J.J College of Arts and Science (Autonomous), Pudukkottai – 622 422

M.Sc – IT (Course Structure under CBCS)

(For the Candidates admitted from academic year 2016 – 2017)

Semester		Paper Code	Course	Title	Instruct Hours/ Week	credit	Exam Hours	Marks		Total
								Internal	External	
I		P1RITCC1	CC - 1	Fundamentals of Multimedia Technology	5	5	3	25	75	100
		P1RITCC2	CC - 2	PHP Scripting Language	5	5	3	25	75	100
		P1RITCC3	CC - 3	OOAD AND UML	5	5	3	25	75	100
		P1RITCC4	CC - 4	Relational Data Base Systems	5	5	3	25	75	100
		P1RITEC1	EC - 1	Elective Course-1 (Taken from list of Electives)	5	3	3	25	75	100
		P1RITCC5P	CC - 5	PHP Scripting Practical	5	5	3	40	60	100
					30	**28**				**600**
II		P2RITCC6	CC - 6	Advanced Java Programming	5	5	3	25	75	100
		P2RITCC7	CC - 7	Middleware Technologies	5	5	3	25	75	100
		P2RITCC8	CC - 8	Cloud Computing	5	5	3	25	75	100
		P2RITCC9	CC - 9	Data Mining	5	5	3	25	75	100
		P2RITEC2	EC - 2	Elective Course-2	5	3	3	25	75	100

				(Taken from list of Electives)						
		P2RITCC10P	CC - 10	Advanced Java Programming Practical	5	5	3	40	60	100
					30	**28**				**600**

III		P3RITCC11	CC - 11	Distributed Technology	6	5	3	25	75	100
		P3RITCC12	CC - 12	Web Technology	6	5	3	25	75	100
		P3RITEC3	EC - 3	Elective Course-3 (Taken from list of Electives)	6	3	3	25	75	100
		P3RITEC4	EC - 4	Elective Course-4 (Taken from list of Electives)	6	3	3	25	75	100
		P3RITCC13P	CC - 13	Distributed Technology Practical	6	5	3	40	60	100
					30	**21**				**500**
		P4RITCC14	CC - 14	Software Testing	6	5	3	25	75	100
IV		P4RITCC15PW	CC - 15	Project work		8				100
						13				**200**
TOTAL CREDITS/MARKS						**90**				**1900**

FUNDAMENTALS OF MULTIMEDIA TECHNOLOGY - C. C - I

Objectives:

- To identify a range of concepts, techniques and tools for creating and editing the interactive multimedia applications.
- To identify the current and future issues related to multimedia technology.
- To identify both theoretical and practical aspects in designing multimedia systems surrounding the emergence of multimedia technologies using contemporary hardware and software technologies.

UNIT-I: Graphics and Images : Introduction to Multimedia – Multimedia Authoring and Tools – Graphics and Image Data Representations.

UNIT-II: Colors and Videos : Color in Image and Video: Color Science- Color Models and Images -Fundamental Concepts in Video.

UNIT-III: Digital Audio : Basics of Digital Audio: Digitization of sound- MIDI: Musical Instrument Digital Interface- Lossless Compression Algorithms

UNIT-IV: Distortion : Lossy Compression Algorithms: Introduction- distortion Measures- The Rate Distortion Theory- Quantization- Wavelet Based Coding- Wavelet Packets- Image Compression Standards.

UNIT-V: Multimedia : Computer and Multimedia Networks- Multimedia network communications and applications.

TEXT BOOK:

1.Ze-Nian Li and Mark S. Drew , Fundamentals of Multimedia , Pearson education / Prentice Hall of India, First Edition,2006, (ISBN 81-7758-823-0)

[Unit-1 :(Chapters 1,2,3); Unit-2 : (Chapters 4(4.1,4.2)5); Unit-3 (Chapters 6(6.1,6.2),7); Unit-4 (Chapters 8(8.1,8.2,8.3,8.4,8.6,8.7),9);Unit-5 (Chapters 15,16)]

REFERENCE BOOK:

1. Computer Graphics & Animations by M.C. Trivedi, Jaico publishing House, 2009.

PHP SCRIPTING LANGUAGE - C.C - II

Objective:

1. To make students understand the significance of server oriented scripting language.
2. To teach the students the similarities between PHP and the other programming languages.
3. To bring up the students to learn about the exclusive characteristics of PHP.

UNIT I : Introduction to PHP : Essential of PHP: Introduction to PHP-Variables and Constants-Operators and flow control: Types of Operators-Conditional statements and loops-skipping iterations.

UNIT II : Strings, Arrays and Functions : Strings and arrays: Sting functions-Converting and formatting strings-Array building , modifying, deleting arrays-Extracting, sorting, comparing array elements - Creating functions: Creating functions -passing functions, arrays, reference, varying number of arguments- Returning data, array, list, reference – Global data-Conditional functions – variable functions, Nesting functions.

UNIT III: Reading data and Browser power : Reading data in web pages – Handling all controls - PHP browser handling power-HTTP headers –dumping form's data- data validation – client-side validation

UNIT IV : OOP and Advanced OOP : Object Oriented programming:Classes-Objects-Accesses-Constructors-Destructors-Overriding methods- Overloading methods- Auto loading classes-Advanced Object oriented programming: Static methods-static members-Abstract classes – Interfaces-Object iteration – Comparing objects – Class constants –Final keyword – Cloning

UNIT V: Files and databases : File handling :File open -File close-–Reading a file –Checking file existence – Using fseek-Copying files- Deleting files-Writing to a file– Working with databases: Creating database-Creating tables- Accessing database – Updating database-Inserting items – Deleting records Sessions, Cookies and FTP.

TEXT BOOK

PHP: The Complete Reference by Steven Holzner,TATA Mc Graw Hill Edition-2008,New Delhi.

Chapters

Unit-1: chapters 1, 2 ; Unit-2: chapters 3,4 ; Unit-3:chapters 5,6 ; Unit-4:chapters 7,8

Unit-5: chapters 9, 10,11

REFERENCE BOOK:

Learning PHP 5 by David Sklar, Shroff publishers and distributors Pvt.Ltd.

OOAD AND UML - C.C- III

Objectives:

- Develop a working understanding of formal object-oriented analysis and design processes.
- Develop an appreciation for and understanding of the risks inherent to large-scale software development.
- Learn (through experience!) techniques, processes, and artifacts that can mitigate these risks.
- Develop the skills to determine which processes and OOAD techniques should be applied to a given project and to develop an understanding of the application of OOAD practices from a software project management perspective

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

UNIT II: Introduction to UML : Various object oriented methodologies – Introduction to UML

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

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

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

TEXT BOOKS:

1. Bahrami Ali, Object oriented systems development, Irwin McGrawHill, 2005 (First 4 units covered here).

2. Booch Grady, Rumbaugh James, Jacobson Ivar, The Unified modeling language – User Guide, Pearson education, 2006 (ISBN 81-7758-372-7) (UNIT -5 covered here).

REFERENCES:

1. Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education.

2. Pascal Roques : Modeling Software Systems Using UML2, WILEY-Dreamtech India Pvt. Ltd.

RELATIONAL DATABASE SYSTEMS - C.C - IV

Objectives:

1. Explain the main advantages of modern database management systems over file systems.
2. Design, create, and query relational databases to satisfy user requirements.
3. Design, build and deploy database-backed applications with dynamic website front-end.
4. Implement data access control mechanisms for database and application security.
5. Analyze the ethical issues and responsibilities related to records management and its impact on privacy, discrimination, etc. and its local and global impact on society.

Unit I: Introduction to database systems and Architecture : Introduction to database systems: Basic concepts and definitions-Data dictionary-database- Database system- Data administrator-Database administrator-File oriented system versus Database systems- Database system architecture

Unit II: Relational Query Language and ER model : Relational Query Language: SQL –QBE. ER model: Introduction – Basic concepts – Conversion of ER model into relations –Problem with ER model – ER diagram symbols.

Unit III: Database Design and Normalization : Introduction to database design: introduction-software development life cycle-Database development life cycle-Normalization: introduction-normalization-normal forms-BCNF-4NF-5NF.

Unit IV: Transaction Processing : Transaction Processing: introduction, Transaction concepts, Concurrency control, Locking and Timestamp methods for concurrency control, Database Recovery System-Database Security.

Unit V: Object oriented Databases : Object oriented databases: Introduction, Object oriented data model, object oriented database, object oriented DBMS, Object data management group-object relational databases -Distributed database systems

Text Book:

Database Systems – S.K.Singn , Published by Dorlong Kindersley (India) Pvt Ltd Unit I- Chapter 1,2 Unit II-Chapters 5,6 Unit III - Chapter 8,10 Unit IV-Chapter 12,13,14 Unit V- Chapter 15,16,18.

REFERENCE BOOK:

1. Date. C.J, An Introduction to database systems, Eight edition, Pearson Education, India, 2003

PHP and Scripting Language practical - C.C - V

1. Create a Web Page to check page Data Validation using Java Script.

2. Create a web page which displays mouse Co-ordinates using Java script.

3. Develop a PHP program using String and Arrays.

4. Develop a PHP program and use default arguments.

5. Create a PHP program for reading data and navigate data between pages.

6. Develop a PHP program for method overloading.

7. Develop a PHP program for auto loading.

8. Create and execute a PHP program using interfaces.

9. Create a PHP program for reading and writing a file.

10. Develop a PHP program to display the table contents using SQL queries on the browser.

COMPUTER NETWORKS - E.C-I

Objectives:

- Explain the importance of data communications and the Internet in supporting business communications and daily activities.
- Explain how communication works in data networks and the Internet.
- Recognize the different internetworking devices and their functions.
- Explain the role of protocols in networking and analyze the services and features of the various layers of data networks.
- Design, calculate, and apply subnet masks and addresses to fulfill networking requirements and analyze the features and operations of various application layer protocols such as Http and DNS.

UNIT I: **OSI Model :** Introduction to Networks- Data Communications- Network Models- Categories of Networks- OSI Model- TCP/IP Protocol Suite - Physical Layer: Transmission Media –Multiplexing – Switching.

UNIT II: Data Link Layer : Data Link Layer: Error Detection- Error Correction- Flow Control- Error Control- HDLC- Virtual Circuit Networks: Frame Relay- ATM.

UNIT III: Network Layer : The Network Layer: Internetworking- Need for Network Layer- IPV4- IPV6- Routing Algorithms- ICMP.

UNIT IV: Transport Layer : Transport Layer: UDP- TCP- Congestion- Congestion Control Mechanisms- Quality of Service

UNIT V: Application Layer : Application Layer: DNS – Namespace- Domain Name Space- DNS in the Internet - Remote Login -Electronic Mail - File Transfer

Text book:

1. Data Communications and Networking, Behrouz A.Forouzan, 4th edition
   [Unit-1 :(Chapters 1,2,7,8); Unit-2 : (Chapters 10,11,18); Unit-3 (Chapters 20,21,22,); Unit-4 (Chapters 23,24);Unit-5 (Chapters25,26)]

Reference Book:

1. COMPUTER NETWORKS -Andrew S. Tanenebaum, PHI Publications, Third Edition, 2001.

Semester 2

CORE COURSE 6 – ADVANCED JAVA PROGRAMMING

Objectives:

1. To develop programming skill and to solve scientific problems using java Programming.
2. To enable the students to understand the core and advanced principles of the Java Language and use visual tools to produce well designed, effective applications and applets.
3. Develop distributed applications using RMI .
4. Develop server side programs in the form of servlets
5. Develop Swing-based GUI Develop client/server applications and TCP/IP socket programming

UNIT I: JAVA FUNDAMENTALS

Object and classes-java language-The Primaries: introduction-character set-Tokens-Constants-Variables-Operators and Expressions-Library Methods-Strings-I/O Statements-Control Statement: If Statement-Switch Statement-While Statement-Do While Statement-For Statement.

Unit II: JDBC Classes

Introduction – Establishing a connection – Creation of Data Tables – Entering data into the tables – Table updating –Use of Prepared statement – Obtaining metadata – Using Transactions – Scrollable Result sets – Stored procedures.

Unit III: Remote Method Invocation

Introduction – Remote Interface – java.rmi.Server Package – The Naming class – RMISecurityManager class – RMI Exceptions – Steps involved in creating RMI Client and Server Classes.

Unit IV: JAVA Servlet

Introduction – Life cycle of a servlet – A simple servlet – Retrieving the values of parameters – Retrieving the values of initialization parameters – Cookies – Creating a cookie and sending it to the client – Retrieving the stored cookies – Session Tracking.

Unit V: Swing Controls

Introduction – JApplet – JLabel – JButton – JTextField – JCheckBox – JRadioButton – JComboBox – Menus –JScrollPane - Tables.

Text Books

1. Programming with Java –C.Muthu. Unit I(Chapter 1,2,3)Unit II(Chapter 18)- Unit III(Chapter 20) –Unit IV(Chapter 19) unit V(Chapter11), Vijay Nicole publications, Second Edition, 2011

References

1. Deitel & Deitel, "Java How to Program", Prentice Hall, 5th Edition ,2002

2. Peter Haggar, "Practical Java: Programming Language Guide", AddisonWesley Pub Co, 1st Edition, 2000

3. Bruce Eckel, "Thinking in Java", Pearson Education Asia, 2nd Edition, 2000

Semester 2

CORE COURSE 7 – MIDDLEWARE TECHNOLOGIES

Objectives:

- To provide the foundation knowledge of middleware, particularly object-oriented Middleware
- understand the motivation of using middleware;
- understand the basic theories underlying the design of middleware;
- learn to make judgment in choosing a suitable middleware for application problems.

UNIT I: Client / Server Concepts

Client – Server – File Server, Database server, Group server, Object server, Web server .Middleware – General Middleware – Service specific middleware. Client / Server Building blocks – RPC – Messaging – Peer – to- Peer.

UNIT II: Ejb Architecture

EJB – EJB Architecture – Overview of EJB software architecture – View of EJB – Conversation – Building and Deploying EJBs – Roles in EJB.

UNIT III: Ejb Applications

EJB Session Beans – EJB entity beans – EJB clients – EJB Deployment – Building an application with EJB.

UNIT IV: CORBA

CORBA – Distributed Systems – Purpose – Exploring CORBA alternatives – Architecture overview – CORBA and networking model – CORBA object model – IDL – ORB – Building an application with CORBA.

UNIT V: COM

COM – Data types – Interfaces – Proxy and Stub – Marshalling – Implementing Server / Client – Interface Pointers – Object Creation, Invocation , Destruction – Comparison COM and CORBA – Introduction to .NET – Overview of .NET architecture – Marshalling – Remoting.

TEXT BOOKS

1. Robert Orfali, Dan Harkey and Jeri Edwards, “The Essential Client/Server Survival Guide”, Galgotia Publications Pvt. Ltd., 2002. (Unit 1)

2. Tom Valesky,”Enterprise Java Beans”,Pearson Education, 2002.(Unit 2 & 3)

3. Jason Pritchard,”COM and CORBA side by side”, Addison Wesley,2000 (Unit 4 & 5)

4. Jesse Liberty, “Programming C#”, 2nd Edition, O’Reilly Press, 2002. (Unit 5)

REFERNCES

1. Mowbray,”Inside CORBA”, Pearson Education, 2002.

2. Jeremy Rosenberger,” Teach yourself CORBA in 14 days”, Tec media, 2000

Semester 2

CORE COURSE 8 - CLOUD COMPUTING

Objectives:

1. To impart fundamental concepts in the area of cloud computing.

2. To impart knowledge in applications of cloud computing.

3. Understanding the systems, protocols and mechanisms to support cloud computing.

4. Understanding the hardware necessary for cloud computing.

UNIT I: Cloud Computing Basics and Benefits

Overview: Applications- Intranet and the cloud – First Movers in the cloud – Organization and Cloud Computing: Benefits – Limitations – Security concerns –Regulatory issues.

UNIT II: Cloud Computing With the Titans

Google - EMC – NetApp – Microsoft – Amazon – Salesf1orce.com - IBM.

UNIT III: Business Case for the Cloud

Cloud Computing Services - How those applications help our Business – Deleting the Data Centre – Salesforce.com – Thomson Reuters – Hardware and Infrastructure: Clients – Security – Network – Services.

UNIT IV: Accessing the Cloud

Platforms – Web applications – Web API – Web Browsers - Cloud storage – Storage Providers.

UNIT V: Best Practices

Standards: Application – Client – Infrastructure – Service- Best practices and the cloud computing: Analyze the service- Best practices – How cloud computing might evolve.

TEXT BOOK

Cloud Computing - A Practical Approach by Anthony T. Velte, Toby J.Velte , Robert Elsenpeter, Tata McGraw-Hill Edition-2010.

Chapters

Unit-1: chapters 1, 2 Unit-2: chapter 3 Unit-3: chapters 4, 5 Unit-4: chapters 6, 7

Unit-5: chapters 8, 14.

REFERENCE BOOK

Cloud Computing by Kris Jamsa, Jones & Bartlett student edition.

Semester 2

CORE COURSE 9 –DATA MINING

Objectives:

- To learn about fundamentals of Data Mining.
- To impart knowledge in various Data Association techniques.
- To understand how to consolidate huge volume of data in one place efficiently.
- Understanding the concept of Data warehousing.

UNIT I: Overview & Association Rule Mining

Introduction -Data Mining process – Applications – Techniques – Practical Examples – Future – Guidelines – Limitations – Data mining software – Association Rule mining: Basics – The Task and a Naïve algorithm- Improving the efficiency of the Apriori algorithm – Apiriori-TID – Direct Hashing and Pruning – Dynamic Item set Counting –FP Growth – Performance evaluation of algorithms.

UNIT II: Classification & Cluster analysis

Introduction – Decision Tree – Building a decision tree – Split Algorithm (Information Theory) – Split Algorithm(Gini index) – Overfitting and Pruning – Decision tree rules – summary – Naïve Bayes method – Estimating predictive accuracy of classification methods – Improving accuracy – other evaluation criteria – Classification software – Cluster Analysis: Introduction – Desired features – Types of cluster analysis methods – Partitional methods – - Hierarchical methods – Density based methods – Dealing with large Databases – Quality and validity of Cluster analysis methods – Cluster analysis software.

UNIT III: Web Data Mining

Introduction – Web mining – Web Terminology and characteristics – Locality and Hierarchy in the web – Web content mining – Web usage mining – Web structure mining – Web mining software – Search Engines: Introduction – Difference between Web search and information retrieval – Characteristics of search engines – Functionality – Architecture – Ranking of web pages – Search query mining – Individual privacy and Query data mining.

UNIT IV: Data Warehousing

Introduction – Operational Data stores – Data warehouses – Data warehouse Design – Guidelines for Data warehouse implementation – Data warehouse metadata – Software for ODS and Data warehousing.

UNIT V: Information Privacy

Online analytical processing (OLAP): – Introduction – OLAP – Characteristics – Motivations – Multidimensional view and Data cube – Implementations – Operations – Guidelines – OLAP software – Information Privacy: Basics principles – Privacy legislation – Uses and misuses of Data mining – Primary aims – Pitfalls of Datamining.

Text Book:

1. G. K. Gupta, Introduction to Data mining with case studies, Pretince Hall India, 2006. Unit 1- Chapters 1,2; Unit 2 – Chapters 3,4; Unit 3 – Chapters 5,6; Unit 4 – Chapters 7, Unit 5 – Chapters 8, 9.

Reference Book:

1. K.P. Soman & Shyam and V.Ajay, Insight to Data Mining Theory and Practice, Pretice Hall of India, 2006.

Semester 2

CORE COURSE 10- ADVANCED JAVA PROGRAMMING PRACTICAL

1. Write Java program to use inheritance.

2. Write a Java program to find the area of rectangle using constructor.

3. Create a Japplet using swing control, which will create the layout shown

below and handle necessary events.

Format

Enter your name:

Enter your age:

select your s/w: *Oracle *Visual Basic *Java

select your city : *Delhi *Mumbai *Chennai

Ok Cancel

4. Use JDBC connectivity and create table, insert and update data.

5. Write a program in Java to list records using JDBC connectivity.

6. Write a program in Java to implement a client/server application using RMI.

7. Write a program in Java to create servlet to count the number of visitors to a web page.

8. Write a program in Java to create a form and validate a password using servlet.

9. Write a program in Java to convert an image in RGB to a grayscale image.

10. Develop chat server using java.

Semester 2

ELECTIVE COURSE 2 -E-COMMERCE

Objectives:

- Understand the nature of e-Commerce.
- Recognize the business impact and potential of e-Commerce.
- Explain the technologies required to make e-Commerce viable.
- Discuss the current drivers and inhibitors facing the business world in adopting and using e-Commerce.
- Explain the economic consequences of e-Commerce.
- Discuss the trends in e-Commerce and the use of the Internet.

Unit I: Introduction to E-Commerce

E-Commerce Framework-Anatomy of E-Commerce applications-E-commerce Consumer Applications-E-commerce organization applications-Network Infrastructure for E-Commerce: Components of the I-way-Network Access Equipment-Global Information Distribution Networks.

Unit II: Internet as a Network Infrastructure

The internet Terminology-Chronological history of the internet-NEFNET: Architecture and Components-National research and education network-Globalization of the academic internet-The business of internet communication: Telco/cable/online companies-National independent ISPs-Regional level ISPs-Local level ISPs-Service providers abroad-service provider connectivity: network intercommunication points-internet connectivity options.

Unit III: Network Security and Firewalls:

Client server network security-Emerging client server security threats-firewalls and network security-data and message security-challenge response systems-encrypted documents and e-mail-e-Commerce and WWW: Architectural framework for E-Commerce- technology behind the web-security and the web-consumer oriented e-Commerce: consumer oriented applications-Mercantile models from the consumer's perspective.

UnitIV: Electronic Payment Systems:

Types of Electronic payment systems-Digital token based Electronic Payment Systems-Smart cards Electronic Payment systems-credit card based Electronic payment systems.-RISK and Electronic payment systems.

Unit V: Electronic Data Interchange:

Electronic data interchange-EDI applications in Business-EDI :Legal security and privacy issues-EDI and Electronic commerce-EDI Software implementations-EDI Envelope for Message transport-Value added networks-internet based EDI

TEXTBOOK

1. ”Frontiers of e-commerce” by Ravi kalakota and Andrew B.Whinston-pearson edu. Unit I(Chapter 1,2)- Unit II(Chapter 3,4)- Unit III(Chapter 5,6,7)- Unit IV(Chapter 8)- Unit V(Chapter 9,10).

REFERENCE BOOK

1) “E-commerce The Cutting Edge of Business”2-edition by kamalesh, k.Bajaj, Debjani Nag-Tata McGraw Hill

2)”E-commerce: Doing business through internet” by S.Jaiswal – Galgotia pub -2001

Semester 3

CORE COURSE 11 -DISTRIBUTED TECHNOLOGY

Objectives:

- To impart knowledge in understanding .NET Framework.
- Understanding the nature of Distributed applications.
- Learning advanced ASP.NET controls.
- Learning database connectivity.
- Developing a simple distributed application.

Unit I: Understanding .NET Framework

Client Server Architecture – 2 Tier Architecture – 3 Tier Model and N Tier Model – Dot Net Architecture

Unit II: Getting Started with ASP .NET

ASP .Net: Introduction – Architecture – ASP .Net Runtime – Internet Information Services – Visual Web Developer – web server – ASP .Net Parser – Assemblies- Page Class.

Unit – III: Building Form with Web Controls

Web server Controls – HTML Controls – AD Rotator and Calendar Controls – Validation Controls – Security Management.

Unit- IV: ASP .Net and ADO .Net

ASP .Net and ADO .Net – System. Data – SQL Client and XML Namespaces – Provider Objects and Consumer Objects.

Unit V: Provider Objects and Consumer Objects

Provider Objects and Consumer Objects – disconnected Data Access – Grid View – Form View

TEXTBOOK:

1. "ASP .Net Bible" Hungry Minds by Mridula Parishal and et al.[**unit: I** – Chapter 1 – **Unit II:** Chapter 2 – **Unit III:** Chapter 3,4,5,6 –**Unit IV :** chapter 8,9,13 – **unit V:** chapter 12]

REFERENCE BOOK:

1. ASP.NET Black Book By Steven Holznor, 2005

Semester 3

CORE COUSE 12 – WEB TECHNOLOGY

Objectives:

- Understanding the functions of various protocols.
- Learn How to create dynamic web pages.
- Learning about E-commerce concepts.
- Learning basics of .NET technology.

UNIT-I: OSI Model

OSI Model – Internetworking concepts – IP, ARP, RARP, ICMP, TCP, UDP protocols and their internal details.

UNIT-II: Protocols

DNS, SMTP/Email, FTP, TFTP, WWW, HTTP, TELNET protocols and their details – Introduction to electronic commerce.

UNIT-III: Introduction to Web technology

Introduction to Web technology – Dynamic web pages – Active web pages.

UNIT-IV: User sessions in E-commerce

User sessions in E-commerce – Electronic commerce Transaction Management – Electronic commerce Security issues – Online payment processing mechanisms.

UNIT-V: Technology for E-commerce

Middleware and Component technology for E-commerce – Electronic data interchange – Case study: Online shopping with ASP – Overview of .NET technology.

TEXT BOOK:

1. Godbole Achyut S. , Kahate, Atul, Web technologies, Tata McGrawHill, 2003(ISBN 0-07-047298-x) [Unit-1 :(Chapters 1,2,3,4); Unit-2 : (Chapters 5,6,7); Unit-3 (Chapters 8,9,10); Unit-4 (Chapters 11,12,13,14) ; Unit-5 (Chapters 15,16,Appendix- A,B)

REFERENCE BOOK:

1."Frontiers of e-commerce" by Ravi kalakota and Andrew B.Whinston-pearson Edu.

Semester 3

CORE COURSE 13-DISTRIBUTED TECHNOLOGY PRACTICAL

1. Design ASP .Net web from using Html server Controls to enter job Seeker's details

2. Create an ASP .Net web form using web controls to enter E-Mail registration form.

3. Apply appropriate validation techniques in E-Mail registration form using Validation controls.

4. Write an ASP .Net application to retrieve form data and display it the Client browser in a tablet format.

5. Create a web application using ADO .Net that uses which performs basic data manipulations: (i) Insertion (ii)Updating (iii) deletion (iv) Selection Hint: Do Operations using Ms-Access and SQL-Server.

6. Create an application using Data grid control to access information's from table in SQL Server

7. Create an application using Data List control to access information's from table in SQL Server and display the result in neat format. Case studies (Must include basic database operations such as Insertion, deletion, Modification, Selection and Searching.

8. Job search Portal

9. College Portal

10. Company Portal.

Semester 3

ELECTIVE COUSE 3 – DIGITAL IMAGE PROCESSING

OBJECTIVE:

- This course gives the knowledge of effectively storing images, extracting interesting Patterns from an image and discriminate between different classes of images.
- This may lead to the confidence in developing image processing applications.

UNIT I: Digital Image Fundamentals

Elements of digital image processing - visual perception-mach band effect -Image sampling and quantization-Basic relationship between pixels. Fourier Transform, Matrix Theory Results,

Block Matrices and Kronecker Products.

UNIT II: Image Transforms

2-D orthogonal transforms, 1-D and 2-D DFT, Cosine, Sine, Walsh, Hadamard, Haar, Slant, Karhunen-loeve, Singular Value Decomposition transforms.

UNIT III: **Image Enhancement**

Point operations - contrast stretching, clipping and thresholding density slicing, Histogram equalization, modification and specification, spatial operations - spatial averaging, low pass, high pass, band pass filtering, direction smoothing, medium filtering, color image enhancement.

UNIT IV: Image Restoration

Image observation models, sources of degradation, inverse and Wiener filtering, geometric mean filter, non linear filters and constrained least squares filtering.

UNIT V: **Image Compression**

Need for data compression – Error free compression: variable length coding, bit plane coding, LZW coding . Lossy compression: Transform coding, wavelet coding. Compression standards: Binary image compression standard, still image compression standards and video compression standards.

Text Books:

1.Rafael C.Gonzalez and Richard E.woods., "Digital Image Processing", 2nd Ed,2009

[Unit-1 :(Chapters 1,2); Unit-3 (Chapter 3); Unit-4 (Chapter 5), Unit-5 (Chapter 8)]

2. E.S. Gopi , "Digital Image Processing using MATLAB**",** Scitech publications, 2008

Unit-2: Chapter 2

References:

1. Anil K. Jain, "Fundamentals of Digital Image Processing", PHI, 1995.

2. Sid Ahmed M.A., "Image Processing", McGraw Hill Inc, 1995.

3. Gonzalaz R. and Wintz P., "Digital Image Processing", Addison Wesley, 2nd Ed, 1987.

Semester 3

ELECTIVE COURSE 4 - MOBILE COMMUNICATIONS

UNIT I: Need for Mobile Computing

Introduction: Applications– Simplified Reference Model – Wireless Transmission: Multiplexing – Spread Spectrum - Cellular Systems – Medium Access Control:SDMA-FDMA-TDMA-CDMA- Comparisons

UNIT II: Communication Systems

Telecommunications Systems: GSM – System Architecture –Localization and calling – Handover - Security – UMTS System Architecture–UTRAN-Handover -Satellite Systems

UNIT III: Wireless LAN

Advantages and Disadvantages-InfraRed vs Radio Transmission-Infrastructure and ad-hoc networks-IEEE 802.11:System Architecture –Protocol Architecture – Bluetooth:User Scenarios-Architecture

UNIT IV: Mobile Network Layer

Mobile IP: Goals –Entities and terminology-IP Packet Delivery –Mobile Ad-hoc Networks – Routing:Differences between wired and ad-hoc networks-DSDV-DSR

UNIT V: Support for mobility

World Wide Web:HTTP-HTML-Wireless Application Protocol: Architecture – WDP – WML-WML Script – WirelessTelephonyApplication

Text Book

1. Jochen Schiller, “Mobile Communications”, Pearson Education, Delhi,2000.
   Unit I : [Chapters 1(1.1,1.5), 2(2.5,2.7,2.8), 3(3.2,3.3,3.4.1,3.4.4,3.4.9,3.4.10,3.5,3.6)]

Unit II: [Chapters 4.1(4.1.2,4.1.5,4.1.6,4.1.7),(4.4.2,4.4.4,4.4.6),5]

Unit III: [Chapter 7(7.1,7.2,7.3.1,7.3.2,7.5.1,7.5.2)]

Unit IV:[(Chapter 8(8.1.1,8.1.2,8.1.3,8.3,8.3.1,8.3.2,8.3.3)]

Unit V : [Chapter 10(10.2,10.2.1,10.2.2,10.3,10.3.1,10.3.2,10.3.7,10.3.8,10.3.9)]

Reference Book

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

Semester 4

CORE COURSE 14 -SOFTWARE TESTING

Objectives:

- To impart knowledge in Software development life cycle
- To understand the need for software testing in software industries
- To know about different types of testing.
- To differentiate functional and nonfunctional testing.
- Description of software tools required for software testing

UNIT I: Principles of testing and Software life cycle

Principles of testing: Context of testing in producing software –A test in time-Automation syndrome-Software development life cycle models: Phases of software project-quality, quality assurance and quality control-testing, verification and validation-life cycle models.

UNIT II: White box and Black box testing

White box testing: What is White box testing -Static testing-Structural testing-Black box testing: What is Black box testing –Why we need Black box testing –When to do Black box testing - How to do Black box testing.

UNIT III: Integration, System and Acceptance testing

Integration testing: What is Integration testing- Integration testing as a type pf testing-Integration testing as a phase of testing. System and Acceptance testing: Overview-Why we need System testing-Functional testing and non-functional testing.

UNIT IV: Performance testing

Performance testing: Introduction-Factors governing performance testing-Methodology for performance testing-Tools for performance testing-Process for performance testing

UNIT V: Regression testing

Regression testing: What is Regression testing –Types of Regression testing- When to do Regression testing-How to do Regression testing

Text Book

Software testing - Principles and practices by Srinivasan Desikan and Gopalaswamy Ramesh-Pearson Education-2006.Unit I –chapter 1,2 Unit II- chapter 3,4 Unit III- chapter 5,6
Unit IV-chapter 7 Unit V- chapter 8

Reference

Introducing software testing by Louis Tamres, LPE, Prentice hall edition

HUMAN COMPUTER INTERACTION - E.C- I

OBJECTIVE:

1. To understand the basics of human-computer interaction.
2. To understand the interaction design basics.
3. To get the knowledge about HCI in the software process.
4. To gain the knowledge about cognitive models.
5. To gain the knowledge about task analysis.

Unit I : The Interaction: Introduction: Models of interaction-Frameworks and HCI-Ergonomics-Interaction styles-Elements of the WIMP interface-interactivity-The context of the interaction-Experience, engagement and fun**.**

Unit II : Interaction design basics: Introduction-what is design? – The process of design-User focus-Scenarios-Navigation design-Screen design and layout-Iteration and prototyping.

Unit III : HCI in the software process: Introduction-The software life cycle-Usability engineering-Iterative design and prototyping-Design rationale. **Design rules:** Introduction-Principles to support usability-Standards-Guidelines-Golden rules and heuristics-HCI patterns.

Unit IV : Cognitive Models: Introduction-Goal and task hierarchies-Linguistic models-The challenge of display-based systems-Physical and device models-Cognitive architectures.

Communication and collaboration models: Introduction-Face-to-face communication-Conversation-Text-based communication-Group working.

Unit V : Task analysis: Introduction-Differences between task analysis and other techniques-Task decomposition-knowledge-based analysis-Entity-relationship-based techniques-Sources of information and data collection-Uses of task analysis. **Dialog notations and design:** What is dialog?-Dialog design notations-Diagrammatic notations-Textual dialog notations-Dialog semantics-Dialog analysis and design.

TEXT BOOK:

1. Alan Dix, Janet Finlay, Gregory D.Abowd, Russell Beale, "Human - Computer Interaction" 3rd edition, Pearson Education. **Unit - 1 : Chapter - 1 Unit - 2 : Chapter-5 Unit-3 : Chapter – 6 , 7 Unit - 4 : Chapter - 12 , 14 Unit - 5 : Chapter - 15 , 16**

REFERENCE BOOK: 1. "Human Computer Interaction fundamental", Andrew sears Julie A.Jacko.

COMPUTER GRAPHICS - E.C- I

OBJECTIVE:

1. To understand the basics of computer graphics.
2. To understand the attributes of output primitives.
3. To get the knowledge about GUI & interactive input methods.
4. To understand the geometric and modeling transformation.
5. To understand the concept of color models.

UNIT I : Overview of Computer System: Display devices –Hard copy devices-Interactive input devices-Display Processor-Graphics Software-Output primitives-Line drawing algorithms-Initializing lines –Line commends-Fill areas-Circle generation algorithms-Area functions-Cell array.

UNIT II : Attributes of output primitives: Line style-Color and intensity-Area filling algorithm-Character attributes-Inquiry function-Bundled attributes-Two dimensional transformations-Basic and composite transformations-Translation-Rotation –Scalling- Matrix representations.

UNIT III : GUI &Interactive input methods: Interactive input methods-Physical input methods-Logical classification of input devices-Interactive picture construction techniques-Input functions-Initial values of inputs-Device parameter-Interactive picture-Construction techniques-Virtual reality environments.

UNIT IV : Geometric and modeling transformations: Translation-Rotation-Scaling-Other transformations functions-3D transformation function-Modeling and coordinates transformation-Projections-Clipping-Hardware implementations-3D viewing functions.

UNIT V : Color models: Properties os lights-xyzcolr model-CIE chromaticity diagram-Intuitive color concepts-RGB color model- YIQ color model- CMY color model –HSV color model – Conversion between HSV& RGB models- HLS color model –Color Selection Applications.

TEXT BOOK:

1."Computer Graphics" –Donald Hearn and M.Pualine Baker – PHI – 1997- 3rd Edition.

Unit I - (Chapter 2,3) Unit II - (Chapter 4,5), Unit III - (Chapter 8), Unit IV - (Chapter 11) , Unit V (Chapter 15)

REFERENCE BOOK:

1. "Principles of Interactive computer Graphics" – William M.Neuman and Robert F Sproul – McGraw Hill International Edition.

ELECTIVE COURSE 2 – EMBEDDED SYSTEM

OBJECTIVES:

1. To understand the basics of embedded system.
2. To understand the concepts of device and busses for device networks.
3. To get the knowledge about real time OS.
4. To gain the knowledge about RTOS.
5. To get the knowledge about hardware and software co-design.

Unit-I Introduction to Embedded System

An embedded system – processer in the system – other hardware units – software embedded into a system. processor and memory organization : Structural units in a processor – processor selection for an embedded system – memory devices – memory selection for an embedded system – direct memory access – processor, memories and I/O devices

Unit-II Devices and Busses for Device networks

I/O devices – timer and counting devices – device drivers – parallel port device drivers in system – serial port device drivers in system – device drivers for internal programmable timing devices – interrupt service mechanism

Unit-III Real time operating system

Operating system services – I/O subsystems – network operating system – real time and embedded operating systems – interrupt routines in RTOS environment – RTOS task scheduling models – interrupt latency and response times of the tasks or performance metrics – performance metrics in scheduling models – OS security issues – Mobile OS

Unit-IV RTOS programming tools : micro C/OS-II and Vx works

Need of a well tested and debugged real operating system – use of µC/OS-II – use of Vx works – case studies of programming with real time operating system

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 phases for an embedded system – use of software tools for development of an embedded system – issues in embedded system design .

TEXT BOOK :

"Embedded System – Architecture, Programming and Design " by Raj Kamal TMH

Unit I Chapter 1,2 Unit II Chapter 3,4 Unit III Chapter 9 Unit IV Chapter 10,11 Unit V Chapter 12

REFERENCE BOOK:

1. "Embedded System Design" by Peter Marwedel, Springer International Edition
2. "Embedded System Design" by Frank Vahid / Tony Girargis, Wiley Student Edition

ELECTIVE COURSE 2

ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEM

OBJECTIVE:

1. To understand the basics of artificial intelligence and expert system.
2. To understand the searching techniques.
3. To understand the two knowledge about knowledge representation.
4. To understand the concept of learning.
5. To get the knowledge about applications.

Unit I : Introduction

Intelligent Agents – Agents and Environments – Good behavior – The nature of environments – Structure of agents – Problem solving – Problem solving agents – Example problems – Searching for solutions – Uniformed search strategies – Avoiding repeated status – Searching with partial information.

Unit II : Searching Techniques

Informed search and exploration – Informed search strategies – Heuristic function – Local search algorithms and optimistic problems – Local search in continuous spaces – Online search agents and unknown environments – Constrain satisfaction problems (CSP) – Backtracking search and Local search for CSP – Structure of problems – Adversarial search – Games – Optimal decisions in games – Alpha-Beta pruning – Imperfect real time decision – Games that include an element of chance.

Unit III : Knowledge Representation

First order logic – Representation revisited – Syntax and semantics for first order logic – Using first order logic – Knowledge engineering in first order logic – Inference in first order logic – Prepositional versus first order logic – Unification and Lifting – Forward chaining – Backward chaining – Resolution – Knowledge representation – Ontological Engineering – Categories and Objects – Actions – Simulation and events – Mental events and mental objects.

Unit IV : Learning

Learning from observations – forms of learning – Inductive learning – Learning decision trees – Ensemble learning – Knowledge in learning – Logical formulation of learning – Explanation based learning – Learning using relevant information – Inductive logic programming – Statistical learning methods – Learning with complete data – Learning with hidden variable – EM algorithm – Instance based learning – Neural networks – Reinforcement learning – Passive reinforcement learning - Active reinforcement learning – Generalization in reinforcement learning

Unit V: Applications

Communication – Communication as action – Formal grammar for a fragment of English – Syntactic analysis – Augmented grammars – Semantic interpretation – Ambiguity and

disambiguation – Discourse understanding – Grammar induction – Probabilistic language processing – Probabilistic language models – Information retrieval – Information extraction – Machine translation.

TEXT BOOK :

1. Stuart Russell, Peter Norvig, "Artificial Intelligence- A modern Approach", 2nd edition, Pearson education / Prentice Hall of India, 2004.
   Unit-I chapter 2(2.1,2.2,2.3,2.4) 3(3.1,3.2,3.3,3.4,3.5,3.6)
   Unit-II chapter 4(4.1,4.2,4.3,4.4,4.5,4.6) 5(5.1,5.2,5.4) 6(6.1,6.2,6.3,6.4,6.5)
   Unit-III chapter 8(8.1,8.2,8.3,8.4) 9(9.1,9.2,9.3,9.4,9.5) 10(10.1,10.2,10.3,10.4)
   Unit-IV chapter 18(18.1,18.2,18.3,18.4) 19(19.1,19.2,19.3,19.4,19.5)
   20(20.1,20.2,20.3,20.4) 21(21.1,21.2,21.3,21.4)
   Unit-V chapter 22(22.1,22.2,22.3,22.4,22.5,22.6,22.7,22.8) 23(23.1,22.2,23.3,23.4)

REFERENCE BOOK :

1. Nils J.Nilsson, Artificial Intelligence: A new Synthesis", Harcourt Asia Pvt.Ltd., 2000
2. Elaince Rich and Kevin Knight, "Artificial Intelligence",2nd edition, Tata McGraw-Hill, 2003.
3. George F.Luger, "Artificial Intelligence – Structures and Strategies for complex problem solving", Pearson Education / PHI,2002.

ELECTIVE COURSE 3 – SYSTEM SOFTWARE

OBJECTIVE:

1. To understand the basics of theory of system software.
2. To understand the concept of assemblers.
3. To gain the knowledge about macros and macro processors.
4. To understand the concepts of compilers and interpreters.
5. To gain the knowledge about linkers.

UNIT-I:

Language processors – Language processing activities and fundamentals – Language specification – Development Tools – Data structures for language processing – scanners and Parsers.

UNIT II:

Assemblers : Elements of assembly language programming – Overview of assembly process – Design of two-pass assembler – A single pass assembler for IBM PC.

UNIT-III :

Macros and Macro processors – Macro definition, call and expansion – Nested macro calls – Advanced macro facilities – Design of macro preprocessor – Compilers : Aspects of Compilation.

UNIT-IV:

Compilers and Interpreters – Memory allocation – Compilation of Expressions and Control structure – Code optimization – Interpreters.

UNIT-V:

Linkers: Linking and Relocation concepts – Design of linker – Self relocating programs – A linker for MS DOS – Linking for over-lays – loaders – Software tools : Software tools for program development – Editors – Debug monitors – Programming environments – User interfaces.

TEXT BOOK :

1.D.M. Dhamdhere, 1999, "Systems Programming and Operating Systems", Second Reviced Edition, Tata McGraw-Hill, New Delhi.

Unit I –(Chapter 1, Chapter 2); Unit II – (Chapter 3, Chapter 4);Unit III –(Chapter 5);
Unit IV- (Chapter 6);Unit V – (Chapter 7)

REFERENCE BOOK :

1.L.L. Beck, 1996, System Software An Introduction to System Programming, 3rd Edition, Addison-Wesley.

ELECTIVE COURSE 3 – PERVASIVE COMPUTING

OBJECTIVE:

1. To understand the basics of pervasive computing.
2. To understand the device technology.
3. To understand the concept of device connectivity.
4. To gain the knowledge about WAP and Beyond.
5. To get the knowledge about personal digital assistant.

Unit I: Pervasive Computing

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

Unit II : Device Technology

Device technology : Hardware – Human machine interfaces – Biometrics – Operating Systems – Java for Pervasive devices.

Unit III : Device Connectivity

Device Connectivity : Protocols – Security – Device management – Web application concepts: WWW architecture – Protocols – Transcoding – Client authentication via internet.

Unit IV : WAP and Beyond

WAP and Beyond : Components of WAP architecture – WAP infrastructure – WAP security issues – WML – WAP push – Products – i-mode –Voice technology : Basics of speech recognition – Voice standards – Speech applications – Speech and Pervasive Computing.

Unit V: Personal Digital Assistant

PDA : Device categories – PDA operation systems – Device Characteristics – Software components – Standards – Mobile Applications – PDA Browsers – Pervasive web application architecture : Background – Development of pervasive computing web applications – Pervasive application architecture.

TEXT BOOK :

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

Unit I - Chapter 1 2, Unit II - Chapter 3, Unit III Chapter 4,5 Unit IV - Chapter 6,7 Unit V Chapter 8,10

REFERENCE BOOK :

1. Fundamentals of mobile and pervasive computing, Frank Adelstein, Sandeep K S Gupta, Golden Ricard III, Loren Schwiebert, McGraw Hill edition, 2006.

ELECTIVE COURSE 4 – SOFTWARE PROJECT MANAGEMENT

OBJECTIVE:

1. To understand the basics of software project management.
2. To understand the software management, project management, process frame work.
3. To get the knowledge about management disciplines.
4. To gain the knowledge about project control.
5. To get the knowledge about risk management.

UNIT I : Software Management Renaissance

Software Management Renaissance: Conventional Software Management – Evolution of Software Economics – Improving Software Economics – The Old Way and The New.

UNIT II : A Software Management Project Management Process Framework

A Software Management Project Management Process Framework: Life-Cycle Phases- Artifacts of the Process – Model – Based Software Architectures – Work Flows of the Process – Check Points of the Process.

UNIT III : Software Management Disciplines

Software Management Disciplines: Iterative Process Planning – Project Organizations and Responsibilities- Process Automation.

UNIT IV : Software Management Disciplines

Software Management Disciplines: Project Control and Process Instrumentation – Tailoring the Process.

UNIT V : Risk Management

Risk Management: Introduction – Risk – Categories of Risk – A Framework for Dealing with Risk – Risk Identification – Risk Assessment – Risk Planning – Risk Management – Evaluating Risk to Schedule – Applying the PERT Technique – Monte Carlo Simulation – Critical Chain Concepts.

TEXT BOOKS:

1.Software Project Management, bob Hughes & Mike Cotterell,

ISBN: 9780070619852) 2006 edition

(Unit I:Chapter 1,2,3,4 Unit II: Chapter 5,6,7,8 Unit III: Chapter 10,11,12,13,14 Unit IV: Chapter 15,16,17).

2.Software Project Management, "Walker Royce, Pearson Education,

ISBN: 8177583786 2006 edition **(Unit V:Chapter 7)**

REFERENCE BOOK:

1. Software Engineering, Roger S.Pressman ,TMH Publications 2006

ELECTIVE COURSE 4 –THEORY OF COMPUTATION

OBJECTIVE:

1. To understand the basics of theory of computation.
2. To understand the regular expression and regular grammar.
3. To gain the knowledge context free language.
4. To understand the Push Down Automata(PDA).
5. To gain the knowledge Turing machines.

Unit I :

Introduction to Theory of Computation-Finite State Machines: Definition and Description of an Automata-Transition System-DFA-Acceptability of a string by a Finite Automata-NFA-Equivalence of NFA and DFA-NFA E-Transitions-Construction of NFA without E-moves from NFA with E-moves-Minimization of FA-Finite Automata with outputs-Equivalence between Moore and Mealy machines-Equivalence of two Finite State Machines

Unit II :

Regular Expressions and Regular Grammars-Regular Sets and Properties: Pumping Lemma for Regular Sets-Applications of Pumping Lemma-Closure Properties of Regular Sets-Decision Algorithms for Regular Sets-The Myhill-Nerode Theorem and Minimization of Finite Automata

Unit III :

Context Free Language: Introduction-Context Free Grammars-Derivation Trees-Left Most derivation and Right Most Derivation-Ambiguity in CFG-Simplification of CFG-Normal Forms-Chomsky Normal Forms(CNF)-Greibach Normal Form(GNF)

Unit IV :

Push Down Automata(PDA): Basic Definition and model of PDA-Deterministic Push Down Automata-Non-Deterministic Push Down Automata-Equivalence of Acceptance by Final State and Empty Stack-Push Down Automata and CFL's-The Pumping Lemma for CFL's-Applications of Pumping Lemma-Closure Properties of CFL's-Decision Algorithms for CFL's-Membership

Unit V :

Turing Machines: Turing Machine Model-Representation of TM-Language Acceptance-Design of TM-Recursively Enumerable Languages- Church's Hypothesis-Counter Machine-Types of TM's

TEXT BOOK:

1."Theory of Computation, Formal Languages and Automata Theory"- G.P.Sarathi Varma, B.Thirupathi Rao, Scitech Publications.

Unit I –(Chapter 1, Chapter 2); Unit II – (Chapter 3, Chapter 4);Unit III –(Chapter 5); Unit IV- (Chapter 6);Unit V – (Chapter 7)

REFERENCE BOOKS:

1.Introduction to Theory Of Computation- C.Martin. Tata McGraw Hill.