

**BHARATHIAR UNIVERSITY::COIMBATORE-641 046**  
**BACHELOR OF COMPUTER APPLICATIONS (B C A) WITH**  
**DIPLOMA in MULTIMEDIA AND ANIMATION**  
(For the students admitted from the academic year 2008-2009 and onwards)

**SCHEME OF EXAMINATION – CBCS PATTERN**

Part	Study Components	Course title	Ins. hrs/ week	Examinations				Credit
				Dur.Hr	CIA	Marks	Total Marks	
	<b>Semester I</b>							
I	Language – I		6	3	25	75	100	3
II	English – I		6	3	25	75	100	3
III	Core 1: COBOL Programming		4	3	25	75	100	4
	Core 2: Digital Fundamentals and Architecture		4	3	25	75	100	5
	Core Lab 1: Programming Lab - COBOL		3	3	40	60	100	3
	Allied 1: Computer Oriented Numerical and Statistical Methods		5	3	25	75	100	5
IV	Environmental Studies #		2	3	-	50	50	2
	<b>Semester II</b>							
I	Language – II		6	3	25	75	100	3
II	English – II		6	3	25	75	100	3
III	Core 3: Data Structures and ‘C’ Programming		6	3	25	75	100	4
	Core Lab 2: Programming Lab – C (Data Structures)		4	3	40	60	100	3
	Allied 2: Computer–Based Optimization Techniques		6	3	25	75	100	5
IV	Value Education – Human Rights #		2	3	-	50	50	2
	<b>Semester III</b>							
	Core 4: Operating Systems		6	3	25	75	100	5
III	Core 5: C++ Programming		6	3	25	75	100	4
III	Core Lab 3: Programming Lab - C++		5	3	40	60	100	3
III	Allied 3: Business Accounting		6	3	25	75	100	5
IV	Skill based Subject I – Diploma Paper - Multimedia		5	3	25	75	100	3
IV	Tamil @ / Advanced Tamil# (OR) Non-major elective - I (Yoga for Human Excellence)# / Women’s Rights#		2	3	75	75	75	2

	Semester IV						
III	Core-6: Visual Programming - Visual Basic	6	3	25	75	100	4
	Core-7: RDBMS AND ORACLE	6	3	25	75	100	5
	Core Lab-4: Programming Lab - Visual Basic & Oracle	6	3	40	60	100	3
	Allied-4: Management Information Systems	6	3	25	75	100	5
IV	Skill based Subject 2 – Diploma paper - Multimedia Lab - Photoshop	4	3	40	60	100	3
IV	Tamil @ /Advanced Tamil # (OR) Non-major elective -II (General Awareness #)	2	3	75	75		2
	Semester V						
III	Core-8: Software Engineering	6	3	25	75	100	5
III	Core-9: Java Programming	6	3	25	75	100	4
III	Core-10: Computer Networks	6	3	25	75	100	5
	Core Lab-5: Java Programming	4	3	40	60	100	3
	Elective - I	5	3	25	75	100	5
IV	Skill based Subject 3 - Diploma Paper - Animation Techniques	3	3	25	75	100	3
	Semester VI						
	Core-11: Software Testing	5	3	25	75	100	4
	Core-12: Web Technology	6	3	25	75	100	5
	Core Lab-6: Programming Lab - HTML	6	3	40	60	100	3
	Elective - II	5	3	25	75	100	5
	Elective III	5	3	25	75	100	5
IV	Skill Based Subject 4 Diploma Paper - Animation Lab - Flash	3	3	40	60	100	3
V	Extension Activities @	-	-	50	-	50	1
	Total					3600	140

@ No University Examinations. Only Continuous Internal Assessment (CIA)

# No Continuous Internal Assessment (CIA). Only University Examinations.

<b>List of Elective papers (Colleges can choose any one of the paper as electives)</b>		
Elective – I	<b>A</b>	Computer Graphics
	<b>B</b>	Embedded Systems
	<b>C</b>	Digital Image Processing
Elective – II	<b>A</b>	Client / Server Computing
	<b>B</b>	Mobile Computing
	<b>C</b>	Distributed Computing
Elective - III	<b>A</b>	E-Commerce
	<b>B</b>	Software Project Management
	<b>C</b>	Artificial Intelligence

## **CORE-1      COBOL PROGRAMMING**

**Subject Description:** This subject deals the programming concepts using COBOL language.

**Goal:** To learn about COBOL programming language.

**Objective:** On successful completion of this subject the students should have skills for writing programs for business applications and file handling concepts.

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**UNIT-I:** Introduction to COBOL: COBOL words - Literals - Structure of COBOL Program - COBOL Coding Sheet-IDENTIFICATION DIVISION- ENVIRONMENT DIVISION – DATA DIVISION – Editing and Non-editing Picture Clauses – Level Numbers – VALUE and FILLER Clause.

**UNIT-II:** PROCEDURE DIVISION – Data Movement Verb – Arithmetic Verbs : Add, Subtract, Multiply, Divide, Compute – Input/Output Statement: Accept, Display Control Verbs: GOTO – GOTO Depending on – Stop Run – CORRESPONDING Option - ROUNDED option - ON SIZE ERROR option - Simple Programs Using Above Verbs.

**UNIT-III:** Conditional Statements: If Statement – Nested if statement – Sign Condition – Class Condition- Condition Name – Compound Condition- PERFORM Statements, More about DATA Division: RENAMES-REDEFINES – Simple Programs Using the above Verbs.

**UNIT-IV:** Files in COBOL: Sequential – Relative – Indexed Sequential - Random files – File description and Record description entries - Input/Output Verbs: Open, read, write, rewrite, Close, Delete – Sort Verb – Simple Programs using above Verbs.

**UNIT-V:** Table Handling: Occurs Clause – Two and Multi-Dimensional Tables – Occurs. Indexed by Clause – SET Verb – START and SEARCH Verb – Random Files-Keys & Their Importance – INVALID KEY Clause – SCREEN SECTION - Simple Programs using above Verbs.

**TEXT BOOK:**

1. **COBOL PROGRAMMING, M.K. ROY & D.GHOSH DASTIDAR, 2<sup>nd</sup> ed, TMH.**

**REFERENCE BOOKS:**

1. **COBOL programming – V. Rajaraman, PHI Pub.**
2. **Introduction To Cobol Programming – Dr. R. Krishnamoorthy, JJ Publications.**
3. **Structured COBOL – Welburn, TMH, 4<sup>th</sup> Edition.**

## **CORE-2      DIGITAL FUNDAMENTALS AND ARCHITECTURE**

**Subject Description:** This subject deals with fundamentals of digital computers, Microprocessors and System architecture.

**Goal:** To learn about Computer Fundamentals and its Architecture.

**Objective:** On successful completion of this subject the students should have Knowledge on digital circuits, Microprocessor architecture, and Interfacing of various components.

**UNIT-I:** Number System and Binary Codes: Decimal, Binary, Octal, Hexadecimal – Binary addition, Multiplication, Division – Floating point representation, Complements, BCD, Excess3, Gray Code. Arithmetic Circuits: Half adder, Full adder, Parallel binary adder, BCD adder, Half-subtractor, Full subtractor, Parallel binary subtractor - Digital Logic: the Basic Gates – NOR, NAND, XOR Gates.

**UNIT-II:** Combinational Logic Circuits: Boolean algebra – Karnaugh map – Canonical form 1 – Construction and properties – Implicants – Don't care combinations - Product of sum, Sum of products, simplifications. Sequential circuits: Flip-Flops: RS, D, JK, T - Multiplexers – Demultiplexers – Decoder – Encoder - Counters.

**UNIT-III: MICROPROCESSOR:** Architecture – Bus Organization – Functional diagram and pin out diagram of 8085 - Addressing modes of 8085 – Instruction set of 8085 – I/O Schemes – Peripherals and Interfaces.

**UNIT-IV:** Input – Output Organization: Input – output interface – I/O Bus and Interface – I/O Bus Versus Memory Bus – Isolated Versus Memory – Mapped I/O – Example of I/O Interface. Asynchronous data transfer: Strobe Control and Handshaking – Priority Interrupt: Daisy-Chaining Priority, Parallel Priority Interrupt. Direct Memory Access: DMA Controller, DMA Transfer. Input – Output Processor: CPU-IOP Communication.

**UNIT-V:** Memory Organization: Memory Hierarchy – Main Memory- Associative memory: Hardware Organization, Match Logic, Read Operation, Write Operation. Cache Memory: Associative, Direct, Set-associative Mapping – Writing into Cache Initialization. Virtual Memory: Address Space and Memory Space, Address Mapping Using Pages, Associative Memory Page Table, Page Replacement.

### **TEXT BOOKS:**

1. **DIGITAL ELECTRONICS CIRCUITS AND SYSTEMS - V.K. Puri, TMH.**
2. **COMPUTER SYSTEM ARCHITECTURE - M. Morris Mano, PHI.**

### **REFERENCE BOOKS:**

1. **Digital principles and applications, Albert Paul Malvino, Donald P Leach, TMH, 1996.**
2. **COMPUTER ARCHITECTURE, Carter, Schaum's outline series, TMH.**

**CORE LAB-1                      PROGRAMMING LAB – COBOL**

**PRACTICAL LIST**

1. Write a COBOL Program to find the sum of individual digits of a 10-digit number until a single digit is produced.
2. Write a COBOL Program to accept the inputs Student Name, Marks for 5 subjects and declare the result as PASS, if the student gets minimum of 10 marks in each subject, otherwise declare as FAIL.
3. Write a COBOL Program to accept the given date (DDMMYY) and display the result in the following specified format: 030498 as 3<sup>rd</sup> APR 1998.
4. Write a COBOL Program to display the given three digit number into words using OCCURS clause. (Example: 342 as *THREE HUNDRED AND FORTY TWO*).
5. Write a COBOL Program to create a student data file STUDENT.DAT, using the following fields: ROLL-NO, NAME, AGE, YEAR-IN-COLLEGE, SEX, MARKS for 5 subjects.
6. Write a COBOL Program to create the following two files, using the student data file STUDENT.DAT (created by Program 5):  
FILE-1.DAT: List of male students who are studying third year  
FILE-2.DAT: List of female students who are studying first year  
(Use MOVE CORRESPONDING option).
7. Write a COBOL Program to sort the student data file STUDENT.DAT (created by Program 5) in the ascending order of the fields SEX, YEAR-IN-COLLEGE and ROLL-NO (use SORT verb) into SORT.DAT file.
8. Write a COBOL Program to create an Indexed Sequential File EMPLOYEE.DAT for the Employees of an Organization using the fields: ROLL-NO, NAME, DOB, SEX, BASIC-PAY and DESIGNATION.
9. Write a COBOL Program to update the BASIC-PAY of each employee in the employee data file EMPLOYEE.DAT (created by Program 8) by incrementing 25% of BASIC-PAY.
10. Write a COBOL Program to find the number of male employees whose BASIC-PAY > 4000 and number of female employees whose BASIC-PAY < 3000 using the employee data file EMPLOYEE.DAT (created by Program 8).
11. Write a COBOL Program to create an Inventory data file INVENT.DAT by using the following fields: ITEM-CODE, DESCRIPTION, OPEN-STOCK, PURCHASES, SALES, SAFETY-LEVEL and CLOSE-STOCK.

12. Write a COBOL Program to prepare Re-Order Level Statement by using the inventory data file INVENT.DAT (created by Program 11), if the CLOSE-STOCK is less than SAFETY-LEVEL.

**ALLIED-1**  
**COMPUTER ORIENTED NUMERICAL AND STATISTICAL METHODS**

**Subject Description:** This subject deals various numerical methods and statistical applications for computer science.

**Goal:** To learn about the computer based numerical and statistical methods.

**Objective:** On successful completion of this subject the students should have:

- Understanding various concepts of numerical analysis.
- Learning various applications statistical methods for Computer Science.

**UNIT-I:** The Solution of Numerical Algebraic & Transcendental Equations – Bisection method – Newton-Raphson method - The method of false position. The Solution of Simultaneous Linear Algebraic Equation – Gauss Elimination method – Gauss Jordan Elimination method – Gauss Seidal method of iteration – Gauss – Jacobi method

**UNIT-II:** Numerical Differentiation – Newton’s Forward Difference formula - Newton’s backward difference formula – numerical Integration – Trapezoidal rule - Simpson’s One-third rule – Simpson’s three-eighths rule.

**UNIT-III:** Interpolation – Newton forward interpolation formula – Newton backward interpolation formula – LaGrange’s formula – Numerical solution of ordinary differential equations – Taylor method – Euler method – Range-Kutta method.

**UNIT-IV:** Measures of central tendency – Mean, Median and mode – Relation between mean, median and mode. Dispersion – Range – Mean deviation & standard deviation.

**UNIT-V:** Correlation – Karl Pearson’s Coefficient of Correlation – Rank correlation regression – Regression Equations- Difference between correlation & Regression

**TEXT BOOKS:**

1. **NUMERICAL METHODS – P. Kandasamy , K. Thilagavathi, K. Gunavathi.** S. Chand & company Ltd. New Delhi Revised Edition 2005 ( UNIT I, II & III)
2. **STATISTICAL METHODS – R. S. N. Pillai, V. Bagavathi** Sultan Chand and Sons & Company Ltd. New Delhi. Reprint 2005. (UNIT IV & V)

**REFERENCE BOOKS:**

1. **COMPUTER ORIENTED NUMERICAL METHODS – V. Rajaraman,** PHI Pub.
2. **NUMERICAL METHODS – E. Balagurusamy** Tata McGraw Hill.
3. **FUNDAMENTAL OF MATHEMATICAL STATISTICS – S.C. Gupta, V. K. Kapoor,** S.Chand and Sons.

### **CORE-3 DATA STRUCTURES AND 'C' PROGRAMMING**

**Subject Description:** This subject deals with the methods of data structures using C programming language.

**Goal:** To learn about C programming language using data structure concepts.

**Objective:**

On successful completion of this subject the students should have writing programming ability on data structures dealing with Stacks, Queues, List, Searching and Sorting algorithms etc.,

**UNIT-I:** Programming development methodologies – Programming style – Problem solving techniques: Algorithm, Flowchart, Pseudocode - Structure of a C program – C character set – Delimiters – Keywords – Identifiers – Constants – Variables – Rules for defining variables – Data types – Declaring and initializing variables – Type conversion. Operators and Expressions – Formatted and Unformatted I/O functions – Decision statements – Loop control statements.

**UNIT-II:** Arrays – String and its standard functions. Pointers – Functions – Preprocessor directives: #define, #include, #ifndef, Predefined macros.

**UNIT-III:** Structure and Union: Features of structure, Declaration and initialization of structure, Structure within structure, Array of structure, Pointer to structure, Bit fields, Enumerated data types, Union. Files: Streams and file types, Steps for file operation, File I/O, Structures read and write, other file functions, Command line arguments, I/O redirection.

**UNIT-IV:** Linear data structures: Introduction to data structures – List: Implementations, Traversal, Searching and retrieving an element, Predecessor and Successor, Insertion, Deletion, Sorting, Merging lists – Stack: Representation, Terms, Operations on stack, Implementation. Single linked list, Linked list with and without header, Insertion, Deletion, Double linked list – Queues: Various positions of queue, Representation.

**UNIT-V:** Searching and Sorting – Searching: Linear, Binary. Sorting – Insertion, Selection, Bubble, Quick, Tree, Heap.

**TEXT BOOK:**

1. Ashok N Kamthane, “PROGRAMMING AND DATA STRUCTURES” – Pearson Education, First Indian Print, 2004.

**REFERENCE BOOKS:**

1. E Balagurusamy, PROGRAMMING IN ANSI C, Tata McGraw-Hill, 1998.
2. Ellis Horowitz and Sartaj Sahni- FUNDAMENTALS OF DATA STRUCTURES, Galgotia Book Source, 1999.
3. DATA STRUCTURES USING C – Aaron M Tanenbaum, Yedidye Langsam, Moshe J Augenstein, PHI.



**CORE LAB-2          PROGRAMMING LAB – C**

**PRACTICAL LIST**

1. Write a C Program to create two **ARRAYS** of integers. Sort and store the elements of both in the third array.
2. Write a C Program to experiment the operation of **STACK** using array implementation.
3. Create a Menu-Driven program to implement **QUEUE** to perform the following using pointers:
  1. **Insertion**
  2. **Deletion**
  3. **Modification**
  4. **List**
4. Write a C Program to create **LINKED LIST** representation of employee records and do the following operations using pointers:
  - (1) To add a new record
  - (2) To delete an existing record
  - (3) To print the information about an employee
  - (4) To find the number of employees in the structure.
5. Write a C Program to count the total nodes of the **LINKED LIST**.
6. Write a C Program to insert an element at the end of the **LINKED LIST**.
7. Write a C Program to insert an element beginning of the **DOUBLY LINKED LIST**.
8. Write a C Program to display a **HASH TABLE**, which is to be prepared by using the Mid-Square method.
9. Write a C Program to demonstrate **BINARY SEARCH**.
10. Write a C Program to insert nodes into a Binary tree and to traverse in pre-order.
11. Write a C Program to arrange a set of numbers in ascending order using **QUICK-SORT**.
12. Write a C Program to arrange a set of numbers in descending order using **EXCHANGE-SORT**.

## ALLIED-2 COMPUTER BASED OPTIMIZATION TECHNIQUES

**Subject Description:** This subject deals various optimization techniques for linear programming, Transportation, Assignment Problems, Game theory, PERT and CPM.

**Goal:** To learn about the managerial concepts like decision making, optimization, etc.

**Objective:** On successful completion of this subject the students should have:

- Understanding various mathematical applications in industries.
- Decision making for real time environment.

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**UNIT-I:** Linear Programming - Mathematical Model assumption of linear Programming – Graphical method - Principles of Simplex method, Big-M Method ,Duality, Dual simplex method.

**UNIT-II:** Transportation and assignment problem - Integer Programming Branch and Round Techniques - Assignment and Traveling Salesman Problem.

**UNIT-III:** Game Theory - Concept of Pure and Mixed Strategies – Solving 2 x 2 matrix with and without saddle point - n x 2 - 2 x m games. Replacement models - Elementary replacement models - present value - rate of return - depreciation - Individual replacement – Group replacement.

**UNIT-IV:** (*Derivations not included*) Queuing Theory - definition of waiting line model -Queue discipline - traffic intensity - poisson arrival – Birth death process - Problem from single server: finite and infinite population model – Problems from multi server: finite and infinite population model.

**UNIT-V:** PERT & CPM - Network representation - backward pass - Forward pass - computation - Pert Network - Probability factor – updating and Crashing.

### TEXT BOOKS

1. **OPERATIONS RESEARCH** - Manmohan, P.K. Gupta, Kanthiswarup, S. CHAND & SONS - 1997.

### REFERENCE BOOKS

1. **OPERATIONS RESEARCH** - Hamdy A Taha, Pearson Education, 7<sup>th</sup> edition, 2002
2. **PROBLEMS IN OPERATIONS RESEARCH** – P.K. Gupta, D.S. Hira, S. Chand Pub

## CORE-4 OPERATING SYSTEMS

**Subject Description:** This subject deals Operating Systems concepts and Information, Process and Memory Managements. Also it deals with advanced topics like Distributed processing, Remote Procedure call and Clusters.

**Goal:** Knowledge on Operating system and how it controls the information and hardware.

**Objective:** To inculcate knowledge on OS concepts and functioning of modern OS.

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**UNIT-I: Operating System Overview:** Operating System Objectives and Functions – The Evolution of Operating Systems – Major Achievements – Developments Leading to Modern Operating Systems – Microsoft Windows Overview – Traditional UNIX Systems – Modern UNIX Systems – Linux 95.

**UNIT-II: OS-Functions and Structure:** Different Services of Operating System – Operating System Structure – Booting. **Information Management:** The File System - Device Driver.

**UNIT-III: Process Management:** What Is A Process? – Evolution of Multiprogramming – Context Switching – Process States – Process State Transitions – Operations on a Process.

**UNIT-IV: Memory Management:** Introduction – Single Contiguous Memory Management – Fixed Partition Memory Management – Variable Partitions – Non-contiguous Allocation – Paging – Segmentation – Combined Systems – Virtual Memory Management Systems.

**UNIT-V: Distributed Processing, Client/Server and Clusters:** Client/Server Computing – Distributed Message Passing- Remote Procedure Calls – Clusters –Windows Cluster – Sun Cluster – Beowulf And Linux Clusters.

### TEXTBOOKS:

1. **OPERATING SYSTEMS Internals and Design Principles** – William Stallings, 5<sup>th</sup> edition, PHI.

(UNIT-I: 2.1-2.8 UNIT-V: 14.1-14.7)

2. **OPERATING SYSTEMS** – Achyut Godbole , 2<sup>nd</sup> edition, TMH.

(UNIT II: 3.2, 3.7, 3.9, 4.2, 4.3 UNIT-III: 5.2-5.6, 5.9 UNIT-IV: 8.1-8.9)

### REFERENCE BOOKS:

1. **OPERATING SYSTEMS Concepts and Design** – Milan Milankovic, 2<sup>nd</sup> edition, TMH.

## CORE-5 C++ PROGRAMMING

**Subject Description:** This subject deals with Object-oriented programming concepts like Abstraction, Encapsulation, Inheritance and Polymorphism.

**Goal:** Knowledge on Object-oriented concept and programming with C++.

**Objective:** To inculcate knowledge on Object-oriented programming concepts using C++.

**UNIT-I: Introduction to C++:** key concepts of Object-Oriented Programming –Advantages – Object Oriented Languages – I/O in C++ - C++ Declaration. **Control Structures: Decision Making and Statements:** *if ..else, goto, break, continue, switch...case* statements. **Loops in C++:** *for, while, do* - Functions in C++ - Inline functions – Function Overloading.

**UNIT-II: Classes and Objects:** Declaring Objects – Defining Member Functions – Static Member variables and functions – array of objects –friend functions – Overloading member functions – Bit fields and classes – Constructor and destructor with static members.

**UNIT-III: Operator Overloading:** Overloading unary, binary operators – Overloading Friend functions – type conversion – Inheritance: Types of Inheritance – Single, Multilevel, Multiple, Hierarchical, Hybrid, Multi path inheritance – Virtual base Classes – Abstract Classes.

**UNIT-IV: Pointers:** Declaration – Pointer to Class, Object – this pointer – Pointers to derived classes and Base classes. **Arrays:** Characteristics – array of classes – Memory models – new and delete operators – dynamic object –binding, Polymorphism and Virtual Functions.

**UNIT-V: Files:** File stream classes – file modes – Sequential read / write operations – Binary and ASCII Files – Random Access Operation – Templates – Exception Handling – **String:** Declaring and initializing string objects – String Attributes – Miscellaneous functions.

### TEXT BOOK:

1. **OBJECT-ORIENTED PROGRAMMING WITH ANSI AND TURBOC C++ - Ashok N Kamthane**, Pearson Education publication. 2003.

### REFERENCE BOOKS:

1. **OBJECT-ORIENTED PROGRAMMING WITH C++**, E.Balagurusamy, 1998, TMH.
2. **C++ PROGRAMMING Black Book**, Steven Holzner, Wiley Student edition, Wiley India.
3. **DATA STRUCTURES USING C & C++**, Yedidyah Langsam, Moshe J. Augenstein & Aaron M. Tanenbaum, 2<sup>nd</sup> edition, PHI.
2. **MODERN OPERATING SYSTEMS** – Andrew S. Tanenbaum, 2<sup>nd</sup> edition, PHI.
3. **OPERATING SYSTEM PRINCIPLES** – Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, 7<sup>th</sup> Edition, Wiley India.

**CORE LAB-3                      PROGRAMMING LAB - C++**  
**PRACTICAL LIST**

1. Write a C++ Program to create a class to implement the Data Structure STACK. Write a constructor to initialize the TOP of the STACK. Write a member function PUSH() to insert an element and member function POP() to delete an element check for overflow and underflow conditions..
2. Write a C++ Program to create a class ARITHMETIC which consists of a FLOAT and an INTEGER variable. Write a Member function ADD(), SUB(), MUL(), DIV() to perform addition, subtraction, multiplication, division respectively. Write a member function to get and display values.
3. Write a C++ Program to read an integer number and find the sum of all the digits until it reduces to a single digit using constructors, destructors and inline member functions.
4. Write a C++ Program to create a class FLOAT that contains one float data member. Overload all the four Arithmetic operators so that they operate on the object FLOAT.
5. Write a C++ Program to create a class STRING. Write a Member Function to initialize, get and display strings. Overload the Operator “+” to Concatenate two Strings, “==” to Compare two strings.
6. Write a C++ Program to create class, which consists of EMPLOYEE Detail like E\_Number, E\_Name, Department, Basic, Salary, and Grade. Write a member function to get and display them. Derive a class PAY from the above class and write a member function to calculate DA, HRA and PF depending on the grade.
7. Write a C++ Program to create a class SHAPE which consists of two VIRTUAL FUNCTIONS Calculate\_Area() and Calculate\_Perimeter() to calculate area and perimeter of various figures. Derive three classes SQUARE, RECTANGLE, TRIANGLE from class Shape and Calculate Area and Perimeter of each class separately and display the result.
8. Write a C++ Program to create two classes each class consists of two private variables, a integer and a float variable. Write member functions to get and display them. Write a FRIEND Function common to both classes, which takes the object of above two classes as arguments and the integer and float values of both objects separately and display the result.
9. Write a C++ Program using Function Overloading to read two Matrices of different Data Types such as integers and floating point numbers. Find out the sum of the above two matrices separately and display the sum of these arrays individually.
10. Write a C++ Program to check whether the given string is a palindrome or not using Pointers.
11. Write a C++ Program to create a File and to display the contents of that file with line numbers.
12. Write a C++ Program to merge two files into a single file.

Annexure No.	58 A
SCAA Dated	20.02.2008

**ALLIED PAPER – BUSINESS ACCOUNTING**  
**FOR B.Sc., Computer Science, B.Sc. Software System and BCA degree courses**  
**(for the students admitted from the academic year 2007-2008 and onwards)**

**Credit Hours: 4**

**Goal:** To enable the students to learn principles and concepts of Accountancy.

**Objective:** On successful completion of this course, the student should have understood

- Concepts and conventions of Accounting.
- Basic Accounting framework

**UNIT – I**

Fundamentals of Book Keeping – Accounting Concepts and Conventions – Journal – Ledger – Subsidiary books – Trial balance.

**UNIT – II**

Final accounts of a sole trader with adjustments – Errors and rectification

**UNIT – III**

Bill of exchange- Accommodation bills – Average due date – Account current.

**UNIT – IV**

Accounting for consignments and Joint ventures

**UNIT – V**

Bank Reconciliation statement – Receipts and Payments and income and expenditure account and Balance sheet – Accounts of professionals.

**Note :** Distribution of Marks between problems and theory shall be 80% and 20%.

**BOOKS FOR REFERENCE**

1. N.Vinayakam, P.L.Mani, K.L.Nagarajan – *Principles of Accountancy* – S.Chand & Company Ltd.,
2. T.S.Grewal – *Introduction to Accountancy*- S.Chand & Company Ltd.,
3. R.L.Gupta, V.K.Gupta, M.C.Shukla – *Financial Accounting* – Sultanchand & sons
4. T.S.Grewal, S.C.Gupta, S.P.Jain – *Advanced Accountancy*- Sultanchand & sons
5. K.L.Narang, S.N.Maheswari - *Advanced Accountancy*-Kalyani publishers
6. S.K.Maheswari, T.S.Reddy - *Advanced Accountancy*-Vikas publishers
7. A.Murthy -*Financial Accounting* – Margham Publishers
8. P.C.Tulsian - *Advanced Accountancy* – Tata McGraw Hill Companies.
9. A.Mukherjee, M.Hanif – *Modern Accountancy. Vol.1*- Tata McGraw Hill Companies

## DIPLOMA-1 MULTIMEDIA

**Subject Description:** This Subject deals Multimedia Applications.

**Goal:** To learn about Multiple media and their technologies.

**Objective:** To inculcate knowledge on Media, Text, Image, Audio, Video, Animation etc.

**UNIT-I: Introduction:** Multimedia Presentation and Production – Characteristics of Multimedia Presentation – Multiple Media- Utilities of Multi-sensory Perception – Hardware and Software Requirements. **Digital Representation:** Analog Representation – Waves – Digital Representation – Need for Digital Representation – Analog to Digital Conversion – Digital to Analog Conversion. **Text:** Types of Text – Unicode Standard – Font – Insertion of Text – Text compression – File formats.

**UNIT-II: Image:** Image Types – Seeing Color – Color Models – Basic Steps for Image Processing – Scanner – Digital Camera – Interface Standards – Specification of Digital Images – CMS – Device Independent Color Models – Image Processing software – File Formats – Image Output on Monitor and Printer.

**UNIT-III: Audio:** Introduction – Acoustics – Nature of Sound Waves – Fundamental Characteristics of Sound – Microphone – Amplifier – Loudspeaker – Audio Mixer – Digital Audio – Synthesizers – MIDI – Basics of Staff Notation – Sound Card – Audio Transmission – Audio File formats and CODECs – Audio Recording Systems – Audio and Multimedia – Voice Recognition and Response - Audio Processing Software.

**UNIT-IV: Video:** Analog Video Camera – Transmission of Video Signals – Video Signal Formats – Television Broadcasting Standards – Digital Video – Digital Video Standards - PC Video – Video Recording Formats and Systems - Video File Formats and CODECs – Video Editing – Video Editing Software.

**UNIT-V: Animation:** Types of Animation – Computer Assisted Animation – Creating Movement – Principles of Animation – Some Techniques of Animation – Animation on the Web – Special Effects – Rendering Algorithms. **Compression:** MPEG-1 Audio – MPEG-1 Video - MPEG-2Audio – MPEG-2 Video.

### TEXTBOOKS:

1. **PRINCIPLES OF MULTIMEDIA – Ranjan Parekh**, 2007, TMH.

(UNIT I: 1.1-1.6, 2.1-2.7, 4.1-4.7 UNIT-II: 5.1-5.16 UNIT-III: 7.1-7.4, 7.8-7.14, 7.18-7.20, 7.22, 7.24, 7.26-28 UNIT-IV: 8.1-8.12 UNIT-V: 9.5-9.10, 9.13, 9.15, 10.10-10.13)

### REFERENCE BOOKS:

1. **MULTIMEDIA: Making it Work – Tay Vaughan**, 7<sup>th</sup> edition, TMH.

2. **Comdex MULTIMEDIA AND WEB DESIGN – Vikas Gupta**, DreamTech press.2007.

## CORE-6 VISUAL PROGRAMMING - VISUAL BASIC

**Subject Description:** This subject deals Visual Basic Programming concepts.

**Goal:** Knowledge on Visual Programming and how to develop a Project using Visual Basic.

**Objective:** To inculcate knowledge on Programming and Project Development using Visual Basic.

**UNIT-I: Introducing Visual Basic:** What is VB? – Event and Event Procedures – Object-related concepts –VB program Development Process – Required Computer Skills – Logical Program Organization -VB Program Components – VB environment – Opening, Saving, Running a VB Project – Getting Help – Sample VB project. **Visual Basic Fundamentals:** Numeric, String constants – Variables – Data Types and Declarations – Operators and Expressions –Hierarchy of Operations – Inserting Parentheses – Special Rules concerning Numeric Expressions – String Expressions - Assigning Values to Variables – Displaying out – Library Functions - Program Comments. **Branching and Looping:** Relational operators and Logical Expressions – Branching with If-Then, If-Then-Else blocks – Selection Select Case – Looping with For-Next, Do-Loop, While-Wend – Stop statement.

**UNIT-II: Visual Basic control Fundamentals:** Control tools – Control tool Categories – Working with Controls – Naming Forms and Controls – Assigning Property values to Forms and Controls – Executing commands – Displaying Output – Entering Input Data – Selecting Multiple Features, Exclusive Alternatives, Form from a List - Assigning Properties collectively – Generating Error Messages – Creating timed Events – Scroll Bars.

**UNIT-III: Menus and Dialog Boxes:** Building Drop-Down Menus – Accessing Menu from Keyboard – Menu Enhancements – Submenus – Pop-Up Menus – Dialog Boxes – more about MsgBox Function – The Input Box function. **Executing and Debugging a New Project:** Syntax errors – Logical errors – Setting Breakpoints – Defining Watch Values – Stepping Through a Program – User-induced Errors – Error-handlers – Generating a Stand alone Executable Program.

**UNIT-IV: Procedures:** Modules and Procedures – Sub Procedures – Event Procedures – Function Procedures – Scope – Optional Arguments. **Arrays:** Characteristics – Declarations – Processing – Passing Arrays to Procedures – Dynamic Arrays – Array-related Functions – Control Arrays – Looping with for Each-Next.

**UNIT-V: Data Files:** Characteristics – Accessing and Saving a File in VB: The Common Dialog Control – Processing a Data file – Sequential Data Files – Random-Access Data files – Binary files.

### TEXTBOOK:

1. **VISUAL BASIC – Byron S. Gottfried**, Schaum's Outline series, TMH.

(UNIT-I: Chapters 1, 2 & 3

UNIT II: Chapter 4

UNIT-III: Chapter 5 & 6

UNIT-IV: Chapters 7 & 8

UNIT V: Chapter 9)

### REFERENCE BOOK:

1. **The Complete reference VISUAL BASIC – Noel Jerke**, TMH.



## CORE-7 RDBMS AND ORACLE

**Subject Description:** This subject deals with RDBMS concepts using Oracle SQL and PL/SQL.

**Goal:** Knowledge on RDBMS-Oracle Programming techniques.

**Objective:** To inculcate knowledge on RDBMS concepts and Programming with Oracle.

**UNIT-I: Database Concepts: A Relational approach:** Database – Relationships – DBMS – Relational Data Model – Integrity Rules – Theoretical Relational Languages. **Database Design: Data Modeling and Normalization:** Data Modeling – Dependency – Database Design – Normal forms – Dependency Diagrams - Denormalization – Another Example of Normalization.

**UNIT-II: Oracle9i: Overview:** Personal Databases – Client/Server Databases – Oracle9i an introduction – SQL \*Plus Environment – SQL – Logging into SQL \*Plus - SQL \*Plus Commands – Errors & Help – Alternate Text Editors - SQL \*Plus Worksheet - iSQL \*Plus. Oracle Tables: DDL: Naming Rules and conventions – Data Types – Constraints – Creating Oracle Table – Displaying Table Information – Altering an Existing Table – Dropping, Renaming, Truncating Table – Table Types – Spooling – Error codes.

**UNIT-III: Working with Table: Data Management and Retrieval:** DML – adding a new Row/Record – Customized Prompts – Updating and Deleting an Existing Rows/Records – retrieving Data from Table – Arithmetic Operations – restricting Data with WHERE clause – Sorting – Revisiting Substitution Variables – DEFINE command – CASE structure. **Functions and Grouping:** Built-in functions – Grouping Data. **Multiple Tables: Joins and Set operations:** Join – Set operations.

**UNIT-IV: PL/SQL: A Programming Language:** History – Fundamentals – Block Structure – Comments – Data Types – Other Data Types – Declaration – Assignment operation – Bind variables – Substitution Variables – Printing – Arithmetic Operators. **Control Structures and Embedded SQL:** Control Structures – Nested Blocks – SQL in PL/SQL – Data Manipulation – Transaction Control statements. **PL/SQL Cursors and Exceptions:** Cursors – Implicit & Explicit Cursors and Attributes – Cursor FOR loops – SELECT...FOR UPDATE – WHERE CURRENT OF clause – Cursor with Parameters – Cursor Variables – Exceptions – Types of Exceptions.

**UNIT-V: PL/SQL Composite Data Types:** Records – Tables – Varrays. **Named Blocks:** Procedures – Functions – Packages – Triggers – Data Dictionary Views.

### TEXTBOOKS:

1. **DATABASE SYSTEMS USING ORACLE** – Nilesh Shah, 2<sup>nd</sup> edition, PHI.  
(UNIT-I: Chapters 1 & 2    UNIT-II: Chapters 3 & 4    UNIT III: Chapters 5 & 6  
UNIT-IV: Chapters 10 & 11    UNIT-V: Chapters 12, 13 & 14)

### REFERENCE BOOKS:

1. **DATABASE MANAGEMNET SYSTEMS** – Arun Majumdar, Pritimoy Bhattacharya, TMH.
2. **DATABASE MANAGEMETN SYSTEMS** – Gerald V. Post, 3<sup>rd</sup> edition, TMH.

## CORE LAB-4 PROGRAMMING LAB - VISUAL BASIC & ORACLE

### PRACTICAL LIST

#### VISUAL BASIC

1. Write a simple VB program to accept a number as input and convert them into
  - a. Binary
  - b. Octal
  - c. Hexa-decimal
2. Write a simple VB program to add the items to list box with user input and move the selected item to combo box one by one.
3. Write a simple VB program to develop a calculator with basic operation.
4. Design an form using common dialog control to display the font, save and open dialog box without using the action control property.
5. Write a simple program to prepare a Questionnaire.
6. Write a VB Program to develop a menu driven program  
Add a MDI window in the form and arrange them in the cascading/horizontal style using menus (Create a menu to add form, arrange) (Menu Item 1).  
Also change the form color using the menu in another menu item (Menu Item 2).

#### ORACLE

##### Data Definition Basics

7. Create the following table (*PK - Primary Key, FK – Foreign Key*) **cat\_head, route\_head, place\_head, route\_detail, ticket\_detail, ticket\_head** with the mapping given below:

cat_head	route_head
(cat_code PK)	(cat_code FK)
route_head	route_detail
(route_id PK)	(route_id FK)
ticket_head	ticket_detail
(tick_no PK)	(tick_no FK)
place_head	route_detail
(place_id PK)	(place_id FK)

- (i) Alter the table ticket\_header to add a check constraint on ticket\_no to accept values between 1 and 500
- (ii) Alter table route\_header to add a column with data type as long.

##### Data Manipulation Basics

8. (a) Insert values to above tables  
(b) Display only those routes that originate in madras and terminate at cochin  
(c) Display only distinct category code from the table route\_header in descending manner.

- (d) Update the table route\_header to set the distance between madras and coimbatore as 500

#### Queries

9. A. Select rows from ticket\_details such that ticket number greater than any ticket\_number in Ticket\_header.  
B. Select rows from route\_header such that the route\_id are greater than all route\_id in route\_detail  
Where place id is "100".  
C. Create view tick from ticket\_header with Ticket\_no, Origin, Destination, route\_id

#### Report

10. Generate a report from the table ticket\_detail for the particular ticket\_no

#### PL/SQL

- 11.
- Write a PL/SQL block to update the bus\_station to be "ERODE" where place\_id is '01' or '05' [place\_header]
  - Write a PL/SQL block to satisfy the following condition by accepting the route\_id as user input. If the distance is less than 500 than update the fare to be 200
  - Write a Database trigger before insert for each row on the table route\_detail not allowing transaction on Saturday / Sunday
  - Write a Database trigger before delete for each row not allowing deletion and give the appropriate message on the table route\_details

#### PROJECT

12. Develop a Simple Project for Student Database Management System using VB as front end and ORACLE as back end.

#### **REFERENCE BOOKS:**

- VISUAL BASIC** – Byron S.Gottfried, Schaum's Outline Series, 2002, TMH.
- DATABASE SYSTEMS USING ORACLE** – Nilesh Shah, 2<sup>nd</sup> edition, PHI.

## ALLIED-4 MANAGEMENT INFORMATION SYSTEMS

**Subject Description:** This subject deals with various management approaches of Information Systems.

**Goal:** Knowledge on how to manage Information like an experienced manager.

**Objective:** To inculcate knowledge on managing different information systems.

**UNIT-I: Introduction to MIS:** MIS concept – Definition – Role of MIS – Impact of MIS – MIS and the User – Management as a Control system – MIS: a support to Management - Management Effectiveness and MIS – Organization as a system – MIS: organization effectiveness. **E-business enterprise:** Introduction – Organization of Business in an E-enterprise – E-business – E-commerce – E-communication – E-collaboration.

**UNIT-II: Strategic Management of Business:** The concept of corporate planning – Essentiality of Strategic Planning – Development of Business Strategies – Types of Strategies – Short-range Planning – Tools of Planning – Strategic Analysis of Business. **Information Security Challenges in E-Business:** Introduction – Security Threats and Vulnerability – Controlling Security Threat and Vulnerability – Management Security Threats and Vulnerability – Disaster Management – MIS and Security Challenges.

**UNIT-III: Decision Making:** Decision-making concepts – Decision-making process – Decision Analysis by Analytical Modeling – Behavioural Concepts in Decision-making – Organizational Decision-making – MIS and Decision-making. **Information and Knowledge:** Information Concepts – Information: a quality product – Classification of Information – Methods of data and Information Collection – Value of Information – General Model of a Human as an Information Processor.

**UNIT-IV: Applications in Manufacturing Sector:** Personnel, Financial, Production, Raw Material and Marketing Managements. **Applications in Service Sector:** Service management System – MIS Application in Service Industry – MIS: Service Industry.

**UNIT-V: Enterprise Management Systems:** Enterprise Management Systems – ERP system – ERP Model and Modules – Benefits of ERP – ERP Product Evaluation – ERP Implementation. Technology of Information Systems: Introduction – Data Processing – Transaction Processing – Application Processing – Information System processing.

### TEXTBOOKS:

1. **MANAGEMENT INFORMATION SYSTEMS Text and Cases** – Waman S Jawadekar, 3<sup>rd</sup> ed, PHI. (UNIT-I: 1.1-1.10, 2.1-2.6 UNIT-II: 3.1-3.7,4.1-4.6 UNIT III: 6.1-6.6,7.7-7.6 UNIT-IV: 12.2-12.6,13.6-13.8 UNIT-V: 15.1-15.6,16.1-16.6)

### REFERENCE BOOKS:

1. **MANAGEMENT INFORMATION SYSTEMS managing the Digital Firm** – Kenneth C. Laudon & Jane P. Laudon, 9<sup>th</sup> edition, PHI.
2. **MANAGEMENT INFORMATION SYSTEMS for the Information Age** – Haag, Cummings, McCubbrey, 4<sup>th</sup> edition, TMH.
3. **MANAGEMENT INFORMATION SYSTEMS a Concise Study** – S.A. Kelkar, 2005, PHI.

## **DIPLOMA-2 MULTIMEDIA LAB – PHOTOSHOP**

### **PRACTICAL LIST**

1. Create Sun Flower using Photoshop.
2. Create Water Drops using Photoshop.
3. Animate Plane Flying the Clouds using Photoshop.
4. Create Plastic Surgery for Nose using Photoshop.
5. Create Mouse using Photoshop.
6. Create See thru text using Photoshop.
7. Create Military Clothe using Photoshop.
8. Create Stone Texture using Photoshop.
9. Create Rollover Buttons using Photoshop.
10. Create Realistic Stone Structure using Photoshop.
11. Create Web Page using Photoshop.
12. Convert Black and White to Color Photo using Photoshop.

### ***REFERENCE BOOKS:***

1. **PHOTOSHOP CS2 BIBLE – Deke McClelland & Laurie Ulrich Fuller**, Wiley India.
2. **Comdex MULTIMEDIA AND WEB DESIGN – Vikas Gupta**, DreamTech press, 2007.

<b>CORE-8</b>	<b>SOFTWARE ENGINEERING</b>
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**Subject Description:** This subject deals with Software Engineering concepts like Analysis, Design, Implementation, Testing and Maintenance.

**Goal:** Knowledge on how to do a software project with in-depth analysis.

**Objective:** To inculcate knowledge on Software engineering concepts in turn gives a roadmap to design a new software project.

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**UNIT-I: Introduction to Software Engineering:** Definitions – Size Factors – Quality and Productivity Factors. **Planning a Software Project:** Planning the Development Process – Planning an Organizational Structure.

**UNIT-II: Software Cost Estimation:** Software cost Factors – Software Cost Estimation Techniques – Staffing-Level Estimation – Estimating Software Estimation Costs.

**UNIT-III: Software Requirements Definition:** The Software Requirements specification – Formal Specification Techniques. **Software Design:** Fundamental Design Concepts – Modules and Modularization Criteria.

**UNIT-IV:** Design Notations – Design Techniques. **Implementation Issues:** Structured Coding Techniques – Coding Style – Standards and Guidelines – Documentation Guidelines.

**UNIT-V: Verification and Validation Techniques:** Quality Assurance – Walkthroughs and Inspections – Unit Testing and Debugging – System Testing. **Software Maintenance:** Enhancing Maintainability during Development – Managerial Aspects of Software Maintenance – Configuration Management.

**TEXTBOOK:**

1. **SOFTWARE ENGINEERING CONCEPTS** – Richard Fairley, 1997, TMH.

(UNIT-I: 1.1-1.3, 2.3-2.4    UNIT-II: 3.1-3.4    UNIT III: 4.1-4.2, 5.1-5.2

UNIT-IV: 5.3-5.4, 6.1-6.4    UNIT-V: 8.1-8.2, 8.5-8.6, 9.1-9.3)

**REFERENCE BOOKS:**

1. **SOFTWARE ENGINEERING FOR INTERNET APPLICATIONS** – Eve Anderson, Philip Greenspun, Andrew Grumet, 2006, PHI.

2. **SOFTWARE ENGINEERING PROJECT MANAGEMENT** – 2<sup>nd</sup> Edition, Wiley India.

3. **SOFTWARE QUALITY ENGINEERING** – Jeff Tian, Student edition, 2006, Wiley India.

<b>CORE-9</b>	<b>JAVA PROGRAMMING</b>
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**Subject Description:** This subject deals with Java Programming concepts.

**Goal:** Enable to create wide range of Applications and Applets using Java.

**Objective:** To inculcate knowledge on Java Programming concepts.

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**UNIT-I: Fundamentals of Object-Oriented Programming:** Object-Oriented Paradigm – Basic Concepts of Object-Oriented Programming – Benefits of Object-Oriented Programming – Application of Object-Oriented Programming. **Java Evolution:** History – Features – How Java differs from C and C++ – Java and Internet – Java and www – Web Browsers. Overview of Java: simple Java program – Structure – Java Tokens – Statements – Java Virtual Machine.

**UNIT-II:** Constants, Variables, Data Types - Operators and Expressions – Decision Making and Branching: *if, if ..else*, nested *if, switch, ?:* operator - Decision Making and Looping: *while, do, for* – Jumps in Loops - Labeled Loops – Classes, Objects and Methods.

**UNIT-III:** Arrays, Strings and Vectors – Interfaces: Multiple Inheritance – Packages: Putting Classes together – Multithreaded Programming.

**UNIT-IV:** Managing Errors and Exceptions – Applet Programming – Graphics Programming.

**UNIT-V: Managing Input/Output Files in Java :** Concepts of Streams- Stream Classes – Byte Stream classes – Character stream classes – Using streams – I/O Classes – File Class – I/O exceptions – Creation of files – Reading / Writing characters, Byte-Handling Primitive data Types – Random Access Files.

**TEXTBOOK:**

1. **PROGRAMMING WITH JAVA – A PRIMER - E. Balagurusamy**, 3<sup>rd</sup> Edition, TMH.

**REFERENCE BOOKS:**

1. **THE COMPLETE REFERENCE JAVA 2 - Patrick Naughton & Hebert Schildt**, 3<sup>rd</sup> ed, TMH

2. **PROGRAMMING WITH JAVA – John R. Hubbard**, 2<sup>nd</sup> Edition, TMH.

3. **JAVA and Object-Oriented Programming Paradigm – Debasish Jana**, 2005, PHI.

<b>CORE-10</b>	<b>COMPUTER NETWORKS</b>
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**Subject Description:** This subject deals different Network concepts like Layers, Wireless Concepts, Transmission and Security.

**Goal:** Knowledge on Computer Networks and technologies like broadband and Bluetooth.

**Objective:** To inculcate knowledge on Networking concepts and technologies like wireless, broadband and Bluetooth.

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**UNIT-I: Network Hardware:** LAN – WAN – MAN – Wireless – Home Networks. **Network Software:** Protocol Hierarchies – Design Issues for the Layers – Connection-oriented and connectionless services – Service Primitives – The Relationship of services to Protocols. **Reference Models:** OSI Reference Model – TCP/IP reference Model – Comparison of OSI and TCP/IP -Critique of OSI and protocols – Critique of the TCP/IP Reference model.

**UNIT-II: PHYSICAL LAYER - Guided Transmission Media:** Magnetic Media – Twisted Pair – Coaxial Cable – Fiber Optics. **Wireless Transmission:** Electromagnetic Spectrum – Radio Transmission – Microwave Transmission – Infrared and Millimeter Waves – Light Waves. **Communication Satellites:** Geostationary, Medium-Earth Orbit, Low Earth-orbit Satellites – Satellites versus Fiber.

**UNIT-III: DATA-LINK LAYER:** Error Detection and correction – Elementary Data-link Protocols – Sliding Window Protocols. **MEDIUM-ACCESS CONTROL SUB LAYER:** Multiple Access Protocols – Ethernet – Wireless LANs - Broadband Wireless – Bluetooth.

**UNIT-IV: NETWORK LAYER:** Routing algorithms – Congestion Control Algorithms. **TRANSPORT LAYER:** Elements of Transport Protocols – Internet Transport Protocols: TCP.

**UNIT-V: APPLICATION LAYER:** DNS – E-mail. **NETWORK SECURITY:** Cryptography – Symmetric Key Algorithms – Public Key Algorithms – Digital Signatures.

**TEXTBOOKS:**

1. **COMPUTER NETWORKS** – Andrew S. Tanenbaum, 4<sup>th</sup> edition, PHI.  
(UNIT-I:1.2-1.4 UNIT-II:2.2-2.4 UNIT-III:4.2-4.6 UNIT-IV:5.2,5.3,6.2,6.5 UNIT-V:7.1,7.2,8.1-8.4)

**REFERENCE BOOKS:**

1. **DATA COMMUNICATION AND NETWORKS** – Achyut Godbole, 2007, TMH.  
2. **COMPUTER NETWORKS Protocols, Standards, and Interfaces** – Uyles Black, 2<sup>nd</sup> ed, PHI.



<b>CORE LAB-5</b>	<b>JAVA PROGRAMMING</b>
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### PRACTICAL LIST

1. Write a Java Applications to extract a portion of a character string and print the extracted string.
2. Write a Java Program to implement the concept of multiple inheritance using Interfaces.
3. Write a Java Program to create an Exception called payout-of-bounds and throw the exception.
4. Write a Java Program to implement the concept of multithreading with the use of any three multiplication tables and assign three different priorities to them.
5. Write a Java Program to draw several shapes in the created windows.
6. Write a Java Program to create a frame with four text fields as name, street, city and pin code with suitable tables. Also add a button called “my details”, When the button is clicked its corresponding values are to be appeared in the text fields.
7. Write a Java Program to demonstrate the Multiple Selection List-box.
8. Write a Java Program to create a frame with three text fields for name, age and qualification and a text field for multiple lines for address.
9. Write a Java Program to create Menu Bars and pull down menus.
10. Write a Java Program to create frames which respond to the mouse clicks. For each events with mouse such as mouse up, mouse down, etc., the corresponding message to be displayed.
11. Write a Java Program to draw circle, square, ellipse and rectangle at the mouse click positions.
12. Write a Java Program which open an existing file and append text to that file.

#### **REFERENCE BOOKS:**

1. **JAVA 6 PROGRAMMING BLACK BOOK, 2007 edition, dreamtech press.**
2. **PROGRAMMING IN JAVA 5.0 – James P Cohoon & Jack Davidson, TMH.**

<b>DIPLOMA-3</b>	<b>ANIMATION TECHNIQUES</b>
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**Subject Description:** This Subject deals with the Animation Techniques.

**Goal:** To learn about Animation.

**Objective:** On Successful Completion of this subject the students should have:

- 2D & 3D Animation, Script Animation, Motion Caption, Audio & Video Format etc.

**UNIT-I:** What is mean by Animation – Why we need Animation – Types of Animation 2D & 3D – Theory of 2D Animation – Theory of 3D Animation – Difference between Graphics & Animation – Application of 2D & 3D Animation – History of Animation – Software’s.

**UNIT-II:** Traditional 2D Animation Concept – Types of 2D Animation – Techniques of 2D Animation – Color – Text – Formation – Size – Script Animation – Time Line Effects – Application of 2D Animation – Characterization 2D – Principle of 2D Animation – Concept Development.

**UNIT-III:** 3D Animation & its Concepts – Types of 3D Animation – Cycle & Non-Cycle Animation – Theory of Character 3D Animation – 3D Transition Animation – Skeleton & Kinetic 3D Animation – Texturing & Lighting of 3D Animation – 3D Camera Tracking – Applications & Software of 3D Animation.

**UNIT-IV:** Motion Caption – Formats – Methods – Usages – Motion Capture Software – Merge with Software – Expression – Formats – Methods – Usages – Expression Capture Softwares – Script Animation Usage – Different Language of Script Animation Among the Software.

**UNIT-V:** Concept Development – Scripting – Story Developing – Output Formats – Audio Formats & Video Formats – Colors – Color Cycle – Color Formats – 3D Production Budgets – 3D Animated Movies – Fields in 3D Animation.

**TEXT BOOK:**

1. **MAYA 6.0 BIBLE - Joestadaro, Donkim.**
2. **3DS MAX BIBLE - Kelly Ldot, Murtock.**

**REFERENCE BOOK:**

1. **MAYA 8.0 THE COMPLETE REFERENCE - Tom Meade, Shinsaku Arima, TMH.**

**ADDITIONAL REFERENCE BOOKS**

1. Animation Writing and Development, Jean Ann Wright, Focal Press Visual Effects and Animation Series.
2. Animators Guide to 2D Computer Animation, Avgeranis George
3. Digital Animation Bible – AVGERAKIF, Tata McGraw Hill.
4. Maya – 8 : The Complete Reference, MEADE, Tata McGraw Hill.

<b>CORE-11</b>	<b>SOFTWARE TESTING</b>
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**Subject Description:** This subject deals software testing concepts like unit-wise testing, integration testing and acceptance testing.

**Goal:** Knowledge on software testing and how to test the software at various levels.

**Objective:** To inculcate knowledge on Software testing concepts.

**UNIT-I: Software Development Life Cycle models:** Phases of Software project – Quality, Quality Assurance, Quality control – Testing, Verification and Validation – Process Model to represent Different Phases - Life Cycle models. **White-Box Testing:** Static Testing – Structural Testing –Challenges in White-Box Testing.

**UNIT-II: Black-Box Testing:** What is Black-Box Testing? - Why Black-Box Testing? – When to do Black-Box Testing? – How to do Black-Box Testing? – Challenges in White Box Testing - **Integration Testing:** Integration Testing as Type of Testing – Integration Testing as a Phase f Testing – Scenario Testing – Defect Bash.

**UNIT-III: System and Acceptance Testing:** system Testing Overview – Why System testing is done? – Functional versus Non-functional Testing - Functional testing - Non-functional Testing – Acceptance Testing – Summary of Testing Phases.

**UNIT-IV: Performance Testing:** Factors governing Performance Testing – Methodology of Performance Testing – tools for Performance Testing – Process for Performance Testing – Challenges. **Regression Testing:** What is Regression Testing? – Types of Regression Testing – When to do Regression Testing – How to do Regression Testing – Best Practices in Regression Testing.

**UNIT-V: Test Planning, Management, Execution and Reporting:** Test Planning – Test Management – Test Process – Test Reporting –Best Practices. **Test Metrics and Measurements:** Project Metrics – Progress Metrics – Productivity Metrics – Release Metrics.

**TEXTBOOKS:**

1. **SOFTWARE TESTING Principles and Practices – Srinivasan Desikan & Gopalswamy Ramesh**, 2006, Pearson Education.

(UNIT-I: 2.1-2.5, 3.1-3.4    UNIT-II: 4.1-4.4, 5.1-5.5    UNIT III: 6 .1-6.7

(UNIT IV: 7.1-7.6, 8.1-8.5    UNIT-V: 15.1-15.6, 17.4-17.7)

**REFERENCE BOOKS:**

1. **EFFECTIVE METHODS OF SOFTWARE TESTING–William E.Perry**, 3<sup>rd</sup> ed, Wiley India.

2. **SOFTWARE TESTING – Renu Rajani, Pradeep Oak**, 2007, TMH.

<b>CORE-13</b>	<b>WEB TECHNOLOGY</b>
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**Subject Description:** This subject deals TCP/IP, FTP, WWW and Web technologies like ASP, JVM, DCOM, XML and WAP.

**Goal:** Knowledge on various Web technologies.

**Objective:** To inculcate knowledge web technological concepts and functioning internet.

**UNIT-I: TCP/IP:** TCP/IP Basics – Why IP address – Logical Address - TCP/IP Example- The concept of IP address – Basics of TCP – Features of TCP – Relationship between TCP and IP – Ports and Sockets – Active Open and Passive Open - TCP Connections – What makes TCP reliable? – TCP Packet format - Persistent TCP connections – UDP – Differences between TCP and UDP.

**UNIT-II:** DNS – E-mail – FTP – TFTP – History of WWW – Basics of WWW and Browsing - Local information on the internet – HTML – Web Browser Architecture – Web Pages and Multimedia – Remote Login (TELNET).

**UNIT-III: Introduction to Web Technology:** Web pages – Tiers – Concept of a Tier – Comparison of Microsoft and Java Technologies – Web Pages – Static Web Pages – Plug-ins – Frames – Forms. **Dynamic Web Pages:** Need – Magic of Dynamic Web Pages – Overview of Dynamic Web Page Technologies – Overview of DHTML – Common Gateway Interface – ASP – ASP Technology – ASP Example – Modern Trends in ASP – Java and JVM – Java Servlets – Java Server Pages.

**UNIT-IV: Active Web Pages:** Active Web Pages in better solution – Java Applets – Why are Active Web Pages Powerful? – Lifecycle of Java Applets – ActiveX Controls – Java Beans. **Middleware and Component-Based E-Commerce Architectures:** CORBA – Java Remote Method Invocation – DCOM. **EDI:** Overview – Origins of EDI – Understanding of EDI – Data Exchange Standards – EDI Architecture – Significance of EDI – Financial EDI – EDI and internet.

**UNIT-V: XML:** SGML – Basics of XML – XML Parsers – Need for a standard. **WAP:** Limitations of Mobile devices – Emergence of WAP – WAP Architecture – WAP Stack – Concerns about WAP and its future – Alternatives to WAP.

**TEXTBOOKS:**

1. **WEB TECHNOLOGIES TCP/IP to Internet Applications Architectures** – Achyut S Godbole & Atul Kahate, 2007 ,TMH.

(UNIT-I: 3.1-3.5,4.1-4.12    UNIT-II: 5.1-5.4,6.1-6.7    UNIT III:8.1-8.1,9.1-9.13

UNIT IV: 10.1-10.7,15.1-15.3,16.1-16.8    UNIT-V: 17.1-17.4,18.1-18.6)

**REFERENCE BOOKS:**

1. **INTERNET AND WEB TECHNOLOGIES** – Rajkamal, TMH.

2. **WEB APPLICATIONS Concepts and Real world Design** – Craig D. Knuckles, David S.Yuen.

<b>CORE LAB-6</b>	<b>PROGRAMMING LAB - HTML</b>
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**PRACTICAL LIST**

1. Develop a HTML document which displays you name as **<h1>** heading and displays any four of your friends. Each of your friend's names must appear as hot text. When you click your friend's name, it must open another HTML document, which tells about your friend.
2. Write names of several countries in a paragraph and store it as an HTML document, *world.html*. Each country name must be a hot text. When you click India (for example), it must open *india.html* and it should provide a brief introduction about India.
3. Design a HTML document describing you. Assign a suitable background design and background color and a text color.
4. Develop a HTML document to print the following:  
***Who can use the solar heaters?***  
***Anybody with a regular hot water demand.***
  - ***In houses for domestic purposes (cooking, bathing and washing).***
  - ***For engineering / chemical industries, dairies and textile/leather process plants, to –preheat boiler feed water.***
  - ***For hostels, hospitals, guest houses and industrial canteens.***
  - ***For food-processing plants and for process applications.***
5. Write a HTML document to print the following:  
***The family has the following facilities:***
  1. ***Own House***
    - ***Living area 2400 square feet***
    - ***Separate bungalow***
    - ***Car shed***
  2. ***Car***
    - ***Maruti Esteem***
    - ***Registration Number TN 38 A 9650***
    - ***1996 Model***
  3. ***Farm***
    - ***35 acres Coconut Groves***
    - ***10 acres Mango Groves***
6. Write a HTML document to print your class Time Table.
7. Develop a Complete Web Page using Frames and Framesets which gives the Information about a Hospital using HTML.

8. Write a HTML document to print your Bio-Data in the following format:

<b>NAME</b>			
<b>Religion</b>			
<b>Community</b>			
<b>Address</b>	<i>Street</i>		
	<i>Town</i>		
	<i>District</i>		
	<i>State</i>		
	<i>PIN Code</i>		
<b>Phone</b>	<i>Office</i>		
	<i>Residence</i>		
	<i>Mobile</i>		
<b>Educational Qualification</b>			
<i>Degree</i>	<i>University/Institute</i>	<i>Month&amp; year</i>	<i>Grade / Mark</i>

9. Develop complete set of web pages to describe you skills in various areas using HTML.

10. Develop a web site to publish your family and the details of each member using HTML.

11. Develop a HTML document to display a Registration Form for an inter-collegiate function.

12. Develop a HTML document to design Alumni Registration form of your college.

**REFERENCE BOOK:**

1. **World Wide Web Design with HTML – C. Xavier, 2007, TMH.**

<b>DIPLOMA-4</b>	<b>ANIMATION LAB - FLASH</b>
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### **PRACTICAL LIST**

1. Create Shapes and Drawings in Flash.
2. Change a Shape to Another Shape. (Shape Animation)
3. Create a Man to walk with the help of Key Frame Animation.
4. Draw a Bird with Flash tools and make it fly with key Frame Animation.
5. Change the Colors of an object with the help of Animation.
6. Animate a Ball with the help of Guide line Animation.(Path Animation)
7. Create a Shining Stores with the help of Movie Clip.
8. Create Buttons & Link with other Frames.
9. Create an Album with the help of Buttons.
10. Create a 3D Rotation of a Box with the Help of Shape Animation.
11. Create Morphing between two images in Flash.
12. Create a Simple game with the help of Action Script.

### ***REFERENCE BOOKS:***

1. **Flash 8 in Simple Steps – Shalini Gupta & Adity Gupta**, 2007, dreamtech.
2. **Flash 8 – Ethan Waterall & Norbert Herber**, dreamtech.

<b>Elective I - A</b>	<b>COMPUTER GRAPHICS</b>
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**Subject Description:** This subject deals with Graphics Concepts and methodologies.

**Goal:** Mathematical Knowledge on Graphics and Technical background.

**Objective:** To inculcate knowledge on Graphics with various concepts.

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**UNIT-I: Output Primitives:** Points and Lines – Line-Drawing algorithms – Loading frame Buffer – Line function – Circle-Generating algorithms – Ellipse-generating algorithms.  
**Attributes of Output Primitives:** Line Attributes – Curve attributes – Color and Grayscale Levels – Area-fill attributes – Character Attributes.

**UNIT-II: 2D Geometric Transformations:** Basic Transformations – Matrix Representations – Composite Transformations – Other Transformations. **2D Viewing:** The Viewing Pipeline – Viewing Co-ordinate Reference Frame – Window-to-Viewport Co-ordinate Transformation - 2D Viewing Functions – Clipping Operations – Point, Line, Polygon, Curve, Text and Exterior clippings.

**UNIT-III: 3D Concepts:** 3D Display Methods – 3D Graphics Packages. **3D Object Representations:** Polygon Surfaces – Curved lines and Surfaces – Quadric Surfaces – Super quadrics – Blobby Objects – Spline representations. **3D Geometric Modeling and Transformations:** Translation – Rotation – Scaling – Other Transformations – Composite Transformations – 3D Transformation functions..

**UNIT-IV: Visible-Surface Detection Methods:** Classification of Visible-Surface algorithms – Back-Face Detection – Depth-Buffer Method – A-Buffer method- Scan-Line Method – Depth-Sorting Method – BSP-Tree Method – Area-Subdivision Method – Octree Methods – Ray-casting Methods – Curved surfaces – Wire frame Methods – Visibility-Detection functions.

**UNIT-V: Illumination Models:** Properties of Light – Standard Primaries ad the Chromaticity Diagram – Intuitive color Concepts – RGB Color Model – YIQ Color Model – CMY Color Model – HSV Color Model – Conversion between HSV and RGB models – Color selection ad Applications.

**TEXTBOOKS:**

1. **COMPUTER GRAPHICS – Donald Hearn, M. Pauline Baker**, 2<sup>nd</sup> edition, PHI.  
(UNIT-I: 3.1-3.6, 4.1-4.5 & UNIT-II: 5.1-5.4, 6.1-6.11 UNIT-III: 9.1-9.2, 10.1-10.6, 11.1-11.6  
UNIT-IV: 13.1-13.13 UNIT-V: 14.1-14.5, 15.1-15.10)

**REFERENCE BOOKS:**

1. **PRINCIPLES OF INTERACTIVE OMPUTER GRAPHICS – Willium M. Newman & Robert F. Sproull**, 2007, TMH.



<b>Elective I - B</b>	<b>EMBEDDED SYSTEMS</b>
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<b>UNIT I</b>	Introduction to Embedded System: An Embedded System – Processor in the System – Other Hardware units – Software embedded into a system – Exemplary embedded system – Embedded system on chip and in VLSI circuit. Processor and Memory organization: Structural units in a processor – Processor selection – Memory devices – Memory selection - Allocation of memory – DMA – Interfacing processor, memories and I/O devices
<b>UNIT II</b>	Devices and buses for device networks: I/O devices – Timer and counting devices – Serial communication – Host system. Device drivers and Interrupts servicing mechanism: Device drivers – Parallel port device drivers – Serial port device drivers – Device drivers for IPTD – Interrupt servicing mechanism – Context and the periods for context-switching, dead-line and interrupt latency
<b>UNIT III</b>	Programming concepts and embedded programming in C and C++: Software programming in ALP and C – C program elements – Header and source files and processor directives – Macros and functions – Data types – Data structures – Modifiers – Statements – Loops and pointers – Queues – Stacks – Lists and ordered lists – Embedded programming in C++ - Java – C program compiler and cross compiler – Source code for engineering tools for embedded C / C++ - Optimization of memory needs
<b>UNIT IV</b>	Program modeling concepts in single and multi processor systems: Modeling process for software analysis before software implementation – Programming models for event controlled or response time constrained real time programs – Modeling of multiprocessor systems. Software engineering practices: Software algorithm complexity – Software development process life cycle and its models – Software analysis – Software design – Implementation – Testing, Validation and debugging – Software maintenance
<b>UNIT V</b>	Inter-process communication and synchronization of processes, tasks and threads: Multiple processor – Problem of sharing data by multiple tasks and routines – Inter process communication. Real time operating systems: Operating system services – I/O subsystem – Network operating systems – Real time and embedded operating systems – Interrupt routine in RTOS environment – RTOS task scheduling – Performance metric in scheduling
<b>Text Book(s)</b>	Raj Kamal, “ Embedded Systems – Architecture, Programming and Design”, TMH, 2007

<b>Elective I - C</b>	<b>DIGITAL IMAGE PROCESSING</b>
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### **UNIT-1 Digital Image Fundamentals**

Image Transforms- Walsh, Hadamard, Discrete cosine, Hotelling Transforms-Image Formation. File Formats.

### **UNIT-2 Image Enhancement**

Histogram Modification Techniques-Image Smoothing-Image Sharpening-Image Restoration-Degradation Model-Diagonalization of Circulant and Black circulant matrices-algebraic approach to restoration.

### **UNIT-3 Image Compression and Segmentation**

Compression Models-Elements of Information Theory-Error free Compression-Image Segmentation- Detection of Discontinuities-Edge Linking and boundary detection-Thresholding-Regions Oriented Segmentations-Morphology.

### **UNIT-4 Feature Extraction**

Image feature descriptions-Interpretations of Line drawings, Image pattern recognition algorithms.

### **UNIT-5 Knowledge Representation and Use**

Knowledge Representation and Use-Image analysis using Knowledge about scenes-Image Understanding using two dimensional methods.

### **TEXT BOOK:**

1. Gonzalez.R.C & Woods. R.E., "Digital Image Processing", 2<sup>nd</sup> Edition, Pearson Education, 2002. (Chapters: 1, 2, 3, 4, 5, 8, 9, 10, 11 and 12).
2. Anil Jain.K, "Fundamentals of Digital image processing", Prentice Hall of India, 1989. (Chapters: 5, 7, 8 and 11).

### **REFERENCES:**

1. Sid Ahmed, "Image Processing", McGraw Hill, New York, 1995.
2. Milan Sonka, Vaclav Hlavac and Roger Boyle, "Image processing Analysis and Machine vision", Second Edition, Thomson Brooks/Cole, 1999.

<b>Elective II - A</b>	<b>CLIENT / SERVER COMPUTING</b>
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**Subject Description:**

This Subject deals with the C/S Computing

**Goal:** To learn about C/S Computing

**Objective:**

On Successful Completion of this subject the students should have:

- C/S Applications , GUI ETC.,

**UNIT I:**

Introduction to Client/Server Computing – What is Client/Server Computing – Benefits of Client/Server Computing – Evolution of C/S Computing – Hardware Trends – Software Trends-Evolution of Operating Systems – N/w Trends – Business Considerations..

**UNIT II:**

Overview of C/S Applications: Components of C/S Applications – Classes of C/S Applications – Categories of C/S Applications . Understanding C/S Computing : Dispelling the Myths – Obstacles – Upfront & Hidden – Open Systems & Standards – Standards – Setting Organizations – Factors of Success .

**UNIT III:**

The Client Hardware & Software : Client Component – Client Operating Systems – What is GUI – Database Access – Client Software Products : GUI Environments – Converting 3270/5250 Screens – Database Tools – Client Requirements : GUI Design Standards – Open GUI Standards – Interface Independence – Testing Interfaces .

**UNIT IV:**

The Server : Categories of Servers – Features of Server Machines – Classes of Server Machines – Server Environment : N/W Management Environment – N/W Computing Environment – Extensions – Network Operating System – Loadable Module..

**UNIT V:**

Server Operating System : OS/2 2.0 – Windows New Technology – Unix Based OS – Server Requirements : Platform Independence – Transaction Processing – Connectivity – Intelligent Database – Stored Procedure – Triggers – Load Leveling – Optimizer – Testing and Diagnostic Tools – Backup & Recovery Mechanisms..

**TEXT BOOK:**

Dawna Travis Dewire –“Client / Server Computing “ – Tata McGraw Hill.

<b>Elective II - B</b>	<b>Mobile Computing</b>
<b>UNIT I</b>	Introduction: Mobility of Bits and Bytes –Wireless The Beginning – Mobile Computing – Dialogue Control – Networks – Middleware and Gateways – Application and services- Developing Mobile computer Applications – security in mobile computing – Standards _ Why is it necessary – Standard bodies. MOBILE COMPUTING ARCHITECTURE: History of computers and Internet – Architecture for mobile computing – Three-tier architecture – Design considerations for mobile computing – Mobile computing through Internet – Making exiting applications mobile enabled
<b>UNIT II</b>	MOBILE COMPUTING THROUGH TELEPHONY: Evaluation of telephony – Multiple access procedures – Mobile computing through telephone – IVR Application – Voice XML – TAPI
<b>UNIT III</b>	EMERGING TECHNOLOGIES: Blue Tooth – RFID – WiMAX – Mobile IP – IPv6 – Java Card. GSM : Global System for mobile communications – GSM Architecture – GSM Entities – Call routing in GSM – PLMN Interfaces – GSM Addresses and Identifiers – Network Aspects in GSM – GSM Frequency allocations – Authentications and Security. SMS
<b>UNIT IV</b>	GPRS – GPRS and packet data network – GPRS network architecture – GPRS network operations – Data services in GPRS – Application for GPRS- Limitations – Billing and Charging. WAP : MMS – GPRS Applications
<b>UNIT V</b>	CDMA and 3G: Spread spectrum technology – Is 95 – CDMA vs GSM – Wireless Data – Third generation networks – Applications on 3G WIRELESS LAN: Wireless LAN advantages – IEEE 802.11 standards – Architecture – Mobile in Wireless LAN – Deploying wireless LAN – Mobile adhoc networks and sensor networks – Wireless LAN Security – WiFi vs 3G
<b>Text Book(s)</b>	MOBILE COMPUTING, Asoke K Talukder , Roopa R Yavagal, TMH, 2005

Elective II - C	DISTRIBUTED COMPUTING
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### **Subject Description**

This Course presents the distributed computing techniques emphasizing the client server model

### **Goals**

To enable the students to learn the concepts of distributed computing

### **Objectives**

On successful completion of the course the students should have:

- Understood the trends and principles of distributed computing

### **Contents**

#### UNIT I

Distributed Systems: Fully Distributed Processing systems – Networks and interconnection structures – designing a distributed processing system.

#### UNIT II

Distributed systems: Pros and Cons of distributed processing – Distributed databases – the challenges of distributed data – loading, factors – managing the distributed resources division of responsibilities.

#### UNIT III

Design considerations: Communication Line loading – line loading calculations- partitioning and allocation - data flow systems – dimensional analysis- network database design considerations- ration analysis- database decision trees- synchronization of network databases

#### UNIT IV

Client server network model: Concept – file server – printer server and e-mail server

#### UNIT V

Distributed databases: An overview, distributed databases- principles of distributed databases – levels of transparency- distributed database design- the R\* project techniques problem of heterogeneous distributed databases

### **Reference:**

1. John a. Sharp, “An introduction to distributed and parallel processing g” *Blackwell Scientific Publication(Unit I & III)*
2. Uyles D. Black, “Data communication and distributed networks”(unit II)
3. Joel M.Crichlow “introduction to distributed & parallel computing (Unit IV)  
Stefans Ceri, Ginseppe Pelagatti “Distributed database Principles and systems” *McGraw Hill*

<b>Elective III - A</b>	<b>E-COMMERCE</b>
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**Subject Description:** This subject deals with E-commerce concepts like E-Commerce, M-Commerce, E-Security and E-payment.

**Goal:** Knowledge on E-commerce and Real World and Cyberspace problem awareness.

**Objective:** To inculcate knowledge on E-Commerce concepts in the present IT world.

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**UNIT-I:** What is e-commerce? – E-Commerce is not E-Business – the drivers – Myths You should know – Advantages and Issues in E-Commerce – Benefits and Limitations of the Internet – Role of E-Strategy – Integrating E-commerce – E-Commerce Business Models – Management Implications.

**UNIT-II: Mobile-Commerce-The Business of Time:** What is M-Commerce? – Why wireless? – How wireless Technology is employed? – Wireless LAN – Wireless application Protocol - Implications for Management.

**UNIT-III: Business-to-Business E-Commerce:** What is B2B E-Commerce? – Supply chain Management and B2B – B2B Models – B2B Tools-EDI.

**UNIT-IV: E-Security:** Security in Cyberspace – Designing for Security – How much risk you afford? – The VIRUS – Security Protection and Recovery – Role of Biometrics - How to secure your system? – Security and Terrorism.

**UNIT-V: Getting the money:** Real World Cash – Electronic Money – Requirements for Internet-Based Payments – How would you like to pay? – B2B and E-Payment – M-Commerce and M-Payment – General Guide to E-Payment.

**TEXTBOOK:**

1. **ELECTRONIC COMMERCE from Vision to Fulfillment** – Elias M. Awad, 3<sup>rd</sup> edition, PHI.

(Chapters: 1, 6, 11, 13 &15)

**REFERENCE BOOKS:**

1. **E-COMMERCE Strategy, Technologies and Applications** – David Whiteley, 2001, TMH.

2. **INTRODUCTION TO E-COMMERCE** – Jeffrey F. Rayport, Bernard J. Jaworski, TMH.

<b>Elective III - B</b>
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<b>SOFTWARE PROJECT MANAGEMENT</b>
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**Subject Description:** This subject deals with various Techniques for Software Project Management.

**Goal:** Enables to have sound knowledge on Software Project Management.

**Objective:** To inculcate knowledge on how to manage a Software Project.

**UNIT-I: Introduction to Software Project management:** Introduction – Why is Software project management is important? – What is a project? – Software project versus other types of project – Contract Management and technical project management – Activities covered by software project management – plans, methods, methodologies – some ways of categorizing software projects. Stepwise: an overview of project planning. Programme Management and Project Evaluation: Programme Management – Managing the Allocation of resources within programmes – strategic programme management – creating a programme – aids to programme management – Benefits Management – Evaluation of Individual projects – technical assessment – cost-benefit analysis - cash flow forecasting – cost-benefit evaluation techniques – risk evaluation.

**UNIT-II: Software Effort Estimation:** Where are estimation done? – Problem with over and under-estimates – basis for software estimating – software effort estimation techniques – expert judgment – estimating by analogy. Activity Planning: The objectives – When to plan? – Project schedules – project and activities – sequencing and scheduling activities – Network Planning models – formulating a network model – adding time dimension – forward pass – backward pass. Risk Management: Risk – Categories – Dealing with risk – Risk identification, assessment, planning and management – Evaluating risk to schedule.

**UNIT-III: Resource Allocation:** Introduction - Nature of resources – identifying the resource requirements – scheduling resources – creating critical path – counting the cost – being specific – publishing the resource schedule – cost schedules – scheduling the sequence. Monitoring and Control: Creating framework – collecting the data – visualizing progress – cost monitoring – earned value analysis – prioritizing monitoring – getting the project back to target – change control.

**UNIT-IV: Managing Contracts:** ISO 12207 approach – supply process – types of contract – stages in contract placement, management – acceptance. Managing People and Organizing Terms: understanding behavior – organizational behavior – selecting the right person for the job – instruction in the best methods – Motivation – Working in groups – becoming a team – decision making – Leadership – organizational structures – dispersed and virtual teams - influence of culture – stress – health and safety.

**UNIT-V: Software Quality:** The place of software quality in project planning – importance of software quality – defining software quality – ISO 9126 - practical software quality measures – product vs process quality management – external standards – techniques to help enhance software quality- quality plans. Small Projects: Introduction – Some problems with student projects – content of a project plan – conclusion.

**TEXTBOOK:**

1. SOFTWARE PROJECT MANAGEMENT – Bob Hughes & Mike Cotterell, 4<sup>th</sup> ed, PHI.

<b>Elective III - C</b>
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<b>ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS</b>
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Subject Description: This subject deals with various AI Concepts and Methodologies.

Goal: To Acquire Knowledge on various AI Techniques and Expert Systems.

Objective: To have enriched knowledge regarding heuristic search, Knowledge representation and Expert systems

UNIT I: Introduction: AI Problems – AI techniques – Criteria for success. Problems, Problem Spaces, Search: State space search – Production Systems – Problem Characteristics – Issues in design of Search.

UNIT II: Heuristic Search techniques: Generate and Test – Hill Climbing – Best-Fist, Problem Reduction, Constraint Satisfaction, Means-end analysis.

UNIT III: Knowledge representation issues: Representations and mappings – Approaches to Knowledge representations – Issues in Knowledge representations – Frame Problem.

UNIT IV: Using Predicate Logic: Representing simple facts in logic – Representing Instance and Isa relationships – Computable functions and predicates – Resolution – Natural deduction.

UNIT V: Representing knowledge using rules: Procedural Vs Declarative knowledge – Logic programming – Forward Vs Backward reasoning – Matching – Control knowledge

Brief explanation of Expert Systems-Definition- Characteristics-architecture- Knowledge Engineering- Expert System Life Cycle-Knowledge Acquisition Strategies- Expert System Tools.

Text Book:

1. Elaine rich and Kelvin Knight, “Artificial Intelligence “, Tata McGrawhill Publication, 2<sup>nd</sup> Edition, 1991.(chapters 1- 6 ).

Reference Book :

1. “Artificial Intelligence a modern Approach “– Stuart Russell & Peter Norvig, 2<sup>nd</sup> Edition Perason Education.

2. “Artificial Intelligence “, George F Luger , 4<sup>th</sup> Edition , Pearsons Education Publ, 2002.

3. “Foundations of Artificial Intelligent and Expert Systems”, V S JANAKI RAMAN, K SARUKESI, P GOPALAKRISHNAN, MacMillan India limited.,