

ANNAMALAI UNIVERSITY
MASTER OF COMPUTER SCIENCE
(2021 - 2022)

The course of Study and scheme of Examination

S.No	Study Components		Ins. Hrs./ week	Credit	Title of the Paper	Maximum Marks		
	Course Title					CIA	Uni. Exam	Total
SEMESTER I								
1	Core	Paper - 1	5	3	Relational Database Management System	25	75	100
2	Core	Paper - 2	5	3	Enterprise Java Programming	25	75	100
3	Core	Paper - 3	5	3	Programming using C#.NET	25	75	100
4	Practical	Paper - 1	3	2	Practical 1:Relational Database Management System	25	75	100
5	Practical	Paper - 2	3	2	Practical 2: Enterprise Java Programming	25	75	100
6	Practical	Paper - 3	3	2	Practical 3: Programming using C#.NET	25	75	100
Internal Elective for same major students (Choose any one)								
7	Core Elective	Paper - 1	3	3	A. Computer Organization B. Parallel Computing C. Embedded System	25	75	100
External Major for other major Students (Inter/multi-disciplinary papers)								
8	Open Elective	Paper - 1	3	3	A. E-Commerce B. Introduction to Computer Applications C. Principles of Internet	25	75	100
			30	21				800
SEMESTER II								
1	Core	Paper - 4	5	3	Advanced Enterprise Java Programming	25	75	100
2	Core	Paper - 5	4	3	Design and Analysis of Algorithm	25	75	100
3	Core	Paper - 6	4	3	Web Application using C#.NET	25	75	100
4	Practical	Paper - 4	3	2	Practical 4: Advanced Enterprises Java Programming	25	75	100
5	Practical	Paper - 5	3	2	Practical 5: Design and Analysis of Algorithm	25	75	100
6	Practical	Paper - 6	3	2	Practical 6: Web Application using c#.NET	25	75	100
Internal Elective for same major students (Choose any one)								
7	Core Elective	Paper - 2	3	3	A. Human Computer Interaction B. Social Information N/W C. Cloud Computing	25	75	100
External Major for other major Students (Inter/multi-disciplinary papers)								
8	Open Elective	Paper - 2	3	3	A. Principles of Web Design B. Open Source Applications C. Problem Solving Techniques	25	75	100
9	*Field Study		-	2		100	-	100
10	Compulsory Paper		2	2	Human Rights	25	75	100
			30	25				1000

*Field Study

There will be field study which is compulsory in the first semester of all PG courses with 2 credits. This field study should be related to the subject concerned with social impact. Field and topic should be registered by the students in the first semester of their study along with the name of a mentor before the end of the month of August. The report with problem identification and proposed solution should be written in not less than 25 pages in a standard format and it should be submitted at the end of second semester. The period for undergoing the field study is 30 hours beyond the instructional hours of the respective programme. Students shall consult their mentors within campus and experts outside the campus for selecting the field and topic of the field study. The following members may be nominated for confirming the topic and evaluating the field study report.

- i) Head of the respective department
- ii) Mentor
- iii) One faculty from other department

ANNAMALAI UNIVERSITY

M.Sc. COMPUTER SCIENCE

SYLLABUS

UNDER CBCS

(2021-2022)

[SEMESTER: CORE]

[Hrs: 5/Credits: 3]

RELATIONAL DATABASE MANAGEMENT SYSTEM

COURSE OBJECTIVES

- To have a broad understanding of database concepts and database management system software
- To have a high-level understanding of major DBMS components and their function
- To be able to model an application's data requirements using conceptual modeling tools like ER diagrams and design database schemas based on the conceptual model.
- To be able to write SQL commands to create tables and indexes, insert/update/delete data, and query data in a relational DBMS.
- To be able to program a data-intensive application using DBMS APIs.

COURSE OUTCOMES

CO1 - Students are able to have a broad understanding of database concepts and databasemanagement system software

CO2 - Students are able tohave a high-level understanding of major DBMS components and their function

CO3 - Students are able tomodel an application's data requirements using conceptualmodeling tools like ER diagrams and design database schemas based on theconceptual model.

CO4 - Students are able towrite SQL commands to create tables and indexes,insert/update/delete data, and query data in a relational DBMS.

CO5 - Students are able toprogram a data-intensive application using DBMS APIs.

UNIT-I: INTRODUCTION

File System Vs. DBMS - Database System Applications - View of Data-Database language - Database design - ER Model _ Relational Model - Network Data Model - Hierarchical Data Model - Data Storage & Querying - Data Architecture.

UNIT-II: RELATIONAL MODEL

Relational Model - Structure of Relational Databases - Relational Algebra and Calculus - SQL - Basic Structure - Set Operations - Aggregate Functions - Null Values - Nested Queries - Complex Queries - Views - Modification of the Database - Advanced SQL - Triggers.

UNIT-III: FUNCTIONAL DEPENDENCIES

Functional Dependencies - Features of Relational designs - Decomposition and Normalization using Functional Dependencies and Multivalued Dependencies - Join dependencies- Domain key Normal form.

UNIT- IV: PHYSICAL STORAGE MEDIA

Overview of Physical Storage Media - Magnetic disks - RAID - tertiary Storage - File Organization - Organization of records in Files - Indexing and Hashing - Ordered Indices - B+ -Tree Index Files - B-Tree Index Files - multiple Key Access - Static and Dynamic Hashing - Query Processing - Transaction Management - Transactions - Concurrency.

UNIT-V: DISTRIBUTED DATABASES

Distributed Databases - Homogeneous and Heterogeneous Databases - Distributed Data Storage - Distributed Transactions - Commit Protocols - Concurrency Control - Object Based Databases - Complex Data types - Structured Types and Inheritance in SQL – Object identity and Reference - Types in SQL - XML - structure of XML data - XML Document - Schema - Querying and Transformation - Data Mining and Data Warehousing.

TEXT BOOK

1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan- “Database System Concepts”, Fifth Edition, McGraw-Hill, 2006.

REFERENCES

1. Raghu Ramakrishnan and Johannes Gehrke, “Database Management Systems”, Tata McGraw-Hill Publishing Company, 2003.
2. Ramez Elmasri and Shamkant B. Navathe, “Fundamental Database Systems”, Third Edition, Pearson Education, 2003.
3. Hector Garcia–Molina, Jeffrey D. Ullman and Jennifer Widom- “Database System Implementation”- Pearson Education- 2000.
4. Narang, “Database Management Systems”, 2nd ed., PHI.

WEB REFERENCES

<https://www.tutorialspoint.com/sql/sql-rdbms-concepts.htm>

<http://www.rjspm.com/PDF/BCA-428%20Oracle.pdf>

<http://kadiaeducation.edu.in/Course/BCA/Course%20Material/RDBMS.pdf>

ENTERPRISE JAVA PROGRAMMING

COURSE OBJECTIVES

- To introduce programming with Applet and AWT.
- An overview of database access and details for managing information using the JDBC API.
- Examine the use of networking and collections.
- Learn how to program Servlet and JSP.
- To understand the web programming concepts in the perspective of Client and Server.

COURSE OUTCOMES

CO1 - Students are able to develop Applet Programming using various techniques

CO2 - Students are able to develop applications using Abstract Window Toolkit and Events

CO3 - Students are able to update and retrieve the data from the databases using JDBC- ODBC

CO4 - Students are able to develop server side programs in the form of Servlets

CO5 - Students are able to build up Java Applications using collections and JSP Tags.

UNIT -I: APPLETS AND GUI

Applet Fundamentals- Applet Class - Applet lifecycle- Steps for Developing Applet Programs- Passing Values through Parameters- Graphics in Applets; GUI Application - Dialog Boxes - Creating Windows - Layout Managers – AWT Component classes – Swing component classes- Borders – Event handling with AWT components - AWT Graphics classes - File Choosers - Color Choosers – Tree – Table –Tabbed panels–Progressive bar - Sliders.

UNIT- II: JDBC AND JAVA NETWORKING

JDBC -Introduction - JDBC Architecture - JDBC Classes and Interfaces – Database Access with MySQL -Steps in Developing JDBC application - Creating a New Database and Table with JDBC - Working with Database Metadata; Java NetworkingBasics of Networking - Networking in Java- Socket Program using TCP/IP - Socket Program using UDP- URL and InetAddressclasses.

UNIT- III: COLLECTIONS AND DESIGN PATTERNS

Collection Framework - ArrayList class - LinkedList class - ArrayListvs Linked List - ListIterator interface - HashSet class, LinkedHashSet class, TreeSet class PriorityQueue class - Map interface, HashMap class, LinkedHashMapclass ,TreeMap class - Comparable interface , Comparator interface, Comparable vs Comparator; Design Patterns: Introduction to Design patterns - Catalogue for Design Pattern - Factory Method Pattern, Prototype Pattern, Singleton Pattern, Adapter Pattern, Proxy Pattern, Decorator Pattern, Command Pattern, Template Pattern, Mediator Pattern;

UNIT -IV: SERVLET AND JSP

Servlet: Advantages over Applets - Servlet Alternatives - Servlet Strengths - Servlet Architecture - Servlet Life Cycle – GenericServlet, HttpServlet - First Servlet - Invoking

Servlet - Passing Parameters to Servlets - Retrieving Parameters - Server-Side Include – Cookies; JSP : JSP Engines Working with JSP - JSP and Servlet - Anatomy of a JSP Page.

UNIT -V: WEB PROGRAMMING

Client-Side Programming: Client-side programming technologies - Form design using HTML, XHTML and DHTML and CSS - Client side validation Using JavaScript - Content Structuring using XML - Adding Interactivity with AJAX -JQuery Framework;
Server-side Programming: Web Servers - Handling request and response - Handling Form data - Session management - Database Access.

TEXT

1. S. Sagayaraj, R. Denis, P.Karthik& D. Gajalakshmi “Java Programming”, Universities Press, 2018.

REFERENCES

1. Patrick Naughton& Herbert Schildt, "The Complete Reference: Java 2", Tata McGraw Hill, 1999.
2. Deitel&Deitel, "Java How to Program", Prentice Hall, 5th Edition, 2002
3. Peter Hagggar, "Practical Java: Programming Language Guide", Addison-Wesley Pub Co, 1st Edition, 2000.
4. C.Muthu, "Programming with Java", McGraw Hill, Second Edition, 2008

WEB REFERENCES

<http://math.hws.edu/javanotes/c6/index.html>

<http://www.tutorialspoint.com/awt/>

www.studytonight.com

www.javatpoint.com

www.learnjavaonline.org

www.codingbat.com

PROGRAMMING USING C#.NET

COURSE OBJECTIVES

- To know the differences between desktop and web application.
- To construct classes, methods, and accessor and instantiate objects.
- To create and manipulate GUI components in C#.
- To code solutions and compile C# projects within the .NET framework.
- To build own desktop application with Database

COURSE OUTCOMES

CO1 - Students are able to know the differences between desktop application and web application.

CO2 - Students are able to construct classes, methods, and access modifier and instantiate objects.

CO3 - Students are able to create and manipulate GUI components in C# for windows application.

CO4 - Students are able to code solutions and compile C# projects within the .NET framework.

CO5 - Students are able to build the desktop application with Database.

UNIT - I: INTRODUCTION TO C#

Introduction to .NET – Features of C# - Data Types – Value Types – Reference Types - Variables and Constants – Declaring – Assigning values – variables of nullable types – Operators – Type Conversions – Implicit and Explicit Type Conversions – Arrays – Single Dimensional and Multidimensional – Control Flow Statements – Selection – Iteration and Jump – Classes and Objects – Access Modifiers – Defining a Class – Variables – Properties and Methods – Creating Objects – Inheritance – Polymorphism- Constructor and Destructors.

UNIT - II: WINDOWS FORMS

Windows Forms – Form Class – Common Operations on Forms – Creating a Message Box – Handling Events – Mouse Events – Keyboard Events – Common Controls in Windows Forms – Label – TextBox – Button – Combo Box – List Box – Check Box – Radio Button – Group Box – Picture Box – Timer – Open File Dialog – Save File Dialog – Font Dialog – Color Dialog – Print Dialog – Tree View – Menu.

UNIT - III: DELEGATES AND EVENTS

Delegates – Declaring a Delegate – Defining Delegate Methods – Creating and Invoking Delegate Objects – Multicasting with Delegates – Events – Event Sources – Event Handlers – Events and Delegates.

UNIT - IV: REFLECTION AND REMOTING

Life Cycle of threads-Using Reflection – Reflecting the Members of a Class - Dynamic Loading and Reflection - .NET Remoting – Architecture – Hosting of Objects – Single Ton and Single Call – Remoting Server – Remoting Client.

UNIT - V: DATABASE

Creating Connection String – Creating a Connection to a Database – Creating a Command Object – Working with Data Adapters – Using Data Reader to work with Databases – Using Dataset.

TEXT BOOKS

1. Vikas Gupta , “Comdex .NET Programming “ , Dream Tech Press, New Delhi, 2011
2. Kogent Solutions, “ C# 2008 Programming Black Book”, Dream Tech Press, New Delhi, Platinum Edition, 2009

REFERENCES

1. Rebecca M.Riordon, “Microsoft ADO .Net 2.0 Step by Step”, Prentice Hall of India Private Limited, New Delhi, 2007
2. David S.Platt , “Introducing Microsoft .Net”, Prentice Hall of India(Private) Limited, Third Edition, New Delhi, 2006

WEB REFERENCES

<http://csharp.net-tutorials.com/index.php>

<http://csharp.net-tutorials.com/classes/introduction/>

<http://www.homeandlearn.co.uk/csharp/csharp.html>

<http://www.indiabix.com/c-sharp-programming/questions-and-answers/>

<https://www.wiziq.com/online-tests/43860-c-basic-quiz>

<http://www.withoutbook.com/OnlineTestStart.php?quizId=71>

http://www.compileonline.com/compile_csharp_online.php

<http://www.ideone.com>

I: RELATIONAL DATABASE MANAGEMENT SYSTEM

1. Creating database tables and using data types.
 - Create table, • Modify table, • Drop table
2. Data Manipulation.
 - Adding data with Insert, • Modify data with Update, • Deleting records with Delete
3. Implementing the Constraints.
 - NULL and NOT NULL, • Primary Key and Foreign Key Constraint • Unique, Check and Default Constraint
4. Data Retrieval
 - Simple select clause, • Accessing specific data with Where, Ordered By, Distinct and Group By
5. Aggregate Functions.
 - AVG, • COUNT, • MAX, • MIN, • SUM, • CUBE
6. String functions.
7. Date and Time Functions, Union, intersection and set difference.
8. Nested Queries & JOIN operation.
9. Practical Based on performing different operations on a view.
10. Practical Based on implementing use of triggers, cursors & procedures.

II: ENTERPRISE JAVA PROGRAMMING

1. Develop Applet Programming with various techniques.
2. Develop applications using AWT.
3. Working with Graphics ,Color and Font
4. Working with JDBC Classes(Database Operations- Create, Insert, Delete, Update, Select)
5. Handling ResultSet and Statements.
6. Jasper Report Generation
7. Working with Servlet and JDBC
8. Handling Client/Server Networking
9. Develop Java Server Pages applications using JSP Tags.
10. Working with Java Collections.

III: PROGRAMMING USING C#.NET

1. Variables, Constants and Arrays
2. Classes and Objects
3. Inheritance
4. Polymorphism
5. Windows Form Controls (Label, Text, Button, Check Box, Radio)
6. Windows Form Controls (List, Combo, Timer, Group Box, Picture Box)
7. Menu Handling
8. Reflection
9. ADO.NET Connection
10. Data Command

A. COMPUTER ORGANIZATION

COURSE OBJECTIVES

- To understand the basics of Computer Organization.
- To know about the functions of various languages and translation
- To know the relationship between computer instruction and the Machine code execution.
- To recognize the need of various types of computer organizations.
- To understand the influence of parallel and vector processing.

COURSE OUTCOMES

CO1 - Students are able to identify the types of instructions and the organization of registers and memory

CO2 - Students are able to describe the translation model of assembly language to machine language.

CO3 - Students are able to understand the micro-program by mapping the instructions.

CO4 - Students are able to recognize the types of computer organizations.

CO5 - Students are able to accept the better way of processing by Parallel and Vector processing.

UNIT – I: ORGANIZATION AND DESIGN

Instruction Codes - Computer Registers - Computer Instructions – Timing and Control – Instruction Cycle - Memory Reference Instructions – Input-Output and Interrupts.

UNIT – II: COMPUTER PROGRAMMING

Introduction - Machine language - Assembly language - The assembler - Program loops - Programming arithmetic and logical operation – Subroutines - Input-output programming.

UNIT – III: MICRO PROGRAM CONTROL

Control Memory – Address Sequencing – Micro program Examples – Design of Control Unit.

UNIT – IV: CENTRAL PROCESSOR UNIT

Introduction – General Register Organization – Stack Organization – Instruction Formats – Addressing Modes.

UNIT - V: PIPELINE AND VECTOR PROCESSING

Parallel Processing – Pipelining - Arithmetic pipeline - Instruction pipeline - Vector Processing - Array Processor.

TEXT

1. Morris Mano M. “Computer System Architecture”. New Delhi: Prentice Hall of India Private Limited, 2011

REFERENCES

1. William Stallings. "Computer Organization and Architecture". 8th edition. Pearson Publication, 2010
2. Morris Mano. "Digital Logic and Computer Design". New Delhi: Prentice Hall of India Private Limited, 2001.

WEB REFERENCES

www.computer-pdf.com/architecture/

www.tutorialspoint.com/computer_logical_organization

<https://www.geeksforgeeks.org/computer-organization-and-architecture-tutorials/>

<https://www.javatpoint.com/computer-organization-and-architecture-tutorial>

<https://www.studytonight.com/computer-architecture/>

B. PARALLEL COMPUTING

COURSE OBJECTIVES

- To learn the Kinds of parallelism, Parallel computer architectures (processor arrays, centralized memory multiprocessors, distributed memory multiprocessors, and multicomputers)
- To know and develop the Parallel algorithm design
- To identify the MPI library of message-passing functions
- To recognize the development of data-parallel programs and development of manager-worker programs with functional parallelism

COURSE OUTCOMES

CO1 - Students are able to compute speedup, efficiency, and scaled speedup of parallel computations, given appropriate data

CO2 - Students are able to apply Amdahl's Law to predict the maximum speedup achievable from a parallel version of a sequential program, given its execution profile

CO3 - Students are able to analyze the efficiency of a parallel algorithm

CO4 - Students are able to explain the relative advantages and disadvantages of mesh, hypercube, and butterfly networks with respect to diameter, bisection width, and number of edges/node

CO5 - Students are able to explain the advantages and disadvantages of constructing parallel computers using

UNIT - I: SCALABILITY AND CLUSTERING

Evolution of Computer Architecture – Dimensions of Scalability – Parallel Computer Models – Basic Concepts Of Clustering – Scalable Design Principles – Parallel Programming Overview – Processes, Tasks and Threads – Parallelism Issues – Interaction / Communication Issues – Semantic Issues In Parallel Programs.

UNIT - II: ENABLING TECHNOLOGIES

System Development Trends – Principles of Processor Design – Microprocessor Architecture Families – Hierarchical Memory Technology – Cache Coherence Protocols – Shared Memory Consistency – Distributed Cache Memory Architecture – Latency Tolerance Techniques – Multithreaded Latency Hiding.

UNIT - III: SYSTEM INTERCONNECTS

Basics of Interconnection Networks – Network Topologies and Properties – Buses, Crossbar and Multistage Switches, Software Multithreading – Synchronization Mechanisms.

UNIT – IV: PARALLEL PROGRAMMING

Paradigms And Programmability – Parallel Programming Models – Shared Memory Programming.

UNIT - V: MESSAGE PASSING PROGRAMMING

Message Passing Paradigm – Message Passing Interface – Parallel Virtual Machine.

TEXT

1. Kai Hwang and Zhi.Weï Xu, “Scalable Parallel Computing”, Tata McGraw-Hill, New Delhi,2003.

REFERENCES

1. David E. Culler & Jaswinder Pal Singh, “Parallel Computing Architecture: A Hardware/Software Approach”, Morgan Kaufman Publishers, 1999.
2. Michael J. Quinn, “Parallel Programming in C with MPI & OpenMP”, Tata McGraw-Hill, New Delhi, 2003.
3. Kai Hwang, “Advanced Computer Architecture” Tata McGraw-Hill, New Delhi, 2003.

WEB REFERENCES

www.computing.llnl.gov/tutorials/parallel_comp/
www.geeksforgeeks.org/introduction-to-parallel-computing/
www.techopedia.com/definition/8777/parallel-computing

C. EMBEDDED SYSTEM

COURSE OBJECTIVES

- To understand basic concepts in the embedded computing systems area;
- To determine the optimal composition and characteristics of an embedded system;
- To understand what is a microcontroller, microcomputer, embedded system
- To design and program an embedded system at the basic level;
- To develop hardware-software complex with the use of the National Instruments products.

COURSE OUTCOMES

CO1 - Students are able to understand basic concepts in the embedded computing systems area;

CO2 - Students are able to determine the optimal composition and characteristics of an embedded system;

CO3 - Students are able to understand what is a microcontroller, microcomputer, embedded system

CO4 - Students are able to design and program an embedded system at the basic level;

CO5 - Students are able to develop hardware-software complex with the use of the National Instruments products.

UNIT I: INTRODUCTION

Replacement for discrete logic-based circuits-Provide functional upgrades- Provide easy maintenance upgrades-Improves mechanical performance- Protection of intellectual property-Replacement for analogue circuits. Inside the embedded system-Processor-Memory-Peripherals-Software-Algorithms -Microcontroller-Expanded microcontroller-Microprocessor based-Board based.

UNIT II: EMBEDDED PROCESSORS

8 bit accumulator processors-Register models-8 bit data restrictions-Addressing memory-System integrity-Example 8 bit architectures-Z80-Z80 programming model-MC6800-Microcontrollers-MC68HC05-MC68HC11-Architecture-Data processors-Complex instructions, microcode and nanocode-INTEL 80286-Architecture-Interrupt facilities-Instruction set-80287 floating point support-Feature comparison. INTEL 80386DX-Architecture-Interrupt facilities-Instruction set-80387 floating point coprocessor-Feature comparison-INTEL 80486-Instruction set-Intel 486SX and overdrive processors-Intel Pentium-Multiple branch prediction-Data flow analysis-Speculative execution-The MMX instructions-The Pentium II- Motorola MC68000-The MC68000 hardware-Address bus-Data bus-Function codes-Interrupts-Error recovery and control signals.

UNIT III: MEMORY SYSTEMS

Memory technologies-DRAM technology - Video RAM - SRAM - Pseudo-static RAM - Battery backed-up SRAM - EPROM and OTP - Flash - EPROM - Memory organisation - By 1 organisation - By 4 organisation - By 8 and by 9 organisations - By 16 and greater organisations - Parity - Parity initialisation - Error detecting and correcting memory - Access times - Packages - Dual in line package - Zig-zag package - SIMM and DIMM - SIP - DRAM interfaces - The basic DRAM interface - Page mode operation - Page interleaving - Burst mode operation 87 EDO memory-DRAM refresh techniques - Distributed versus burst refresh - Software refresh - RAS only refresh - CAS before RAS (CBR) refresh - Hidden refresh - Memory management - Disadvantages of memory management - Segmentation and

paging - Memory protection units - Cache memory - Cache size and organisation

UNIT IV: BASIC PERIPHERALS

Parallel ports-Multi-function I/O ports-Pull-up resistors-Timer/counters-Types-8253 timer modes-Interrupt on terminal count-Programmable one-shot -Rate generator-Square wave rate generator-Software triggered strobe-Hardware triggered strobe-Generating interrupts-MC68230 modes-Timer processors-Real-time clocks-Simulating a real-time clock in software-Serial ports-Serial peripheral interface-I2C bus-Read and write access-Addressing peripherals-Sending an address index-Timing.

UNIT V: REAL-TIME OPERATING SYSTEMS

What are operating systems?-Operating system internals-Multitasking operating systems-Context switching, task tables, and kernels-Time slice -Pre-emption-Co-operative multitasking-Scheduler algorithms-Rate monotonic- Deadline monotonic scheduling-Priority guidelines-Priority inversion-Disabling interrupts -Message queues-Waiting for a resource-VMEbus interrupt messages-Fairness systems-Tasks, threads and processes-Exceptions-Memory model-Memory allocation-Memory characteristics-Example memory maps-Memory management address translation-Bank switching-Segmentation-Virtual memory-Choosing an operating system-Assembler versus high level language-ROMable code-Scheduling algorithms-Pre-emptive scheduling-Modular approach-Re-entrant code-Cross-development platforms-Integrated networking-Multiprocessor support-Commercial operating systems-pSOS+ - pSOS+ kernel-pSOS+m multiprocessor kernel-pREPC+ runtime support-pHILE+ file system -pNA+ network manager-pROBE+ system level debugger-XRAY+ source level debugger-OS-9.

TEXT

1. Heath S. "Embedded Systems Design", Butterworth - Heinemann 1997.

REFERENCES

1. Kirk Zurell - "C Programming for Embedded Systems" R & D, Books - 2000
2. David. E, Simon, "An embedded software primer", Pearson Education Asia - Addison Wesley Longman (Singapore), Low Priced Edition, 2001, ISBN - 81 - 7808 - 045 - 1.
3. Michael Barr, "Programming Embedded Systems in C and C++", Shroff Publishers & Distributors Pvt.Ltd., Calcutta., March 2001, ISBN - 81 - 7366 - 076 - X.

WEB REFERENCES

www.entrancetutorials.com/embedded-systems-by-rajkamal-pdf/
www.internetofthingsagenda.techtarget.com/definition/embedded-system
www.en.wikipedia.org/wiki/Embedded_system

[SEMESTER I: OPEN ELECTIVE]

[Hrs: 3/Credits: 3]

A. E-COMMERCE

COURSE OBJECTIVES

- To demonstrate an understanding of the foundations and importance of E-commerce

- To demonstrate an understanding of retailing in E-commerce by: analyzing branding and pricing strategies, using and determining the effectiveness of market research and assessing the effects of disintermediation.
- To analyze the impact of E-commerce on business models and strategy
- To describe Internet trading relationships including Business to Consumer, Business-to-Business, Intra-organizational.
- To describe the infrastructure for E-commerce
- To describe the key features of Internet, Intranets and Extranets and explain how they relate to each other.

COURSE OUTCOMES

CO1 - Students are able to demonstrate an understanding of the foundations and importance of E-commerce

CO2 - Students are able to demonstrate an understanding of retailing in E-commerce by: analyzing branding and pricing strategies, using and determining the effectiveness of market research and assessing the effects of disintermediation.

CO3 - Students are able to analyze the impact of E-commerce on business models and strategy

CO4 - Students are able to describe Internet trading relationships including Business to Consumer, Business-to-Business, Intra-organizational.

CO5 - Students are able to describe the infrastructure for E-commerce

Describe the key features of Internet, Intranets and Extranets and explain how they relate to each other.

UNIT – I: E-COMMERCE FUNDAMENTALS

Introduction - The e-commerce environment - The e-commerce marketplace - Focus on portals - Location of trading in the marketplace - Commercial arrangement for transactions - Focus on auctions - Business models for e-commerce - Revenue models - Focus on internet start-up companies - E-business infrastructure: Introduction on Internet - Internet standards - Focus on controls the internet - Managing e-business infrastructure - Focus on web service and service-oriented - Focus on new access devices.

UNIT – II: E-PROCUREMENT

Introduction - Drivers of e-procurement - Focus on estimating e-procurement cost savings - Risks and impacts of e-procurement - Implementing e-procurement - Focus on electronics B2B marketplaces - The future of e-procurement E-marketing: Introduction - E-marketing planning - Situation analysis - Objective setting – Strategy - Focus on characteristics of new-media marketing communications – Tactics - Focus on online branding – Actions - Control.

UNIT – III: CUSTOMER RELATIONSHIP MANAGEMENT

Introduction:e-CRM-conversion marketing - the online buying process - customer acquisition management - focus on marketing communications for customer acquisition - customer retention management focus on excelling in e-commerce service quality - customer extension - Analysis and design: Introduction - process modeling - Data modeling - Design for e-business - Focus on user centered site design - Focus on security design for e-business.

UNIT – IV: M-COMMERCE

Introduction to m-commerce: Emerging applications - different players in m-commerce - m-commerce life cycle - Mobile financial services - mobile entertainment services - and

UNIT – V: MANAGEMENT OF MOBILE COMMERCE SERVICES

Content development and distribution to hand-held devices - content caching - pricing of mobile commerce services - The emerging issues in mobile commerce: The role of emerging wireless LANs and 3G/4G wireless networks - personalized content management - implementation challenges in m-commerce - futuristic m-commerce services.

TEXT

1. Dave Chaffey, “E-Business and E-Commerce Management”, 3rd Edition, 2009, Pearson Education.

REFERENCES

1. Henry Chan, Raymond Lee and etl., “E-Commerce Fundamental and Applications”, Wiley.
2. Brian Mennecke and Troy Strader, “Mobile Commerce: Technology, Theory”.
3. Nansi Shi, “Mobile Commerce Applications”, IGI Global, 2004.
4. Gary P. Schneider, “Electronic Commerce”, 7th Edition, CENGAGE Learning India, New Delhi.
5. K.K. Balaji, D.Nag “E-Commerce”, 2nd Edition, Mc Graw Hill Education, New Delhi.
6. P.T.Joseph,” E-Commerce an Indian Perspective,” PHI Publication, New Delhi.
7. Bhaskar Bharat, “Electronic Commerce – Technology and Application”, McGraw Hill.

WEB REFERENCES

www.feinternational.com/blog/what-is-e-commerce-an-introduction-to-the-industry/
www.abetterlemonadestand.com/what-is-ecommerce/

[SEMESTER I: OPEN ELECTIVE]

[Hrs: 3/Credits: 3]

B. INTRODUCTION TO COMPUTER APPLICATION

COURSE OBJECTIVES

- To know about computer and basic applications of computer.
- To get knowledge about operating system
- To aim at imparting a basic level appreciation Programme

COURSE OUTCOME

CO1 - Students are able to know about computer and basic applications of computer.

CO2 - Students are able to get knowledge about operating system

CO3 - Students are able to aim at imparting a basic level appreciation Programme

UNIT I: KNOWING COMPUTER

What is Computer - Basic Applications of Computer - Components of Computer System - Central Processing Unit (CPU) – VDU - Keyboard and Mouse - Other input/output Devices - Computer Memory - Concepts of Hardware and Software - Concept of Computing - Data and Information; Applications of IECT - Connecting keyboard – mouse - monitor and printer to CPU and checking power supply.

UNIT II: OPERATING COMPUTER USING GUI BASED OPERATING SYSTEM

What is an Operating System - Basics of Popular Operating Systems - The User Interface - Using Mouse - Using right Button of the Mouse and Moving Icons on the screen - Use of Common Icons - Status Bar - Using Menu and Menu – selection - Running an Application - Viewing of File - Folders and Directories - Creating and Renaming of files and folders - Opening and closing of different Windows - Using help - Creating Short cuts - Basics of O.S Setup - Common utilities.

UNIT III: UNDERSTANDING WORD PROCESSING

Word Processing Basics - Opening and Closing of documents - Text creation and Manipulation - Formatting of text - Table handling - Spell check -language setting and thesaurus - Printing of word document.

UNIT IV: USING SPREAD SHEET

Basics of Spreadsheet - Manipulation of cells - Formulas and Functions - Editing of Spread Sheet - printing of Spread Sheet.

UNIT V: MAKING SMALL PRESENTATION

Basics of presentation software - Creating Presentation - Preparation and Presentation of Slides - Slide Show - Taking printouts of presentation / handouts.

TEXT

1. Introduction to Computer Applications, TNAU, Tamil

Nadu.<https://www.agrimoon.com/introduction-to-computer-applications-pdf-book/>

WEB REFERENCES

<https://homepage.cs.uri.edu/faculty/wolfe/book/Readings/Reading01.htm>

<https://peda.net/kenya/ass/subjects2/computer-studies/form-1/itc2>

C. PRINCIPLES OF INTERNET

COURSE OBJECTIVES

- To learn the basics of Internet.
- To provide fundamental knowledge in WWW.

COURSE OUTCOMES

CO1 - Students are able to learn the basics of Internet.

CO2 - Students are able to provide fundamental knowledge WWW.

UNIT-I: INTERNET

The wired world of the internet –Information travels across the internet –TCP/IP – Understanding internet addresses and domains –Anatomy of web connections –Internet file types. Internet’s Underlying Architecture: Domain name system –Routers –The internet’s client/server architecture.

UNIT-II: CONNECTING TO THE INTERNET

Connecting your computer –Connecting to the internet from online services –ISDN –The internet/television connection –Network computers –DSL(Digital Subscriber Line). Communicating on the internet:E-mail–Usenet and newsgroups –Internet chat and instant messaging –Making phone calls on the internet.

UNIT-III: WORLD WIDE WEB

Webpages –Web browsers –Markup Languages –Hypertext –Image maps and interactive forms –Web host servers –Websites with databases. Common Internet Tools:Gophers –Telnet –FTP and downloading files –Searching the internet.

UNIT-IV: MULTIMEDIA ON THE INTERNET

Audio on the internet –Video on the internet –Intranet and shopping on the internet.

UNIT-V: SAFEGUARDING THE INTERNET

Firewalls–Viruses –Digital certificates.

TEXT

1. Preston Gralla, “How the Internet works”, 10thEdition, Que publishers, 2014.

REFERENCES

1. Raj Kamal, “Internet and Web Technologies”, Tata Mc Graw Hill, 2002.
2. C Xavier, “World Wide Web design with HTML”, Tata Mc-Graw Hill, 2008.

WEB REFERENCES

www.informatics.buzdo.com/p912-internet-principles.htm

COURSE OBJECTIVES

- To expose the knowledge of MVC and Java server faces
- To provide the knowledge and skills required to develop web applications using the MVC framework provided by Apache Struts
- To Develop Enterprise web application using EJB.
- To understand and implement the object-relation mapping using Hibernate
- To explore the knowledge of Aspect Oriented Programming using Spring and Spring MVC.

COURSE OUTCOMES

CO1 - Students are able to work with JSP, JSF and Servlet using MVC approach.

CO2 - Students are able to develop the web applications using the MVC framework provided by Apache Struts

CO3 - Students are able to develop Enterprise web application using EJB.

CO4 - Students are able to implement the Object-Relation Mapping technique using Hibernate

CO5 - Students are able to get knowledge of Aspect Oriented Programming using Spring and Spring MVC.

UNIT - I: INTEGRATING SERVLETS AND JSP, JAVA SERVER FACES

JSP: Basics – Life cycle of JSP- Static and dynamic content- javaBeans components; Understanding the need for MVC: implementing MVC with request dispatcher, summarizing the MVC code, interpreting relative URL, three data sharing approaches; JSF: Basics, Framework roles, Simple JSF application, Life Cycle of JSF page, using core tags, using HTML Component tags, localized messages, Standard Converters and Validators.

UNIT- II: STRUTS FRAMEWORK

Introduction to Struts , Understanding Struts , Struts Flow Control Six Basic steps in using Struts, FormBeans, Forms, Using properties files, Advanced Action, Manual Validation, validation in the Action, validation in the form bean, Struts Tiles, Motivations , Basics, Tiles definitions file.

UNIT - III: ENTERPRISE JAVA BEANS

EJB: Session Bean, Entity Bean, Message driven Bean, defining clients access with interfaces, life cycle of enterprise Bean, creation of Enterprise Bean, web client, other Enterprise Bean features, handling exceptions, Container- Managed Transactions, Bean Managed Transactions.

UNIT - IV: HIBERNATE

Basics- Enterprise Application architectures, Hibernate Motivation, Object Relation Mapping, Collection Mapping, Association Mapping, Collection and Association Relationships, Relationships in Java and Databases, Component Mapping, Inheritance Mapping, Life cycle of Hibernate Entities, Transactions, HQL, Native SQL, Querying Terminology, SQL Query Options, Querying With Hibernate.

UNIT - V: SPRING

Foundation: Motivation- Spring Hello World, Runtime environment, Dependency injection- Inversion of control ,Spring IoC container, Spring framework composition, Spring container instantiation, Spring bean definitions ,Bean naming, Bean scoping, Referencing other beans,

Properties integration-Resource integration - Collection mapping, AOP with spring framework.

TEXTS

1. Marty Hall, Larry Brown., “Core Servlets and Java Server Pages”, 2nd Edition, Pearson Education, 2004
2. Stephanie Bodoffetl., “The J2EETM Tutorial”, Pearson Education, Second Edition, 2005
3. Hibernate Reference Documentation 3.3.1, Copyright © 2004 Red Hat Middleware, LLC available at http://www.hibernate.org/hib_docs/v3/reference/en/html_single/
4. Gary Mak, Josh Long and Daniel Rubio, “Spring Recipes: A Problem-Solution Approach”, Apress Publications, Second Edition, 2010
5. Craig Walls, ”Spring in action”, Manning Publisher, Third Edition, 2011

REFERENCES

1. Cay S.Horstmann, Gary Cornell, “Core Java Volume I – Fundamentals Core Concepts”, Prentice Hall of India, Ninth Edition, 2012
2. Cay S.Horstmann, Gary Cornell, “Core Java Volume II – Advanced Features”, Prentice Hall of India, Ninth Edition, 2013
3. Minter Dave, Linwood Jeff, “Beginning Hibernate, From Novice to Professional”, Apress, Second Edition, 2006
4. Doray, Arnold, “Beginning Apache, From Novice to Professional”, Apress, Second Edition, 2006

WEB REFERENCES

<http://courses.coreservlets.com/Course-Materials/struts.html>

<http://www.roseindia.net/jsp/index.shtml>

<http://www.oracle.com/technetwork/java/javaee/javaserverfaces-139869.html>

<http://docs.oracle.com/javaee/1.4/tutorial/doc/JSFIntro.html>

<http://docs.oracle.com/javaee/6/tutorial/doc/bnaph.html>

http://en.wikipedia.org/wiki/JavaServer_Faces

DESIGN AND ANALYSIS OF ALGORITHMS

COURSE OBJECTIVES

- To prove the correctness and analyze the running time of the basic algorithms for those classic problems.
- To understand the basic knowledge of algorithm design and its implementation.
- To learn the key techniques of Divide-and-Conquer and Greedy Method.
- To recognize the concept of Dynamic Programming and its algorithms
- To familiarize with Backtracking algorithms.
- To understand Branch and Bound techniques for designing and analyzing algorithms.

COURSE OUTCOMES

CO1 - Students are able to prove the correctness and analyze the running time of the basic algorithms for those classic problems.

CO2 - Students are able to understand the basic knowledge of algorithm design and its implementation.

CO3 - Students are able to learn the key techniques of Divide-and-Conquer and Greedy Method.

CO4 - Students are able to recognize the concept of Dynamic Programming and its algorithms

CO5 - Students are able to familiarize with Backtracking algorithms.

CO6 - Students are able to understand Branch and Bound techniques for designing and analyzing algorithms.

UNIT - I: INTRODUCTION

Algorithm Specification-Performance Analysis: Space complexity- Time Complexity- Asymptotic notations-practical complexities-performance measurement- Randomized algorithms: An informal Description- Identifying the repeated element- Primality testing- Advantages and Disadvantages.

UNIT - II: DIVIDE-AND-CONQUER AND GREEDY METHOD

Divide-and-conquer: General method-Binary Search-Finding the maximum and minimum-Merge sort- quick sort- Strassen's Matrix multiplication- The greedy Method: The general method-Knapsack problem-Minimum cost spanning tree

UNIT - III: DYNAMIC PROGRAMMING

Dynamic Programming: Dynamic programming- All pairs shortest paths- Single source shortest paths- String editing- 0/1 knapsack- The traveling salesperson problem-Flow shop scheduling

UNIT - IV: BACKTRACKING

Backtracking: General Method-8 queen's problem- Sum of subsets- Graph coloring-Hamiltonian cycles-Knapsack Problem

UNIT - V: BRANCH AND BOUND

Branch-and-Bound: General method of algebraic problem-Modular arithmetic- Comparison trees-Lower bound through reduction-Planar graph coloring problem-Bin packing.

TEXT

1. Ellis Horowitz, SartajSahni, SanguthevarRajasekaran, “Fundamentals of Computer Algorithms”, Galgotia Publications Pvt.Ltd, 2005

REFERENCES

1. S.K.Basu, “Design Methods and Analysis of Algorithms”, Fourth edition, 2010
2. A.V.Aho, J.E. Hopcroft and J.D.Ullman, “The Design and Analysis of Computer Algorithms”, Pearson Education Asia, Addison-Wesley Publishing Company, 2003
3. AnanyLevitin, “Introduction to the Design and Analysis of Algorithm”, Pearson Education Asia, Dorling Kindersley India Pvt.Ltd, 2003

WEB REFERENCES

<http://www.personal.kent.edu/~rmuhamma/Algorithms/algorithm.html>

<http://cs.uef.fi/pages/franti/asa/notes.html>

<http://computerstuff7090.blogspot.in/2012/11/design-analysis-and-algorithm-video.html>

WEB APPLICATION USING C#.NET

COURSE OBJECTIVES

- To know the differences between desktop and web application.
- To construct classes, methods, and accessor and instantiate objects.
- To create and manipulate GUI components in C#.
- To code solutions and compile C# projects within the .NET framework.
- To build own desktop application with Database

COURSE OUTCOMES

CO1 - Students are able to know the differences between desktop application and web application.

CO2 - Students are able to construct classes, methods, and access modifier and instantiate objects.

CO3 - Students are able to create and manipulate GUI components in C# for windows application.

CO4 - Students are able to code solutions and compile C# projects within the .NET framework.

CO5 - Students are able to build the desktop application with Database.

UNIT- I: INTRODUCTION TO ASP.NET AND WEB FORMS

Developing ASP.NET Applications - ASP.NET File Types - The bin Directory - Application Updates - A Simple Application from Start to Finish-web.config file Web Form Fundamentals - A Simple Page Applet - The Problem With Response.Write - Server Controls - HTML Server Controls - ViewState - The HTML Control Classes - Events - Event Handling Changes - The Currency Converter application-Adding Support for Multiple Currencies - Adding Linked Images - Setting Styles – A Deeper Look at HTML control classes-HTML control events-The HTML control Base class-The HtmContainerControl Class-The HtmlInputControl Class-The Page class-The Controls collection-The HttpRequest Class-The HttpResponse Class-The ServerUtility Class-Assessing HTML Server controls

UNIT - II: WEB CONTROLS

Web Controls - Stepping Up to web Controls - Basic Web Control Classes - The web Control Tags - The WebControl Base Class - Units Enumerated Values - Colors - Fonts - List Controls - Table Controls - AutoPostBack and Web Control Events - How Postback Events Work - The Page Lifecycle - The Greeting Card Applet - Validation and rich Controls- The Calendar Control-Formatting the Calendar-restricting Dates- The AdRotator control-The Wizard control-Validation-The Validation Controls -The Validation Process-The Validator Class-A Simple Validation Example –Sever side example-Manual Validation-Understanding Regular Expressions-Literals and MetaCharacters-Finding a Regular expression- A Validated Customer Form

UNIT - III: COMPONENT BASED PROGRAMMING

Introduction – Creating a Simple Component – Properties and State – Database Components – Consuming the Database Component – Enhancing the Component with Error Handling – Aggregate Information – Data Objects.

UNIT - IV: CUSTOM CONTROLS

User Controls – Creating a Simple User Control – Visual Studio.NET Custom Control Support – Independent User Controls – Integrated User Controls – User Control Events – Limitations – Deriving Custom Controls.

UNIT - V: DATABASE ACCESS WITH COMMAND, ADAPTER AND XML

ADO.NET Data Access - About the ADO.NET Example - Obtaining the Sample Database - Simple Data Access - Simple Data Update - Importing the Namespaces - Creating a Connection - The Connection String SQL - Making the Connection - Defining the Select Command - Using a Command with a DataReader - Updating Data - Using Update - Insert - and Delete Commands - Accessing Disconnected Data - Selecting Disconnected Data - Selecting Multiple Tables - Modifying Disconnected Data - Modifying and Deleting Rows - Adding Information - to a DataSet - Updating Disconnected Data - The Command Builder - Updating a DataTable - Controlling Updates - An Update Example – Using XML - XML's Hidden Role in .NET - XML Basics - Attributes - Comments - The XML Classes - the XML TextWriter - The XML Text Reader - Working with XML Documents - Reading an XML Document - Searching an XML Document - XML Validation – CreatingXML Schema -XSD Documents - Validating an XML File.

TEXTS

1. Mathew MacDonald, “ASP.NET: The Complete Reference”, Tata McGraw Hill Publishing Company Ltd., New Delhi, 2006
2. Dino Eesposito, “Introducing Microsoft ASP.NET 2.0”, AsokeK.Ghosh, Prentice Hall of India, Eastern Economy Edition, New Delhi, 2006

REFERENCE

1. Stephen Walther, ”ASP.NET 3.5 Unleashed“, Pearson Education, Dorling Kindersley Pvt. Ltd, Second Edition, 2008

WEB REFERENCES

<http://csharp.net-tutorials.com/index.php>

<http://csharp.net-tutorials.com/classes/introduction/>

<http://www.homeandlearn.co.uk/csharp/csharp.html>

<http://www.indiabix.com/c-sharp-programming/questions-and-answers/>

<https://www.wiziq.com/online-tests/43860-c-basic-quiz>

<http://www.withoutbook.com/OnlineTestStart.php?quizId=71>

http://www.compileonline.com/compile_csharp_online.php

<http://www.ideone.com>

PRACTICAL IV: ADVANCED ENTERPRISE JAVE PROGRAMMING

1. JSP and MVC with Request Dispatcher
2. JSF in JSP Pages,Using all HTML and core render kit
3. Actions and Forms
4. Properties and Messages
5. Creating Web Client and Session Bean
6. Bean Managed Transactions and Container Managed Transaction
7. Object Relation Mapping and Collection Mapping
8. Association Mapping and Component Mapping
9. Inheritance Mapping
10. Spring Actions and Spring MVC

PRACTICAL V: DESIGN AND ANALYSIS OF ALGORITHMS

1. Divide and Conquer with Recursive Function
2. Divide and Conquer with Non-Recursive Function
3. Strassen's Matrix Multiplication
4. Greedy Method
5. Dynamic programming
6. Shortest path problem
7. Travelling sales person problem
8. Back tracking
9. Modular Arithmetic
10. Bin Packing

PRACTICAL VI: WEB APPLICATION USING C#.NET

1. Web Configuration File
2. Viewstate
3. HTML Control Classes, Control Events, Container and Input Control Classes,
4. Web Control Classes & Control Tags
5. Validation Controls
6. Rich Controls
7. Data Access
8. Components
9. Custom Controls
10. User Controls

A. HUMAN COMPUTER INTERACTION

COURSE OBJECTIVES

- To plan and Develop procedures and life cycle of Human Computer Interaction
- To analyze product usage through appropriate assessments and testing techniques.
- To apply the interface structure standards/rules for different users.
- To encourage communication between understudies of brain science, structure, and software engineering on UI improvement projects.
- To understand the intensity of HCI in the cutting edge world and the job it can play in advancing value, openness, and progress.

COURSE OUTCOMES

CO1 - Students are able to plan and Develop procedures and life cycle of Human Computer Interaction

CO2 - Students are able to analyze product usage through appropriate assessments and testing techniques.

CO3 - Students are able to apply the interface structure standards/rules for different users.

CO4 - Students are able to encourage communication between understudies of brain science, structure, and software engineering on UI improvement projects.

CO5 - Students are able to understand the intensity of HCI in the cutting edge world and the job it can play in advancing value, openness, and progress.

UNIT – I: HCI FOUNDATIONS

Input–output channels, Human memory, Thinking: reasoning and problem solving, Emotion, Individual differences, Psychology and the design of interactive systems, Text entry devices, Positioning, pointing and drawing, Display devices, Devices for virtual reality and 3D interaction, Physical controls, sensors and special devices, Paper: printing and scanning, Memory, Processing and networks: Design focus - The myth of the infinitely fast machine

UNIT – II: DESIGNING INTERACTION

Introduction, Models of Interaction, Framework and HCI, Ergonomics, Interaction Styles, Elements of WIMP Interfaces, Interactivity, Paradigms of Interaction, Interaction design basics, Process of design, User focus, Scenarios, Navigation design, Screen design and layout, Iteration and prototyping. Design Rules – Principles to support usability, Standards, Guidelines, Golden rules and heuristics, HCI Patterns

UNIT – III: EVALUATION TECHNIQUES

Evaluation, Goals of evaluation, Evaluation through expert analysis, Evaluation through user participation, Choosing and evaluation method. Universal design: Introduction, design principles, Multi-Modal Interaction – Designing websites for screen readers, Choosing the right kind of speech, Apple Newton, Designing for diversity. User Support – Requirements of User support, Approaches to user support, Adaptive help systems, designing user support systems.

UNIT – IV: MODELS AND THEORIES

Model Human Processor - Working Memory, Long-Term Memory, Processor Timing, Keyboard Level Model - Operators, Encoding Methods, Heuristics for M Operator

Placement, What the Keyboard Level Model Does Not Model, Application of the Keyboard Level Model, GOMS - CMN-GOMS Analysis, Modeling Structure, State Transition Networks - Three-State Model, Glimpse Model, Physical Models, Fitts' Law. Guide Lines in HCI - Shneiderman's eight golden rules, Norman's Seven principles, Norman's model of interaction, Nielsen's ten heuristics, Heuristic evaluation, contextual evaluation, and Cognitive walk-through.

UNIT – V: COLLABORATION AND COMMUNICATION MODELS

Face-to-face Communication, Conversation, Text-based Communication, Group working. 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, Use of task analysis. Dialog design notations, Diagrammatic notations, Textual dialog notations, Dialog semantics, Dialog analysis and design.

TEXT

1. Dix, A., Dix, A. J., Finlay, J., Abowd, G. D., & Beale, R. “Human-computer interaction”. Pearson Education, Haddington, 2003.

WEB REFERENCES

<https://www.udacity.com/course/human-computer-interaction--ud400>

<https://www.edx.org/professional-certificate/gtx-human-computer-interaction>

https://www.tutorialspoint.com/human_computer_interface/index.htm

B. SOCIAL INFORMATION NETWORKS

COURSE OBJECTIVES

- To understand the real world applications
- To comprehend the elements of the social network
- To demonstrate and envision the social network
- To understand the role of web in the social network
- To apply the concept of social network in appropriate application

COURSE OUTCOMES

CO1 - Students are able to clear understanding of real world applications

CO2 - Students are able to comprehend the elements of the social network

CO3 - Students are able to demonstrate and envision the social network

CO4 - Students are able to understand the role of web in the social network

CO5 - Students are able to apply the concept of social network in appropriate application

UNIT-I: INTRODUCTION

Introduction to social network analysis – Fundamental concepts in network analysis – social network data – notations for social network data – Graphs and Matrices, Relations and attributes, Analysis of network data, Interpretation of network data.

UNIT-II: MEASURES & METRICS

Strategic network formation - network centrality measures: degree, betweenness, closeness, eigenvector - network centralization–density – ego-centric and socio-centric-reciprocity – transitivity – ego network – measures for ego network - dyadic network – triadic network - cliques - groups- clustering – search.

UNIT-III: COMMUNITY NETWORKS

Community structure - modularity, overlapping communities - detecting communities in social networks – discovering communities: methodology, applications - community measurement - evaluating communities – Applications, Models.

UNIT-IV: NETWORK DYNAMICS

Small world network - Watts–Strogatz networks - Statistical Models for Social Networks – Network evolution models: dynamical models, growing models - Nodal attribute model: exponential random graph models – Preferential attachment - Power Law - random network model: Erdos-Renyi and Barabasi- Albert–Epidemics - Hybrid models of Network Formation.

UNIT-V: THE WORLD WIDE WEB

Structure of the web - Modelling and aggregating social network data – developing social semantic application – evaluation of web-based social network extraction – Data Mining – Text Mining in social network – Tools – case study.

TEXT BOOK

1. Wasserman, S. and Faust, K. Social network analysis: Methods and applications, Vol. 8. Cambridge university press, 1994.

2. Newman, M. (2018). Networks. Oxford university press..

WEB REFERENCES

<https://www.classcentral.com/course/sna-338>

https://www.tutorialspoint.com/internet_technologies/social_networking.htm

<https://www.datacamp.com/community/tutorials/social-network-analysis-python>

C. CLOUD COMPUTING

COURSE OBJECTIVES

- To introduce the broad perceptive of cloud architecture and model.
- To understand the concept of parallel and distributed computing
- To be familiar with the different technologies.
- To understand the features of virtualization.
- To learn to design the trusted cloud Computing system with different cloud platforms

COURSE OUTCOMES

CO1 - Students are able to understand the broad perceptive of cloud architecture and model.

CO2 - Students are able to understand the concept of parallel and distributed computing

CO3 - Students are able to understand the different technologies.

CO4 - Students are able to understand the features of virtualization.

CO5 - Students are able to learn to design the trusted cloud computing system with different cloud platforms

UNIT - I: INTRODUCTION

Cloud Computing at a Glance, The Vision of Cloud Computing, Defining a Cloud, Cloud Computing Reference Model, Characteristics and Benefits, Challenges Ahead, Historical Developments - Distributed Systems, Virtualization, Web 2.0, Service-Oriented Computing, Utility-Oriented Computing, Building Cloud Computing Environments - Application Development, Infrastructure and System Development, Computing Platforms and Technologies - Amazon Web Services (AWS), Google AppEngine, Microsoft Azure, Hadoop, Force.com and Salesforce.com

UNIT – II: PRINCIPLES OF PARALLEL AND DISTRIBUTED COMPUTING

Parallel vs. Distributed Computing , Elements of Parallel Computing - Hardware Architectures for Parallel Processing, Approaches to Parallel Programming, Levels of Parallelism, Laws of Caution, Elements of Distributed Computing - General Concepts and Definitions, Components of a Distributed System, Architectural Styles for Distributed Computing, Models for Inter-Process Communication, Technologies for Distributed Computing - Remote Procedure Call, Distributed Object Frameworks, Service Oriented Computing.

Virtualization - Introduction, Characteristics of Virtualized Environments, Taxonomy of Virtualization Techniques, Execution Virtualization, and Other Types of Virtualization, Virtualization and Cloud Computing, Pros and Cons of Virtualization, Technology Examples - Xen: Paravirtualization, VMware: Full Virtualization, Microsoft Hyper-V

UNIT - III: CLOUD COMPUTING ARCHITECTURE

Introduction, Cloud Reference Model - Architecture, Infrastructure / Hardware as a Service, Platform as a Service, Software as a Service, Types of Clouds - Public Clouds, Private Clouds, Hybrid Clouds, Community Clouds, Economics of the Cloud, Open Challenges - Cloud Definition, Cloud Interoperability and Standards, Scalability and Fault Tolerance, Security, Trust, and Privacy, Organizational Aspects. High-Throughput Computing: Task Programming - Task Computing, Characterizing a Task, Computing Categories, Frameworks for Task Computing, Task-based Application Models, Aneka Task-Based Programming.

UNIT - IV: ANEKA

Cloud Application Platform - Framework Overview, Anatomy of the Aneka Container -

From the Ground Up: Platform Abstraction Layer, Fabric Services, Foundation Services, Application Services, Building Aneka Clouds - Infrastructure Organization Logical Organization, Private Cloud Deployment Mode, Public Cloud Deployment Mode, Hybrid Cloud Deployment Mode, Cloud Programming and Management - Aneka SDK , Management Tools. Concurrent Computing: Thread Programming- Introducing Parallelism for Single Machine Computation, Programming Applications with Threads - Techniques for Parallel Computation with Threads, Multithreading with Aneka - Introducing the Thread Programming Model, Aneka Thread vs. Common Threads, Programming Applications with Aneka Threads - Aneka Threads Application Model, Domain Decomposition: Matrix Multiplication Functional Decomposition: Sine, Cosine, and Tangent.

UNIT - V: CLOUD PLATFORMS IN INDUSTRY

Amazon Web Services - Compute Services, Storage Services, Communication Services, Google AppEngine - Architecture and Core Concepts, Application Life-Cycle, Cost Model, Observations, Microsoft Azure - Azure Core Concepts - SQL Azure - Windows Azure Platform Appliance. Cloud Applications - Scientific Applications - Healthcare: ECG Analysis in the Cloud - Biology: Protein Structure Prediction - Biology: Gene Expression Data Analysis for Cancer Diagnosis - Geoscience: Satellite Image Processing, Business and Consumer Applications - CRM and ERP - Productivity - Social Networking - Media Applications - Multiplayer Online Gaming. Advanced Topics in Cloud Computing - Energy Efficiency in Clouds, Market Based Management of Clouds, Federated Clouds / InterCloud, Third Party Cloud Services

TEXT

1. Rajkumar Buyya, Christian Vecchiola, and S. Thamarai Selvi. Mastering cloud computing: foundations and applications programming. Tata McGraw Hill Education Private Limited, New Delhi , 2013

REFERENCES

1. Rittinghouse and Ransome, Cloud Computing: Implementation, Management, and Security, CRC Press, 2016.
2. Michael Miller “Cloud Computing Web based application that change the way you work and collaborate online”. Pearson edition, 2008.
3. Kris Jamsa, Cloud Computing: SaaS, PaaS, IaaS, Virtualization, Business Models, Mobile, Security and More, Jones & Bartlett Learning, 2012.

WEB REFERENCES

<https://www.ibm.com/cloud>

<https://www.javatpoint.com/cloud-computing-tutorial>

[SEMESTERII: OPEN ELECTIVE]

[Hrs: 3/Credits: 3]

A. PRINCIPLES OF WEB DESIGN

COURSE OBJECTIVES

- To provide a comprehensive overview of the largest Web Technologies, Hyper Text

Markup Languages (HTML) and Cascading Style Sheet (CSS).

- To learn through hands-on, practical instruction that will assist the students to tackle the real-world problems they face in building websites today—with a specific focus on HTML5 and CSS3.

COURSE OUTCOMES

CO1 - Students are able to learn how to combine basic HTML elements to create Web pages.

CO2 - Students are able to understand the use of HTML tags and tag attributes to control a Web page's appearance.

CO3 - Students are able to capable to learn how to add absolute URLs, relative URLs, and named anchors to Web pages.

CO4 - Students are able to gain a good understanding of using tables and frames as navigational aids on a Web site.

CO5 - Students are able to control appearance webpages by applying style sheet.

UNIT - I : HTML INTRODUCTION

Web page: Static & Dynamic Page - Web Browsers - HTML Editors - Tags – Elements – Attributes - HTML Page Structure - HTML Basic tags: Head – Title – Body. Basic text formatting: Heading tags – Paragraph tag – hr tag - Line break – Pre formatted. Presentational Element - Phrase Elements. List Tags: Ordered List – Unordered List – Definition List.

UNIT – II: LINKS, IMAGES AND TABLES

Link: Basic link – Directories and directory structure – creating links. Image and Object: Adding image to your site – Adding other objects – Using image as links.

Tables: Basic table elements and attributes – Advanced table – Accessibility issues with tables.

UNIT – III: FRAMES AND FORMS

Frames: The Frameset, No Frame Element - Creating Link between Frames - Nested Frameset. Form: Text Fields - Password Field - Radio Button – Checkbox - Submit Button – Reset Button – Button – Select – option – text area.

UNIT – IV: CASCADING STYLE SHEET-I

Introduction – syntax – ID selector - Class selector – External CSS – Internal CSS – Inline CSS – Font property: Font family - font size – font weight - font style - font variant - font stretch - font size adjust. Text Formatting: Color, text-align, vertical-align, decoration – indent- shadow –transform- letter spacing –word pacing- white space - direction. Text Pseudo Classes: First-letter pseudo class - First line pseudo class.

UNIT - V: CASCADING STYLE SHEET-II

Background: color – image – repeat – position – attachment. List: style type – style position – style image – marker offset. Table: table specific – border collapse – border spacing – caption side – empty cell – table layout. Outlines: outline width – outline style – outline color. The :focus and :active pseudo classes.

TEXT

1. Jon Ducktt. “Web Programming with HTML, CSS and JAVA SCRIPT”, Wiley Publishing, 2005. Unit – I : Ch.1 Unit – II : Ch. 2, 3 & 4 Unit - III : Ch.5, 6 Unit – IV : Ch.7

REFERENCES

1. Joel Skylar. “Principles of Web Design”. Singapore : Thomson Asia Pvt. Ltd 2000
2. Powell , Thomas A. “Web Design – The Complete Reference”, Tata McGraw Hill Edition 2000
3. Alexis Goldstein, Louis Lazaris, Estelle Weyl. “HTML5 & CSS3 for the Real World”.

WEB REFERENCES

<http://www.w3schools.com/css>

<http://www.tutorialspoint.com/css>

B. OPEN SOURCE APPLICATIONS

COURSE OBJECTIVES

- To understand the features of PHP
- To develop the different applications using PHP
- To demonstrate the applications using PHP with Mysql
- To understand the concepts of Perl
- To develop the applications using Perl

COURSE OUTCOMES

CO1 - Students are able to understand the features of PHP

CO2 - Students are able to develop the different applications using PHP

CO3 - Students are able to demonstrate the applications using PHP with Mysql

CO4 - Students are able to understand the concepts of Perl

CO5 - Students are able to develop the applications using Perl

Unit- I: BASIC PHP

Web Server-Apache-PHP-Data Types-User defined Variables-Constants-Operators-Control Structures-User defined Functions-Directory Functions-File system Functions-Arrays-String Functions-Date and Time Functions-Mathematical Functions-Miscellaneous Functions

UNIT - II: ADVANCED PHP WITH MYSQL

Exceptions handling-Error Handling Functions-Predefined Variables-Cookies-Sessions-COM-DOM- CURL-SOAP-Classes and Objects-Mail Function-URL Functions. PHP with MySQL: PHP MySQL Functions-Database driven application.

UNIT - III: ADVANCED PHP WITH AJAX, SEO AND CMS PHP WITH AJAX

Introducing Ajax-Ajax Basics-PHP and Ajax-Database Driven Ajax. PHP with SEO: Basic SEO-Provocative SE Friendly URLs-Duplicate Content- CMS: Wordpress Creating an SE-Friendly Blog.

UNIT - IV: BASIC PERL

Introduction-Scalar Data- Lists and Arrays-Subroutines-Input and Output- Hashes-Regular Expressions-Control Structures-Perl Modules-File Tests

UNIT 5: ADVANCED PERL

Directory Operations-Strings and Sorting-Smart Matching-Process Management- Advanced Perl Techniques

TEXTS**Unit 1 & 2 :**

Mehdi Achour, Friedhelm, Betz Antony Dovgal, Nuno Lopes, Hannes Magnusson, Georg Richter, Damien Seguy, Jakub Vrana And several others, "PHP Manual (Download the manual from PHP official website www.php.net)", 1997-2011 the PHP Documentation Group.

Unit 3 :

Lee Babin, "Beginning Ajax with PHP From Novice to Professional", Apress, 2007

(Chapters 1, 2, 3 and 4) Jaimie Sirovich and Cristian Darie, “Professional Search Engine Optimization with PHP A Developer’s Guide to SEO”, Wiley Publishing, Inc., Indianapolis, Indiana ,2007 (Chapters 2, 3, 5 and16)

Unit 4 & 5:

Randal L. Schwartz, Tom Phoenix, brian d foy, “Learning Perl, Fifth Edition Making Easy Things Easy and Hard Things Possible”, O’Reilly Media, June 2008

REFERENCES

Steven D. Nowicki, Alec Cove, Heow Eide-goodman ,“Professional PHP”, Wrox Press, 2004.

WEB REFERENCES

www.php.net

www.phpclasses.org

C. PROBLEM SOLVING TECHNIQUES

COURSE OBJECTIVES

- To develop problem solving skills with top down design principles.
- To become competent in algorithm design and program implementation.
- To develop skills to apply appropriate standard methods in problem solving

COURSE OUTCOMES

CO1 - Students are able to develop programming techniques required to solve a given problem.

CO2 - Students are able to develop problem solving skill using top – down design principles.

CO3 - Students are able to design an algorithm for a problem.

CO4 - Students are able to develop techniques to handle array structure

CO5 - Students are able to develop techniques such as searching and sorting

UNIT - I: PROGRAMMING TECHNIQUES

Steps Involved in Computer Programming – Problem Definition – Outlining The Solution – Flow Chart – Developing Algorithms – Efficiency of Algorithms - Analysis of Algorithms.

UNIT – II: FUNDAMENTAL ALGORITHMS

Exchanging the Values – Counting – Summation of Set of Number – Factorial Computation – Sine Computation – Fibonacci Sequence – Reversing the Digits of an Integer – Base Conversion – Character to Number Conversion.

UNIT – III: FACTORING METHODS

Finding the Square Root of a Number – Smallest Divisor of an Integer – GCD of Two Integers – Generating Prime Numbers – Computing the Prime Factors of an Integer – Generation of Pseudo-Random Numbers – Raising a Number to a Large Power – Computing the Nth Fibonacci Number.

UNIT – IV: ARRAY TECHNIQUES

Array Order Reversal – Array Counting Or Histogramming – Finding the Maximum Number in a Set – Removal of Duplicates from an Ordered Array – Partitioning an Array – Finding The kth Smallest Element – Longest Monotone Subsequence.

UNIT – V: MERGING, SORTING AND SEARCHING

Two Way Merge - Sorting by Selection, Exchange, Insertion, Partitioning - Binary Search – Hash Searching.

TEXT

1. Dromey R G, “How to Solve it by Computer”, Prentice Hall of India, 1997

REFERENCES

1. Michael Schneider, Steven W. Weingart, David M. Perlman, “An Introduction to Programming and Problem Solving with Pascal”, Wiley Eastern Limited, New Delhi, 1982.
2. Harold Abelson and Gerald Sussman with Julie Sussman, “ Structure and Interpretation of

Computer Programs”, MIT Press, 1985.

WEB REFERENCES

<http://nptel.ac.in/courses/106104074/>

<http://javahungry.blogspot.com/2014/06/algorithm-problem-solving-techniques-or-approaches-for-software-programmer.html>
