation testing – system testing and debugging.

UNIT 5: SOFTWARE PROJECT MANAGEMENT

Measures and measurements – S/W complexity and science measure – size measure – data and logic structure measure – information flow measure. Software cost estimation – function point models – COCOMO model- Delphi method.- Defining a Task Network – Scheduling – Earned Value Analysis – Error Tracking – Software changes – program evolution dynamics – software maintenance – Architectural evolution. Taxonomy of CASE tools.

Text Books:

1. "Software engineering- A practitioner's Approach", Roger S. Pressman, McGraw-Hill International Edition, 5th edition, 2001.
2. "Software engineering", Ian Sommerville, Pearson education Asia, 6th edition, 2000.
3. "Software Engineering Concepts ", Richard E. Fairley, McGraw-Hill edition, 2002.

Reference Books:

1. "Software Engineering – An Engineering Approach", James F Peters and Witold Pedryez, John Wiley and Sons, New Delhi, 2000.

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CORE COURSE XI – PROGRAMMING WITH JAVA

UNIT-I

Introduction – Literals – Data types – The structure of Java program – Operators – Control statements

UNIT-II

Arrays – Classes - Inheritance

UNIT-III

Packages and Interfaces – Wrapper classes – mathematical methods – Exceptions

UNIT-IV

Input and Output classes

UNIT-V

Threads – Applets - Graphics.

TEXT BOOK:

1. Dr. K. Somasundaram, "Programming in Java 2", Jaico Publishing House - 2008

REFERENCE BOOK

1. Ken Arnold, Games Gosling, David Holmes, "The Java Programming Language", 3rd Edition, TMH
2. Patric Naughton and Herbert Schildt, "Jave 2 Complete Reference", TMH, 1999
3. Nortron Peter and William Stanek, "Guide to Java Programing", Samsnet 1996

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CORE COURSE XII – JAVA PROGRAMMING LAB

1. Assume that a bank maintains
2 kinds of account for its customers' one called savings account and the other current account' The savings account provides compound interest and withdraw facilities but no cheque book facility. The current account provides cheque book facility but no interest. Current account falls below this level a service charge is imposed. Create a class Account that stores customers name' account number and type of account. From this derive the classes curr-acct and sav-acct to make them more specific to their requirements. Introduce the necessary methods in order to achieve the following tasks:

     a. Accept deposit form a customer and update the balance.
     b. Display any deposit interest
     c. Compute and deposit interest.
     d. Permit withdrawal and update the balance.
     e. Check for the minimum balance' impose penalty' if necessary and update the balance.

1. Use constructors and methods to initialize the class members.
   Write a program that accepts a shopping list of five items from the command line and stores them in a vector and accomplish the following:
   a. To delete an item in the list.
   b. To add an item at a specified location in the list.
   c. To add an item at the end of the list.
   d. To print the contents of the vector.

3. Implementation of the concept of multiple inheritance using interfaces and design a package to contain the class students and another package to contain the interfaces sports.

4. Develop a simple real-life application program to illustrate the use of multithreads.

5. Create a try block that is likely to generate three types of exception and then

incorporate necessary catch blocks to catch and handle them appropriately.

6. Write a Java applet' which will create the layout below:
FORMAT
Enter your Name:
Enter your Age:
Select City: *Delhi *Madras
Select SIW: *Oracle *Visual Basic *Java
OK CANCEL
Handle the following simple validations.
The name entered should be less than 25 characters wide.
Age entered should be done as the user exits the fields as well as when OK button is pressed. Hint use the Boolean action (Event evt' object arg).
7. Write an Applet which will play two sound notes in a sequence continuously use the play ( ) methods available in the applet class and the methods in the Audio clip interface.

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CORE COURSE XIII - RDBMS LAB (Oracle 9i with SQL)

1. Creating & updating and inserting into database & simple queries.

2. Uses of Select statement - for queries.
   a. AND' OR' NOT Operators' WHERE clause.
   b. UNION' INTERSECTION' MINUS.
   c. Sorting and grouping.

3. Nested queries using SQL.
   a. Sub queries.
   b. Join.

4. Built-in-functions of SQL.

5. Use of indexes' creating views and querying in views.

6. Cursors' triggers and stored procedures and functions.

7. Case studies:
   a. Student evaluation systems.
   b. Pay - roll system
   c. Income tax calculations.
   d. Seat reservation Problems
   e. Mark - sheet Preparation.

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ELECTIVE COURSE I:1 – COMPUTER SYSTEM ARCHITECTURE

UNIT I

Data Representation: Data Types – Complements – Fixed Point Representation – Floating Point Representation – Error Detection codes. **Register Transfer and Microoperations**: Register Transfer Language – Register Transfer – Bus and Memory Transfers – Arithmetic Microoperations – Logic Microoperations – Shift Microoperations – Arithmetic Logic Shift Unit

UNIT II

Basic Computer Organization and Design: Instruction Codes – Computer Registers - Computer Instructions – Timing and Control – Memory-Reference Instructions – Input – Output and Interrupt –Complete Computer Description – Design of Accumulator Logic.

UNIT III

Central Processing Unit: Introduction – General Register Organization – Stack Organization – Instruction Formats – Addressing Modes – Data Transfer and Manipulation – Program Control – Reduced Instruction Set Computer(RISC).

UNIT IV

Computer Arithmetic: Introduction – Addition and Subtraction – Multiplication Algorithms – Division Algorithms –Floating point Arithmetic Operations - Decimal Arithmetic Unit – Decimal Arithmetic Operations.

UNIT V

Input-Output Organization: Peripheral Devices – Input Output Interface – Asynchronous Data Transfer – Modes of Transfer – Priority Interrupt – Direct Memory Access – Input Output Processor – Serial Communication. **Memory Organization:** Associative Memory – Cache Memory.

Text Book:

M.Morris Mano, "Computer System Architecuture", Prentice Hall of India pvt Ltd , New Delhi, Third Edition.,1999.

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ELECTIVE COURSE I:2 – DISTRIBUTED OPERATING SYSTEMS

Unit I

Fundamentals: What is Distributed Operating System – Evolution of Distributed Computing System – Distributed Computing System Models – Why are Distributed Computing Systems gaining popularity – What is a Distributed Computing System – Issues in Designing Distributed Computing System – Introduction to Distributed Computing Environment.
Introduction to Computer Networks – Network types – LAN –WAN – Communication protocols – Internetworking – ATM Technology

Unit II

Message Passing: Introduction – Desirable features – Issues in PC Message Passing – Synchronization – Buffering – Multidatagram Messages – Encoding and Decoding – Process Addressing – Failure Handling – Group Communication

Unit III

Distributed Shard Memory: Introduction – General Architecture of DSM system – Design and Implementation Issues of DSM – Granularity – Structure of Shared Memory – Consistency Models – Replacement Strategy – Thrasing – Other Approaches to DSM – Heterogeneous DSM – Advantages

Synchronization: Introduction – Clock Synchronization – Event Ordering – Mutual Exclusion – Deadlock – Election Algorithm

Unit IV

Distributed File System: Introduction – Desirable features – File Models – File Accessing Models – File Sharing Semantics – File Caching Schemes – File Replication – Fault Tolerance – Atomic Transactions – Design Principles

Unit V

Security: Introduction – Potential Attacks to Computer System – Cryptography – Authentication – Access Control – Digital Signatures – Design Principles

Text Book

Distributed Operating Systems – Concepts and Design, Pradeep K Sinha, PHI, 2003

References:

Distributed Operating Systems 1e, Andrew S Tanenbaum, PHI.

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ELECTIVE COURSE I:3 – COMPUTER GRAPHICS

UNIT-I

A survey of computer graphics – Overview of Graphic systems- output primitive (Mathematical functions for creating graphic output) – setting attribute of Output primitives

UNIT-II

Two dimensional geometric transformations – Two dimensional viewing

UNIT-III

Graphic structures – Hierarchical modeling – Graphical user interfaces and interactive input methods

UNIT-IV

3D Concepts – 3D- object Representation – 3D Geometric and Modeling Transformations.

UNIT-V

Visible surface detection methods – Illumination models – Computer Animation

TEXT BOOK:

1. **Hearn Donald, Baker Paulin M.,** Computer graphics – C version**,** Second edition, Pearson education, 2006. (ISBN 81-7758-765-X)

REFERENCE BOOK:

1. **Newman William M., & Sproull Robert F**., Principles of interactive computer graphics, Second edition, Tata –McGraw Hill, 1 (ISBN 0-07-463293-0)

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ELECTIVE COURSE I:4 – PRINCIPLES OF PROGRAMMING LANGUAGES

Unit 1

The Study of Programming Languages – Why Study Programming Languages ? – A Short History of Programming Languages – What Makes a Good Language? – Effects of Environments on Languages. Language Design Issues: The Structure and Operation of a Computer – Virtual Computers and Binding Times – Languages Paradigms. Language Translation Issues: Programming Language Syntax – Stages in Translation – Formal Translation Models.

Unit II

Elementary and structured data type: Data object variables, constants, data type, elementary data types, declaration, assignments and initialization, enumeration, characters strings.

Structured data type and objects: Specification of data structured types, vectors and arrays, records, variable size data structure, pointers and programmer constructed data structure, Set files.

Imperative Languages: Block structure, Scope rules, Parameter Passing, Construct like co-routines, Tasks etc.

Unit III

Object oriented languages: The class notion- Information hiding and data abstraction using classes, derived classes and inheritance– Polymorphism – Parameterized types.

Unit IV

Functional languages: Functional programming concepts – Referential transparency – Types – Type systems - Names, bindings, environment and scope – Recursive functions – Polymorphic functions – Type variables – High order functions – Curried functions – Lists and programming with lists – Definition of new user defined types in ML – Abstract data types – Evaluation methods.

Unit V

Logic languages: Review of predicate logic – Clause-form logic – Logic as a programming language- Unification algorithm - Abstract interpreter for logic programs – Theory of logic programs – Applications of Logic programming - Introduction to Prolog, Data Structures in Prolog, Programming techniques, Control in Prolog

Text Book

"Programming Languages – Design and Implementation" - by Terrence W. Pratt & Marvin V. Zelkowitz, Fourth Edition
"Programming Languages – Concepts & Constructs" - by Ravi Sethi, Pearson Education.

Reference Books

"Programming Language Design Concepts"– by David A. Watt and William Findlay
"Fundamentals of Programming Languages" – by Ellis Horowitz – SecondEdition

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CORE COURSE XIV – J2EE TECHNOLOGIES

UNIT – I

Client – Server Architecture: Two Tier Model – 3 Tier Model – n Tier Model – J2EE Architecture - .net Architecture – MPC Architecture.

UNIT – II

Interaction Services: RMI – CORBA – XML – JMS

UNIT – III

Presentation Services: JSP – Javamail – Servlet

UNIT- IV

Component Model:

EJB: Session beans: Stateless and Statefull – Entity beans – CMP and BMP – Message Driven Beans

UNIT V

Struts Framework: Introduction – Building a simple struts – Model layers – View layer – controller layer – Validator – Tiles –Declarative Exception Handling –Struts Modules.

Text Books:

1. Jim Keogh "The Complete Reference J2EE "Tata McGraw – Hill Edition 2002.
2. James Holmes "The Complete References Struts Second Edition " Tata McGraw Hill Edition-2007

Reference Books:

1. Jusin Couch, Daniel H. Steinberg, "J2EE Bible" Wily India (P) Ltd, New Delhi 2002.
2. Paul Tremblett, "Instant Enterprise Java Y-Beans", Tata McGraw Hill Publishing Company, New Delhi, 2001.

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CORE COURSE XV – WEB TECHNOLOGIES

Unit I

WEB PROGRAMMING : PHP introduction : variables – operators – control structures – Advanced concepts in PHP : Cookies – sessions – server variables

Unit II

PHP Files :accessing files – reading – writing - MySQL database: insert – update – delete – join – group by – aggregate functions – formats – case studies .

Unit III

WEB SERVICES: Introduction – What are web services? SOAP WSDL UDDI-Why Web Services are important ? – The evolution of web applications Not just another distributed computing platform – Web services and enterprises. XML: XML Fundamentals XML: The Lingua Franca of web services - XML Documents XML namespaces Explicit and Default namespaces, Inheriting namespaces, And not inheriting namespaces, Attributes and namespaces –XML Schema XML schema and namespaces, A first schema, Implementing XML schema types, The any Element, Inheritance, Substitution groups, Global and local type declarations, Managing Schemas, Schemas and instance documents, XML schema best practices- Processing XML SAX: Simple API for XML, DOM: Document object Model, XSLT, XPATH

Unit IV

SOAP and WSDL5 The SOAP Model- SOAP- SOAP Messages SOAP Envelope, SOAP Header, SOAP Body, SOAP Faults- SOAP encoding – SOAP RPC- Using alternative SOAP Encodings, Document, RPC, Literal, Encoded SOAP RPC and SOAP Document-Literal, SOAP web services and the REST Architecture-Looking back to SOAP 1.1 Syntactic differences between SOAP 1.2 and SOAP 1.1- Changes to SOAP-RPC- SOAP Encoding- WSDL structure, The stock quote WSDL interface, definitions, The type element, bindings, services, managing WSDL descriptions, Extending WSDL – Using SOAP and WSDL

Unit V

UDDI: UDDI at a glance- The UDDI Business registry- UDDI under the covers – Accessing UDDI- How UDDI is playing out Conversations Overview – Web Services – Web services Conversation Language – WSCL Interface components – The Bar scenario conversations – Relationship between WSCL and WSDL Workflow Business Process Management – Workflow and Workflow management systems – Business process execution language for web services

Text Book(s)

1. K. Meena , R. Sivakumar , A.B. Karthick Anand Babu "Web programming using PHP and MySQL" - Himalaya Publishing House – 2011. (**for Unit 1 and Unit 2)**
2. Sandeep Chatterjee, James Webber, "Developing Enterprise Web Services - An Architect's Guide" - Pearson Education– Second Indian Reprint 2005. (**for Unit 3, Unit 4 and Unit 5)**

Reference

Eric Newcomer, Greg Lomow, Understanding SOA with Web Services, , Pearson Education, First Indian Reprint 2005.

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CORE COURSE XVI – ORGANIZATIONAL BEHAVIOR

Unit I

Introduction to Organizational Behavior –Related Disciplines – Theoretical Framework – Organizational Approaches – Modern Organizational Scenario: Impact of Globalization

Unit II

Individual Behavior – Perception – Process – Changes - Personality and Attitudes – Job Satisfaction

Unit III

Motivation: Needs, Content and Process: Motivation: Content Theories – Process Theories – Contemporary Theories – Motivation Applied – Job Design and Goal setting. Leadership – Background – Process- Styles – Activities – Skills.

Unit IV

Group Dynamics – The nature of Informal Organizations – Formal Groups – Interactive conflict: Interpersonal conflict – Inter-group behavior and conflict – Negotiation Skills: Going beyond conflict management – Traditional Negotiation Approaches - Contemporary negotiation skills.

Unit V

Communication – Role and background – Interpersonal communication – Informal communication- The Decision Making process – Participative Decision making techniques – Organization design – culture – Organization change and development.

Text Book:

1. Fred Luthans, Organizational Behavior, 9th Edition, McGraw-Hill Irwin, 2002.
2. John W. Newstorm and Keith Davis, Organizational Behavior, Tenth Edition, TMG, 1998.

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CORE COURSE XVII– DISCRETE MATHEMATICS

Unit I

Sets, Relations & Functions: Property of binary relations, equivalence, compatibility, partial ordering relations, Hasse diagram, functions, inverse functions, compositions of functions, recursive functions.

Unit II

Mathematical logic: Logic operators, Truth tables, Theory of inference and deduction, mathematical calculus, predicate calculus, predicates and qualifiers.

Unit III

Groups & Subgroups: Group axioms, permutation groups, subgroups, cosets, normal subgroups, semi groups, free semi-groups, monoids, sequential machines, error correcting codes, modular arithmetic grammars.

Unit IV

Lattices & Boolean Algebra: Axiomatic definition of Boolean algebra as algebra as algebraic structures with two operations , basic results truth values and truth tables, the algebra of propositional functions, Boolean algebra of truth tables.

Unit V

Combinatorics & Recurrence Relations: Disjunctive and sequential counting, combinations and permutations, enumeration without repetition, recurrence relation, Fibonacci relation, solving recurrence relation by substitution, solving non- recurrence relation by conversion to linear recurrence relation.

Text Book(s)

1. Trembly. J.P & Manohar. P., "Discrete Mathematical Structures with Applications to Computer Science" McGraw Hill.
2. Kolman, Busy & Ross "Discrete Mathematical Structures", PHI
3. K.D Joshi, "Foundations of Discrete Mathematics", Wiley Eastern Limited.

References

1. Seymour Lipschutz & March Lipson Tata Mc Graw Hill.
2. C.L. Liu " Elements of screte mathematics " Tata McGraw Hill.

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CORE COURSE XVIII – J2EE TECHNOLOGY LAB

1. To find the marks of the students using Remote Method Invocations.
2. To write a Servlet program to calculate the bonus of an employee
3. To write a Servlet program to implement Session Tracking.
4. To write a Servlet program to check authentication for user using Cookies.
5. To write a Servlet program and use JDBC in it.
6. To write a simple program for JSP.
7. To write a JSP program that works with JDBC.
8. To write a JSP Program with Bean Class.
9. To write a EJB Stateless Program to create bonus of an employee.

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CORE COURSE XIX
WEB DESIGN LAB (Ruby, Photoshop, Flash and PHP)

RUBY ON RAILS:

NOTE: LAB EXERCISES ARE NOT RESTRICTED TO THE LIST BELOW. BE ADVISED TO GENERATE MORE CREATIVE EXERCISES

1. Write a program to explain the class and object concept in Ruby.
2. Write a program for the following array operators
    1)array & other_array
    2) array * int [or] array * str
    3) array + other_array
    4) array . other_array
    5) array == other_array
1. Write a program to read the content in the file using file concepts in ruby.
2. Write a program to create a user defined function and how to call the function.
3. Write a program to
1) Fetch the values from textbox and radio button
2) Explain the session and cookies in rails.
4. Write a program to retrieve data from the database
5. Write a program for create Rails Controllers and Rails Views
6. Write a program to explain the concept of uploading files.

MULTIMEDIA LAB:

NOTE: LAB EXERCISES ARE NOT RESTRICTED TO THE LIST BELOW. BE ADVISED TO GENERATE MORE CREATIVE EXERCISES.

Recommended Tools: Photoshop, Flash, Maya, 3D Max etc

1. Create an e-Invitation for college day with audio note.
2. Create 30 second multi-media profile about your University Technology Park.
3. Animate a 5 yr child walking on the street.
4. Animate the same child stops when a vehicle crosses.
5. Generate a new comic character and give a name to it.
6. Create a video-resume about yourself.
7. Generate a voice that says the Alphabet when the key is pressed. If letter "A" is typed, your code should say "A".
8. Out of the box Thinking:
    Creatively think of any other multimedia application for blind or deaf people.

PHP

- Design a webpage that should compute one's age on a given date using PHP.
- Design a webpage to generate multiplication table for a given number.
- Design a authentication web page in PHP with MySQL to check user name and password

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ELECTIVE COURSE II:1

SYSTEMS PROGRAMMING AND SYSTEM SOFTWARE

UNIT I

Introduction: What is System Software? – Components of System Software – Evolution of System Software – The Model of a Computer System.

UNIT II

Assemblers: Elements of Assembly Language Programming – Overview of the Assembly Process – Design of a Two-Pass Assembler – Case Study of a Single Pass Assembler – Macros and Macro Processors.

UNIT III

Compilers: What is a Compiler? – Overview of the Compilation Process – Programming Language Grammars – Scanning (Lexical Analysis) – Parsing - Storage Allocation –Compilation of Expressions –Compilation of Control Structures – Code optimization.

UNIT IV

Loaders and Linkage Editors

Loading, Linking and Relocation – Program Relocatability – Overview of Linkage

Editing – Linkage Editor of IBM/360 – Linking for Program Overlays

UNIT V

Variety of Software Tools – Text Editors – Interpreters and Program Generators –Debug Monitors – Programming Environments.

Text Book(s)

1. D M DHAMDHERE, "Introduction to System Software" , Tata McGraw-Hill Publishing Company Limited

Reference Book

1. Leela & Beck – "System Programming" – Pearson Education, 2003

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ELECTIVE COURSE II:2 – MOBILE COMMUNICATIONS

Unit I

Introduction: Mobile and Wireless Devices – Simplified Reference Model – Need for Mobile Computing – Wireless Transmission – Multiplexing – Spread Spectrum and cellular systems – Medium Access Control – Comparisons

Unit II

Telecommunications System: Telecommunication System – GSM – Architecture – Sessions – Protocols – Hand over and Security – UMTS and IMT 2000 – Satellite System

Unit III

Wireless LAN : IEEE S02.11 – Hiper LAN – Bluetooth – MAC Layer – Security and Link Management.

Unit IV

Mobile IP: Goals – Packet Delivery – Strategies – Registration – Tunneling and Reverse Tunneling – Adhoc Networks – Routing Strategies

Unit V

WIRELESS APPLICATION PROTOCOL: Wireless Application Protocol (WAP) – Architecture – XML – WML Script – Applications

Text Book(s)

1. Jochen Schiller, "Mobile Communication", Pearson Education, Delhi, 2000.

References

1. "The Wireless Application Protocol: Writing Applications for the Mobile Internet", Sandeep Singhal, et al.

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ELECTIVE COURSE II:3 – MULTIMEDIA AND WAP

UNIT I

MULTIMEDIA INTRODUCTION: Multimedia applications – System architecture – Objects of Multimedia Systems – Multimedia databases- Compression and File formats- image compression – CCIT – JPEG – Video image compression – MPEG – DVI Technology – Audio compression – RTF format- TIFF file format- RIFF file format – MIDI – JPEG DIB – TWAIN, video & Audio Codes.

UNIT II

MULTIMEDIA APPLICATIONS: Application classes- Types of systems- Virtual reality design – Components – Data base- Authoring Systems- Hyper media – user interface design – Display/ Playback issues- Hypermedia linking and embedding – Production of Multimedia systems.

UNIT III

PHOTOSHOP – Using the Toolbox – Palettes – Creating a simple image – creating Banners- Creating buttons – Creating Shapes & Logos – Creating Patterns and Creating brush. **FLASH** – How Flash works – Uses of flash – what can flash do- The Timeline – The stage

UNIT IV

OVERVIEW OF WAP: WAP and the Wireless World – WAP Application Architecture – WAP Internal Structure –WAP versus the Web – Wap1.2 – WTA and Push Features **SETTING UP WAP** Available Software Products – WAP Resources -The Development Toolkits

UNIT V

WAP GATEWAYS: What is a WAP Gateway? – Functionality of WAP Gateway – The Web Model Vs the WAP Model – Positioning of a WA P Gateway in the Network – Selecting a WAP Gateway **BASIC WML**: eXtensible Markup Language – WML Structure – A Basic WML Card –Text Formatting – Navigation – Advanced Display Features

Text Books:

1. Fred T. Hofstterm " Multimedia Literacy " 1995, McGraw Hill
2. Charles Arehart, "Professional WAP", Wrox Press Ltd.

REFERENCE BOOKS

1. Jen Dehaan "Macromedia FLASH MX 2004", Macromedia Press, Techmedia.
2. Adobe Press "Adobe Photoshop CS", Techmedia.
3. Tay Vaughan, "Multimedia Making It Work", Tata McGraw Hill Publishing Company Ltd

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ELECTIVE COURSE II:4
ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS

UNIT-I: What is Artificial Intelligence? The AI Problems – The Underlying Assumptions – What is an AI Techniques? Problems: Problems spaces and search – Defining the Problems as a State Space Search – Production Systems – Problem Characteristics – Production System Characteristics – Issues in the Design of Search Programmes.

UNIT II: Generate – and-Test – Hill Climbing – Best-First Search – Problem Reduction – Constraint Satisfaction – Means – Ends – Analysis-Knowledge Representation issues: Representation and Mappings – Approaches to Knowledge Representation – Issues in Knowledge Representation – The Frame Problem

UNIT III: Using predicate logic – Representing Simple facts in Logic – Representing Instance and Is a relationships – Computable functions and Predicates – Resolutions – Natural Deductions – Representing Knowledge Using Rules: Procedural versus Declarative Knowledge – Forward versus Backward Reasoning – Matching – Control Knowledge

UNIT IV: Symbolic Reasoning under uncertainty – Introduction to Non Monotonic Reasoning – Logics for Non Monotonic Reasoning – Implementation issues – Augmenting a Problem solver – Implementation : Deapth – First Search – Implementation : Breadth – First Search – Statistical reasoning – Bayesian Networks – Fuzzy Logic- Learning: What is learning? – Rote Learning – Learning by taking advice – Learning in Problem Solving

UNIT V: Connectionist Models – Introduction – Hopfield Networks – Learning in Neural Networks – Applications of Neural Networks – Expert Systems – Representing and Using Domain Knowledge – Expert System Shells – Explanation – Knowledge acquisition

Text Book:

Artificial Intelligence, Elaine Rich, Kevin Knight, 2/e, TataMcGraw Hill Publishing Ltd., - New Delhi, 1991
Chapters: 1.1 – 1.3, 2.3, 4.5, 6.7, 8.3 – 8.5, 17.1 – 17.4, 18.1 – 18.3 & 20

Reference Books:

1. Introduction to Artificial Intelligence and Expert Systems, Dan W.Patterson, Prentice Hall of India, New Delhi, 1992
2. Artificial Intelligence, A Modern Approach, Stuart J. Russell and Peter Norvig, Pearson Education, reprint 2003.
3. Introduction to Expert Systems, 3/e, Peter Jackson, Pearson Education, Reprint 2003
4. Artificial Intelligence, A New Synthesis, Nils J. Nilsson Harcourt Asia Pvt. Ltd., 1998

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CORE COURSE XX – .NET TECHNOLOGIES

UNIT I

Introduction to .Net - .Net Framework Features & Architecture, CLR, Common Type System, MSIL, Assemblies and Class Libraries.

UNIT II

Advanced ADO.NET –Disconnected Data Access – Gridview, Details View, and Form View Controls – Crystal Reports –Role of ADO.NET in Distributed Applications.

UNIT III

Advanced ASP.NET – Ad Rotator, Multiview, Wizard and Image Map Controls – Master Pages – Site Navigation – Web Parts – Uses of these controls and features in Website development.

UNIT IV

Advanced features of ASP.NET – Security in ASP.NET – State Management in ASP.NET – Mobile Application development in ASP.Net – Critical usage of these features in Website development.

UNIT V

Introduction to Dynamic Web Applications: Server Side Scripting basics – Server Side Scripting Languages – PHP Scripting - General Syntactic Characteristics – Primitives, operations and expressions – Control Statement – Arrays – Functions – Pattern Matching – Form Handling – Files – Cookies – Session Tracking – Database access with PHP and MYSQL.

Text Books

1. Wather, ASP .Net 3.5, SAMS Publication, 2005

2. Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP", James Lee and Brent Ware, Dorling Kindersley (India) Pvt. Ltd, 2008

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CORE COURSE XXI – DATA MINING AND WAREHOUSING

Objective: *In this course students shall learn the mathematical & algorithmic details of various data association techniques to discover patterns in underlying data (namely mining data).He also learn how to consolidate huge volume of data in one place efficiently.*

UNIT-I

Introduction to data mining – Association Rule Mining.

UNIT-II

Classification – Cluster analysis.

UNIT-III

Web Data Mining – Search engines.

UNIT-IV

Data warehousing – Algorithms & operations to create data warehouse – Designing data warehouse- Applications of data warehouse.

UNIT-V

Online analytical processing – Information Privacy.

TEXT BOOK:

1. **G.K. Gupta,** Introduction to Data mining with case studies ,Prentice Hall India, 2006 (ISBN 81-203-3053-6) **[Unit-1 : (**Chapters 1,2); **Unit-2** : (Chapters 3,4); **Unit-3 (**Chapters 5,6); **Unit-4 (**Chapters 7), **Unit-5 (**Chapters 8,9)**].**

REFERENCE BOOK:

1**. K.P.Soman & Shyam Diwakar and V. Ajay,** Insight to Data Mining Theory and Practice, Prentice Hall of India, 2006. (ISBN -81-203- 2897-3)
2. **Jiawei Han and Micheline Kamber**, Data Mining Concepts and Techniques, Elsevier, Second Edition, 2007 (ISBN: 81-312-0535-5)

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CORE COURSE XXII – ACCOUNTING AND FINANCIAL MANAGEMENT

Unit I

Accounting Principles and Concepts – Double entry book keeping- Income and expenditure- Accounting record and system- assets and liabilities- Depreciation, Depletion and Amortization - Accounting for depreciation.

Unit II

Journal – Ledger- Trial Balance- Trading, Manufacturing and profit and Loss account – Balance sheet.

Unit III

Analysis and interpretation of financial statements with ratios

Unit IV

Cost Accounting- Methods and Techniques of Cost Accounting- classifications of cost - Material Cost- Labour Cost – Overhead- fixed and variable cost- Cost-volume – profit analysis - marginal costing and decision making.

Unit V

Budgeting and budgetary control – types of budgets- Preparation of various functional budgets- Preparations of cash budgets- flexible budgets- Advantages of Budgeting and Budgetary control.

Text Book(s):

1. T.S. Grewal, "Double Entry Book Keeping", All India Sultan Chand (Recent Edition)
2. S.N. Maheswari "Principles of Management Accounting ", Sultan Chand, New Delhi (Recent Edition)
3. Shukla, Grewal & Gupta, "Advanced Accounts "Sultan Chand Publications

Reference(s):

1. S.K. Gupta & R.K. Sharma- Practical Problems in Management Accounting (Recent edition)
2. Khan and Jain "Financial Management" Tata McGraw Hill (Recent Edition)

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CORE COURSES XXIII - PROBABILITY AND STATISTICS

Unit I

Probability: Definitions of probability, Addition theorem, Conditional probability, Multiplication theorem, Baye's theorem of probability and Geometric probability. Random variables and their properties, Discrete Random variable, Continuous Random variable, Probability Distribution joint probability distributions their properties, Transformation variables, Mathematical expectations, probability generating functions

Unit II

Probability Distributions / Discrete distributions: Binomial, Poisson Negative binominal distributions and their properties. (Definition, mean, variance, moment generating function, Additive properties, fitting of the distribution.) Continuous distributions: Uniform, Normal, exponential distributions and their properties. Curve fitting using Principle of Least Squares.

Unit III

Multivariate Analysis: Correlation, correlation coefficient, Rank correlation, Regression Analysis, Multiple Regression, Attributes, coefficient of Association, X2 – test for goodness of fit, test for independence.

Unit IV

Sample, populations, statistic, parameter, Sampling distribution, standard error, unbiasedness, efficiency, Maximum likelihood estimator, notion & interval estimation. Testing of Hypothesis: Formulation of Null hypothesis, critical region, level of significance, power of the test.

Unit V

Queuing theory: Queue description, characteristics of a queuing model, study state solutions of M/M/1: α Model, M/M/1 ; N Model.

Text book:

1. T.Veerarajan, "Probability, Statistics and Random Processes", Tata McGraw Hill

Reference Book:

1. Kishor S. Trivedi, "Probability & Statistics with Reliability, Queuing and Computer Applications", Prentice Hall of India, 1999

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CORE COURSE XXIV – .NET TECHNOLOGIES LAB

1. Design a web page that makes uses of AdRotator Control. & Design a web page involving Multi View or Wizard Control.

2. Make use of Image Control involving two hot spots in a web page.

3. Design a simple web site that makes use of Master Pages.

4. Establish the security features in a simple web site with five pages.

5. Use state management concepts in a mobile web application.

6. Develop a web service that has an ASP.NET client.

7. Develop a web service to fetch a data from a table and send it across to the client.

8. Write a server side PHP program that displays marks, total, grade of a student in tabular format by accepting user inputs for name, number and marks from a HTML form.

9. Write a PHP program to access the data stored in a mysql table.

10. Write a PHP program interface to create a database and to insert a table into it.

11. Write a PHP program using classes to create a table.

12. Create a mysql table and execute queries to read, add, remove and modify a record from that table.

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CORE COURSE XXV
ACCOUNTING AND FINANCIAL MANAGEMENT LAB

1.   Creation of company, Groups – Single & Multiple

2.   Posting of Journal to ledger – Single & Multiple.

3.   Preparation of Accounting vouchers.

4.   Preparation of Trail balance.

5.   Financial Statement: Trading account, profit and loss account and Balance sheet.

6.   Preparation of Bank Reconciliation Statement

7.   Preparation of Inventory: Stock Item, Stock Group, Stock category,

8.   Preparation of VAT (Value Added Tax)

9.   Inventory Voucher.

10. Preparation of TDS (Tax Deducted at Source) & Service Tax.

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ELECTIVE COURSE III:1
MICROPROCESSOR ARCHITECTURE AND APPLICATIONS

UNIT-I

Basic concepts of microprocessors- 8085 Assembly language – 8085 architecture and memory interfacing.

UNIT-II

Interfacing I/O - 8085 Instruction set.

UNIT-III

Programming techniques - Counters-Time delays – Stack –Subroutines.

UNIT-IV

Software systems & assemblers - Interrupts – Programmable interface devices.

UNIT-V

Serial I/O – Microprocessor applications.

TEXT BOOK:

1. GAONKAR Ramesh, Microprocessor architecture, programming, and applications with 8085, Fifth edition, Penram international publishers, 2000 [Unit-1 :(Chapters 1, 2, 3, 4); Unit-2 : (Chapters 5, 6); Unit-3 (Chapters 7, 8, 9); Unit-4 (Chapters 11, 12, 14), Unit-5 (Chapters 16, 17)]

REFERENCE BOOK

1. Mathur Adithya P., Introduction to microprocessors, Tata McGrawHill, 2003(ISBN 0-07-460222-5)

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ELECTIVE COURSE III:2 – ENTERPRISE RESOURCE PLANNING

Objective: *In this course students shall learn various components of an application software that help computerize functioning of an enterprise such as sales, materials, production, financial , customer relationship AND supply chain modules.*

UNIT-I

A Foundation for Understanding Enterprise Resource Planning systems – Re-engineering and Enterprise Resource Planning Systems – Planning ,Design ,and Implementation of Enterprise Resource Planning Systems – ERP Systems: Sales and Marketing – ERP Systems: Accounting and finance ERP Systems :Production and Materials Management ERP Systems: Human Resources

UNIT-II

Managing an ERP Project – Supply chain Management and the marketplace – Rules of the game – Winning as a team.

UNIT-III

Solutions - Supply chains as Systems - Modeling the Supply Chain – Supply Chain Software - **Operations** – Meeting Demand – Maintaining Supply – Measuring Performance

UNIT-IV

Planning – Forecasting Demand – Scheduling Supply – Improving performance – Mastering Demand – Designing the Chain – Maximizing Performance

UNIT-V

Essentials of Customer relationship management – Designing CRM application – Various modules of CRM application - Advantages of CRM

TEXT BOOK:

1. **Sumner Mary**, Enterprise Resource Planning, First edition, Pearson education, 2006 (ISBN 81-317-0240-5) (**Unit 1**: Chapters 1 to 7; **Unit 2:** Chapters 8, 9 (continued on text book number TWO)
2. **Taylor David A**., Supply Chains (A managers guide), Pearson education, 2004 (ISBN 81-297-0334-3) (**Unit 2:** Chapters 1, 2, 3; **Unit 3:** Chapters 4, 5, 6, 7, 8, 9; **Unit 4:** Chapters 10, 11, 12, 13)
3. **Tiwana**, Essential guide to knowledge management : The e-business and CRM applications, Pearson education (ISBN 81-780-8326-4) **(Unit 5)**

REFERENCE BOOK:

1. **ALTEKAR Rahul V**., Enterprise wide resource planning (Theory and practice), Prentice Hall of India, 2005 (ISBN 81-203-2633-4)
2. **Garg Vinod K & Venkitakrishnan N.K**, Enterprise resource planning, Second edition, Prentice Hall of India, 2006 (ISBN 81-203-2254-1).
3. **Handfield R. B & Nichols. Ernest L**., Introduction to supply chain management, Prentice Hall of India, 2006 (ISBN 81-203-2753-5)

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ELECTIVE COURSE III:3 – e-COMMERCE

Unit I

Electronic Commerce Framework – Electronic Commerce and Media Convergence – The Anatomy of E-Commerce Applications – Electronic Commerce Consumer Applications – Electronic Commerce Organization Applications. The Network Infrastructure for Electronic Commerce: Components of the High way – Network Access Equipment – Global information Distribution Networks.

Unit II

The Internet as a Network Infrastructure: The Internet Terminology – NSFNET Architecture and components – National Research and Education Network – Internet Governance – An overview of Internet Applications. The Business of Internet Commercialization :Telco/Cable/On-Line Companies - National Independent ISPs – Regional Level ISPs – Local –level ISPs – Internet Connectivity options.

Unit III

Electronic Commerce and the World Wide Web: Architectural Framework for Electronic
Commerce – World Wide Web as the Architecture – Technology behind the Web – Security and the Web, Consumer-Oriented Electronic Commerce: Consumer-Oriented Applications – mercantile process model – mercantile models from the consumers perspective.

Unit IV

Electronic Payment Systems: Types of Electronic Payment Systems – Digital Token based Electronic Payment Systems – Credit Card – Based Electronic Payment Systems – Risk and Electronic Payment Systems – Designing Electronic Payment Systems. Inter Organizational Commerce and EDI: Electronic Data Interchange – EDI Applications in Business – EDI: Legal, Security and Privacy issues.

Unit V

Advertising and the Marketing on the Internet: The New Age of Information Search and Retrieval – Electronic Commerce Catalogs – Information filtering – Consumer – Data Interface – Emerging Tools. On Demand Education and Digital Copyrights: Computer-based Education and Training – Technological Components of Education on demand. Software Agents: Characteristics and Properties of Agents – The Technology behind Software Agents – Applets, Browsers and Software Agents.

Book for Study:

"Frontiers of Electronic Commerce", Ravikalakota & Andrew Whinston, Adison Wesley, 2000.

Book for Reference:

"Electronic Commerce", Pete Loshin & Paul A.Murphy, Second edition, Jaico Publishing House, 2000.

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ELECTIVE COURSE III:4 – SYSTEM MODELING AND SIMULATION

UNIT I. INTRODUCTION

Systems, modeling, general systems theory, Concept of simulation, Simulation as a decision making tool, types of simulation.

UNIT II. RANDOM NUMBERS

Pseudo random numbers, methods of generating random variables, discrete and continuous distributions, testing of random numbers.

UNIT III. DESIGN OF SIMULATION EXPERIMENTS

Problem formulation, data collection and reduction, time flow mechanism, key variables, logic flow chart, starting condition, run size, experimental design consideration, output analysis and interpretation validation.

UNIT IV. SIMULATION LANGUAGES

Comparison and selection of simulation languages, study of anyone simulation language.

UNIT V. CASE STUDIES

Development of simulation models using simulation language studied for systems like queuing systems, Production systems, Inventory systems, maintenance and replacement systems and Investment analysis.

TEXT BOOKS

1. Geoffrey Gordon, "System Simulation", 2nd Edition, Prentice Hall, India, 2002.
2. Narsingh Deo, "System Simulation with Digital Computer, "Prentice Hall, India, 2001.

REFERENCES

1. Jerry Banks and John S.Carson, Barry L. Nelson, David M.Nicol, "Discrete Event System Simulation", 3rd Edition, Prentice Hall, India, 2002.
2. Shannon, R.E. Systems simulation, The art and science, Prentice Hall, 1975.
3. Thomas J. Schriber, Simulation using GPSS, John Wiley, 1991.

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SKILL DEVELOPMENT

SKILL DEVELOPMENT COURSE

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Unit I: Reading Comprehension.

Unit II: Error Correction.

Unit III: Proficiency in English.

Unit IV: Group Discussion and Interview, Presentation Skills.

Unit V: Percentage and its Applications, Direct and Inverse Variation, Arithmetic Progression.

Text Book: A book on Development of Soft Skills – K.Meena & V.Ayothi.

Reference Books:

1. English Companion for All Competitive Examinations – I Jayakaran, 2M Publishing International.
2. Objective English for Competitive Examinations – Hari Mohan Prasad & Uma Rani Sinha – Third Edition – The McGraw-Hill Companies.
3. Effective English Communication for You – V. Shymala – Emerald Publishers.
4. Course Mental Ability and Quantitative Aptitude for Competitive Examinations – Edgar Thorpe – 2nd Edition – Tata McGraw – Hill Publishing Company Limited, New Delhi.
5. Quantitative Aptitude for Competitive Examinations – R.S.Aggarwal – S. Chand & Company Ltd, New Delhi.
6. Quantative Aptitude for Competitive Examinations – Abhijit Guha – 3rd Edition – Tata McGraw- Hill Publishing Company Limited, New Delhi.

CORE COURSE XXVI – NETWORK SECURITY

Unit I

Overview-Symmetric Ciphers: Classical Encryption Techniques

Unit II

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

Unit III

Network Security Practices: Authentication applications-Electronic Mail Security

Unit IV

Network Security Practices: IP Security-Web Security

Unit V

System Security: Intruders-Malicious Software-Firewalls

Text Book:

1. William Stallings, Cryptography and Network Security-Principles and Practices, Prentice-Hall, Third edition, 2003 **ISBN:** 8178089025

References:

1. Johannes A. Buchaman, Introduction to cryptography, Springer-Verlag 2000.
2. Atul kahate, Cryptography and Network Security, Tata McGraw Hill. 2007 Note: Books are available in Amazon.com and Flipcart.com besides the bookstore.

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CORE COURSE XXVII – MOBILE COMPUTING

Unit I

Getting to know Android – Android development environment – Android development environment for real applications – start up code, M J Android applications.

Unit II

Debugging Android applications – the ApiDemos Application – signing and publishing an applications

Unit III

SQLiteo databases and connect providers – locating and mappling

Unit IV

Building a view – A widget bestiary

Unit V

Drawing 2D and 3D graphics – simple phone calls

Text Book:

Chapters: 1 - 12 and 14
Android – Applications Development R. Roger, J Lombardo, Z Mednieks and B. Meike, O'Reilly, Shroft Publishers & Distributors Pvt Ltd, New Delhi, 2010.

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CORE COURSE – XXVIII - OPTIMIZATION TECHNIQUES

UNIT – I

Linear Programming : Introduction – History of OR – Meaning of OR – Principles of Modeling – Linear equation – Gaussian Elimination – Formulation of LP models – Graphical Solution – Algebraic Solutions – Simplex Method – Feasibility – Optimality – Artificial Variables – M – Technique – Duality – Dual simplex Algorithm – Transportation Problem – Assignment Problem – Least Time Transportation Problems.

UNIT – II

Queuing Models : Introduction – Deterministic Model – Queue Parameters – M/M/I Queue – Limited queue Capacity – Multiple Servers – Finite Sources – Waiting Times – Queue discipline – Non – Markovian Queues – Probabilistic models.

UNIT – III

Inventory Models: Determine Models – EOQ – Finite and Infinite Delivery Rates without Back- Ordering – Finite and Infinite delivery rates with Backordering – Quantity Discounts – EOQ with constraints – Probabilistic model – Single Period Model – Reorder Point Model – Variable Lead Times

UNIT – IV

PERT / CPM: Arrow (Network) Diagram Representation – Time estimates – Critical Path – Floats – Construction of Time chart and Resource Leveling – Probability and Cost Consideration in Project Scheduling – Project Control.

UNIT – V

Replacement Theory : Introduction – Various replacement situations – Replacement Policy – Variables Maintenance costs and fixed money value – Variable Maintenance Costs and Variable Money Value – Individual Replacement Policy – Group Replacement Policy – Reliability.

Text Book:

Kanti Swarup P.K. Gupta and Man Mohan, "Operation Research", Sultan & Chand Publishers New Delhi, 1992.

Reference Book:

1. Hamdy A Taha, Operations Research – An Introduction Macmillan Publishing Company, 1982.
2. Don.T. Philps, A.Ravindran, James. J. Solberg, "Operations Research – Principles and Practice John Wiley & Sons, 1976.

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CORE COURSE XXIX - NETWORK SECURITY LAB

Recommended Tools: C, C# or J2SE 1.5 and above

NOTE: LAB EXERCISES ARE NOT RESTRICTED TO THE LIST BELOW. BE ADVISED TO GENERATE MORE CREATIVE EXERCISES.

SIMPLE NETWERK SPECIFIC EXERCISES:

1. Write a networking program in Java to implement a TCP server that provides services for a TCP Client.
2. Write a networking program to implement socket programming using User datagram Protocol in Java.
3. Implement an FTP server using socket programming.
4. Implement a chat server using socket programming.
5. Implement an ECHO server using socket programming.
6. Implement Address Resolution Protocol using socket programming.
7. Implement Ping server and Ping client using socket programming.
8. Implement Single Window Protocol.
9. Implement Remote Command Execution using network programming.
10. Using Remote Method Invocation distribute the processing to three nodes.
11. Implement a program to retrieve the data for the specified URL.
12. Write a Java program to check whether the given DNS is found in the internet or not.
13. Write a program to implement multicasting.
14. Write a network program using HTTP to print the document for the given URL.

SECURITY CENTRIC EXERCISES:

1. Write a program to convert your college name from plain text to cipher text using Transposition cipher method of encryption.
2. Write a program to convert your name from plain text to cipher text using the One Time Pads method of encryption.
3. Write a program to encrypt a paragraph using the Data Encryption Standard Algorithm.
4. Write a program to encrypt your biodata using the Advanced Encryption Standard Algorithm.
5. Write a program to decrypt the "Network Security" theory syllabus using the RSA Algorithm.
6. Write a program that takes a binary file as input and performs bit stuffing and Cyclic Redundancy Check Computation.
7. Write a program to Simulate the working of Sliding-Window protocol.
8. Write a program to find the shortest path in a network using Dijkstra's Algorithm.
9. Write a program to implement the Token Bucket Algorithm for Congestion Control.
10. Write a program for the following chat application.
One to One : Open a Socket connection and display what is written by one to another.
Many to Many : Each Client Opens a Socket connection to the client server and writes to the socket. Whatever is written by one can be seen by all.
11. Out of the box Thinking:Can you secure a video or a movie from VCD piracy? How do protect video resources from copied?

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CORE COURSE XXX – MOBILE COMPUTING LAB

1. Create an Application which deals with the Android Content Providers.

2. Create Application using Android Layouts, Views and Events

3. Create an application which uses Files, Preferences and Notifications

4. Create Application to Create, Modify and Query an SQLite Database

5. Create an application for Querying web services and Parsing response

6. Create Application which uses the concept of Services and Background Threats

7. Creating Android Audio Video Application

8. Create an Application which uses Map Activity and points the locations onto the Map Locations

9. Create an Application with One-Time, Repeating Alarms, and Long-Running Background Task as Service.

10. Create an Application for Simple Mobile Game.

ELECTIVE COURSE IV:1 – PARALLEL PROCESSING

Unit I

Parallel computer models: the state of computing – Multiprocessors and multicomputers – Multivector and SIMD computers.

Unit II

Program and Network properties: Conditions of parallelism – Program partitioning and scheduling – program flow mechanisms – system interconnect architectures.

Unit III

Processors and memory hierarchy : Advanced processor Technology – Superscalar and vector processors – Linear Pipeline Processors – Nonlinear Pipeline Processors.

Unit IV

Multiprocessors and Multicomputers: Multiprocessor System Interconnects-Message-Passing Mechanisms – SIMD Computer Organization. The Connection Machine CM5 – Fine – Grain Multicomputers.

Unit V

Software for Parallel Programming : Parallel Programming Models – Parallel Languages and Compilers – Dependence Analysis of Data Arrays.

Books for reference:

1. "Computer Architecture and Parallel Processing", Kai Hwang and Baye
2. "Parallel Computing, Theory and Practice" Michel J.Quinn, McGraw-Hill International Edn., Singapore 1994

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ELECTIVE COURSE IV:2 – PERVASIVE COMPUTING

Unit I:

Pervasive Computing: Past, Present and Future - Pervasive Computing Market – m-Business – Application examples: Retail, Airline check-in and booking – Health care – Car information system – E-mail access via WAP and voice.

Unit II:

Device Technology: Hardware – Human Machine Interfaces – Biometrics – Operating Systems – Java for Pervasive devices.

Unit III:

Device Connectivity: Protocols – Security – Device Management - Web Application Concepts: WWW architecture – Protocols – Transcoding - Client Authentication via Internet.

Unit IV:

WAP and Beyond: Components of the WAP architecture – WAP infrastructure – WAP security issues – WML – WAP push – Products – i-Mode - Voice Technology: Basics of Speech recognition- Voice Standards – Speech applications – Speech and Pervasive Computing.

Unit V:

PDA: Device Categories – PDA operation Systems – Device Characteristics – Software Components - Standards – Mobile Applications - PDA Browsers - Pervasive Web Application architecture: Background – Development of Pervasive Computing web applications - Pervasive application architecture.

Text Book:

Pervasive Computing, Technology and Architecture of Mobile Internet Applications, Jochen Burkhardt, Horst Henn, Stefan Hepper, Thomas Schaech & Klaus Rindtorff, Pearson Education, 2006.

Reference Book:

Fundamentals of Mobile and Pervasive Computing, Frank Adelstein, Sandeep KS Gupta, Golden Richard III, Loren Schwiebert, McGraw Hill edition, 2006.

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ELECTIVE COURSE IV:3 – IMAGE PROCESSING

UNIT I: INTRODUCTION AND DIGITAL IMAGE FUNDAMENTALS:

Introduction - What is Image Processing- examples of fields that uses DIP-Fundamentals step in DIP. Digital image fundamentals – image sensing and acquisition, Image sampling and quantization – Basic relationship between pixels.

UNIT II: IMAGE ENHANCEMENT TECHNIQUES:

Some basic intensity transformation functions – Histogram processing-Fundamental steps of spatial filtering – smoothing spatial filters.

UNIT III: IMAGE RESTORATION:

Model of Image Degradation/restoration process – noise models – restoration in the presence of Noise only Spatial filtering.

UNIT IV: IMAGE COMPRESSION:

Fundamentals – Coding redundancy – Spatial and temporal redundancy – Irrelevant information. Some basic compression methods: Huffman coding – arithmetic coding – LZW coding – Run Length coding – Bit-plane coding.

UNIT V: IMAGE SEGMENTATION AND REPRESENTATION:

Morphological image processing: preliminaries – Erosion and Dilation. Fundamentals – point, line, and Edge detection: Line Detection – Basic edge detection – More advanced techniques for Edge detection – Edge linking and boundary detection – Thresholding

Text Book:

Digital Image Processing, Third Edition, Rafel C.Gonzalez and Richard E. Woods, Pearson Education, 2008.
Chapters:1.1, 1.3, 1.4, 2.3, 2.4, 2.5, 3.2-3.5, 5.1-5.3, 8.1.1, 8.1.2, 8.2.3-8.2.5, 8.2.7, 9.1, 9.2, 10.1, 10.2.3, 10.2.5-10.2.7, 10.3

Reference Books:

1. Fundamentals of Digital Image Processing, Anil K. Jain, Prentice Hall of India, 1989.
2. Digital Image Processing and Analysis, B. Chandra and D. Dutta Majumder, PHI, New Delhi, 2006.

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ELECTIVE COURSE IV:4 – HUMAN COMPUTER INTERACTION

Unit I :

The Interaction : Introduction – Models of interaction – Frameworks and HCI Ergonomics – Interaction styles – Elements of the WIMP interface – Interactivity – The context of the interactions.
Paradigms : Introduction – Paradigms for interaction.

Unit II :

Interaction, Design basics : Introduction – What is design? – User focus – Scenarios – Navigation design – Screen design and layout – Interaction and prototyping.
HCL in the software process : Introduction – The software lifecycle – Usability engineering – interactive design and prototyping – Design rationate.

Unit III :

Design rules : Introduction – Principles to support usability – Standards – Guidelines – Golden rules and heuristics – HCI patterns.
Implementation Support : Introduction – Elements of windowing systems – Programming the application Using toolkits – User interface management systems.

Unit IV :

Evaluation techniques : What is evaluation – Goals of evaluation – Evaluation through expert analysis – Evaluation through user participation – Choosing an evaluation method.
Universal Design : Introduction – Universal design principles – Multi-modal interaction – Designing for diversity – summary. Introduction – Requirements of user support – Approaches to user support Adaptive help systems – Designing user support systems.

Unit V :

User support : Introduction Requirements of user support – Approaches to; user support – Adaptive help systems designing designing user support systems.

Text Book :

1. Human - Computer Interaction, Third Edition, "Alan Dix, Janet Finlay, Gregory D. Abowd and Russell Beale", Pearson Education, 2004.

Reference Book :

1. Human – Computer Interaction in the New Millennium, "John C. Carroll", Pearson Education" 2002.

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ELECTIVE COURSE V:1 – GRID COMPUTING

Unit I

Introduction: Grid Computing & Key Issues – Applications – Other Approaches – Grid Computing Standards – Pragmatic Course of Investigation.

Unit II

Grid Benefits & Status of Technology: Motivations – History of Computing, Communications and Grid Computing – Grid Computing Prime Time – Suppliers and Vendors – Economic Value – Challenges.

Unit III

Components of Grid Computing Systems and Architectures: Basic Constituent Elements-A Functional View – A Physical View – Service View.

Unit IV

Grid Computing Standards-OGSI: Standardization – Architectural Constructs – Practical View – OGSA/OGSI Service Elements and Layered Model – More Detailed View.

Unit V

Standards Supporting Grid Computing-OGSA: Functionality Requirements – OGSA Service Taxonomy – Service Relationships – OGSA Services – Security Considerations.

Text Book(s)

1. A Networking Approach to Grid Computing, Daniel Minoli, Wiley Publication

References

1. Grid Computing – A Practical Guide to Technology and Applications, Ahmar Abbas, Charles River Media Publication.

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ELECTIVE COURSE V:2 – CLOUD COMPUTING

UNIT I – FUNDAMENTALS OF GRID AND CLOUD COMPUTING

Fundamentals – Cloud computing – History of Cloud Computing – Cloud Architecture – Cloud Storage – Why cloud computing Matters – Advantages of Cloud computing – Disadvantages of Cloud Computing – Companies in the Cloud Today – Cloud Services

UNIT   II – DEVELOPING CLOUD SERVICES

Web-Based Application – Pros and Cons of Cloud Service Development – Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Services – On-Demand computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2- Google App Engine – IBM Clouds.

UNIT III – CLOUD COMPUTING FOR EVERYONE

Centralizing Email communications – collaborating on Schedules – Collaborating on To-Do Lists – Collaborating Contact Lists – Cloud computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation.

UNIT IV – USING CLOUD SERVICES

Collaborating on Calendars, Schedules and Task Management – Exploring Online Scheduling Applications – Exploring Online Planning and Task Management – Collaborating on Event Management – Collaborating on Contact Management – Collaborating on Project Management – Collaborating on Word Processing – Collaborating on Databases – Storing and Sharing Files – Evaluating Web Mail Services – Evaluating Web Conference Tools – Collaborating via Social Networks and Groupware – Collaborating via Blogs and Wikis.

UNIT V – GRID COMPUTING

OGSA – Sample Use Cases – OGSA Platform Components – OGSI – OGSA Basic Services. Globus Toolkit – Architecture – Programming Model – High Level Services – OGSI.Net. Middleware Solutions.

REFERENCE BOOKS

1. Michael Miller, Cloud Computing : Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, August 2008.
2. Haley Bear, Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs.

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ELECTIVE COURSE V:3 COMPILER DESIGN

Unit I : Introduction

Compilers – Analysis of the source program – Phases of a compiler – Cousins of the Compiler – Grouping of Phases – Compiler construction tools – Lexical Analysis – Role of Lexical Analyzer – Input Buffering – Specification of Tokens

Unit II: Basic Data Structures

Role of the parser, Writing Grammars – Context – Free Grammars – Top Down parsing – Recursive Descent parsing – Predictive parsing – bottom –up parsing – shift Reduce Parsing – Operator Precedent Parsing – LR Parsers – SLR Parser – Canonical LR Parser – LALR Parser

Unit III: Advanced Data Structures

Intermediate Languages – Declarations – Assignment Statements – Boolean Expressions – Case Statements – Back patching – procedure calls

Unit IV: Sorting & Searching Techniques

Issues in the design of code generator – The target machine – Runtime Storage management – Basic Blocks and Flow Graphs – Next use Information – A simple Code generator – DAG representation of Basic Blocks – Peephole optimizaion

Unit V: Files

Introduction – Principal Sources of Optimization – Optimization of basic Blocks – Introduction to Global Data Flow Analysis – Runtime Environments – Source Language issues – Storage Organization – Storage Allocation strategies – Access to non-local names – Parameter Passing

Text Book(s)

1. Alfred Aho, Ravi Sethi, Jeffy D. Ullman, "Compilers – Principles, Techniques and Tools", Pearson Education Asia, 2003

References

1. Henk Alblas and Albert Nymeyer, "Practice and Principles of Compiler Building with C", PHI, 2001
2. Kenneth C. Louden, «Compiler Construction : Principles and Practices», Thompson Learning, 2003

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ELECTIVE COURSE V:4 – SOFT COMPUTING

UNIT I – FUZZY SET THEORY

Introduction to Neuro – Fuzzy and Soft Computing – Fuzzy Sets – Basic Definition and Terminology – Set – Theoretic Operations – Member Function Formulation and Parameterization – Fuzzy Rules and Fuzzy Reasoning – Extension Principle and Fuzzy Relations – Fuzzy If Then Rules – Fuzzy Reasoning – Fuzzy Inference Systems – Mamdani Fuzzy Models – Sugeno Fuzzy Models – Tsukamoto Fuzzy Models – Input Space Partitioning and Fuzzy Modeling.

UNIT II – OPTIMIZATION :

Derivative based Optimization – Descent Methods – The Method of Steepest Descent – Classical Newton's Method – Step Size Determination – Derivative Free Optimization – Genetic Algorithms – Simulated Annealing – Random Search – Downhill Simplex Search.

UNIT III – NEURAL NETWORKS:

Supervised Learning Neural Networks – Perceptrons – Adaline Backpropagation Multilayer perceptrons – Radial Basis Function Networks – Unsupervised Learning and Other Neural Networks – Competitive Learning Networks – Kohonen Self – Organizing Networks – Learning Vector Quantization – Hebbian Learning.

UNIT IV – NEURO FUZZY MODELING:

Adaptive Neuro – Fuzzy Inference Systems – Architecture – Hybrid Learning Algorithm – Learning Methods that Cross fertilize ANFIS and RBFN – Coactive Neuro Fuzzy Modeling – Framework – Neuron Functions for Adaptive Networks – Neuro Fuzzy Spectrum.

UNIT V – APPLICATION OF COMPUTATIONAL INTELLIGENCE:

Printed Character Recognition – Inverse Kinematics Problems – Automobile Fuel Efficiency Prediction – Soft Computing for Color Recipe Prediction.

TEXT BOOK

1. J.S.R. Jang, C.T. Sun and E. Mizutani, "Neuro Fuzzy and Soft Computing", PHI, Pearson Education, 2004.

REFERENCE BOOK

1. Timothy J. Ross, "Fuzzy Logic with Engineering Application, "Mc Graw Hill, 1977.
2. Davis E. Goldberg, "Genetic Algorithms Search, Optimization and Machine Learning", Addision Wesley, 1989.
3. S. Rajasekaran and G.A.V. Pai, "Neural Networks, Fuzzy Logic and Genetic Algorithms", PHI, 2003.   Emereo Pty Limited, July 2008.
4. Ahmar, Abbas, "Grid Computing - A Practical Guide to technology and Applications", Charles River media, 2003.

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