

**4BHARATHIAR UNIVERSITY::COIMBATORE-641 046**  
**B.Sc. MULTIMEDIA & WEB TECHNOLOGY**  
**WITH COMPULSORY DIPLOMA IN COMPUTER NETWORKING**  
(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.Hrs	CIA	Marks	Total Marks	
	Semester I							
I	Language – I		6	3	25	75	100	3
II	English – I		6	3	25	75	100	3
III	Core 1: Data Structures and C Programming		4	3	25	75	100	4
	Core 2: Computer Organisation and Architecture		4	3	25	75	100	5
	Core Lab 1: C Programming Using Data Structures		3	3	40	60	100	3
	Allied 1: Mathematical Structures for Computer Science		5	3	25	75	100	5
IV	Environmental Studies #		2	3	-	50	50	2
	Semester II							
I	Language – II		6	3	25	75	100	3
II	English – II		6	3	25	75	100	3
III	Core 3: Object Oriented Programming with C++		6	3	25	75	100	4
	Core Lab 2: Programming in C++		4	3	40	60	100	3
	Allied 2: Discrete Mathematics		6	3	25	75	100	5
IV	Value Education – Human Rights #		2	3	-	50	50	2
	Semester III							
	Core 4: Introduction to Web Design and Applications		6	3	25	75	100	5
III	Core 5: Internet & Java Programming		6	3	25	75	100	4
III	Core Lab 3: HTML, XML, JAVA Script		5	3	40	60	100	3
III	Allied 3: Client/Server Computing		6	3	25	75	100	5
IV	Skill based Subject I – Diploma Paper - Data Communication and Networks		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: Computer Graphics	6	3	25	75	100	4
	Core 7: Multimedia & its Applications	6	3	25	75	100	5
	Core Lab 4: Computer Graphics & Multimedia	6	3	40	60	100	3
	Allied 4: Computer Aided Design and Manufacturing	6	3	25	75	100	5
IV	Skill based Subject 2 – Diploma paper - Network Lab	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: Animation Techniques	6	3	25	75	100	5
III	Core 9: System Programming	6	3	25	75	100	4
III	Core 10: Digital Image Processing	6	3	25	75	100	5
	Core Lab 5: Animation Lab	4	3	40	60	100	3
	Elective I	5	3	25	75	100	5
IV	Skill based Subject 3 - Diploma Paper - Network Security & Cryptography	3	3	25	75	100	3
	Semester VI						
	Core 11: .Net Programming	5	3	25	75	100	4
	Core 12: Mobile Computing	6	3	25	75	100	5
	Core Lab 6: Web Technology	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 Lab: Network Security Lab	3	3	40	60	100	3
V	Extension Activities @	-	-	50	-	50	1
	Total					3600	140

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

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<b>List of Elective papers (Colleges can choose any one of the paper as electives)</b>		
Elective – I	<b>A</b>	Embedded Systems
	<b>B</b>	Software Engineering
	<b>C</b>	Management Information Systems
Elective – II	<b>A</b>	Flash
	<b>B</b>	Distributed Computing
	<b>C</b>	E-Commerce
Elective - III	<b>A</b>	3Ds MAX Animation
	<b>B</b>	Web Services
	<b>C</b>	Software Project Management

## CORE 1 : 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 structural 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. Simple programmes using the above methods.

### UNIT V:

Searching and Sorting – Searching: Linear, Binary.

Sorting – Insertion, Selection, Bubble, Quick, Tree, Heap. Simple programmes using above methods.

**TEXT BOOK:**

Ashok N Kamthane, “PROGRAMMING AND DATA STRUCTURES” – Pearson Education, First Indian Print 2004, ISBN 81-297-0327-0.

**REFERENCE BOOK:**

1. E Balagurusamy: Programming in ANSI C, Tata McGraw-Hill, 1998.
2. Ellis Horowitz and Sartaj Sahni: Fundamentals of Data Structure, Galgotia Book Source, 1999.
3. Pradip Dey, Manas Ghosh , “ Computer fundamendals and programming in C “, Oxford University Press.

## **CORE 2 : COMPUTER ORGANISATION AND ARCHITECTURE**

**Subject Description:**

This subject deals with fundamentals of digital computers, Microprocessors and system architecture.

**Goal:**

To learn about computer fundamentals and its organization.

**Objective:**

On successful completion of this subject the students should have:

- Knowledge on digital circuits
- 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**

**CENTRAL PROCESSING UNIT:** General register organization – control word – examples of Micro operations – Stack organization – Instruction formats – Addressing modes – Data transfer and manipulation control.

**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, TATA McGRAW-HILL Pub. Company
2. Computer System Architecture, M. MORRIS MANO, Pearson Education Pub, III Edition.

## CORE LAB 1 : C PROGRAMMING LAB USING DATA STRUCTURES

1. Write a C program to create two array list of integers. Sort and store the elements of both of them in the third list.
2. Write a C program to experiment the operation of STACK using array implementation.
3. Write a C program to create menu drive program to implement QUEUE to perform the following:
  - I. Insertion
  - II. Deletion
  - III. Modification
  - IV. Listing of elements using pointers
4. Write a C program to create LINKED LIST representation of employee records and do the following operations using pointers:
  - I. To add a new record
  - II. To delete an existing record
  - III. To print the information about an employee
  - IV. 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 at the beginning of the Double linked list.
8. Write a C program to display the 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 transverse 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 Paper 1: MATHEMATICAL STRUCTURES FOR COMPUTER SCIENCE**

### **Subject Description:**

This subject deals with mathematical concepts like Matrices, Numerical analysis and Statistical methods for computer science and applications.

**Goal:** To learn about the mathematical structures for computer based applications.

### **Objective:**

On successful completion of this subject the students should have:

- Understanding the concepts of mathematics
- Learning applications of statistical and numerical methods for Computer Science.

### Unit I

Matrices – Introduction – Determination – Inverse of a matrix – Rank of a Matrix - Eigen value Problems

### Unit II

System of Simultaneous Linear algebraic Equation – Gauss elimination, Gauss Jordan, Gauss Seidal methods. The solution of Numerical Algebraic & Transcendental equation – Bisection method – Newton – Raphson method – false position method.

### Unit III

Numerical Difference ion – Newton's forward Difference - Backward Difference – Startling formula Numerical Integration – Trapezoidal Rule & Simpson's rule Numerical solutions of ordering differential Equations – Taylor series & Runge kutta method

### Unit IV

Measures of central tendency – Mean Media and Mode – Relationship among mean media and mode. Measures of dispersion – Range, quartile deviation, mean deviation and Standard deviation

### Unit V

Regression and Correlation – Types of relationship – Linear regression – Correlation – Coefficient of correlation – Regression equation of variables – Discrete Probability distribution – Uniform, Binomial & poisson Distribution

### Text Book:

1. Engineering Mathematics Volume II – Dr M.K. Venkataraman - NPC (Unit I)
2. Numerical Methods in science & Engineering - M.K. Venkataraman – NPC , Revised Edition -2005 (Unit II & III)
3. Business Statistics - S.P. Gupta & M.P. Gupta **Sultan Chand and Sons** (Unit IV & V)

### Reference Book:

1. Numerical methods – E. Balagurusamy Tata MC Graw Hill.
2. Fundamental of Mathematical statistics S C Gupta, V. K. Kapoor **Sultan Chand and Sons**

## **CORE 3 : OBJECT ORIENTED PROGRAMMING WITH C++**

### **Subject Description:**

This subject deals with Object-oriented programming concepts using C++.

### **Goal:**

To learn about on Object-oriented Programming concept.

### **Objective:**

On successful completion of this subject the students should have:

- Writing programming ability on OPDS concepts like Encapsulation, Abstraction, Inheritance, Polymorphism and Exception handling ect.,

### **UNIT-I**

Introduction to C++ - key concepts of Object-Oriented Programming –Advantages – Object Oriented Languages – I/O in C++ - C++ Declarations. Control Structures : - Decision Making and Statements : If .. else ,jump, goto, break, continue, Switch case statements - Loops in C++ : For,While, Do - Functions in C++ - Inline functions – Function Overloading.

### **UNIT-II**

Class and Objects: Declaring objects – Defining member functions – Static member variables and functions – Array of objects – Friend functions – Overloading member functions – Bit fields and Class – Constructor and Destructors – Characteristics – Calling constructor and Destructors – Constructor and Destructor with static member.

### **UNIT-III**

Operator Overloading: Overloading unary, binary operators – Overloading Friend functions – type conversion – Inheritance: Types of Inheritance – Single, Multilevel, Multiple, Hierarchal, 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 BOOKS :**

Ashok N Kamthane: Object-Oriented Programming with ANSI and Turbo C++, Pearson Education publication. 2003.

### **REFERENCE BOOKS:**

1. E. Balagurusamy: Object Oriented Programming with C++, TMH Pub., 1998.
2. Maria Litvin and Gary Litvin: C++ for you++, Vikas Publ, 2002.
3. John R Hubbard: Programming with C++, TMH Publ. II Edition, 2002.
4. Bhushan Trivedi , “ Programming with Ansi C++ “, Oxford university Press. 2007

### **CORE LAB 2 : PROGRAMMING IN C++**

1. Create a class to implement the data structure STACK. Write a constructor to initialize the TOP of the stack to 0. Write a member function POP( ) to delete an element. Check for overflow and underflow conditions.
2. Create a class ARITH which consists of a FLOAT and an integer Variable. Write member ADD(), SUB (), MUL (), DIV (), MOD () to perform addition, multiplication ,division and modulus Respectively. Write member functions to get and display values.
3. Create a class MAT has a 2-d matrix and R&C represents the rows and columns of the matrix. Overload the operators + ,-, \* to add subtract and multiply two matrices. Write member functions to get and display MAT object values.
4. Create a class STRING. Write member function to initialize, get and display strings .Overload the operator + to concatenate two strings, == to compare two strings and a member function to find the length of the string.
5. Create a class which consists of EMPLOYEE detail like eno, ename, dept, basic-salary, and grade. Write member functions to get and display them. Derive a class PAY from the above class and write a member function to calculate da , hra , pf depending on the grade and Display the Payslip in a neat format using console I/O.
6. Create a class SHAPE which consist of two VIRTUAL FUNCTIONS Cal\_Area( ) and Cal\_PERI to calculate AREA and PERIMETER of various figures. Derive three classes SQUARE, RECTANGLE and TRIANGLE from the class SHAPE and calculate AREA and PERIMETER of each class separately and Display the result. .
7. Create two classes which consists of two private variables, one float And one integer variables in each class. Write member functions to get and display them. Write FRIEND function common to arguments And the integer and float values of both the objects separately and Display the result.
8. Write a user defined function USERFUN( ) which has the formatting commands like setw( ) , showpoint , showpos precision( ). Write a program which prints an multiplication table and uses USERFUN( ) for formatting.
9. Write a program to perform Insertion, Deletion and Updation using files.
10. Write a program which takes a file as argument and copies in to another file with line numbers using Command Line Arguments.



## ALLIED PAPER 2 : DISCRETE MATHEMATICS

### Subject Description:

This subject deals with discrete structures like set theory, mathematical logic, relations, languages, graphs and trees.

**Goal:** To learn about the discrete structures for computer based applications.

### Objective:

On successful completion of this subject the students should have :

- Understanding the concepts of discrete mathematics
- Learning applications of discrete structures in Computer Science.

### Unit I

Set theory-Introduction-Set & its Elements-Set Description-Types of sets-Venn-Euler Diagrams- Set operations & Laws of set theory-Fundamental products-partitions of sets-minsets-Algebra of sets and Duality-Inclusion and Exclusion principle

### Unit II

Mathematical logic – Introduction- propositional calculus –Basic logical operations-Tautologies-Contradiction-Argument-Method of proof- Predicate calculus.

### Unit III

Relations – Binary Relations – Set operation on relations-Types of Relations – Partial order relation – Equivalence relation – Composition of relations – Functions – Types of functions – Invertible functions – Composition of functions.

### Unit IV

Languages – Operations on languages – Regular Expressions and regular languages – Grammar – Types of grammars – Finite state machine – Finite – State automata

### Unit V

Graph Theory – Basic terminology – paths, cycle & Connectivity – Sub graphs - Types of graphs – Representation of graphs in compute memory - Trees – Properties of trees – Binary trees – traversing Binary trees – Computer Representation of general trees.

### Text Books:

1. Discrete Mathematics – J.K. Sharma Second Edition – 2005 , Macmillan India Ltd.  
(UNIT I TO V)

### Reference Books:

1. Discrete Mathematics Structures with Applications to computer science - J. P Tremblay R Manohar – Mc Graw Hill International Edition  
Discrete Mathematics – Dr M. K. Venketaramen, Dr N.Sridharan, N. Chandarasekaran – The National publishing Company Chennai.

## Core 4 :INTRODUCTION TO WEB DESIGN AND APPLICATIONS

### UNIT I:

**Fundamentals of Electronic Mail :** Introduction - Email :Advantages and Disadvantages – User ids, Passwords and Email addresses - Message Components - Message Composition - Mailer Features - E mail Inner Workings - Email Management - MIME Types .  
**Browsing and Publishing ;** Introduction – Browser bare bones – Coast – to – Coast surfing – Hyber Text Markup Languages – Web page installation – Web page set up – HTML formatting and hyper link creation .

### UNIT II:

**The internet :** Introduction – internet defined – internet history – the way the internet works – internet congestion – Inter net culture – Business culture and the internet – collaborative computing and the internet .  
**World Wide Web :** introduction the web defined – web browser details – web writing styles – web presentation outline, design , and management – registering web pages.

### UNIT III:

**Searching the world wide web :** introduction – directories , search engines and metasearch engines – search fundamentals – search strategies – how does a search engine works.  
**Telnet and FTP :** introduction – telnet and remote login – File transfer – Computer Viruses .

### UNIT IV:

**Basic HTML :** introduction – semantic versus syntactic – based style types – headers and footers – lists – tables – debugging .  
**Advanced HTML :** introduction – frames – html forms – CGI scripts – dynamic documents – html tools – next generation html – cascading style sheets.

### UNIT V:

**News groups, Mailing Lists, Chat rooms and MUDs :** introduction – news groups and mailing lists history – mailing list fundamentals – newsgroups and mailing lists availability – chat-rooms – MUDs.  
**Electronic Publishing :** introduction – electronic publishing advantages and disadvantages – copy right issues – project Gutenberg and on-line books – electronic journals , magazines and news papers – miscellaneous publishing issues.

### TEXT BOOK:

Raymond Greenlaw, Ellen Hepp , Fundamentals of the INTERNET and the World Wide Web, Second Edition , Tata McGRAW –Hill Edition, 2005.

### Reference Books

1. K.L.James “ The Internet : “ A User guide “ , PHI , 2007.
2. C.Xavier , “ World Wide Web Design with HTML”, TMH 2007

## **Core 5: INTERNET AND JAVA PROGRAMMING**

### **UNIT I:**

Internet – An Introduction – The World Wide Web – Internet / Web Browsing – Internet addressing – Internet Protocols – Electronic Mail – Basic concepts of HTML .

### **UNIT II:**

Java Programming: Constants, Variables and Data Types – Operators and Expressions – Decision Making and Branching – Decision Making and Looping

### **UNIT III:**

Classes, Objects and Methods – Arrays, Strings and Vectors – Interfaces : Multiple Inheritance

### **UNIT IV:**

Multi threaded Programming: Creating Threads, Extending the Thread class – Stopping and Blocking a Thread – Life cycle of a thread – Using Thread Methods – Thread Priority. Managing Errors and Exceptions – Types of errors – Syntax – Multiple Catch statements

### **UNIT V:**

Applet Programming: Building Applet code – Applet Life cycle – Creating an executable applet – Designing a web page – Running the applet – Passing parameters to applets – Program examples. Graphics programming: Graphics class – Lines and Rectangles – Circles and Ellipses – Drawing Arcs and Polygons.

### **TEXT BOOK:**

E.Balagursamy, “ Programming with Java – A Primer”, Tata McGraw-Hill Publishing Company Limited, Third Edition, 2007

### **Reference Books**

- 1.ISRD Group ,” Introduction on to Object Oriented Programming through Java”, TMH publishing 2007.
- 2.John R.Hubbard .” Programming with Java “ , Schannm ’s outlines . TMH 2007.

## **Core Lab 3 : HTML, XML, JAVA Scripts**

### **Students are required to write code snippets, which covers the following objectives**

- Design Simple Web Pages using standard HTML tags like, HEAD, TITLE, BODY
- Design HTML web pages, which make use of INPUT, META, SCRIPT, FORM, APPLET, BGSOUND, MAP.
- Working with various attributes of standard HTML elements.
- Using Java Script's Window and document objects and their properties and various methods like alert (), eval (), ParseInt () etc. methods to give the dynamic functionality to HTML web pages.
- Writing Java Script snippet which make use of Java Script's inbuilt as well as user defined objects like navigator, Date Array, Event, Number etc.
- Write code which does the form validation in various INPUT elements like TextFiled, Text Area, Password, Selection list etc.
- Writing XML web Documents which make use of XML Declaration, Element Declaration, Attribute Declaration .
- Usage of Internal DTD, External DTD, Entity Declaration.

### **Allied Paper 3: CLIENT / SERVER COMPUTING**

#### **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.

## DIPLOMA 1 : DATA COMMUNICATION AND NETWORKS

### UNIT- I

**Introduction to communications and Networking :** Introduction – Fundamental concepts - Data communications – Protocols- standards - Standards organizations - Signal propagations- Analog and Digital signals- Bandwidth of a signal and a medium - Fourier analysis and the concept of bandwidth of a signal - The data transmission rate and the bandwidth.

**Information encoding:** Introduction – Representing different symbols- Minimizing errors- Multimedia – Multimedia and Data compression.

### UNIT- II

**Analog and digital transmission methods:** Introduction - Analog signal, Analog transmission - Digital signal, Digital transmission - Digital signal , Analog transmission - Baud rate and bits per second - Analog signal, Digital (Storage and) transmission - Nyquist Theorem.

**Modes of data transmission and Multiplexing:** Introduction – Parallel and Serial communication - Asynchronous, Synchronous and Isochronous communication - Simplex, Half-duplex and Full-duplex communication – Multiplexing - Types of Multiplexing - FDM versus TDM.

**Transmission Errors: Detection and correction :** Introduction – Error classification – Types of Errors – Error detection.

### UNIT- III

**Transmission media:** Introduction - Guided media - Un Guided media - Shannon capacity.

**Network topologies, switching and routing algorithms:** Introduction - Mesh topology - Star topology - Tree topology - Ring topology - Bus topology - Hybrid topology - Switching basics- Circuit switching – Packet switching - Message switching - Router and Routing – Factors affecting routing algorithms - Routing algorithm -Approaches to routing.

### UNIT- IV

**Networking protocols and OSI model:** Introduction – Protocols in computer communications - The OSI model - OSI layer functions.

**Integrated services digital networking (ISDN):** Introduction – Background of ISDN - ISDN architecture – ISDN interfaces - Functional grouping – Reference points - ISDN protocol architecture - Broadband ISDN (B-ISDN).

### UNIT- V

**Asynchronous transfer mode (ATM):** Introduction- Overview of ATM – Packet size – Virtual circuits in ATM – ATM cells – Switching – ATM layers – Miscellaneous Topics.

#### **Text book:**

Data Communications and Networks, ACHYUT. S. GODBOLE, Tata McGraw-Hill Publishing Company, 2007.

#### **Reference books**

1. Andrew S.Tanenbaum , “Computer Networks” , 4<sup>th</sup> Edition , PHI , 2007

## Core 6 :COMPUTER GRAPHICS

**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.

**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 and 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 and 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 COMPUTER GRAPHICS – William M. Newman & Robert F. Sproull**, 2007, TMH.

## **Core 7 :MULTIMEDIA & ITS APPLICATIONS**

**Subject Description :** This Subject deals with the Multimedia & its Application

**Goal : :** To learn about Multimedia

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

- Media , Sound & Audio , Images , Animation , Video etc.,

### **UNIT I :**

Introduction – Branch Overlapping Aspects of Multimedia Content – Global Structure – Multimedia Literature . Multimedia – Media and Data Streams – Medium .

### **UNIT II:**

Sound/Audio : Basic Sound Concepts – Music –Speech , Images and Graphics : Basic Concepts – Computer Image Processing – Video and Animation : Basic Concepts – Television – Computer Based Animation .

### **UNIT III:**

Data Compression : Storage Space – Coding Requirements – JPEG – MPEG – DVI , Optical Storage Media , Computer Technology – Multimedia Operating System.

### **UNIT IV:**

Networking System : Layers , Protocols and Services , Networks , Metropolitan Area Networks , WAN , Multimedia Communication System.

### **UNIT V:**

User Interfaces, Synchronization , Abstraction for Programming : Abstraction Levels – Libraries – System Software – Toolkit – Higher Programming Languages . Multimedia Application : Introduction – Media Population – Media Composition – Media Communication – Trends.

### **TEXT BOOK :**

Ralf Steinmetz & Klara Nahrstedt – “ Multimedia Computing , Communication & Applications “  
Pearson Education.

### **REFERENCE BOOK:**

- 1.Fred T,Hofstetter – “ Multimedia Literacy “ – 3<sup>rd</sup> edition TMH. 2005
2. Rajan Parekh , “ Principles of Multimedia “ TMH 2007

## **Core Lab 4 : COMPUTER GRAPHICS AND MULTIMEDIA LAB**

### **Graphics Lab:**

Design and implement the following algorithms:

1. Line Drawing (DDA, Bresenham's)
2. Circle Generation.
3. 2D Transformation.
4. Simple Animation (Bouncing ball, Blinking eye etc.,)
5. Histogram and Bar chart
6. Free hand drawing
7. Displaying text on different fonts.

### **Multimedia Lab:**

#### **Flash:-**

1. Creating movies.
2. Twined animation
3. Action scripts.

#### **Macro Media-Director**

1. Play school Teaching aid.
2. Advertisement for products, Institutions.
3. Animation of 3D object with sound.

#### **Free hand:-**

1. Designing the Gate, window etc.
2. Greeting card Design – Designing the Greeting card.

#### **Adobe Photoshop:-**

1. Editing the Images.
2. Design an Invitation.

## **Allied Paper 4: COMPUTER AIDED DESIGN AND MANUFACTURING**

### **UNIT – I:**

**Introduction:** CAD/ CAM Defined – The Product Cycle and CAD/CAM – Automation and CAD/CAM – Organization.

**Fundamentals of CAD:** Introduction – The Design Process – The Application of Computers for Design – Creating the Manufacturing Data Base – Benefits of Computer-Aided Design.

### **UNIT –II:**

**Hardware in Computer-Aided Design:** Introduction - The Design Workstation - The Graphics terminal - Operator input Devices- Plotters and Other Output Devices - The Central Processing Unit - Secondary Storage.

**Conventional Numerical Control:** Introduction – Basic Components of an NC System – The NC Procedure – NC Coordinate System – NC Motion Control Systems – Applications of Numerical Control – Economics of Numerical Control.

### **UNIT – III:**

**Robot Technology:** Introduction – Robot Physical Configurations – Basic Robot Motions – Other Technical Features – Programming the Robot – Robot Programming Languages – End Effectors – Work Cell Control and Interlocks – Robotic Sensors.



**Robot Applications:** General Considerations in Robot Applications – Material Transfer – Machine Loading - Welding - Spray Coating - Processing Operations - Assembly - Inspection.

**UNIT – IV:**

**Group Technology:** Introduction – Part Families – Part Classification and Coding - Three Parts Classification and Coding Systems – Group Technology Machine Cells – Benefits of group Technology.

**Computer-Aided Process Planning:** The Planning Function – Retrieval-Type Process Planning Systems – Generative Process Planning Systems – Benefits of CAPP – Machinability Data Systems – Computer-Generated Time Standards.

**UNIT – V:**

**Production Planning and Control:**

Introduction – Traditional Production Planning and Control – Problems with Traditional Production Planning and Control – Computer-Integrated Production Management System – Cost Planning and Control.

**Inventory Management and MRP:** Introduction – Inventory Management – Material Requirements Planning – Basic MRP Concepts – Inputs to MRP – How MRP works – MRP Output Reports – Benefit Of MRP – MRP II:Manufacturing Resource Planning.

**Text Books:**

**CAD/CAM Computer-Aided Design and Manufacturing, Mikell.P.Groover and Emory.W.Zimmers, Jr., Pearson Edition, 2003.**

**Diploma Paper 2 (Lab): NETWORK LAB**

Design and implement the following tasks:

1. Sending message to client using TCP/UDP.
2. Client/Server Communication using TCP and UDP.
3. Stop and wait protocol.
4. Display network configuration and system details.
5. Simulation of sliding window protocol
6. RPC.
7. FTP
8. Chatting Process
9. HTTP
10. Socket implementation

## **Core 8: ANIMATION TECHNIQUES**

**Subject Description :** This Subject deals with the Animation Techniques.

**Goal :** To learn about Animation Techniques.

**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 – History of Animation – Uses of Animation – Types of Animation – Principles of Animation – Some Techniques of Animation – Animation on the WEB – 3D Animation – Special Effects - Creating Animation.

**UNIT-II:** Creating Animation in Flash: Introduction to Flash Animation – Introduction to Flash – Working with the Timeline and Frame-based Animation - Working with the Timeline and Tween-based Animation – Understanding Layers - Actionscript.

**UNIT-III:** 3D Animation & its Concepts – Types of 3D 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 – Expression – Motion Capture Software's – Script Animation Usage – Different Language of Script Animation Among the Software.

**UNIT-V:** Concept Development –Story Developing –Audio & Video – Color Model – Device Independent Color Model – Gamma and Gamma Correction - Production Budgets - 3D Animated Movies.

### **TEXT BOOK:**

1. **PRINCIPLES OF MULTIMEDIA – Ranjan Parekh**, 2007, TMH. (Unit I, Unit V)
2. **Multimedia Technologies – Ashok Banerji, Ananda Mohan Ghosh – McGraw Hill Publication.** (Unit II: Chapter 10)

### **CORE-9: SYSTEM PROGRAMMING**

**Subject Description:** It deals Fundamentals of System Software and Resources of Operating System.

**Goal:** Knowledge on various System Software and Operating System concepts.

**Objective:** Enable the student to get sufficient knowledge on various system resources.

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**UNIT- I:** Introduction –System Software and machine architecture-Assemblers-Basic assembler functions - Machine dependent features-program relocation-Machine independent features – literals - symbol defining statements-expressions-program blocks-control sections and program linking - Assembler design options-one pass assemblers-multi pass assemblers.

Loader and Linkers: Basic Loader Functions - Machine dependent loader features – relocation – program – linking - Machine independent loader features - Automatic Library search - Loader options - Loader design options - linkage editor - dynamic linking - Bootstrap loader.

**UNIT- II:** Macroprocessor: Basic macroprocessor functions - Machine independent macroprocessor features - concatenation of macro parameter macro processor design options-recursive macro expansion - general purpose macro processor - macro processing within language translators. Text Editors: Overview of editing process - user interface - editor structure.

**UNIT-III:** Machine dependent compiler features - Intermediate form of the program-Machine dependent code optimization-machine independent compiler features-Compiler design options-division into passes-interpretors-p –code compilers-compiler-compilers.

**UNIT IV:** Introduction: Definition of DOS – History of DOS – Definition Of Process - Process states - process states transition – Interrupt processing – interrupt classes - Storage Management Real Storage: Real storage management strategies – Contiguous versus Non-contiguous storage allocation – Single User Contiguous Storage allocation- Fixed partition multiprogramming – Variable partition multiprogramming.

Virtual Storage: Virtual storage management strategies – Page replacement strategies – Working sets – Demand paging – page size.

**UNIT V:** Processor Management Job and Processor Scheduling: Preemptive Vs Non-preemptive scheduling – Priorities – Deadline scheduling - Device and Information Management Disk Performance Optimization: Operation of moving head disk storage – Need for disk scheduling – Seek Optimization –

File and Database Systems: File System – Functions – Organization – Allocating and freeing space – File descriptor – Access control matrix.

#### **TEXT BOOK:**

1. Leland –L-Beck, “System Software-An Introduction to Systems Programming”, Pearson Education Publishers, Third Edition-2003.
2. H. M Deitel , “ Operating Systems “ , 2<sup>nd</sup> Edition, Perason Education Publication,2003.

#### **REFERENCE BOOKS :**

1. Achyut s Godbole , “ Operating Systems” , TMH Publications , 2002
2. John J. Donovan , “Systems Programming ” , TMH Publications , 1991
3. D.M. Dhamdhrer, “Systems Programming and Operating Systems “ , 2<sup>nd</sup> Revised Edition.

## **Core 10: DIGITAL IMAGE PROCESSING**

### **UNIT – I**

Introduction to Digital Image Processing and its origins; Example fields using digital image processing; Fundamental steps in digital image processing; Components of an Image Processing system;

### **UNIT – II**

Image Enhancement: Intensity transformations and spatial filtering; Histogram processing; Fundamentals of spatial filtering; Smoothing and sharpening spatial filters; Filtering in frequency domain: Fourier Series and Transform; Sampling; Fourier Transform of Sampled Functions; Discrete Fourier Transform; Frequency Domain Filtering Fundamentals; Image smoothing and sharpening using Frequency Domain Filters; Homomorphic Filtering;

### **UNIT – III**

Image Compression Fundamentals: Lossless and Lossy Compression; Basic Compression Methods: Huffman Coding; Run-Length Coding; LZW Coding; Bit-Plane Coding; Predictive Coding; Transform Coding; Wavelet Coding;

### **UNIT – IV**

Image Segmentation: Fundamentals; Point, Line, and Edge Detection; Thresholding; Region-Based Segmentation; Motion-Based Segmentation;

### **UNIT – V**

Image Representation: Boundary Representation; Chain Codes; Polygonal Approximations; Signatures; Boundary Segments; Skeletons; Boundary Descriptors: Simple Descriptors; Shape Numbers;

### **Text Book:**

1. Rafael C. Gonzalez, Richard E. Woods, Digital Image Processing, PHI.

### **Reference Books:**

1. William K. Pratt, Digital Image Processing, John Wiley & Sons.
2. B.Chanda, D. Dutta Majumder, Digital Image Processing and Analysis, PHI.
3. A.K. Jain, Fundamental of Digital Image Processing, PHI.
4. Millman Sonka, Vaclav Hlavac, Image Processing Analysis and Machine vision, Thompson Learning.

## **Diploma 3: NETWORK SECURITY & CRYPTOGRAPHY**

### **UNIT I**

Overview: Services, Mechanisms, and Attacks – The OSI Security Architecture – A Model for Network Security – Classical Encryption Techniques: Symmetric Cipher Model – Substitution Techniques – Transposition Techniques – Rotor Machines – Steganography.

### **UNIT II**

Block Ciphers and the Data Encryption Standard Simplified DES – Block Cipher Principles – The Data Encryption Standard – The Strength of DES – Differential and Linear Cryptanalysis – Block Cipher Design Principles – Block Cipher Modes of Operation.

### **UNIT III**

Advanced Encryption Standard: Evaluation criteria for AES – The AES Cipher – Contemporary Symmetric Ciphers: Triple DES – Blowfish – RC5 – Characteristics of Advanced Symmetric Block Ciphers – RC4 Stream Cipher.

### **UNIT IV**

Confidentiality Using Symmetric Encryption: Placement of Encryption Function – Traffic Confidentiality – Key Distribution – Random Number Generation – Public – Key Cryptography and RSA: Principles of Public-key Cryptosystems – The RSA Algorithm.

### **UNIT V**

Key Management – Diffie-Hellman Key Exchange – Authentication Requirements – Authentication Functions – Digital Signatures and Authentication Protocols: Digital Signatures – Authentication Protocols – Digital Signature Standard.

### **Text Book:**

1. William Stallings, “Cryptography and Network Security – Principles and Practices”, Pearson Education / PHI, 3<sup>rd</sup> Edition, 2005.

### **Reference Books:**

1. C.P.Pfleeger, S.L.Pfleeger, “Security in Computing”, Pearson, 3<sup>rd</sup> Edition, 2003.
2. Bruce Schneier, Niel Ferguson, “Practical Cryptography”, Wiley, 2003.

### **Core Lab5 : ANIMATION LAB -Using Photoshop/Flash/Macro Media**

- How to Create Sun Flower?
- How to Create Water Drops?
- How to Animate Plane Flying the Clouds?
- How to Create Plastic Surgery For Nose?
- How to Create Mouse?
- How to Create See thru text?
- How to Create Military Clothe?
- How to Create Stone Texture?

- How to Create Rollover Buttons?
- How to Create Realistic Stone Structure?
- How to Create Web Page?
- How to Convert Black and White to Color Photo?
- How to Create IceText?
- How to Create Realistic Blood Structure?
- How to Create Fog Effects.

## **Core 11 : .NET PROGRAMMING**

### **UNIT I**

Introduction to .Net: .net framework- difference between VB6 and VB.Net-Object-Oriented programming and VB.Net-Data types-Variables-Operators-Arrays-Conditional logic.

### **UNIT II**

Procedures- Dialog boxes- File IO and System objects- Error handling- Namespaces-Classes and Objects- Multithreading-Message Queue- Programming MSMQ.

### **UNIT III**

VB.Net IDE-Compiling and Debugging-Customizing- Data access: ADO.Net- Visual studio .Net and ADO.Net. Windows Forms: Controls-Specific controls- Irregular forms.

### **UNIT IV**

Vb.Net and web: Introduction to ASP.Net page framework- HTML server controls- Web controls- Validation controls- Events-CSS- State management- Tracing- Security.

### **UNIT V**

Web Services: Introduction- Infrastructure- SOAP-Building web services- Deploying and publishing web services- Finding and consuming web services.

### **Text Book:**

1. Bill Evjen, Jason Beres, et.al, "Visual Basic .Net programming", Wiley Dreamtech India (p) Ltd. ISBN 81-265-0254-1. (Chapters: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 21, 22, 25, 26, 27, 29, 31, 32, 33, 34, 35, 36, 38, 39, 40, 42, 43, 44, 45, 46, 47, 48, 49, 50).

### **References:**

1. Fergal Grimes, "Microsoft .NET for programmers", shroff publishers & distributors (p) Ltd. ISBN 81-7366-540-0.
2. Thuan Thai & Hoang Q.Lam, ".NET Framework essentials", shroff publishers & distributors (p) Ltd. ISBN 81-7366-654-7

## **CORE 12 : MOBILE COMPUTING**

### **UNIT I :**

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.

### **UNIT II :**

MOBILE COMPUTING THROUGH TELEPHONY: Evaluation of telephony – Multiple access procedures – Mobile computing through telephone – IVR Application – Voice XML – TAPI.

### **UNIT III :**

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.

### **UNIT IV :**

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.

### **UNIT V :**

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 .

### **Text Book:**

MOBILE COMPUTING, Asoke K Talukder , Roopa R Yavagal, TMH, 2005

## **CORE LAB 6: WEB TECHNOLOGY LAB**

1. Design a personal web page using HTML.
2. Design a data entry form in HTML.
3. Write a Program in ASP to get data using a form, validate the data and returns the same data for correction if any using the same form.
4. Write a program in ASP to display the Session properties.

5. Write a program in ASP that makes use of Ad Rotator component.
6. Write a program in ASP that makes use of Browser Capabilities component.
7. Write a program in ASP that makes use of Content Rotator component.
8. Write a program in ASP that makes use of page counter component.
9. Write a program in ASP to get the data of students using forms and stores them in database.
10. Write a program in ASP to perform record navigation using a form.

#### **DIPLOMA 4 (LAB): NETWORK SECURITY LAB**

1. Write a program to encrypt the data using the encryption method using Substitution Ciphers
2. Write a program to implement DES algorithm.
3. Write a program to implement the Public Key Cryptography using Diffie -Hellman Algorithm.
4. Write a program to implement the Public Key Cryptography using RSA algorithm.
5. Write a program to secure the Database using User Authentication Security.
6. Write a server security program for Dynamic Page Generation.
7. Write a program for generation of random numbers.
8. Write a program to encrypt the data using the encryption method Transposition ciphers.
9. Write a program to implement a Simple Digital Signature Algorithm.

#### **ELECTIVE I – A : EMBEDDED SYSTEMS**

##### **UNIT I :**

An Embedded System – Processor in the System – Other Hardware Units – Software Embedded into a System , Exemplary Embedded Systems – Embedded System on Chip & VLSI Circuit. Processor & Memory Organization : Structural Units in a Processor – Processor Selection for an Embedded System – Memory Devices – Memory Selection for an Embedded System – DMA .

##### **UNIT II :**

Devices & Buses for Device Networks : I/O Devices – Timer & Counting Devices – Serial Communication Using the I<sup>2</sup> C, CAN & Advanced I/O Buses between the Networked Multiple Devices .Device Drivers – Parallel Port Device Drivers in a System – Serial Port Device Deriver in a System – Device Derivers for Internal Programmable Timing Devices .

##### **UNIT III :**

Software Programming in Assembly Language & in High Level Language “C” – C Program Elements : Headers & Source Files & Preprocessor Directives – Macros & Functions –



Data Types , Data Structures , Modifiers , Statements , Loops and Pointers – Queues – Stacks – List & Ordered Lists .

UNIT IV :

Real - Time Operating System : Operating System Services – I/O Subsystems – Network Operating Systems – Real Time & Embedded System Operating Systems – Interrupt Routines in RTOS Environment : Handling of Interrupt Source Call by the RTOSs – RTOS Task Scheduling Models , Interrupt Latency & Response Times of the Tasks as Performance Metrics - Mobile OS.

UNIT V :

Hardware – Software Co-Design in an Embedded System : Embedded System Project Management – Embedded System Design and Co-Design Issues in System Development Process – Design Cycle in the Development Phase for an Embedded System – Uses of Target System or its Emulator and In-Circuit Emulator (ICE) – Use of Software Tools for Development of an Embedded System – Use of Scopes & Logic Analysers for System Hardware Tests - Embedded Digital Signal Processors.

**Text Book:**

Raj Kamal – “ Embedded Systems – Architecture , Programming & Design “- Tata McGraw Hill . 2007

REFERENCES:

1. Jane. W. S. Liu, “Real-Time systems”, Pearson Education Asia, 2000
2. C. M. Krishna and K. G. Shin, “Real-Time Systems”, ,McGraw-Hill, 1997.
3. Frank Vahid and Tony Givargi, Embedded System Design: A Unified Hardware/Software Introduction, John Wiley & Sons, 2000.

## **ELECTIVE I – B : SOFTWARE ENGINEERING**

**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.

**ELECTIVE I – C : 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.

**ELECTIVE II – A : FLASH**

**UNIT I :**

An Introduction to Flash – What's New in Flash Mx 2004 – Simple Drawing Techniques – Adding Some Easy Animation – Learning about the Tools .

**UNIT II :**

Using the TimeLine – Controlling Drawn Objects – Creating Symbols – Using the Library – Importing & Optimizing Graphics.

**UNIT III :**

Adding & Optimizing Sounds – Importing & Using Video – Understanding Tweens - Adding Interactions.

**UNIT IV:**

Using Masking Techniques – Guiding Animations – Optimizing Your Movies – Creating Flash Movies - Creating Flash Movies for the Pocket PC .

**UNIT V:**

An Action Script Primer – Applying Action Script – Intermediate Action Script Examples .

**TEXT BOOK:**

Brian Underdahl – “ The Complete Reference – Macromedia Flash Mx2004 “ 2<sup>nd</sup> edition – TMH.

Reference Books

1. FLASH MX 2004 , Thyaghraran Anbumani , TMH .

**ELECTIVE II – B : DISTRIBUTED COMPUTING**

**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)
4. Stefans Ceri, Ginseppe Pelagatti “Distributed database Principles and systems” *McGraw Hill*

## **ELECTIVE II – C : E-COMMERCE**

**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.

### **ELECTIVE III – A : 3Ds MAX ANIMATION**

#### **UNIT I :**

Introducing Animations – Types of Animations – Animation Methods – Storyboarding -  
Introducing 3Ds Max – Interface Basics – Animation Tools & Controls – Creating a Simple  
Animation – Modifiers in Animations – Applying Modifiers to Animations – Controllers in  
Animations – Applying Controllers Using the Motions Panel – Applying Controllers Using the  
Track View Dialog Box.

#### **UNIT II :**

Animating using Constraints – Constraints in Animations – Applying Constraints to  
Animations – Introducing a Hierarchy – Animating Hierarchies – Particle Systems – Basics of  
Particle System – Creating Particle Systems in 3Ds Max – Types of Particle Systems in 3Ds Max  
– Creating Basic Particle Systems – Creating Advanced Particle Systems.

#### **UNIT III:**

Space Warps and Gizmos – Space Warps – Types of Space Warps in 3Ds Max –  
Applying Space Warps – Creating a Dynamic Simulation in 3Ds Max – Gizmos – Creating  
Gizmos – Animating with Lights – Lights in 3Ds Max – Adjusting Light Parameters – Additional  
Light Controllers – Animating Lights – Applying Lights to Create Animation.

#### **UNIT IV:**

Animating with Cameras – Types of Cameras – Camera View Port – Camera Parameters  
– Cameras in Animations – Animating with the Target and Free Cameras – Camera Matching.

#### **UNIT V:**

Rendering Animations – Rendering – Rendering Methods – Render Scene Dialog Box –  
Rendering Tools – Rendering an Animation – Previewing Animations – Using the RAM Player –  
Adding Effects to Animations – Environments Effects – Rendering Effects – Video Post .

#### **Text Book :**

3D Animation – An overview – Prentice Hall India.

#### **Reference Books**

1. George Avgerakis,. “ Digital Animation Bible”, TMH, 2005.
2. Barrett Fox. “ 3 D’s Max 6 Animation “, TMH , 2005.

### **ELECTIVE III – B : WEB SERVICES**

**Subject Title : Web Services**

**Course Number:**

**Number of Instruction Hours: 3 Number of Credits : 4**

#### **Subject Description**

This Course presents the Web Services Provided.

**Goal :** To enable the students to learn what is web service and Protocols used for Web services

## **Objective**

On successful completion of the course the students should have:

- Understood how to build the real world applications using Web Services.

## **Contents**

### **Unit I**

Introduction to Web Services – Industry standards, Technologies and Concepts underlying Web Services – their support to Web Services, Applications that consume Web Services.

### **Unit II**

XML – its choice for Web Services – Network protocols to backend databases – Technologies – SOAP, WSDL – exchange of information between applications in distributed environment – Locating remote Web Services – its access and usage, UDDI Specification – an introduction.

### **Unit III**

A brief outline of Web Services – Conversation – static and interactive aspects of system interface and its implementation, Work Flow – Orchestration and refinement, Transactions, Security issues – the Common attacks – security attacks facilitated within Web services Quality of Services – Architecting of systems to meet users requirement with respect to latency, performance, reliability, QOS metrics, Mobile and wireless Services – energy consumption, network bandwidth utilization, Portals and Services Management.

### **Unit – IV**

Building real world Enterprise applications using Web Services – sample source codes to develop Web Services – Steps necessary to build and deploy Web Services and Client applications to meet Customer’s requirement – Easier development, Customisation, maintenance, Transactional requirements, seamless porting to multiple devices and platforms.

### **Unit – V**

Development of Web Services and applications onto Tomcat application Server and Axis SOAP server (both are freewares) – Web Services Platform as a set of Enabling technologies for XML based distributed Computing.

## **REFERENCE BOOKS :**

1. Sandeep Chatterjee, James Webber, “Developing Enterprise Web Services: An Architects Guide”, Prentice Hall, Nov 2003
2. Keith Ballinger, “NET Web services: Architecture and Implementation with .Net”, Pearson Education, First Education Feb 2003.
3. Ramesh Nagappan, Developing Java Web Services: Architecting and developing secure Web Services Using Java”, John Wiley and Sons, first Edition Feb 2003
4. Eric A Marks and Mark J Werrell, “Executive Guide to Web services”, John Wiley and sons, March 2003
5. Anne Thomas Manes, “Web Services: A managers Guide” Addison Wesley, June 2003.

### **ELECTIVE III – C : SOFTWARE PROJECT MANAGEMENT**

**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.