

**DIVISION
OF
COMPUTER APPLICATIONS**

Karunya University

Code	Subject Name	Credit
CA101	Computers and Internet Fundamentals	1:0:0
CA102	Introduction to Information Technology	3:0:0
CA201	Computer System Architecture	4:0:0
CA202	Theory of Programming Languages	4:0:0
CA203	Microprocessors	4:0:0
CA204	Data Structures and Algorithms-I	3:0:0
CA205	Data Structures and Algorithms-I Lab	0:0:2
CA206	Programming in C++	4:0:0
CA207	Programming in C++ lab	0:0:2
CA208	Database systems	4:0:0
CA209	Database system lab	0:0:2
CA210	System Analysis and Design	3:1:0
CA211	Internet and Java Programming Lab	0:0:2
CA212	Web Technology	4:0:0
CA213	Web Technology Lab	0:0:2
CA214	Component Object Technology Lab	0:0:2
CA215	Resource Management Techniques	3:0:0
CA216	OOAD Lab	0:0:2
CA217	Advanced Computer Architecture	4:0:0
CA218	Network Programming Lab	0:0:2
CA219	Compiler Design	3:0:0
CA220	Theory of Computation	4:0:0
CA221	Front End Lab	0:0:2
CA222	Embedded System Design	4:0:0
CA223	Parallel Computing	4:0:0
CA224	Unix Architecture	4:0:0
CA225	Component Object Technology	4:0:0
CA226	Computer Hardware Lab	0:0:2
CA227	Unix and Linux Lab	0:0:2
CA228	Theory of Computations	4:0:0
CA229	Data structures and algorithms	4:0:0
CA230	Programming lab	0:0:2
CA231	System Software	3:0:0
CA232	Software Engineering	4:0:0
CA233	Resource Management and Techniques	3:1:0
CA234	Web Technology	4:0:0
CA235	Web Technology Lab	0:0:2

CA101 COMPUTERS AND INTERNET FUNDAMENTALS

Credit: 1:0:0
Marks: (40+60)

Unit I : Introduction To Computer Organization

Computer Organisation -Input technology tools -keyboard, mouse, pointing stick, touch screen, sound I/O . automatic speech recognition system, light pen, par code reader, optical mark recognition, magnetic -ink character recognition, optical character recognition, image scanning- output technology tools.

Unit II : Printer

Impact, non impact, ink jet, dot matrix, letter quality printer, laser printer, plotter, Terminal: VDU, Tele printer terminal, smart and intelligent terminals. Types of memories: fundamentals of memory concepts -core storage, semi conductor storage, bubble storage, card concepts, card devices, the tape system, tape devices, magnetic tape storage technology.

Disk system: Disk concepts -disk storage technologies, magnetic hard disk storage technologies, optical diskstorage technologies – Brief history of micro processors (8088, 80286, 80386, 80486, Pentium etc) -types of computers → PC, mini, mainframe, super computer.

Unit : III

Understanding the Internet, overview of the Internet

Unit : IV

Connect to the net, Internet addresses, Mail.

Unit : V

Using mail well , web , safety, security and privacy.

Text Books

1. Haag, Cummings, "Management Information Systems for the Information Age", Irwin McGraw Hill, 1998.
2. Harley Hahn, *Teaches the Internet* , PHI, 1999 (Chapters 1 to 8)

Reference Rooks

1. V. Rajaraman, Radhakrishanan, ,, An Introduction to digital Computers deisgn“, PHI, 1997
2. Andrews S Tannenbaum, „Modern Operating Systems“, second edition, 1996
3. Bibim C Desai, ,, An Introduction to Database Systems“, West publishing company

CA102 INTRODUCTION TO INFORMATION TECHNOLOGY

Credit: 3:0:0
Marks: (40+60)

Unit I : Software

Application software system software basics of operating system and networks operating objectives – operating system as a user/computer interface, operating system a resource manager – evolution of operating systems – serial processing, simple batch systems, multiprogram batch systems, timesharing systems, parallel systems, distributed systems, real time systems DOS, UNIX, windows.

Unit II : Network Technologies and Concepts

Types of networks, communication media, communication processor – communication methods, standards and protocols – internet – client/server – client/server as a business model – types of client/server – implementation, distributed data in client / server environment, advantages and disadvantages of client / server.

Unit III : Fundamentals of Information Technology

Information technology – information in the new business, a new key business resource, information in an organization, transaction processing and customer integrated systems, management information systems, work group support systems, decision support systems and artificial intelligence, executive information systems, interorganisational systems.\

Unit IV : System Analysis

Definitions of systems analysis – starting a project – generating a broad alternative solution – economic feasibility – tools and methods of gathering information. System design : Data flow diagrams – user interface design – program design. Change over procedures – performance evaluation – quality assurance : Inceptions and walk through testing.

Unit V : Introduction to Database and Database Management Systems

Relational database model – entity classes and primary keys, defining relationship among entities, structure of relational database – relational commercial language – SQL – SQL integrity constraints, referential integrity – functional dependencies – assertions – triggers – Relational database design : Normalization.

Text Books

1. Haag. Cummings, “Management Information Systems for the Information Age”, Irwin McGraw Hill, 1998.

Reference Books

1. V. Rajaraman, Radhakrishnan, “An Introduction to digital Computers design”, PHI 1997
2. Andrews.S Tannenbaum, “Modern Operating Systems, second edition, 1996.
3. Bibnim C. Desai, “An Introduction to Database Systems”, West Publishing Company.

CA201 COMPUTER SYSTEM ARCHITECTURE

Credit: 4:0:0
Marks (40 + 60)

Unit : I

Register transfer and microoperations, Register transfer language, Register transfer, Bus and memory transfers, Arithmetic, logic and shift micro operations
Basic computer organization and design: Instruction Codes, Computer Instructions, Timing and Control Instruction Cycle, Memory-Reference Instructions, Input-Output and Interrupt. (Chapter 4 & 5)

Unit : II

Central Processing Unit : General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, Reduced Instruction Set Computer (RISC). (Chapter 8)

Unit : III

Microprogram control : Control Memory, Address Sequencing.
Processings: Parallel Processing, Pipelining, Vector Processing, Array Processors, and Characteristics of Multiprocessors
Computer arithmetic: Addition and Subtraction, Multiplication Algorithms, Division Algorithms. (Chapter 7,10)

UNIT : IV

Input-output organization: Peripheral Devices, Input-Output Interface, Asynchronous Data Transfer, Modes of Transfer, Direct Memory Access (DMA). (Chapter 11)

Unit : V

Memory organization: Memory Hierarchy, Main Memory, Associative Memory, Cache Memory, Virtual Memory.(chapter 12)

Text Book

1. M. Morris Mano, *Computer System Architecture*, Third Edition, Prentice Hall of India, 1996. (Chapters 4,5,7,8,10-12 only)

Reference book

1. William Stallings, *Computer Organization and Architecture*, Fourth Edition, Prentice Hall of India, 1996.

CA202 THEORY OF PROGRAMMING LANGUAGES

Credit 4:0:0
Marks 40+60

Unit I

Defining syntax, character set, BNF, syntax graphs, syntax and program readability, Programming languages, Variables expression and statements assignment statement.

Unit II

Binding time & storage allocation, constant & initialization, expression, conditional statements. Interactive statement, go to statement & labels, types, data types and typing, enumerated types, elementary, pointers.

Unit III

Structured data type, type coercion, type equivalence, scope and extent, basic, run time implementation, binding scope & extent. Procedure, features.

Unit IV

Parameter evaluation & parsing, call by name, specification of objects in a procedure, aliasing, overloading generic functions, coroutines. Data abstraction, Introduction, abstract data types, examples.

Unit V

Exception handling, need & issues in exception handling. Concurrency, concepts, semaphores, monitors, message passing, input & output. Concepts & difference between functional program, data flow programs & Object oriented programs.

Text Book

1. Ellis Horowitz, "Fundamentals of Programming Language", Galgotia Publications, 1995.

Reference books

1. Terrance W Pratt, "Theory of Programming Language"
2. Ravi Sethi, "Computer in Programming Language"

CA203 MICROPROCESSORS

Credit 4:0:0
Marks 40+60

Unit I

Intel 8086/8088 Internal Architecture : Architecture of 8086, Bus Interface Unit, Execution Unit, Instruction Set, Addressing Modes, minimum and maximum modes of operation.

Unit II

Assembler 86: Reserved Words, Segment Directives, declaratives, macros, simple assembly language programming.

Unit III

Memory Section : General features of Memory Interface, simple memory sections, Business structures, memory section for Intel 8086.

Unit IV

Interrupts & DMA : Interrupts in 8086, Programmable Peripheral Interface 8259A, Single & Cascade, DMA in 8086, Pentium & Pentium Pro (only Architecture).

Text Book

1. Douglas V. Hall, Microprocessor and Interfacing : Programming and Hardware, Second Edition, Tata McGraw Hill, 1993.

CA204 DATA STRUCTURES AND ALGORITHMS – I

Credit 3:0:0
Marks 40+60

Unit I

Introduction – Overview – How to create programs and analyse them, Arrays – structure – ordered lists – representation of arrays – simple applications.

Unit II

Stacks : Operations on Stack, Polish Expressions and their Compilation using Stacks.
Queues : Representation of Queues, operation on Queues, priority queues. (Chapter 3)

Unit III

Linear Linked List : Operations on Linear List using Singly Linked Storage structures, circular linked lists. (Chapter 4)

Unit IV

Doubly linked lists, polynomial manipulation using linked list, garbage collection and compaction using linked list. (Chapter 4).

Unit V

Trees: operation on binary tree, storage representation & manipulation of binary trees, conversion of general tree to binary tree, manipulation of arithmetic expression using Trees, sparse matrices.
Graphs: Matrix representation of graphs, list structures, breadth first search, depth first search, spanning trees, shortest path algorithm.

Test Book

1. Jeen-Paul Tremblay and Paul G Sorenson, An Introduction to Data structures with Applications, Second Edition, McGraw Hill Book Company, 1998.

Reference Book

1. Ellis Horowitz & Sartaj Sahni, “Fundamentals of Data Structures”, 1983, Computer Science.

CA 205(CA204P) DATA STRUCTURES & ALGORITHMS – I LAB

Credit:0:0:2
Marks: 50+50

1. Program for adding two Polynomials.
2. Program for implementing Stack operations
3. Program for implementing Queue operations
4. Implementation of circular Queue.
5. Program for operations on Single Linked List.
6. Program for inserting and deleting elements in Double Linked List.
7. Program to implement Towers of Hanoi Problem.
8. Program to convert an infix expression to postfix
9. Program to sort elements in ascending and descending order using bubble sort.
10. Program to search an element using the search techniques

Text Book

1. Jean – Paul Tremblay and Paul G. Sorenson, “An Introduction to Data Structures with Applications” Second Edition, McGraw Hill Book Company, 1998.

CA206 PROGRAMMING IN C++

Credit 4:0:0
Marks: (40+60)

Unit I : The Object Oriented Approach

Objects, classes, inheritance, reusability, creating new data types, polymorphism and overloading. Basic program construction, data types: integer, character, float, double, long double and Boolean. Input output statements: cin, cout, comments, escape sequence, manipulators, type conversion, arithmetic logical and relational operators, and library function(Chapter 1,2).

Unit II : Loops And Decisions

For loop, while loop & do loop and if, if...else, switch & other control statements. Structures, Enumeration, Functions: passing arguments to functions, returning values from functions, reference arguments, overloaded functions, inline functions, default arguments, variables and storage class and returning by reference(Chapter 3-5)

Unit III : Objects And Classes

A simple class, c++ objects as physical objects, c++ objects and data types, object as function argument, constructors, as function argument, overloaded constructors, copy constructors, returning objects from functions, structures and classes, static class data, const and classes, Arrays and Strings(Chapter 6,7).

Unit IV : Operator Overloading

Overloading unary and binary operator, data conversion, and pitfalls. Inheritance: derived class and base class, derived class constructors, overloading member functions, class hierarchies, public and private inheritance, level of inheritance, multiple inheritance.

Pointers: address and pointers, pointers and arrays, pointer and c-type strings, new and delete operator, pointers to pointer(Chapters 8-10)

Unit V : Virtual functions

Virtual functions, friend functions, static functions, this pointer. Streams and files: stream classes, stream errors, disk file I/O with streams, file pointers, error handling in file I/O. Templates and exception: function templates, class templates, exceptions.
(Chapter 11-14)

Text Book

1. Robert Lafore, *Object Oriented Programming In C++*, Third Edition, Galgotia, 1999. (Chapters 1-14).

Reference Book

1. Herbert Schildt, *C++ The Complete Reference*, Third Edition, McGraw Hill, 1999.

CA207 PROGRAMMING IN C++ LAB

Credit 0:0:2
Marks: (50+50)

1. Objects, classes.
2. Inheritance, Polymorphism.
3. Operator overloading.
4. Data type conversion.
5. Constructors, Pointers.
6. Virtual functions.
7. Friend Functions.
8. Static Functions.
9. This pointer.
10. Streams.
11. Exception handling.
12. Templates.
13. File operations.

CA208 DATABASE SYSTEMS

Credit 4:0:0
Marks: (40+60)

Unit : I

Introduction – Data Models – Database languages – Transaction – Storage management – Database administrator – Users – overall system structure – Entity – Relationship Model – Basic concepts – Mapping constraints – keys – E-R Diagram – Weak Entity Sets – reduction of E-R Diagram to tables.(Chapter 1,2)

Unit : II

Relational Model – structure – relational algebra – extended operations – Modifications on a database – views – SQL – basic structure – set operations – aggregate functions – Nested Sub queries – derived relations, views. (Chapter 3,4)

Unit : III

Integrity constraints – Domain constraints – referential integrity – assertions – triggers – functional dependencies – relational database design – decomposition – normalization using functional, multi valued, Join dependencies – Domain – Key Normal form – alternative approaches. (Chapter 6,7)

Unit : IV

Object Oriented data Model – Languages – Object Relational databases : Nested Relations – Complex types and object Orientation – Querying with complex types – creation of complex values and objects – comparison. (Chapter 8, 9)

Unit : V

Database System Architectures : Centralized Systems, Client server systems, Distributed systems, Parallel databases – introduction – inter query – intra query, intra-operation – interoperation parallelism – distributed databases – distributed data storage – network transparency – Query processing – Transaction model – Commit protocols – coordinator selection – concurrency control – deadlock handling – multi database systems. (Chapter 16,17,18)

Text Book

1. Henry F. Korth and Abraham Silberschatz, S. Sudarshan, Database System Concepts, 3rd edition, McGraw-Hill, 1997.

Reference Books

1. 1.Bipin C. Desai, An Introduction to Database Systems, West Publications, 6th edition, 1995.
2. 2.C.J.Date, An introduction to database systems, Addison Wesley publications, 6th edition 1995.

CA209 DATABASE SYSTEMS LAB

Credit 0:0:2
Marks: (50+50)

1. Usage of DDL commands.
2. Usage of DML and DCL commands.
3. Usage of TCL commands.
4. Multiple Subqueries.
5. Correlated Subqueries.
6. Usage of REF and OID.
7. Object creation.
8. Arrays manipulation.
9. BFILE management.

PL/SQL

1. Usage of Explicit cursors and implicit cursors.
2. Usage of functions.
3. Usage of procedures.
4. Exception Handling.
5. Usage of database triggers, packages.

CA210 SYSTEMS ANALYSIS AND DESIGN

Credit 3:1:0
Marks: (40+60)

Unit I : Introduction to Information System Development

Overview of Systems Analysis and Design, What Systems Analysis Is NOT, Systems Analyst's Work, Responsibility for Computer Programming, Changes in Systems Analyst's Responsibilities, Who Are the Users?, Business Systems Concepts, Categories of Information Systems, Systems Development Strategies, Implementation and Evaluation, Tools for Systems Development. Managing the Application Development Portfolio: The Good Old Days of Information Systems, How Systems Projects Are Begun, Information Systems Planning Methodologies, Managing Project Review and Selection, Managing the Portfolio Direction, Integrating the Application Portfolio, The Project Request, Preliminary Investigation, Selecting the Project Development Strategy. (Chapters 1 and 2)

Unit II : Requirements Analysis and Determination

What is requirements Determination?, Fact-Finding Techniques, Tools for Documenting Procedures and Decisions. Structured Analysis Development Strategy: Structured Analysis, Features of Data Flow Strategy, Developing Data Flow Diagrams, General Rules for Drawing Logical Flow Data Diagrams, Evaluate Data Flow Diagram for Correctness, Features of Data Dictionary, Recording Data Descriptions. (Chapters 3 and 4)

Unit III : Systems Design

The Analysis to Design Transition: Specifying Application Requirements, Objectives in Designing an Information System, What Features Must Be Designed?, Maintenance, Managing the Design Process for Institutional Applications, Managing End-User Developed Systems. Design of Computer Output: How to Identify Computer Output Needs, Designing Computer Output, How to Present Information, Designing Printed Output, Designing Visual Display Output, Display Screens. (Chapters 7 and 8)

Unit IV : Design Of Input And Control

What Concerns Guide Input Design, Capturing Data for Input, Input Validation. Design of Online Dialogue: How is Online Different?, What is an Interface?, Interface Devices, Designing Dialogues, Dialogue Strategies, Data Entry Dialogues. Systems Engineering and Quality Assurance: Design Objectives, Program Structure Charts, Design of

Software, Software Design and Documentation Tools, Managing Quality Assurance, Managing Testing Practices. (Chapters 9,10 and 14)

Unit V : Managing System Implementation

Training, Management's Perspective on Training, Conversion, Finding the Weak Links in a System, Post Implementation Review. Managing Information Systems Development: Estimation and Management of Development Time, Personnel and Development Management. Hardware and Software Selection: Hardware Selection, Software Selection. (Chapters 15, 16 and 17)

Text Book

1. James A. Senn, *Analysis and Design of Information Systems*, Tata McGraw- Hill, Second Edition, 1989.

Reference Book

1. Sheely Cashman Rosenblatt, *Systems Analysis and Design*, Galgotia , Third Edition, 1999.
2. Mary Campione and Kathy walrath, *The Java Tutorial*, Second Edition, Addison Wesley, 1998.

CA211 INTERNET AND JAVA PROGRAMMING LAB

Credit 0:0:2
Marks: (50+50)

1. Classes and objects.
2. Arrays.
3. Thread.
4. Exception handling.
5. Inheritance.
6. Applet Program.
7. Event Handling.
8. Networking-URL, TCP/IP, Chat, Communication.
9. JDBC Connection.
10. Streams
11. Java Beans.

Internet:

1. A simple Web page.
2. Web page with image.
3. Hyper linked web pages.
4. Web page with applet.
5. Web page with table.

CA212 WEB TECHNOLOGY

Credit 4:0:0
Marks: (40+60)

Unified Modeling Language

Unit I : The Process

Software development process – The Rational Unified Process – Static structure: Process description – Dynamic Structure: Iterative Development. (Part 1-4)

Unit II : Process workflows

Project management workflow – Business modeling workflow – Requirements workflow – Analysis and Design Workflow. (Part 7 – 10)

Unit : III

Implementation workflow – Test work flow – Configuration and Change management workflow – Environment work flow – Deployment work flow – Typical Iteration plans – Implementing the Rational Unified process (Part 11 – 17)

XML

Unit IV : Introducing XML

What is XML? – Why XML? – Life of an XML document – related technologies – XML application – XSL – XLL – DCD – creating XML document – Structuring data.

Unit V : XML

Attributes, Empty tags & XSL – well formed XML documents – legacy character set – Unicode Character set – writing XML in Unicode- Document type declarations – validation – element declarations – attribute declarations – embedding non_XML data.

Text Book

1. Philippe Kruchten **The Rational Unified Process – An Introduction**, Addison Wesley, 2nd edition, 2000.
2. Elliott Rusty Harold, **XML Bible**, IDG Books India(P) Ltd, April 2000.

Reference Book

1. Vivek Sharma, Rajiv Sharma, **Developing E-Commerce sites – An Integrated Approach**, Addison Wesley, First Edition, 2000

CA213 WEB TECHNOLOGY LAB

Credit 0:0:2
Marks: (50+50)

ASP

1. Creation of simple web pages.
2. Usage of scripting objects.
3. Usage of Application and Session objects.
4. Adding data entry features.

5. Usage of database in ASP.

XML

1. Creating simple web page using XML.
2. Applying animations and multimedia effects.
3. Usage of database in XML.

CA214 COMPONENT OBJECT TECHNOLOGY LAB

Credit: 0:0:2
Marks: (50+50)

1. COM, DCOM.
2. Active X.
3. OLE.
4. GUI Programming.
5. Java classes.
6. Java wrapper.
7. SQL Server.
8. ADO.
9. Message Queuing.

CA215 RESOURCE MANAGEMENT TECHNIQUES

Credit 3:0:0
Marks: (40+60)

Unit I : The Linear Programming Problem

Introduction, formulation of Linear Programming problem, Limitations of L.P, Graphical solution to L.P.P, Simplex Method, Artificial variable techniques, Two phase Method, Variants of the Simplex Method.

Unit II : Duality In Linear Programming

Concept of duality, Fundamental properties of Duality, Duality & simplex method, Dual simplex method. THE TRANSPORTATION PROBLEM: Introduction, Transportation Model, transportation problem as an L.P model, Finding initial basic feasible solutions, Moving towards optimality, Degeneracy.

Unit III : Assignment Problem

Introduction, Mathematical formulation of the problem, Solution of an Assignment problem, Multiple Solution, Hungarian Algorithm, Maximization in Assignment Model, Impossible Assignment.

Unit IV : Sequencing

Job sequencing, n jobs through two machines, Two jobs through m machines, n jobs through m machines. QUEUING THEORY: Introduction, Definition of terms in Queuing model, problem-involving M/M/1: α /FIFO queue.

Unit V : Replacement Of Model

Replacement of items with gradual deterioration, items deteriorating with time value of money, items that fail completely and suddenly, staff replacement problems.

Textbook

1. S.Dharani Ventakrishnan, Operations Research, Principles and Problems, Keerthi Publishing House Private Ltd., 1992.

Reference book

1. Kanti Swarup, Manmohan, P.K. Gupta, Operations Research, Sultan Chand & Sons, 1991.
2. Venkatesan, Operation Research, JS Publications, 1998.

CA216 OOAD LAB

Credit 0:0:2
Marks: (50+50)

1. Classes and objects.
2. Methods
3. Inheritance
4. Interfaces
5. Strings
6. Exceptions
7. Packages and visibility issues.
8. Using the AWT
9. Applets
10. Threads
11. Communications

CA217 ADVANCED COMPUTER ARCHITECTURE

Credit: 4:0:0
Marks: 40 + 60

Unit I: Theory Of Parallelism – Part I

Parallel Computer Models: The state of computing, Multiprocessors and multicomputers, Multivector and SIMD Computers, PRAM and VLSI Models, Architectural Development Tracks.

Unit II : Theory Of Parallelism – Part II

Program and Network Properties: Conditions of Parallelism, Program Partitioning and Scheduling, Program Flow Mechanisms, System Interconnect Architectures.

Principles of Scalable Performance: Performance Metrics and Measures, Parallel Processing Applications, Speedup Performance Loss, Scalability Analysis and Approaches.

Unit III : Hardware Technologies

Processors and Memory Hierarchy: Advanced Processor Technology, Super scalar and Vector Processors, Memory Hierarchy Technology, Virtual Memory Technology.
Bus, Cache and Shared Memory: Back plane Bus Systems, Cache Memory Organizations, Shared-memory Organizations, Sequential and Weak Consistency Models.

Unit IV : Pipelining And Multiprocessing

Pipelining and Super scalar Techniques: Linear Pipeline Processors, Non-linear Pipeline Processors, Instruction Pipeline Design, Arithmetic Pipeline Design, Super scalar and Super pipeline Design.

Multiprocessors and Minicomputers

Multiprocessor System Interconnects, Cache Coherence and Synchronization Mechanisms, Three Generations of Multicomputers, Message-Passing Mechanisms.

Unit V : Vector Processing And Scalable Architecture

Multivector and SIMD computers: Vector Processing Principles, Multivector Multiprocessors, Compound Vector Processing, SIMD Computer Organizations, The Connection Machine CM-5.

Scalable, Multithreaded and Dataflow Architectures: Latency-Hiding Techniques, Principles of Multithreading, Fine-grain Multicomputers, Scalable and Multithreaded Architectures, Dataflow and Hybrid Architectures.

Text Book:

1. K. Hwang and F. A. Briggs. *Computer Architecture and Parallel Processing* , McGraw Hill, 1985.

References

1. H. Stone. *Advanced Computer Architecture* , Addison Wesley, 1989.
2. H. J. Siegel. *Interconnection Network for Large Scale Parallel Processing* , McGraw Hill, 1990.
3. J. L. Hennessy and D. A. Patterson, *Computer Architecture: A Quantitative Approach* , 2nd Edition, Morgan Kaufmann, 1995.

CA218 NETWORK PROGRAMMING LAB

Credit: 0:0:2
Marks: (50+50)

- 1) Socketpair Communication
- 2) Checking for Pending Connections
- 3) Reading Internet Datagrams
- 4) Sending Internet Datagrams
- 5) Reading UNIX Datagrams
- 6) Sending UNIX Datagrams
- 7) Initiating a UNIX Stream Connection
- 8) Accepting UNIX Stream Connections

- 9) Receiving Packets Over Ethernet
- 10) Sending Packets Over Ethernet
- 11) Analyzing Packets Over the Network

CA219 COMPILER DESIGN

Credit 3:0:0
Marks: (40+60)

Unit-I : Introduction to Compiling

Compilers-Analysis of the source program-The phases of a compiler- Cousins of the compiler-The grouping of phases-Compiler-construction tools. A Simple One-Pass Compiler: Overview-Syntax definition-Syntax-directed translation-Parsing –A translator for simple expressions-Lexical analysis-Incorporating a symbol table-Abstract stack machines-Putting the techniques together.

Unit-II : Lexical Analysis

The role of the lexical analyzer-Input buffering-Specification of tokens-Recognition of tokens-A language for specifying lexical analyzers-Finite automata-From a regular expression to an NFA-Design of a lexical analyzer generator-Optimization of DFA -based pattern matchers.

Syntax Analysis: The role of the parser-Context-free grammars-Writing grammar-Top-down parsing-Bottom-up parsing-Operator-precedence parsing-LR parsers-Using ambiguous grammars-Parser generators.

Unit-III : Syntax-Directed Translation

Syntax-directed definitions-Construction of syntax trees-Bottom-up evaluation of S-attributed definitions-L-attributed definitions-Top-down translation-Bottom-up evaluation of inherited attributes-Recursive evaluators-Space for attribute values at compile time-Assigning space at compiler –construction time-Analysis of syntax-directed definitions.

Type Checking: Type systems-Specification of simple type checker-Equivalence of type expressions-Type conversions-Overloading of functions and operators-Polymorphic functions-An algorithm for unification.

Unit-IV : Run-time Environments

Source language issues-Storage organization-Storage-allocation strategies-Access to nonlocal names-Parameter passing-Symbol tables-Language facilities for dynamic storage allocation-Dynamic storage allocation techniques-Storage allocation in Fortran. Intermediate Code Generation: Intermediate languages-Declarations-Assignment statements-Boolean expressions-Case statements-Backpatching-Procedure calls.

Unit-V : Code Generation

Issues in the design of a code generator-The target machine-Run-time storage management-Basic blocks and flow graphs-Next-use information-A simple code generator-Register allocation and assignment-The dag representation of basic blocks-

Peephole optimisation-Generating code from dags-Dynamic programming code-generation algorithm-Code-generator generators.

Code Optimization: Introduction-The principal sources of optimisation-Optimization of basic blocks-Loops in flow graphs-Introduction to global data-flow analysis-Iterative solution of data-flow equations-Code-improving transformations-Dealing with aliases - Data-flow analysis of structured flow graphs-Efficient data-flow algorithms-A tool for data-flow analysis-Estimation of types-Symbolic debugging of optimised code.

Text Book

1. Alfred V. Aho, Ravi Sethi, Jeffrey D. Ullman Compilers Principles, Techniques, and Tools

References:

1. V. Aho, R. Sethi, and J. D. Ullman. Compilers: Principles, Techniques and Tools , Addison-Wesley, 1988.
2. C. Fischer and R. LeBlanc. Crafting a Compiler , Benjamin Cummings, 1991.
3. C. Fischer and R. LeBlanc. Crafting a Compiler in C , Benjamin Cummings.
4. A. C. Holub. Compiler Design in C , Prentice-Hall Inc., 1993.
5. Appel. Modern Compiler Implementation in C: Basic Design , Cambridge Press.
6. Appel. Modern Compiler Implementation in Java: Basic Design , Cambridge Press.

CA220 THEORY OF COMPUTATION

Credits: 4:0:0
Marks: 40 + 60

Unit I : Algorithms

Introduction - Structure and Properties – Classification - Flowchart Description - Structured Flowcharts - Recursion and Iteration

Unit II : Machines

Introduction - Basic Machine - Finite State Machine - Behavioural Description - Turning Machines - POST-WANG – MINSKY.

Unit : III

PUSH-DOWN STACK-MEMORY machine - Linearly Bounded Memory Machine.

Unit IV: Functions

Introduction - Base Functions and Strategy Set - Primitive Recursive Functions Over Integers - Primitive Recursive Predicates - Primitive Recursive Functions Over An Alphabet - Partial And General Recursive Functions - McCarthy's Formalisation, Programs and Recursive Functions.

Unit V : Productions

Introduction - Production Systems - Acceptors and Generators - Markov Algorithms – Grammars - Grammars and Compiler Design - Stochastic Grammars - Higher-Dimensional grammars.

Text Book:

1. E.V. Krishnamoorthy, Introductory Theory of Computer Science.

Reference Book:

1. C. Papadimitrou and C. L. Lewis. Elements of Theory of Computation , Prentice-Hall, 1981.
2. J.E. Hopcroft and J.D. Ullman. Introduction to Automata Theory, Languages of Computations , Addison-Wesley, 1979. (Indian edition available from Narosa.)

CA221 FRONT END LAB

Credit 0:0:2
Marks: (50+50)

1. Simulate a standard Windows Color Box.
2. Simulate a standard Windows Print Dialog Box.
3. Create a Graphics Editor
4. Simulate a digital calculator.
5. Simulate an electronic polling system using VB & Access
6. Simulate Online Quiz program
7. Create an Image Processing system
8. Design a Web Page to get Bio-Data of a person
9. Create Online Chat Application with Winsock control
10. Create a Hotel Bill Calculating system using DDX and Excel
11. Simulate a stack using class modules.
12. Find out the memory specifications of a computer using Windows API calls.

A package has to be developed using Oracle as a back end with the front end as visual basic by the students and to be submitted for valuation at the end of the semester with the above problems.

Reference Book

1. Michael Lee and Clark Christensen, Visual basic 6 Distributed Applications, BPB Publications, 1999.

CA222 EMBEDDED SYSTEM DESIGN

Credit 4:0:0

Unit- I

The Embedded System Design life cycle :Introduction, Project Specification, Hardware/Software Partitioning, Iteration and Implementation, Detailed Hardware Software Design, Hardware/Software Integration, Product Testing and Release, Maintaining and upgrading existing products

Unit- II

The Selection process: Packaging the Silicon, Adequate Performance, RTOS Availability, Tool chain Availability, Other issues in Selection process

Unit- III

The Partitioning Decision: Hardware/Software duality, Hardware Trends, ASICs and Revision costs The Development Environment: The Execution Environment, Memory Organization, and System Startup

Unit -IV

A Basic Toolset: Host-Based Debugging, Logic Analyzer BDM, JTAG and Nexus: Background Debug mode

Unit - V

The ICE Integrated solution: Bullet-Proof Run control, Real-Time trace, Hardware Breakpoints, Overlay Memory, Timing constraints, Usage Issues, Setting the trigger Testing: Why Test? When to Test?, Which Test?, When to Stop?, Choosing Test-Cases, Testing Embedded Software, Performance Testing, Maintenance Testing The Future: Reconfigurable Hardware

Text Book

1. David. E. Simon, “An Embedded Software Primer”, First Edition, Addison Wesley Pub LTD, 1999.

Reference

1. Bart Broekman, Edwin Notenboom, “Testing Embedded Software”, First Edition, Addison Wesley Pub LTD, 1999.

CA223 PARALLEL COMPUTING

Credit 4:0:0

Marks: 40+60

UNIT – I

Introduction to Parallel Computing – Parallel processing terminology – Data Parallelism and control parallelism. Sieve of Eratos themes – Control – Parallel Approach.

UNIT – II

Model of Serial Computation, PRAM Model of Parallel Computation, PRAM Algorithms – Parallel Reduction, Prefix sums, list ranking, pre order tree traversal, merging two sorted lists.

UNIT – III

Processor Arrays, Multiprocessors and Multicomputers – Flynn’s Taxnomy – Speedup, Sealed Speed up, and parallelisability.

UNIT – IV

Mapping and scheduling – Mapping data to processors on Processor arrays and Multicomputers, Dynamic load balancing on Multicomputers, Dynamic load balancing on Multicomputers, static scheduling on UMA Multiprocessors, Dead lock. Elementary Parallel Algorithms – Reduction, Broadcast. Matrix Multiplication.

UNIT - V

Sorting – Enumeration sort, Odd even transposition sort, Bitonic merge. Graph Algorithms – Searching a Graph, Connected components, All pairs shortest path, Minimum cost spanning tree. Combinatorial Search – Introduction, Divide and conquer, Branch and Bound, Parallel branch and bound algorithm.

Text Book

1. Michael J. Quinn, “**Parallel Computing – Theory and Practice**”, Tata McGraw Hill, II Edition 2002.

Reference

1. K.Hwang, “**Advanced Computer Architecture**”, Parallelism, Scalability, Programmability”, Tata McGraw Hill, 1993.

CA224 UNIX ARCHITECTURE

Credit 4:0:0

Marks: 40+60

Unit I

General Overview of the system: History, system structure, user perspective, operating system services, and assumptions about hardware. *Introduction to the kernel*: Architecture of the UNIX operating system, introduction to system concepts kernel data structures, system administration. *The buffer cache*: Buffer headers, structure of the buffer pool, scenarios for retrieval of a buffer, reading and writing disk blocks, advantages and disadvantages of the buffer cache.

Unit II

The internal representation of Files: INODE, structure of a regular file, directories, conversion of a path name to an INODE, super block, INODE assignment to a new file, allocation of disk blocks, other file types. *System calls for the file system*: Open, read, write, file and record locking, adjusting the position of the file I/O – lseek, close, file creation, creation of special files, change directory and change root, change owner and change mode, stat and fstat, pipes, DUP, mounting and unmounting file systems, link, unlink, file system abstractions, file system maintenance.

Unit III

The structure of processes: Process states and transitions, layout of system memory, the context of a process, saving the context of a process, manipulation of the process address space, sleep.

Process control: Process creation, signals, process termination, awaiting process termination, invoking other programs, the user ID of a process, changing the size of a process, shell, system boot and the init process. Process scheduling and time: process scheduling, system calls for time, clock.

Unit IV

Memory Management policies: Swapping, demand paging, a hybrid system with swapping and demand paging. The I/O subsystem: driver interfaces, disk drivers, terminal drivers streams.

Unit V

Interprocess communication: Process tracing, system V IPC, network communications, sockets.

Text Book

1. Maruice J. Bach, “**The design of the UNIX operating system**”, Prentice-Hall of India, 20th Indian Reprint 2001.

Refereces

1. W.Richard Stevens, “**Unix Network Programming**”, Prentice Hall of India, 1990.
2. Rebecca Thomas, Lawrence R.Rogers, Jean L. Yates, “**Advanced Programmers Guide to Unix System V**”, Mc Graw Hill International Editions, 1987.
3. Yashawant kanetkar, “**Unix Shell Programming**”, First Edition – 1996.
4. Sumitabha Das, “**Unix Concepts and Applications**”, Second Edition – 2000.

CA225 COMPONENT OBJECT TECHNOLOGY

Credit 4:0:0

Marks: (40+60)

Unit I

Architectural Overview: Electronic Commerce, Encapsulation, Gnome Locality, Record Management, and Three-Tier Architecture. COM / DCOM Issues: COM, DCOM, Active X, and OLE, The COM Approaches, Introduction to Broker System, Interface of Broker Systems, Implementation of Broker Operation, Client Location, Gnome Sharing.

Unit II

The Java Layer: The Java Battleground, The Java Wake-Up Call, The Java Religion, Object Interfaces, and Broker Interfaces. Components: Client / GUI Programming, Visual Basic/COM/Java Example, The Original Java Classes, Checking the Java Wrapper, Registering COM Classes, The Java Client, Location Independence of the Broker House.

Unit III

Persistence: Persistence and MDCA, The Great Fraud, File Systems, Relationships between Objects and Data, Creating an Association, Implementing Load. Sharing and Scalability: The Loyal Taxi Strategy, The Disposable Taxi Strategy, The Taxi Pool

Strategy, State and COM Objects, making Objects Stateless, Base Clients, Components, and Java Objects.

Unit IV

Transactions and Databases: Transactional Systems, Record Management Gnomes, Locks, Logging, Deadlocks, Multi-Room Locking, The Record Manager Solutions, MDCA, Three Layers of Data Access, SQL Server, ADO, Server Processes. Multi-tier Architecture: The Client Tier, The Component Tier, The Data Management Tier.

Unit V

Security: NT Security, MTS Authorization, Client Impersonation versus Client Authorization, Roles, Authentication, Advanced Security – Crypto API, Encryption / Decryption, Verification. Clustering: Blob Prerequisites, Blob Reliability, Clusters, Clusters in Multi-Tier Systems, Microsoft Cluster Design, and Cluster Applications, Cluster API. Message Queuing: MSMQ, The MSMQ API, MSMQ Transactions.

Text Book

1. COM AND DCOM – Microsoft’s Vision for Distributed Objects, Roger Sessions, 1998

Reference Book

1. COM / DCOM Primer Plus, The Waite Group’s, Corry, Mayfield, Cadman, First Edition 1999, Sams Techmedia Publishing.

CA226 COMPUTER HARDWARE LAB

Credit : 0:0:2

Marks: 50+50

1. Introduction to PC components.
2. Study and troubleshooting motherboard and power supply unit.
3. Study and troubleshooting memory.
4. Study and troubleshooting I/O ports.
5. Study and troubleshooting video adapters and video capture.
6. Study and troubleshooting floppy and CD drive.
7. Study and troubleshooting hard disk drive
8. Study and troubleshooting keyboard and mouse.
9. Study and troubleshooting monitor
10. System assembling
11. Study and troubleshooting CPU problems.
12. Study and troubleshooting printer.
13. Study and troubleshooting plug-and-play devices and anti-virus tools.
14. Partition and formatting the Hard disk
15. Windows '98 Installation
16. Application software Installation (VB and Oracle).
17. VGA card configuration and changing monitor settings.

18. Installation of other devices (Mother Board, CD Drive, Keyboard, Mouse, Soundcard)
19. Windows NT installation and Hub configuration.
20. Ethernet configuration and networking logic.
21. LAN file installation.
22. Trouble shooting theory.

Reference

1. Stephen J. Bigelow, “**Troubleshooting, maintaining & repairing PCs**”, Second Edition, Tata McGraw Hill, First Edition 1999.

CA227 UNIX & LINUX LAB

Credit 0:0:2

Marks: 50+50

UNIX

1. Basic commands (Learning an editor, Learning to write, make file, Compiling C program in Unix)
2. Implementation of system calls related to file system
3. Process creation, execution
4. Pipes (Implementation of Interprocess communication using pipes)
5. Semaphores
6. Message Queues
7. Shared Memory
8. Socket programming – TCP sockets
9. Shell script

LINUX

1. Changing Terminal Characters
2. Process Accounting
3. Working With Environment Variables
4. Shell Scripts.
5. To delete a particular pattern from a line in a file.

REFERENCES:

1. Martice J. Bach, “**The design of the UNIX operating system**”, Prentice-Hall of India, 20th Indian Reprint 2001.
2. Richard Peterson, “**The Complete Reference Linux**”, Tata McGraw Hill, Second Edition, Sixth Reprint 2001.
3. Yashawant kanetkar, “**Unix Shell Programming**”, First Edition – 1996.
4. Sumitabha Das, “**Unix Concepts and Applications**”, Second Edition – 2000.

CA228 THEORY OF COMPUTATIONS

Credit 4:0:0

Marks: 40+60

Unit-I

Algorithms – Introduction, Structure and Properties, Classification, Recursion and Iteration Machines - Basic Machine, Finite State Machines, Behavioral description, Construction of Finite State machines, Deterministic and Non-Deterministic Finite State machines, Conversion from NDFSA to DFSA, Limitations of Finite State machines

Unit-II

Turing machines – Construction of Turing machines, Examples of Turing Machines, Universal Turing machine, Halting Problem
POST WANG machine – Construction

Unit-III

Push down machines – Acceptance by empty store and final state, Construction of PDMs, Examples of Push down machines, PDMS and Context Free grammar

Unit-IV

Functions – Base Functions and Strategy set, Primitive recursive functions over integers, Primitive recursive predicates

Unit-V

Productions- Introduction, Production Systems, Acceptors and Generators, Markov Algorithms
Grammers – Type 0, Type 1, Type 2, Type 3 Grammer, Stochastic Grammers, Construction of Grammers for generation of languages.

Text Books

1. E. V. Krishna moorthy, “**Introductory theory of Computer Science**”, 1990
2. J. E. Hop Croft and J. D Ullman, “**Introduction to Automata theory, Languages of Computations**”, Addison-Wesley, First Edition, Reprint, 2001

References

1. C. Papadimitron and C. L. Lewis, “**Elements of Theory of Computation**”, Prentice Hall 1981
2. K. L. P. Mishra and N. Chandrasekaran, “**Theory of Computations (Automata, languages and Computation)**”, Prentice Hall 2000, II Edition

CA229 DATA STRUCTURES AND ALGORITHMS

Credit 4:0:0

Marks: 40+60

UNIT –I : Introduction

Introduction - Lists - Stacks - Queues - Linear data structure, Array and Linked lists - Implementation - Applications.

UNIT – II : Trees

Trees - General and binary trees - Operations - Traversals - Search trees -Balanced trees.
SORTING : Sorting - Insertion sort - Quick sort - Merge sort - Heap sort - Sorting on several keys - External sorting.

UNIT – III : Graphs

Graphs representation - Traversal - Topological tables and files - Sorting - Applications - Representation - Marking techniques - Files - Sequential - Index sequential - Random access organization - Implementation.

UNIT – IV : Algorithm Analysis and Design

Algorithms - Time and space complexity - Sorting - Design techniques - Knapsack - Traveling salesman - Graph coloring – Squeezing

UNIT – V : Algorithm Design Model

The Greedy method, Divide and Conquer, Dynamic Programming, Backtracking, Branch and bound.

Text Book

1. Horowitz, Sahni, S.Rajasekaran, **“Computer Algorithms”**, Galgotia, 2000.
2. Jean Paul tremblay,Paul G.Sorenson, **“An Introduction to data structures with Application”**,Tata McGraw Hill, Second Edition, 2001.

References

1. Tanenbaum A.S,Langram Y.,Augestein M.J., **“Data structures using C & C++”**,PHI,2002.
2. Robert L. Kruse, Bruce P. Leung, Cloris L. Tondo , **“Data structures and program design in C”**,PHI, Fourth Reprint 2000.
3. Ellis Horowitz, Sahni & Dinesh Mehta, **“Fundamental of data structures in C++”** Galgotia, 2002.
4. Sartaj Sahni, **“Data Structures ,Algorithms and Applications in C ++”**, Tata McGraw Hill, 1998.
5. Aho.Alfred.V, Hopcraft.Jaohn. E, Ullman, Jeffrey. D, **“The Design and Analysis of Computer Algorithms”**, First Edition – Addison Wesley – 1974.

CA230 PROGRAMMING LAB

Credit 0:0:2

Marks: 50+50

Simple C Programs

1. Control statements
2. Functions
3. Arrays and structures
4. Pointers
5. File handling

Text Book

1. Herbert Schildt , “**The Complete reference C**”, Tata Mc GrawHill , 4th Edition, V Reprint, 2002.

CA231 SYSTEM SOFTWARE**Credit 3:0:0****Marks: 40+60****UNIT I : Introduction**

System software and machine Architecture - the Simplified instructional Computer (SIC)
– Traditional CISC machines – RISC machines.

UNIT II : Assemblers

Basic assembler functions – machine-dependent and independent assembler features –
Assembler Design options – Implementation examples.

UNIT III : Loaders And Linkers

Basic loader functions – machine-dependent and independent loader features – Loader
Design options – Implementation examples.

UNIT IV : Macro Processors

Basic Macro Processor functions – machine independent Macro processor features –
Macro Processor Design options – Implementation examples.

UNIT V : Other System Software

Compiler functions – Interpreters – Operating System functions – Text Editors –
Interactive Debugging System.

Text Book

1. Leland L. Beck , “**System Software- An Introduction to Systems Programming**”, 3rd Edition, Addison Wesley, Reprint,2002

References

1. D.M.Dhamdhare, “**System Programming and Operating Systems**”, Tata Mc Graw Hill Company, 1997.
2. Donald Becker, “**System Software**”, Third Edition, 1998.

CA232 SOFTWARE ENGINEERING

Credit 4:0:0

Marks: 40+60

UNIT – I : Introduction

Software Engineering paradigms - Waterfall life cycle model, spiral model, prototype model, 4th Generation techniques - Planning - Cost estimation - Organization structure - Software project scheduling, Risk analysis and management - Requirements and specification - Rapid prototyping.

UNIT – II : Software Design

Abstraction - Modularity - Software architecture - Cohesion, coupling - Various design concepts and notations - Real time and distributed system design - Documentation - Dataflow oriented design - Jackson system development - Designing for reuse - Programming standards.

Unit – III : Software Metrics

Scope - classification of metrics - Measuring Process and Product attributes - Direct and indirect measures - Reliability - Software quality assurance - Standards.

UNIT – IV : Software Testing And Maintenance

Software testing fundamentals - Software testing strategies - Black box testing, White Box testing, System testing - Testing tools - Test case management - Software maintenance organization - Maintenance report - Types of maintenance.

UNIT – V : Software Configuration Management(SCM) & Case Tools :

Need for SCM - Version control - SCM process - Software configuration items - Taxonomy - case repository - Features.

Text Books

1. Roger S. Pressman, “**Software Engineering: A Practitioner Approach**”, 5th Edition, McGraw Hill, 2001.

Reference Books

1. Fairley, “**Software Engineering Concepts**”, McGraw Hill, X Reprint 2000.
2. Ian Sommerville, “**Software Engineering**”, 5th Edition, Addison Wesley, VI Reprint 2000.

CA233 RESOURCE MANAGEMENT TECHNIQUES

Credit 3:1:0

Marks: 40+60

Unit I

The Linear Programming Problem - Introduction, formulation of Linear Programming problem, Limitations of L.P, Graphical solution to L.P.P, Simplex Method, Artificial variable techniques, two phase Method, Variants of the Simplex Method.

Unit II

Duality In Linear Programming - Concept of duality, Fundamental properties of Duality, Duality & simplex method, Dual simplex method. THE TRANSPORTATION PROBLEM: Introduction, Transportation Model, transportation problem as an L.P model, finding initial basic feasible solutions, moving towards optimality, Degeneracy.

Unit III

Assignment Problem - Introduction, Mathematical formulation of the problem, Solution of an Assignment problem, Multiple Solution, Hungarian Algorithm, Maximization in Assignment Model, Impossible Assignment. Inventory Models: Purchasing model: No Shortages, Manufacturing Model: No Shortages, EOQ: System of Ordering.

Unit IV

Sequencing - Job sequencing, n jobs through two machines, two jobs through m machines, n jobs through m machines. QUEUING THEORY: Introduction, Definition of terms in Queuing model, problem-involving $M/M/1$: α FIFO queue, $M/M/M$: FCFS, $M/M/1$: FCFS, $M/M/S$: FCFS

Unit V

Replacement Of Model - Replacement of items with gradual deterioration, items deteriorating with time value of money, items that fail completely and suddenly, staff replacement problems. Simulation Models: Elements of Simulation Model- Monte carlo Technique- Applications.

Text Book

1. S.Dharani Ventakrishnan, "Operations Research, Principles and Problems", Keerthi Publishing House Private Ltd., 1992.

References

1. Kanti Swarup, Manmohan, P.K. Gupta, "Operations Research", Sultan Chand & Sons, 1991.
2. Venkatesan, "Operation Research", JS Publications, 1998.

CA 234 WEB TECHNOLOGY

Credits 4:0:0

Marks: 40+60

Unit I (ASP)

ASP fundamentals: Handling request and response- client server interaction, Asp request and response objects, working with forms and query string collections, cookies, Server variables, manipulating the http headers

ASP applications and sessions: What is web application? - Asp application and session objects

Scripting runtime objects: What are scripting objects? – Scripting.dictionary object- the scripting.filesystemobject objects – the Scripting.textstream object

Unit II (XML)

Introducing XML: What is XML? Life of an XML documents related technologies- XML applications XSL XLL DCD creating XML document Structuring data

Unit III (XML)

Attributes, Empty tags & XSL well formed XML documents legacy character set Unicode character set – Writing XML in Unicode – document type declarations validation element declaration attribute declarations embedding non XML data

Unit IV (Scripts)

JavaScript: Programming Fundamentals – object orientations – built-in objects – form object & elements - working with data – flow control structures – operators – custom functions & objects – data entry & validation – tables & forms (Part II and II of text 3) VBScript: ActiveX controls - 2D layout of web pages – Error handling – VBScript controls – Web based applications (Part II and III of Text 4)

Unit V (UML)

The Process: Software development process, the rational unified process, static structure: process description Dynamic Structure: iterative development Implementing the rational unified process.

Textbooks:

1. Philippe Kruchten **The Rational Unified Process An Introduction**, Addison Wesley II edition 2000
2. Elliotte Rusty Harold, **XML Bible**, IDG Books India(P) Ltd, April 2000
3. Danny Goodman **“JavaScript Bible”** 2nd Edition Comdex Computer Publication, 1997
4. Kenneth L. Spencer, Kenneth C. Miller & Luran Lassesen **“Introducing VBScript & ActiveX”** Comdex Computer Publication, 1997
5. **Professional Active Server Pages** Alex Homer, Dave Sussman, Brian Francis

Reference Books:

1. **Professional XML** Shroff Publications Richard Anderson
2. Vivek Sharma, Rajiv Sharma, **Developing E- Commerce sites an Integrated Approach**, Addison Wesley, First Edition, 2000

CA235 WEB TECHNOLOGY LAB

Credit 0:0:2

Marks: 40+60

ASP

1. Creation of Simple Web pages.
2. Usage of scripting objects
3. Usage of Application and session objects
4. Adding data entry features
5. Usage of databases in ASP
6. Usage of components in ASP

7. Usage of Cookies in ASP.

XML

1. Creating simple web pages using XML
2. Applying animations and multimedia effects through XML
3. Usage of databases in XML
4. Simple web page using XML, XSL etc.

References

1. Richard Anderson, Dan Denault, Brian Francis, “**ASP 3.0 Programmer's Reference**”, IDG books India (P) Ltd., 2000.
2. Elliot Rusty Harold, “**XML Bible**”, IDG Books India (P) Ltd, II Edition, April 2000
3. Vivek Sharma, Rajiv Sharma, “**Developing E-Commerce sites – An Integrated Approach**”, Addison Wesley, First Edition, 2000

**DEPARTMENT
OF
COMPUTER SCIENCE & TECHNOLOGY**

ADDITIONAL SUBJECTS

Code	Subject Name	Credits
CA236	System Software and compiler	4:0:0
CA237	Operating System Concepts	4:0:0
CA238	Software Engineering	4:0:0
CA239	Java programming and Networking Lab	0:0:2
CA240	Computer System Architecture	4:0:0
CA241	Programming in C	3:1:0
CA242	Microprocessors	4:0:0
CA243	C Programming Lab	0:0:2
CA244	Advanced PC Software and Internet Lab	0:0:2
CA245	Artificial Intelligence	4:0:0
CA246	Management Information System	4:0:0
CA247	Decision Support System	4:0:0
CA248	Database Administration	4:0:0
CA249	Enterprise Java and .Net Lab	0:0:2

CA236 SYSTEM SOFTWARE AND COMPILER

Credits 4:0:0

Marks(40+60)

Unit - I

Introduction – System Software and machine Architecture, The Simplified Instructional Computer, Traditional Machines, RISC Machines
(Chapter1)

Unit- II

Assemblers- Basic Assembler Functions, Machine-Dependent Assembler Features, Machine-Independent Assembler Features, Assembler Design Options, Implementation Examples (Chapter 2)

Unit-III

Loaders and Linkers-Basic Loader Functions, Machine-Dependant Loader Features, Machine-Independent Loader Features, Loader-Design Options, Implementation Examples
(Chapter 3)

Unit-IV

MacroProcessors- Basic Macro Processor Functions, Machine-Independent Macro Processor Features, Macro Processor Design Options, Implementation Examples
(Chapter 4)

Unit- V

Compilers- Basic Compiler Functions, Machine-Dependant Compiler Features, Machine-Independent Compiler Features, Compiler Design Options, Implementation Options

Other System Software -Text Editors, Interactive Debugging Systems
(Chapter 5, Sections 7.2 & 7.3)

Text Book

1. Leland L Beck, *System Software – An Introduction to System Programming*, III Edition, Pearson Education, 2003

CA237 OPERATING SYSTEM CONCEPTS

Credits: 4 : 0 : 0

Marks: (40 + 60)

UNIT I

Introduction – Overview of different types of systems – Feature Migration – Computing Environments – Computer-System Operation – I/O Structure – Storage Structure – Storage Hierarchy – Hardware Protection – Network Structure – System Components – Operating System Services – System Calls – System Programs – System Structure – Virtual Machines – System design and Implementation – System generation

UNIT II

Process Concept – Process Scheduling – Operation on Processes – Cooperating Processes – Interprocess Communication – Communication in Client Server Systems – Threads – Multithreading Models – Threading Issues – Pthreads – Solaris 2 Threads – Window 2000 Threads – Linux Threads – Java Threads – Basic Concepts of CPU Scheduling – Scheduling Criteria – Scheduling Algorithms – Multiple Processor Scheduling – Real-Time Scheduling – Algorithm Evaluation – Process Scheduling Models

UNIT III

Process Synchronization – The Critical Section Problem – Synchronization Hardware – Semaphores – Classic Problems of Synchronization – Critical Regions – Monitors – OS Synchronization – Atomic Transaction – System Model – Deadlock Characterization – Methods for handling deadlocks- Deadlock Prevention – Deadlock Avoidance –Deadlock Detection – Recovery from deadlock - Memory Management Background – Swapping – Contiguous memory allocation – Paging – Segmentation – Segmentation with Paging.

UNIT IV

Introduction to Virtual Memory – Demand Paging – Process Creation – Page Replacement – Allocation of Frames – Thrashing – Operating System Examples – Other Considerations – File Concept – Access Methods – Directory Structure – File-System Mounting – File Sharing – Protection- File-System Structure – File-System Implementation – Directory Implementation – Allocation Methods – Free-Space Management – Efficiency and Performance – Recovery – Log-Structured File System –NFS

UNIT V

Overview of I/O systems – I/O Hardware – Application I/O Interface – Kernel I/O Subsystem – Transforming I/O to Hardware Operations – Streams – Performance – Disk Structure – Disk Scheduling –Disk Management – Swap-space Management – RAID Structure – Disk Attachment – Stable-Storage Implementation – Tertiary-Storage Structure-

Protection-Goals of protection-Domain of Protection-Access Matrix-Implementation of access Matrix-Revocation of Access rights-Capability –Based systems-Language Based Protection

Text Book:

Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, *Operating System Concepts*, Sixth Edition, John Wiley and Sons, 2002. (Chapters 1-14,18)

CA238 SOFTWARE ENGINEERING

Credits: 4 : 0 : 0

Marks: (40 + 60)

UNIT I

Introduction to Software Engineering-- A system Approach – An Engineering Approach – Members of the development team - Modeling the Process and Life Cycle – the meaning – Software Process Models – Tools and Techniques - Practical Process modeling – Planning and Managing the project – tracking Progress – project personnel – Effort Estimation – Risk management – the project plan – process models and project management.

UNIT II

Capturing the requirements – The Requirements process – types – Characteristics – prototyping requirements – requirements documentation – participants in the process – requirements validation – measuring – choosing a requirements specification – Designing the system – decomposition and modularity – architectural styles – issues – characteristics – techniques – evaluation and validation – documenting

UNIT III

Concerning Objects – What is OO – the OO development process – use cases – UML – OO system design – OO program design – OO measurement – Writing the programs – standards and procedures – guidelines – documentation – Testing the programs – Software faults and failures – Testing issues – unit testing – integration testing – testing OO systems – test planning – automated testing tools .

UNIT IV

Testing the system – principles of system testing – function testing – performance testing – reliability, availability, and maintainability – acceptance testing – installation testing – automated system testing – test documentation – testing safety-critical systems – delivering the system – training – documentation – maintaining the system – the changing system – nature – problems –measuring maintenance characteristics – techniques and tools – software rejuvenation

UNIT V

Evaluating products, processes, and resources – approaches to evaluation – selecting an evaluation techniques – assessment vs prediction – evaluating products – evaluating processes – evaluating resources – Improving predictions, products, processes, and resources – improving prediction – improving products – improving processes – general improvement

guidelines- Wasserman's steps to maturity-Future of Software Engineering-Technology transfer-Decision making software engineering

Text Book

1. Shari Lawrence Pfleeger, *Software Engineering – Theory and Practice*, Third Edition, Pearson Education, 2001. (Chapters 1-14)

Reference Book

1. James F.Peters, Witold Pedrycz, *Software Engineering – An Engineering Approach*, John Wiley and Sons, 2000.

CA239 JAVA PROGRAMMING AND NETWORKING LAB

Credits: 0 : 0 : 2

Marks: (50 + 50)

12 experiments will be notified by HOD from time to time

CA240 COMPUTER SYSTEM ARCHITECTURE

Credit 4:0:0

Marks (40+60)

Unit 1

Digital Logic Circuits , Digital Components, Data Representation
(Chapter1,2,3)

Unit 1I

Register transfer and Microoperations, Basic computer organization and design
(Chapter 4 & 5)

Unit III

Microprogrammed control , Central Processing Unit
(Chapter 7,8)

UNIT IV

Computer arithmetic, Input-output organization
(Chapter 10,11)

Unit V

Memory organization
(Chapter 12)

Text Book

1. M. Morris Mano, *Computer System Architecture*, Third Edition, Prentice Hall of India, 1996.

CA241 PROGRAMMING IN C

Credits 3:1:0

Marks (40+60)

UNIT I

Introduction – C Fundamentals: The C Character Set – Identifiers and Keywords – Data Types – Constants – Variables – Declarations – Expressions – Statements – Symbolic Constants – Operations and Expressions: Arithmetic Operators – Unary Operators – Relational and Logical Operators – Assignment Operators – The Conditional Operator – Library Functions – Data Input and Output: Single Character Input & Output – Entering Input Data – Writing Output Data – Preparing and running a complete C program. (Chapter 1-5)

UNIT II

Control Statements: Branching – Looping – Nested Control Structures – The switch, break, continue, comma statements – The Goto Statement – Functions: Defining a Function – Accessing a Function – Function Prototypes – Passing Arguments to a Function – Recursion – Program Structure: Storage Classes – Automatic Variables – External Variables. (Chapter 6-8)

UNIT III

Arrays: Defining an Array – Processing an Array – Passing Arrays to Functions – Multidimensional Arrays – Arrays and Strings – Dynamic Memory Allocation. (Chapter 9, Section 10.5)

UNIT IV

Pointers: Fundamentals – Pointer Declarations – Passing Pointers to Functions – Pointers and One-Dimensional Arrays – Operations on Pointers – Pointers and Multidimensional Arrays – Arrays of Pointers – Passing Functions to other Functions – Structures & Unions: Defining a Structure – Processing a Structure – User-Defined Data Types – Structures and Pointers – Passing Structures to Functions – Self Referential Structures. (Chapter 10,11)

UNIT V

Data Files: Opening and Closing a Data File – Creating a Data File – Processing a Data File – Unformatted Data Files – Low Level Programming – Additional Features of C. (Chapter 12-14)

Text Book

1. Byron S. Gottfried, *Theory and Problems of Programming With C*, Second Edition, Tata McGraw Hill, 1996

CA242 MICROPROCESSORS

Credits 4:0:0

Marks(40+60)

Unit-I

Microprocessors, Microcomputers and Assembly Language, Introduction to 8085 Assembly language programming, Microprocessor Architecture and Microcomputer Systems (Chapter 1,2,3)

Unit-II

8085 Microprocessor Architecture and Memory Interfacing, Interfacing I/O Devices (Chapter 4,5)

Unit-III

Introduction to 8085 Instructions, Programming Techniques with Additional Instructions (Chapter 6,7)

Unit -IV

Counters and Time Delays ,Stack and Subroutines, Interrupts (Chapter 8,9,12)

Unit-V

General-Purpose Programmable Peripheral Devices- 8255A PPI, 8254 PIT, 8259 APIC, 8237 DMA Controller (Chapter 15)

Text Book:

1. Ramesh S Gaonkar, *Microprocessor Architecture, Programming, and Applications with the 8085*, Fifth Edition, Penram International Publishing, 1999

CA243 C PROGRAMMING LAB

Credit 0:0:2

Marks: 50+50

12 experiments will be notified by HOD from time to time

CA244 ADVANCED PC SOFTWARE AND INTERNET LAB

Credit 0:0:2

Marks: 50+50

12 experiments will be notified by HOD from time to time

CA245 ARTIFICIAL INTELLIGENCE

Credits 4:0:0

Marks(40+60)

Unit -I:

Introduction –Foundations of AI, History of AI, State of the Art

Intelligent Agents- Agents and Environments, Good Behaviour, Nature of Environments, Structure of Agents

Problem Solving : Solving problems by searching- Problem-solving agents, Example Problems. Searching for solutions, Uninformed Search Strategies, Avoiding repeated search states, searching with partial information

Unit- II

Informed Search and exploration – Informed Search Strategies, Heuristic functions, Local Search Algorithms and Optimization Problems, Local Search in Continuous spaces, Online Search Agents and Unknown environments

Adversial Search – Games, Optimal Decisions in Games, Alpha-Beta Pruning, Imperfect Real-Time Decisions, Games that include an Element of Chance, State-of-the-art Game Programs

Unit-III

Knowledge and Reasoning : Logical Agents – Knowledge-Based Agents, The Wumpus world, Logic, Propositional Logic, Reasoning patterns in PL, Effective Propositional inference, Agents based on PL

First-Order Logic- Syntax and Semantics of First-Order Logic, Using First-Order Logic, Knowledge Engineering in First-Order Logic

Inference in First-Order Logic- Propositional vs First-Order Logic inference, Unification and Lifting, Forward Chaining, Backward Chaining, Resolution

Unit-IV

Knowledge Representation- Ontological Reasoning, Categories and Objects, Actions. Situations and Events, Mental Events and Mental Objects, The Internet Shopping World, Reasoning Systems for Categories, Reasoning with Default Information, Truth Maintenance Systems

Planning- The Planning Problem, Planning with State-Space search, Partial-Order Planning, Planning graphs, Planning with Propositional Logic

Unit-V

Uncertainty – Acting under Uncertainty, Basic Probability Notation, The Axioms of Probability, Inference using Full-Joint Distributions, Independence, Bayes' Rule and its use

Making Simple Decisions- Combining Beliefs and Desires under Uncertainty, Basis of Utility Theory, Utility Functions, Multiattribute Utility Functions, Decision Networks, The Value of Information, Decision-Theoretic Expert Systems

Learning : Learning from observations – Forms of Learning, Inductive Learning, Learning Decision Trees, Ensemble Learning,

Text Book :

1. Stuart Russell, Peter Norvig, *Artificial Intelligence – A Modern Approach*, Second Edition, Pearson Education, 2004. (Chapters 1-4, 6-11, 13, 16,18)

CA246 MANAGEMENT INFORMATION SYSTEMS

Credit 4:0:0

Marks (40+60)

Unit-I

Organizations, Management and the Networked Enterprises – Managing the Digital Firm, Information Systems in the Enterprise, Information Systems, Organizations, Management and Strategy, The Digital Firm- Electronic Business and Electronic Commerce, Ethical and Social Issues in the Digital Firm

(Chapter 1-5)

Unit-II

Information Technology Infrastructure – Managing Hardware and Software Assets, Managing Data Resources, Telecommunications and Networks, the Internet and the New Information Technology Infrastructure

(Chapter 6-9)

Unit-III

Management and Organizational Support Systems for the Digital Firm – Managing knowledge for the Digital Firm, Enhancing Management Decision making for the Digital Firm

(Chapter 10,11)

Unit-IV

Building Information Systems in the Digital Firm – Redesigning the organization with Information Systems, Understanding the Business Value of systems and Managing change

(Chapter 12,13)

Unit-V

Managing Information Systems in the Digital Firm- Information Systems Security and Control, Managing International Information Systems

(Chapter 14,15)

TextBook

1. Kenneth C Laudon and Jane P Laudon, *Management Information Systems – Managing the Digital Firm*, Eighth Edition, Prentice Hall of India, 2003

CA247 DECISION SUPPORT SYSTEMS

Credits 4:0:0

Marks(40+60)

Unit – I

Decision Support Systems – An Overview, Data Management (Chapter 2 & 3)

Unit-II

Modeling and Model Management, User Interface, Constructing a Decision Support System (Chapter 5-7)

Unit-III

Group Decision Support Systems, Distributed Group Support Systems (Chapter 9 & 10)

Unit IV

Applied Artificial Intelligence- An overview, Fundamentals of Expert Systems (Excluding case study) (Chapter 12 & 13)

Unit –V

Integrating Decision Support Technologies, Implementing Management Support Systems (Chapter 20 & 21)

Text Book:

1. Efraim Turban , *Decision Support and Expert Systems*, Fourth Edition, Prentice Hall,1995

CA248 DATABASE ADMINISTRATION

Credits 4:0:0

Marks (40+60)

UNIT – I

The Oracle Architecture: Oracle Memory Structures – Oracle Background process – Oracle Disk Utilization Structures – Getting started with oracle saner

Managing an Oracle Instance: Starting and stopping the Oracle instance – Selecting an authentication method – starting the Oracle instance and opening the database – shutting down the oracle instance - changing database availability and restricting login.

Creating a Database: Entity Relationships and Database objects – Creating a Database in Oracle – Creating the Oracle Data Dictionary.

(Chapter 6)

UNIT – II

Managing the Physical Database Structure:

Maintaining the control file - Maintaining the Redo log file

Accessing the Updating Data : Steps in SQL statement processing – The benefits of shared SQL Area –the function and contents of the Buffer cache – Role of the server process - Role of the DBWR process – Events triggering DBWR Activity.

Managing Transaction Currency: The Log Writer process – Components and purpose of checkpoints – Data Concurrency and statement – Level Read consistency.

Managing the Database structure :- Database storage allocation – customizing the database structure – preparing accessory table spaces – The different type of segments

Managing storage Allocation :- Allocating extents to Database objects – Database storage allocation parameters – using space utilization parameters – Displaying database storage information.

(Chapter 7)

UNIT – III

Database Storage: *Managing Database Objects* – Roll back segment concept and function – creating and sizing roll back segments – storage and performance trade – offs – Determining the number of roll back segments

Managing Table spaces and Data files –

Managing Tables and Indexes:- Sizing Tables – Sizing Indexes – Understanding storage and performance trade offs – Reviewing space usage.

Managing clusters: - Identifying the advantages & Disadvantages of clusters – Creating Index cluster – Creating Hash cluster

Managing Data Integrity Constraints:- Types of Declarative integrity constraints – constraints in Action – Managing Constraint violations – Viewing information about constraints. (Chapter 8)

UNIT – IV

Managing Database Usage:- *Managing Users:* Creating New Data base users – Altering and dropping existing users – Monitoring information about existing users – termination user sessions.

Managing Resource Usage: Understanding Oracle Resource Usage – Managing profiles created for system – creating and assigning user profiles.

Managing Database Access and Roles: Creating and Controlling System privileges – Object privileges explained – creating and controlling roles. (Chapter 9)

UNIT – V

Back up and Recovery – Overview of Backup and Recovery – Backup and Recovery Motives:

Importance of Backups – Importance of Business Requirements – Disaster Recovery Issues – Management Involvement Importance of Testing backup and strategy.

Backup Methods: Logical Vs Physical Backups – Mechanics of taking a good backup – Backup strategies – Implications of Achieving – Backup and Recovery in 24 X 7 operations – Implications of Recovery Time – Implications of Backup time – Back up and recovery on Read only table spaces.

Logical Backup and Recovery: Failure scenarios – Statement failure – User process failure – Instance failure – User Error – Media Error..

Logical Backups – Using Export – Export Modes – Using Export for Backups – Using Import – Read consistency and database export – Using export direct path – using right character set – Export, Import and achieved Redo Logs.

(Chapter 11 & 12)

Text Book:-

1. Jason S. Couchman *DBA Certification Exam Guide*.Tata McGraw-Hill Publishing Company Ltd. 2001 Edition

CA249 ENTERPRISE JAVA (J2EE) AND .NET PROGRAMMING LAB

Credits: 0 : 0 : 2

Marks: (50 + 50)

12 experiments will be notified by HOD from time to time

**SCHOOL
OF
COMPUTER SCIENCE AND
TECHNOLOGY**

Karunya University

ADDITIONAL SUBJECTS

Code	Subject Name	Credit
CA250	Discrete Mathematics	4:0:0
CA251	Computer Oriented Statistical and Numerical Methods	4:0:0
CA252	Computer Organisation and Architecture	4:0:0
CA253	Business Data Networks	4:0:0
CA254	Software Testing	4:0:0
CA255	Wireless Networks	4:0:0
CA256	Principles of E-Commerce	4:0:0
CA257	Programming in J2EE	4:0:0
CA258	Web Technology	4:0:0
CA259	Software Project Management	4:0:0
CA260	System Simulation	4:0:0
CA261	Data Warehousing	4:0:0
CA262	Data Mining Techniques	4:0:0
CA263	Principles of Financial and Management Accounting	4:0:0

CA250 DISCRETE MATHEMATICS

Credit: 4:0:0

Marks: 40+60

Unit I:

Logic - Propositional Equivalences - Predicates and Quantifiers-Nested Quantifiers - Methods of Proof – Sets - Set operations - Functions (Chapter 1).

Boolean Functions - Representing Boolean Functions – Logic Gates – Minimization of Circuits (Chapter 10).

Unit II:

Proof Strategy – Sequences and Summations – Mathematical Induction – Recursive Definitions and Structural Induction – Recursive Algorithms – Program Correctness (Chapter 3).

Relations and their Properties – n -ary Relations and their applications – Representing Relations – Closure of Relations – Equivalence Relations – Partial Orderings (Chapter 7).

Unit III:

Introduction to Graphs – Graph Terminology – Representing Graphs and Graph Isomorphism – Connectivity – Euler and Hamiltonian Paths – Shortest Path Problems – Planar Graphs – Coloring Graphs (Chapter 8).

Unit IV:

Introduction to Trees – Applications of Trees – Tree Traversal – Spanning Trees – Minimum Spanning Trees (Chapter 9).

Unit V:

Languages and Grammars – Finite-State Machines with Output – Finite-State Machines with No Output – Language Recognition – Turing Machines (Chapter 11).

Text Book:

Kenneth H. Rosen, *Discrete Mathematics and its Applications*, Fifth Edition, Tata McGraw-Hill Edition, 2003, ISBN: 0-07-053047-5.

Reference Books:

Edgan G. Goodaire, Michael M. Parmer, *Discrete Mathematics with Graph Theory*, Third Edition, 2003, ISBN: 81-203-2121-9.

CA251 COMPUTER ORIENTED STATISTICAL AND NUMERICAL METHODS**Credit: 4:0:0****Marks: 40+60****Unit I:**

Introduction–Statistics–Definition–Functions–Applications–Limitations. Classifications– Discrete Frequency distributions, Continuous Frequency distribution–Graphs of frequency Distribution–Histogram, Frequency Polygon. Measures of central Value–Mean, Median, Mode–Merits and Demerits– Measures of Dispersion– Range, Mean deviation, Standard deviation. (Chapters–Volume I: 1, 5, 6, 7, 8)

Unit II:

Correlation Analysis – Scatter Diagram – Karl Pearsons Coefficient of correlation – Rank Correlation – Regression Analysis–Regression Lines–Regression Equations. (Chapters– Volume I: 10 & 11)

Unit III:

Probability and Expected value–Theorems of Probability–conditional probability–Bayes Theorem–Mathematical Expectation. Theoretical Distributions:- Binomial distribution, Poisson distribution and Normal distribution. (Chapters–Volume II: 1 & 2)

Unit IV:

The Solution of Numerical Algebraic and Transcendental Equations–Bisection method– Successive approximation method –False position method–Newton Raphson method– Simultaneous Linear Algebraic Equations–Gauss Elimination method–Jacobi method –Pivotal condensation–Gauss seidal–Gauss Jordan –Eigen values and Eigen vectors–Power Method. (Chapters–3 & 4)

Unit V:

Numerical differentiation–Newtons forward and backward difference formula. Integration– Trapezoidal rule–Simpsons $1/3^{\text{rd}}$ rule–Newtons 3.8^{th} . Solution of differential equations–

Tailors series-Eulers Method,Predictor-corrector method-Runge-Kutta method. (Chapters–9 & 11)

Text Books

1. S.P.Gupta, *Statistical Methods*, 33rd edition, Sultan Chand & Co., 2004. ISBN: 81-8054-214-9.
2. M.K.Venkataraman, *Numerical Methods in Science and Engineering*, 5th Edition, The National Publishing Company, 1999.

CA252 COMPUTER ORGANISATION AND ARCHITECTURE

Credit: 4:0:0

Marks: 40+60

Unit I:

Digital Logic Circuits: Digital computers – Logic gates – Boolean algebra – Map simplification – Combinational circuits – Flip-flops – Digital Components: Integrated circuits – Decoders – Multiplexers – Registers. (Chapter 1,2)

Unit II:

Data Representation: Data types – Complements – Fixed point representation – Floating point representation – Register Transfer and Microoperations: Register transfer language – Register transfer – Bus and memory transfers – Arithmetic microoperations – Logic Microoperations – Shift Microoperations – Arithmetic logic shift unit. (Chapter 3, 4)

Unit III:

Basic Computer Organization and Design: Instruction codes – Computer registers – Computer instructions – Timing and control – Instruction cycle – Memory reference instructions – Input-output and interrupt – Complete computer description – Design of basic computer – Design of accumulator logic – Central Processing Unit: Introduction – General register organization – Stack organization – Instruction formats – Addressing modes – Data transfer and manipulation – Program control – Reduced instruction set computer. (Chapter 5, 8)

Unit IV:

Computer Arithmetic: Introduction – Addition and subtraction – Multiplication algorithms – Division algorithms – Floating-point arithmetic operations – Decimal arithmetic unit – Decimal arithmetic operations – Input-Output Organization: Peripheral devices – Input-output interface – Asynchronous data transfer – Modes of transfer – Priority interrupt – Direct memory Access(Chapter 10, 11)

Unit V:

Memory Organization: Memory Hierarchy – Main memory – Auxillary memory – Associative memory – Cache memory – Virtual memory – Memory management hardware. (Chapter 12)

Text Book:

M. Morris Mano, *Computer System Architecture*, Pearson Education, Third edition, 2006, ISBN: 81-7758-429-4.

CA253 BUSINESS DATA NETWORKS

Credit: 4:0:0

Marks: 40+60

Unit I:

Core Network Concepts: Introduction – Applications, Client Stations, and Servers – Transmission links – Switches – Quality of Service – Geographical scope – Internets, Intranets, and Extranets. Standards: Introduction – Layered communication – The physical, data link, and internet layers – Layer cooperation at the physical, data link and internet layers – The transport and application layers – Standard architectures. (Chapter 1,2)

Unit II:

Physical layer propagation: Introduction – Signaling – UTP signal propagation – Optical fiber transmission links – Radio signal propagation – Physical layer topologies. A small ethernet PC network: Introduction – UTP transmission links – Hubs and Switches – Network Interface cards – Server services. (Chapter 3, 4)

Unit III:

Other LAN technologies: Introduction – larger ethernet standards – Wireless LANs – ATM LANs. Telephony: Internal and External: Introduction – Internal Telephony – The technology of PSTN – Analog and digital transmission in the PSTN – Cellular telephony. (Chapter 5-6)

Unit IV:

Wide Area Networks: Introduction – Telephone model communication – Leases line networks – Public Switch Data Networks. TCP/IP Networking: Introduction – Routing decisions. Security: Introduction – Attack prevention systems. (Chapter 7-9)

Unit V:

Network management and system administration: Introduction – Cost analysis – Administrative servers – Server management – Access permissions. Network Applications: Introduction – Traditional applications architecture – Electronic mail – the world wide web and E-Commerce – Web Services – Peer-to-Peer applications. (Chapter 10,11)

Text Book:

Raymond R Panko, *Business Data Networks and Telecommunications*, Prentice hall of India, Fourth edition, 2004. ISBN: 81-203-2171-5.

CA254 SOFTWARE TESTING

Credit: 4:0:0

Marks: 40+60

Unit I:

Assessing software testing capabilities and staff competencies: Multiple roles of testing – Defect – Business perspective for testing. Building a Software Testing Strategy: Computer

system strategic risks – Economics of testing – Common computer problems – Economics of SDLC testing – Testing issue – Testing policy – Structured approach – Test strategy – Testing methodology – Status of software testing. Establish a Software Testing Methodology: Defects – Cost of testing – Verification and validation – Functional and structural testing – work bench concept – eight considerations in developing testing methodologies. (Chapter 1 – 3)

Unit II:

Determining Software Testing Techniques: Testing techniques/Tool selection process – Structural system testing techniques – Functional system testing techniques – Unit Testing techniques – Functional testing and analysis – Functional testing – Test factor/test technique matrix. Eleven Steps Software Testing Process Overview: Cost of computer testing – Life cycle testing concept – Verification and validation in Software – Eleven-step software-testing process. (Chapter 4, 6)

Unit III:

Assess Project Management Development Estimate and Status – Develop Test Plan – Requirements Phase Testing – Design Phase Testing [Overview, Objective, Concerns, Workbench, Input, Do procedure, Check Procedure, Output] (Chapter 7 – 10)

Unit IV:

Program Phase Testing – Execute Test and Record Results – Acceptance Test – Report Test Results. [Overview, Objective, Concerns, Workbench, Input, Do procedure, Check Procedure, Output] (Chapter 11 – 14)

Unit V:

Testing Software Installation – Test Software Changes – Evaluate Test Effectiveness. [Overview, Objective, Concerns, Workbench, Input, Do procedure, Check Procedure, Output] (Chapter 15 – 17)

Text Book:

William E Perry, *Effective Methods for Software Testing*, John Wiley & Sons”, Second Edition, 2005. ISBN: 9971-51-345-5.

Reference Book:

Illene Burnstien, *Practical Software Testing*, Springer International Edition, First Edition, 2004. ISBN: 81-8128-089-X.

CA255 WIRELESS NETWORKS

Credit: 4:0:0

Marks: 40+60

Unit I:

Evolution of Wireless Networks, Challenges, Wireless communications Principles and Fundamentals: The Electromagnetic Spectrum, Wireless Propagation Characteristics and Modeling, Analog and Digital Data transmission, Modulation Techniques for Wireless Systems, The Cellular Concept, Wireless Services. [Chapter 1,2]

Unit II:

First Generation (1G) – Cellular Systems, Second Generation (2G) – Cellular Systems, Third Generation (3G) – Cellular Systems, Fourth Generation (4G) – Cellular Systems. [Chapter 3,4,5,6]

Unit III:

Satellite Networks: Introduction, Satellite Systems, VSAT Systems, Examples of Satellite-based Mobile Telephony Systems, Satellite-based Internet Accesss. Fixed Wireless Access Systems: Wireless Local Loop versus Wired Access, Wireless Local Loop, Wireless Local Loop Subscriber Terminals (WLL), Wireless Local Loop Interfaces to the PSTN, IEEE 802.16 Standards.[Chapter 7,8]

Unit IV:

Wireless Local Area Networks: Introduction, Wireless Lan Topologies, Wireless LAN Requirements, The Physical Layer, The Medium Access Control (MAC) Layer, Latest Developments. Wireless ATM and Ad Hoc Routing: Introduction, Wireless ATM Architecture, HIPERLAN 2: An ATM Compatible WLAN, Routing in Wireless Ad Hoc Networks. [Chapter 9,10]

Unit V:

Personal Area Networks: Introduction to PAN Technology and Applications, Commercial Alternatives: Bluetooth, Commercial Alternatives: HomeRF. Security Issues in Wireless Systems: The Need for Wireless Network Security, Attacks on Wireless Networks, Security Services, Wired Equivalent Privacy (WEP) Protocol, Mobile IP, Weaknesses in the WEP Scheme, Virtual Private Network (VPN) [Chapter 11,12].

Text Book:

P.Nicopolitidis, M.S. Obaidat, G.I Papadimitriou, A.S. Pomportsis, *Wireless Networks*, John Wiley & Sons, Ltd., 2003,ISBN 9812-53-033-9..

CA256 PRINCIPLES OF E- COMMERCE

Credit: 4:0:0

Marks: 40+60

Unit I:

What Is E- Commerce? – Advantages and Limitations of E- Commerce – The Role of Strategy in E- Commerce – Value Chains in E- Commerce – Integrating E – Commerce – Managerial Implications. The Internet and The World Wide Web: The Internet Today – In

the beginning – Unique Benefits of the Internet – Searching Online – Bulletin Board Systems (BBSs) and Pay Services – Some Web Fundamentals – The Language of the Internet – Managerial Implications. (Chapter 1-2)

Unit II:

Launching a Business on the Internet: The Life Cycle Approach – The Business Planning and Strategizing Phase – Hardware, Software, Security, and Setup Phase - The Design Phase – The Marketing Phase – The Fulfillment Phase – The Maintenance and Enhancement Phase. Internet Architecture: What Is a Network? – Information Transfer – Network Hardware – Designing a Network – Managing the Network – Management Implications. (Chapter 3-4)

Unit III:

Payment Systems: Getting the Money: From Barter to Money – Requirements for Internet-Based Payments – Electronic Payment Credit Cards, Debit Cards, Smart Cards. E- Security: Security in Cyberspace – Designing for Security – How Much Risk Can You Afford? – The Virus: Computer Enemy Number One – Security Protection and Recovery – How to Secure Your System. (Chapters 8-9)

Unit IV:

Encryption: A Matter of Trust: What Is Encryption? – The Basic Algorithm System – Authentication and Trust – Key Management – Internet Security Protocols and Standards – Other Encryption Issues. Marketing on the Internet: The Pros and Cons of Online Shopping – Internet Marketing Techniques – The E- Cycle of Internet Marketing – Marketing Your Presence – Attracting Customers to Your Site – Tracking Customers – Customer Service – Managing Implication. (Chapters 10-11)

Unit V:

Implementation and Maintenance: Implementation Strategies – Managing Implementation – Maintenance Strategies – Management Implications. Web-Based Business –to-Business E-Commerce: What Is B2B E- Commerce? – B2B Models – B2B Tools – EDI – Beyond B2B:A2Z – Management Applications. (Chapters 12-13)

Text Book:

Elias M. Awad, *Electronic Commerce*, Prentice-Hall Of India, 2003. ISBN: 81-203-2133-2.

CA257 PROGRAMMING IN J2EE

Credit: 4:0:0

Marks: 40+60

UNIT I

Overview – Distributed multitiered applications – J2EE containers – Web services support – Packaging applications – Development roles – J2EE 1.4 platform APIs – Understanding XML – Introduction to XML – Generating XML data – Designing an XML data structure – Getting started with web applications – Web application life cycle – Web modules – Configuring web applications – Accessing database from web applications.

UNIT II

Java Servlet Technology – What is a servlet – Example servlets – Servlet lifecycle – Sharing information – Initializing a servlet – Writing service methods – Filtering request and response – Invoking other web resources – Accessing the web context – Maintaining client state – Finalizing the servlet. What is a JSP page – Example JSP pages – Life cycle of a JSP page – Creating static content – Creating dynamic content – Expression language – Java beans components using custom tags – Reusing content in JSP – Transferring content to another web component – Including an applet – Setting properties for groups of JSP pages.

UNIT III

Java Server Pages documents – Example JSP documents – Creating a JSP document – Identifying JSP document to the container – JSP standard tag library – Using JSTL – Core tag library – XML tag library – Internationalization tag library – SQL tag library – Functions – Custom tag in JSP – What is a custom tag – Types of tags – Encapsulating reusable content using tag files – Library descriptors = Programming simple tag handlers.

UNIT IV

Scripting in JSP pages – Using scripting – Disabling scripting – Declarations – Scriptlets – Expressions – Programming the tag that accepts scripting elements – Enterprise beans – Enterprise bean – Session bean – Entity bean – Message driven bean – Defining client access with enterprises – Contents of a enterprise bean – Life cycle of enterprise bean – Getting started with enterprise beans.

UNIT V

Session bean examples – The Cart bean example – Other enterprise bean features – Using the timer service – Handling exceptions – Bean managed persistence examples – Saving account bean example – Mapping table relationships for bean managed persistence – Primary key for bean managed persistence – Container managed persistence examples – The player bean code – Primary keys for container managed persistence – Message driven bean example.

Text Book:

Stephanie Bodoff, Eric Armstrong, Jennifer Ball, Debbie Bode Carson, Ian Evans, Dale Green Kim, Haase Eric Jendrock, *The J2EE Tutorial*, Second Edition, Pearson Education, 2004, ISBN 81-297-0934-1.

CA258 WEB TECHNOLOGY

Credit: 4:0:0

Marks: 40+60

Unit I:

VBScript Language Elements: Constants - Variables and Data Types - Mathematical Operations - Logical Operators - Looping and Decision Structures. VBScript Functions and Objects: Data Conversion Functions - Mathematical Functions - Data Formatting Functions - Text Manipulation Functions - Date and Time Functions - Built-in Objects. (Chapters: 2,3)

Unit II:

ASP fundamentals: Using Server – Side Includes- Learning the SSI Directives – Creating Modular ASP Code. Using the Request Object: Using Form Information - Using Query String Information – Using Server Variables. Using the Response Object: Create Output – Managing Output – Managing the Connection. (Chapters: 4,5,6)

Unit III:

Using Cookies: Introduction to Cookies – Cookies and Your Browser – Creating a Cookie – Modifying and removing Cookies – Tracking Preferences with Cookies Using the Application, Session, and Server Objects: The application Object - The Session Object – The Server Object – Using the global .asa file - Active Data Objects Essentials: Microsoft’s Universal Data Access Strategy – The Connection Object – The Record set and Field Objects – The Command and Parameter Objects – Using the Errors Collection. (Chapters: 7,8,10)

Unit IV:

Introducing XML: What is XML - Why are Developers Excited About XML? – The Life of an XML documents - Related technologies- XML Applications: XML Applications – XML for XML – Behind the Scene Uses of XML-Your First XML Document: Hello XML – Exploring the Simple XML Document – Assigning Meaning to XML Tags – Writing a Style Sheet for an XML Document – Attaching a Style Sheet to an XML Document - Structuring Data: Examining the Data – XML izing the Data – The advantages of the XML Format - Preparing a Style Sheet for Document Display. (Chapters: 1,2,3,4)

Unit V:

Attributes, Empty tags & XSL: Attributes – Attributes versus Elements – Empty Elements and Empty Element Tags – XSL-DTDs and Validity: Document Type Definitions - Element Declarations – DTD Files – Document Type Declarations – Validating Against a DTD- Element Declarations – Entity Declarations: What Is an Entity – Internal General Entities – External General Entities – Internal Parameter Entities – External Parameter Entities – Building a Document from Pieces. (Chapters: 5,8,9,10)

Text Books:

1. Eric A. Smith, *ASP 3 Programming Bible*, Wiley-Dreamtech India (P) Ltd, 2002. ISBN 81-265-0049-2
2. Eliotte Rusty Harold, *XML Bible*, 2nd edition, IDG Books India (P) Ltd, 2001. ISBN 81-265-0212-6

CA259 SOFTWARE PROJECT MANAGEMENT**Credit: 4:0:0****Marks: 40+60****Unit I:**

Introduction to Software Project Management, Step Wise: an Overview of Project Planning, Project Evaluation: Introduction (Chapters 1-3)

Unit II:

Selection of an appropriate project approach, Software effort estimation. (Chapters 4,5)

Unit III:

Activity Planning, Risk Management. (Chapters 6,7)

Unit IV:

Resource Allocation, Monitoring and control, managing contracts. (Chapters 8-10)

Unit V:

Managing people and organizing teams, Small Projects, Chapters (11,13)

Text Book

Bob Hughes, Mike Cotterell, *Software and Project Management*, Tata McGraw-Hill Publishing Company Limited, Third Edition, 2004. ISBN: 0-07-709834-X.

Reference Book

Walker Royce, *Software Project Management*, Addison-Wesley, 1998. ISBN: 0-20-1309580.

CA260 SYSTEM SIMULATION**Credit: 4:0:0****Marks: 40+60****Unit I:**

Introduction to simulation: Advantages and disadvantages of simulation – areas of application – Systems and system environment – Components of a system – Discrete and continuous system – Models of a system – Types of models – Discrete event system simulation – steps in simulation study. Simulation examples: Simulation of queueing systems – Simulation on inventory systems – Other examples of simulation. (Chapter 1, 2)

Unit II:

General Principles: Concepts in discrete-event simulation – List processing. Statistical models in simulation: Review of terminology and concepts – useful statistical models – Discrete distributions – Continuous distributions – Poisson process – Empirical distributions. (Chapter 3, 5)

Unit III:

Queueing models: Characteristics – Queueing notation – Long-run measures of performance of queueing systems – Steady-state behaviour of infinite-population markovian models – Steady-state behaviour of finite-population models – Network of Queues (Chapter 6)

Unit IV:

Random-Number Generation: properties – Generation of Pseudo-Random numbers – Techniques for generating random numbers – Tests for random numbers. (Chapter 7)

Unit V:

Random-Variate Generation: Inverse transforms technique – Direct transformation for the normal and lognormal – Convolution method – Acceptance-Rejection technique. Input modeling: Data collection – Identifying the distribution with data – Parameter estimation – Goodness-of-fit tests – Selecting input models without data – Multivariate and time-series input models. (Chapter 8, 9)

Text Book:

Jerry Banks, John S Carson II, Barry L. Nelson, David M. Nicol, *Discrete-Event System Simulation*, Prentice hall of India private limited, Third edition, 2003. ISBN: 81-203-2071-9.

CA261 DATA WAREHOUSING**Credit: 4:0:0****Marks: 40+60****Unit I:**

Introduction: Background – Delivery Process – System process - Process Architecture (Chapter 1-4)

Unit II:

Database Schema – Partitioning strategy – Aggregations (Chapters 5-7)

Unit III:

Data Marting - Metadata – System and data warehouse process managers. (Chapters 8-10)

Unit III:

Hardware and operational design: Hardware architecture – Physical layout – Security. (Chapters 11-13)

Unit IV:

Backup and Recovery – Service level agreement – Operating the data warehouse - Capacity planning. (Chapters 14-17)

Unit V:

Tuning the data warehouse - Testing the data warehouse. (Chapters 18-19)

Text Book:

Sam Anohory, Dennis Murray, *Data Warehousing in the Real World*, Addison Wesley, First Edition, 2000. ISBN: 981-235-967-2.

Reference Book:

W H Inmon, *Building the data warehouse*, Wiley Computer Publishing, Third edition, 2002. ISBN: 0-471-08130-2.

CA262 DATA MINING TECHNIQUES

Credit: 4:0:0

Marks: 40+60

Unit I:

Introduction – Data Mining – Functionalities – Classification of data mining systems – Major issues in data mining. Data warehouse and OLAP technology for data mining: What is a data warehouse – A Multi dimensional model – Data Warehouse Architecture – Data Warehouse Implementation – Future development of Data cube technology. (Chapter 1,2)

Unit II:

Data preprocessing: Data cleaning – Data integration and transformation – Data reduction – Discretization and concept hierarchy generation. Data Mining Primitives: What defines a data mining tasks. (Chapter 3, 4 [Section 4.18])

Unit III:

Mining Association Rules in Large Databases: Association rule mining – Mining single dimensional Boolean association rule from transactional databases Mining Multidimensional association rules from relational databases and data warehouses. (Chapter 6 [Page 225 - 250])

Unit IV:

Classification and Prediction: What is classification – Issues regarding classification – Classification by decision tree induction – Bayesian classification (Chapter 7 [Page 279 – 302])

Unit V:

Cluster Analysis: Types of data in cluster analysis – Categorization of major clustering methods – Partitioning methods – Hierarchical Methods (Chapter 8 [Page 335 – 362])

Text Book:

Jiawei Han, Micheline Kamber, *Data Mining – Concepts and Techniques*, Morgan Kaufmann Publishers, First Edition, 2003. ISBN: 81-8147-049-4.

Reference Book:

Michael J A Berry, Gordon S Linoff, *Data Mining Techniques*, Wiley Publishing inc, Second Edition, 2004. ISBN: 81-265-0517-6.

CA263 PRINCIPLES OF FINANCIAL AND MANAGEMENT ACCOUNTING

Credits: 4:0:0

Marks: (40+60)

UNIT I

Basic concepts of accounting – Double entry book keeping – Classification of accounts – Classification of expenditure and receipts – Capital and revenue expenditure – deferred revenue expenditure, capital and revenue receipts.

Journal and ledger – Trial balance – Manufacturing account – Trading account – Profit and loss account – Balance sheet

UNIT II

Significance and limitations of financial statements – Financial statement analysis – Common size, comparative and trend percentage analysis. Ratio analysis – Profitability – Solvency – leverage – Activity ratios

UNIT III

Fund flow statement – Statement of changes in working capital – Calculation of funds from operation – Fund flow statement. Preparation of cash from operation statement – Cash flow statement – Significance of fund flow and cash flow statements

UNIT IV

Costing – Elements of costing – Types of cost – Preparation of cost sheet – Budgeting and budgetary control – Types of budgets – Preparation of purchase budget – Flexible budgets – Cash budget – Sales budget – Materials budget – Master budget – Zero based budgeting

UNIT V

Marginal costing – Cost volume – Profit analysis – Break even analysis – Break – Even chart – Applications

Capital budgeting decisions – Techniques of capital budgeting – payback period method – Rate of return method – Discount cash flow method – net present value method – Internal rate of return method

Textbooks:

1. Grewal T.X., *Double Entry Book-keeping*, Sultan Chand & Sons, 1999.
2. Reddy P.N. and Appannaiah H.R., *Management Accounting*, 1997.

Reference books:

1. Sukla and Grewal, *Advanced Accountancy*, Sultan Chand, NewDelhi.
2. Gupta and Radhasamy, *Advanced Accountancy*, Sultan Chand, NewDelhi
3. Jain and Narang, *Advanced Accountancy*, Sultan Chand, NewDelhi.
4. Maheswari S.N., *Management Accounting*, Sultan Chand, NewDelhi.

ADDITIONAL SUBJECTS

Code	Subject Name	Credits
CA314	Discrete Mathematics	4:0:0
CA315	Financial and Management Accounting	4:0:0
CA316	Computer Oriented Statistical and Numerical Methods	4:0:0
CA317	Resource Management Techniques	4:0:0
CA318	Computer Organization and Architecture	4:0:0
CA319	Programming in C	4:0:0
CA320	Object Oriented Analysis and Design	4:0:0
CA321	Database Systems	4:0:0
CA322	Data Structures	4:0:0
CA323	Programming in C++	4:0:0
CA324	System Software and Compiler	4:0:0
CA325	Java Programming	4:0:0
CA326	Operating Systems	4:0:0
CA327	Business Data Networks	4:0:0
CA328	Software Engineering	4:0:0
CA329	C Programming Lab	0:0:2
CA330	Advanced PC Software and Internet Lab	0:0:2
CA331	Programming in C++ Lab	0:0:2
CA332	Database Systems Lab	0:0:2
CA333	Front End Lab	0:0:2
CA334	Data Structures Lab	0:0:2
CA335	Java Programming Lab	0:0:2
CA336	Wireless Networks	4:0:0
CA337	Electronic Commerce	4:0:0
CA338	Programming in J2EE	4:0:0
CA339	C# Programming	4:0:0
CA340	System Simulation	4:0:0
CA341	Data Warehousing	4:0:0
CA342	Data Mining Techniques	4:0:0

CA314 DISCRETE MATHEMATICS

Credit: 4:0:0

Marks: 40+60

Unit I:

Logic - Propositional Equivalences - Predicates and Quantifiers-Nested Quantifiers - Methods of Proof – Sets - Set operations - Functions (Chapter 1).
 Boolean Functions - Representing Boolean Functions – Logic Gates – Minimization of Circuits (Chapter 10).

Unit II:

Proof Strategy – Sequences and Summations – Mathematical Induction – Recursive Definitions and Structural Induction – Recursive Algorithms – Program Correctness (Chapter 3).

Relations and their Properties – n-ary Relations and their applications – Representing Relations – Closure of Relations – Equivalence Relations – Partial Orderings (Chapter 7).

Unit III:

Introduction to Graphs – Graph Terminology – Representing Graphs and Graph Isomorphism – Connectivity – Euler and Hamiltonian Paths – Shortest Path Problems – Planar Graphs – Coloring Graphs (Chapter 8).

Unit IV:

Introduction to Trees – Applications of Trees – Tree Traversal – Spanning Trees – Minimum Spanning Trees (Chapter 9).

Unit V:

Languages and Grammars – Finite-State Machines with Output – Finite-State Machines with No Output – Language Recognition – Turing Machines (Chapter 11).

Text Book:

1. Kenneth H. Rosen, *Discrete Mathematics and its Applications*, Fifth Edition, Tata McGraw-Hill Edition, 2003, ISBN: 0-07-053047-5.

Reference Book:

1. Edgan G. Goodaire, Michael M. Parmeter, *Discrete Mathematics with Graph Theory*, Third Edition, 2003, ISBN: 81-203-2121-9.

CA315 FINANCIAL AND MANAGEMENT ACCOUNTING**Credit: 4:0:0****Marks: 40+60****Unit I**

Basic concepts of accounting – Double entry book keeping – Classification of accounts – Classification of expenditure and receipts – Capital and revenue expenditure – deferred revenue expenditure, capital and revenue receipts.

Journal and ledger – Trail balance – Manufacturing account – Trading account – Profit and loss account – Balance sheet

Unit II

Significance and limitations of financial statements – Financial statement analysis – Common size, comparative and trend percentage analysis. Ration analysis – Profitability – Solvency – leverage – Activity ratios

Unit III

Fund flow statement – Statement of changes in working capital – Calculation of funds from operation – Fund flow statement. Preparation of cash from operation statement – Cash flow statement – Significance of fund flow and cash flow statements

Unit IV

Costing – Elements of costing – Types of cost – Preparation of cost sheet – Budgeting and budgetary control – Types of budgets – Preparation of purchase budget – Flexible budgets – Cash budget – Sales budget – Materials budget – Master budget – Zero based budgeting

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Marginal costing – Cost volume – Profit analysis – Break even analysis – Break – Even chart – Applications

Capital budgeting decisions – Techniques of capital budgeting – payback period method – Rate of return method – Discount cash flow method – net present value method – Internal rate of return method

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2. Reddy P.N. and Appannaiah H.R., *Management Accounting*, 1997.

Reference books:

1. Sukla and Grewal, *Advanced Accountancy*, Sultan Chand, NewDelhi.
2. Gupta and Radhasamy, *Advanced Accountancy*, Sultan Chand, NewDelhi
3. Jain and Naang, *Advanced Accountancy*, Sultan Chand, NewDelhi.
4. Maheswari S.N., *Management Accounting*, Sultan Chand, NewDelhi.

CA316 COMPUTER ORIENTED STATISTICAL AND NUMERICAL METHODS

Credit: 4:0:0

Marks: 40+60

Unit I:

Introduction–Statistics–Definition–Functions–Applications–Limitations.Classifications– Discrete Frequency distributions,Continuous Frequency distribution–Graphs of frequency Distribution–Histogram, Frequency Polygon. Measures of central Value–Mean, Median, Mode–Merits and Demerits– Measures of Dispersion– Range,Mean deviation,Standard deviation. (Chapters–Volume I: 1 ,5,6,7,8)

Unit II:

Correlation Analysis – Scatter Diagram – Karl Pearsons Coefficient of correlation – Rank Correlation – Regression Analysis–Regression Lines–Regression Equations. (Chapters–Volume I: 10 & 11)

Unit III:

Probability and Expected value–Theorems of Probability–conditional probability-Bayes Theorem–Mathematical Expectation. Theoretical Distributions:- Binomial distribution, Poisson distribution and Normal distribution. (Chapters–Volume II: 1 & 2)

Unit IV:

The Solution of Numerical Algebraic and Transcendental Equations-Bisection method– Successive approximation method –False position method–Newton Raphson method– Simultaneous Linear Algebraic Equations-Gauss Elimination method-Jacobi method –Pivotal

condensation-Gauss seidal-Gauss Jordan –Eigen values and Eigen vectors–Power Method. (Chapters–3 & 4)

Unit V:

Numerical differentiation-Newtons forward and backward difference formula.Integration-Trapezoidal rule-Simpsons 1/3rd rule-Newtons 3.8's . Solution of differential equations-Tailyors series-Eulers Method,Predictor-corrector method-Runge-Kutta method. (Chapters–9 & 11)

Text Books

1. S.P.Gupta, *Statistical Methods*, 33rd edition, Sultan Chand & Co., 2004, ISBN: 81-8054-214-9.
2. M.K.Venkataraman, *Numerical Methods in Science and Engineering*, 5th edition, The National Publishing Company, 1999.

CA317 RESOURCE MANAGEMENT TECHNIQUES

Credit: 4:0:0

Marks: 40+60

Unit-I

The Linear Programming Problem - Introduction, formulation of Linear Programming problem, Limitations of L.P, Graphical solution to L.P.P, Simplex Method, Artificial variable techniques, two phase Method, Variants of the Simplex Method.

Unit-II

Duality In Linear Programming - Concept of duality, Fundamental properties of Duality, Duality & simplex method, Dual simplex method. THE TRANSPORTATION PROBLEM: Introduction, Transportation Model, transportation problem as an L.P model, finding initial basic feasible solutions, moving towards optimality, Degeneracy.

Unit-III

Assignment Problem - Introduction, Mathematical formulation of the problem, Solution of an Assignment problem, Multiple Solution, Hungarian Algorithm, Maximization in Assignment Model, Impossible Assignment. Inventory Models: Purchasing model: No Shortages, Manufacturing Model: No Shortages, EOQ: System of Ordering.

Unit-IV

Sequencing - Job sequencing, n jobs through two machines, two jobs through m machines, n jobs through m machines. QUEUING THEORY: Introduction, Definition of terms in Queuing model, problem-involving $M/M/1$: α FIFO queue, $M/M/M$: FCFS μ/μ , $M/M/1$: FCFS N/μ , $M/M/S$: FCFS μ/μ

Unit-V

Replacement Of Model - Replacement of items with gradual deterioration, items deteriorating with time value of money, items that fail completely and suddenly, staff replacement problems. Simulation Models: Elements of Simulation Model- Monte carlo Technique- Applications.

Text Book

1. S.Dharani Ventakrishnan, *Operations Research, Principles and Problems*, Keerthi Publishing House Private Ltd., 1992.

References

1. Kanti Swarup, Manmohan, P.K. Gupta, *Operations Research*, Sultan Chand & Sons, 1991.
2. Venkatesan, *Operation Research*, JS Publications, 1998.

CA318 COMPUTER ORGANIZATION AND ARCHITECTURE**Credit: 4:0:0****Marks: 40+60****Unit I:**

Digital Logic Circuits: Digital computers – Logic gates – Boolean algebra – Map simplification – Combinational circuits – Flip-flops – Digital Components: Integrated circuits – Decoders – Multiplexers – Registers. (Chapter 1,2)

Unit II:

Data Representation: Data types – Complements – Fixed point representation – Floating point representation – Register Transfer and Microoperations: Register transfer language – Register transfer – Bus and memory transfers – Arithmetic microoperations – Logic Microoperations – Shift Microoperations – Arithmetic logic shift unit. (Chapter 3, 4)

Unit III:

Basic Computer Organization and Design: Instruction codes – Computer registers – Computer instructions – Timing and control – Instruction cycle – Memory reference instructions – Input-output and interrupt – Complete computer description – Design of basic computer – Design of accumulator logic – Central Processing Unit: Introduction – General register organization – Stack organization – Instruction formats – Addressing modes – Data transfer and manipulation – Program control – Reduced instruction set computer. (Chapter 5, 8)

Unit IV:

Computer Arithmetic: Introduction – Addition and subtraction – Multiplication algorithms – Division algorithms – Floating-point arithmetic operations – Decimal arithmetic unit – Decimal arithmetic operations – Input-Output Organization: Peripheral devices – Input-output interface – Asynchronous data transfer – Modes of transfer – Priority interrupt – Direct memory Access(Chapter 10, 11)

Unit V:

Memory Organization: Memory Hierarchy – Main memory – Auxillary memory – Associative memory – Cache memory – Virtual memory – Memory management hardware. (Chapter 12)

Text Book:

1. M. Morris Mano, *Computer System Architecture*, Prentice Hall of India Pvt Ltd, Third edition, 2002. ISBN: 81-203-0855-7.

CA319 PROGRAMMING IN C

Credits: 4:0:0

Marks (40+60)

Unit I

Introductory Concepts - Introduction to Computers– What is a Computer – Block Diagram of Computer – Computer Characteristics – Hardware vs Software – How to Develop a Program – Modes of Operation – Types of Programming Languages – Introduction to C – Desirable Program Characteristics – Introduction to C Programming - The C Character Set – Writing First Program in C - Identifiers and Keywords – A More Useful C Program – Entering the Program into the Computer – Compiling and Executing the Program - Data Types – Constants – Variables and Arrays – Declarations – Expressions – Statements – Symbolic Constants – Operators and Expressions - Arithmetic Operators – Unary Operators – Relational and Logical Operators – Assignment Operators – The Conditional Operator – Library Functions – Data Input and Output – Preliminaries - Single Character Input & Output – Entering Input Data – More About scanf Function - Writing Output Data – More About printf Function – The Gets and Puts Functions – Interactive Programming – Preparing and Running a Complete C Program – Planning a C Program- Writing a C Program – Error Diagnostics – Debugging Techniques (Chapters 1-5)

Unit II

Control Statements – Preliminaries - Branching – Looping – More Looping – Still More Looping - Nested Control Structures – The switch, break, continue, comma statements – The Goto Statement – Functions Defining a Function – Accessing a Function – Function Prototypes – Passing Arguments to a Function – Recursion (Chapter 6-7)

Unit III

Program Structure - Storage Classes – Automatic Variables – External Variables – Static Variables – Multifile Programs – More About Library Functions Arrays - Defining an Array – Processing an Array – Passing Arrays to Functions – Multidimensional Arrays – Arrays and Strings. (Chapter 8-9)

Unit IV

Pointers - Fundamentals – Pointer Declarations – Passing Pointers to Functions – Pointers and One-Dimensional Arrays – Dynamic Memory Allocation - Operations on Pointers – Pointers and Multidimensional Arrays – Arrays of Pointers – Passing Functions to other Functions – Structures & Unions - Defining a Structure – Processing a Structure – User-Defined Data Types – Structures and Pointers – Passing Structures to Functions – Self Referential Structures - Unions (Chapter 10,11)

Unit V

Data Files – Why Files - Opening and Closing a Data File – Reading and Writing a Data File – Processing a Data File – Unformatted Data Files – Concept of Binary Files - Low Level Programming – Register Variables – Bitwise Operations – Bit Fields – Additional Features of C – Enumerations – Command Line Parameters – More About Library Functions – Macros – The C Preprocessor (Chapter 12 - 14)

Text Book:

1. Byron S. Gottfried, *Programming with C*, Second Edition, 1996 (Indian Adapted Edition 2006), Tata McGraw Hill, ISBN 0-07-059369-8.

CA320 OBJECT ORIENTED ANALYSIS AND DESIGN**Credit: 4:0:0****Marks: 40+60****Unit I:**

Object Basics , Object oriented philosophy, objects, classes, attributes, object behavior and methods, encapsulation and information hiding, class hierarchy, polymorphism, object relationships and associations, aggregations and object containment, case study, object identity, persistence.. Object oriented systems development life cycle: Software development process, building high quality software, use- case driven approach, reusability.(chapters 1-3)

Unit II : Object Oriented Methodologies

Rumbaugh et al.'s object modeling technique, Booch methodology, Jacobson et al methodologies, patterns, frameworks, the unified approach. Unified modeling language: Static and dynamic models, UML diagrams, UML class diagrams, use-case diagrams, UML dynamic modeling, packages, UML extensibility and UML metamodel.(chapters 4 & 5)

Unit III : Object Oriented Analysis Process

Business object analysis, use-case driven object oriented analysis, business process modeling, use-case model, developing effective documentation, case study. Classification: Classification theory, noun phrase approach, common class patterns approach, use-case driven approach, classes, responsibilities, and collaborators, naming classes. (chapters 6&7)

Unit IV : Identifying Object Relationships, Attributes And Methods

Association, super-subclass relationships, a-part of relationships, case study, class responsibility, defining attributes for vianet bank objects, object responsibility, defining methods for vianet bank objects Design process and design axioms: Corollaries, design patterns. (chapters 8 & 9)

Unit V : Designing Classes

UML object constraint languages, designing classes, class visibility, refining attributes for the vianet bank objects, designing methods and protocols, designing methods for the vianet bank objects, packages and managing classes. (chapter 10)
Designing access layer, case study. (sections 11.10,11.11)
Designing view layer, macro level process.(sections 12.3 ,12.4)

Text Book

1. Ali Bahrami, *Object Oriented Systems Development using the Unified Modeling Language*, McGraw Hill, 1999 (chapters 1-10 & sections 11.10,11.11,12.3, 12.4 only).

Reference Book

1. Bernd Oestereich, *Developing Software with UML, Object-Oriented Analysis and Design in Practice*, Addison-Wesley, 2000.

CA321 DATABASE SYSTEMS

Credits : 4:0:0

Marks(60+40)

Unit I

Introduction: Database-System Application, Purpose of Database System, View of Data, Database Language, Relational Database, Database Design, Object-Based and Semi structured Databases, Data Storage and Querying, Transaction Management, Data mining and Analysis, Database Architecture, Database Users and Administrators. Relational Model: Structure of Relational Databases, Fundamental Relational-Algebra operations, Additional Relational-Algebra operations, Extended Relational Algebra, Null value, Modification of the database. (Chapter 1.1-1.12, 2.1-2.6)

Unit II

SQL: Background, Data Definition, Basic Structure of SQL Queries, Set Operations, Aggregate functions, Null values, Nested sub queries, Complex Queries, Views, Modification of Database. Advanced SQL: SQL Data Types and Schema, Integrity Constraint, Authorization, Embedded SQL, Dynamic SQL. (Chapter 3.1-3.10, 4.1-4.5)

Unit III

Database Design and E-R Model: Overview of the design process, E-R model, Constraints, E-R Diagram, E-R Design Issues, Weak Entity, Extended E-R Features, Database Design for Banking Enterprise, Reduction to Relational Schema. Database-System Architecture: Centralized and Client-Server Architecture, Server System Architecture. (Chapter 6.1-6.9, 20.1, 20.2)

Unit IV

Relational Database Design: Features of good Relational Design, Atomic Domains and First Normal Form, Decomposition Using Functional dependencies, Functional- Dependency Theory, Decomposition Using Functional Dependencies, Multivalued Dependencies, More Normal form, Database-Design Process, Modeling Temporal data.

Application Design and Development: Triggers, Authorization in SQL. Storage and File Structure: File organization, Organization of records in files, Data Dictionary Storage. (Chapter 7.1-7.9, 8.6, 8.7, 11.6-11.8)

Unit V

Indexing and Hashing: Basic Concept, Ordered Indices, B+ Tree Index Files, B-Tree Index Files, Multiple-Key Access, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing. Transaction: Transaction concepts, Transaction State, Implementation of atomicity and durability, Concurrent executions, Serialization.

(Chapter 12.1-12.8, 15.1-15.5)

Text Book:

1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan, *Database System Concepts*, Fifth Edition, Mc Graw-Hill International Edition, 2006. ISBN 007-124476-X.

Reference Book:

1. Ramez Elmasri, Durvasula V.L.N. Somayajulu, Shamkant B. Navathi and Shyam K. Gupta, *Fundamentals of Database Systems*, Pearson Education, 2006. ISBN 81-7758-476-6

CA322 DATA STRUCTURES

Credit: 4:0:0

Marks: 40+60

Unit I

Algorithms for Data Structures - Specifics of PSEUDO - Data types, constants, Variables and expressions, Program modules in PSEUDO Logic and Control structures in PSEUDO - Linked lists, arrays, singly linked lists - Insertions and deletions - variations on linked list structures, Dummy Headers, Circular linked lists, Doubly linked circular list - Fixed length string method - workspace/Index table method Processing efficiency considerations of the workspace/Index table method - Garbage collection - Linked list method. (Chapters 1,2,3)

Unit II

Circular implementation of a queue - Linked list implementation of a queue, priority queues - stacks - Array implementations of a stack - linked list implementation of a stack - Parsing and Evaluation of Arithmetic expressions using stacks - postfix, prefix and infix notations converting to infix expressions to postfix - Evaluating post fix expressions - Recursion, Towers of Hanoi Problem - Recursive Algorithms - Implementing non -recursively - recursion - stacks and backtracking - The 8 queens problem. (Chapters 4,5)

Unit III

Tree structures - Binary trees, implementation of Binary trees - linear representation of a binary tree - linked representation of a binary tree- binary tree traversals - pre-order, In order-post order traversals of a binary tree - Deletion algorithm for lists maintained with binary tree - Threaded binary trees - insertions into a binary tree - height - balanced trees, AVL rotations - General trees. (Chapters 6,7)

Unit IV

Implementing a multidimensional array - sparse matrices and generalized Dope vector implementation - Linked list implementation of a sparse matrix. Graphs and networks, implementation of graphs - the adjacency matrix, Depth-first search, breadth-first search. Networks - Minimum spanning tree - The shortest path algorithm - Topological ordering. (Chapters 8,9)

Unit V

Sorting: Internal sorts, The Bubble sort, The Insertion sort, The selection sort, The shell sort, The Quick sort, The Heap sort External sorting or File sorting: The Merge sort -- Search Strategies: Quantity-Dependent search techniques: Sequential Search, Binary Search, Binary Tree Search (Chapters 10,11)

Text Book:

1. Bhagat Singh and Thomas L.Naps, *Introduction to Data Structures*, Tata McGraw-Hill 1986.

Reference Book:

1. Robert Kruse, C.L.Tondo and Bruce Leung, *Data Structures and Program Design in C*, Second Edition, Prentice-Hall India 1997. ISBN-81-203-2097-2

CA323 PROGRAMMING IN C++

Credit: 4:0:0

Marks: 40+60

Unit I :

Objects, classes, inheritance, reusability, creating new data types, polymorphism and overloading. Basic program construction, data types: integer, character, float, double, long double and Boolean. Input output statements: cin, cout, comments, escape sequence, manipulators, type conversion, arithmetic logical and relational operators, and library function(Chapter 1,2).

Unit II:

For loop, while loop & do loop and if, if...else, switch & other control statements. Structures, Enumeration, Functions: passing arguments to functions, returning values from functions, reference arguments, overloaded functions, inline functions, default arguments, variables and storage class and returning by reference(Chapter 3-5)

Unit III:

A simple class, c++ objects as physical objects, c++ objects and data types, object as function argument, constructors, as function argument, overloaded constructors, copy constructors, returning objects from functions, structures and classes, static class data, const and classes, Arrays and Strings(Chapter 6,7).

Unit IV:

Overloading unary and binary operator, data conversion, and pitfalls. Inheritance: derived class and base class, derived class constructors, overloading member functions, class hierarchies, public and private inheritance, level of inheritance, multiple inheritance. Pointers: address and pointers, pointers and arrays, pointer and c-type strings, new and delete operator, pointers to pointer(Chapters 8-10)

Unit V:

Virtual functions, friend functions, static functions, this pointer. Streams and files: stream classes, stream errors, disk file I/O with streams, file pointers, error handling in file I/O. Templates and exception: function templates, class templates, exceptions. (Chapter 11,12,14)

Text Book:

1. Robert Lafore, *Object Oriented Programming In C++*, Fourth Edition, Tech Media, 2002. ISBN 0-672-32308-7(Chapters 1-12, 14).

Reference Book:

1. Herbert Schildt, *C++ The Complete Reference*, Fourth Edition, Tata McGraw – Hill, 2003 ISBN 0-07-053246-X.

CA324 SYSTEM SOFTWARE AND COMPILER

Credit: 4:0:0

Marks: 40+60

Unit – I

Introduction – System Software and machine Architecture, The Simplified Instructional Computer, Traditional Machines, RISC Machines (Chapter1)

Unit- II

Assemblers- Basic Assembler Functions, Machine-Dependent Assembler Features, Machine-Independent Assembler Features, Assembler Design Options, Implementation Examples (Chapter 2)

Unit-III

Loaders and Linkers-Basic Loader Functions, Machine-Dependant Loader Features, Machine-Independent Loader Features, Loader-Design Options, Implementation Examples (Chapter 3)

Unit-IV

Macro Processors- Basic Macro Processor Functions, Machine-Independent Macro Processor Features, Macro Processor Design Options, Implementation Examples (Chapter 4)

Unit- V

Compilers- Basic Compiler Functions, Machine-Dependant Compiler Features, Machine-Independent Compiler Features, Compiler Design Options, Implementation Options
Other System Software -Text Editors, Interactive Debugging Systems
(Chapter 5, Sections 7.2 & 7.3)

Text Book

Leland L Beck, *System Software – An Introduction to System Programming*, III Edition, Pearson Education, 2003.

CA325 JAVA PROGRAMMING

Credit: 4:0:0

Marks: 40+60

Unit I:

The History and evolution of Java - An Overview of Java - Data Types, Variables and Arrays – Operators - Control Statements (Chapters 1-5)

Unit II:

Introducing Classes –A Closer look at Methods and Classes - Inheritance - Packages and Interfaces - Exceptions Handling (Chapters 6-10)

Unit III

Multithreaded Programming –Enumerations, Autoboxing and Metadata- Generics (Chapters 11,12,14)

Unit IV

String Handling - Input/Output: Exploring java.io - Networking - The Applet Class (Chapters 15,19-21)

Unit V

Event Handling-Introducing the AWT: Working with Windows, Graphics and Text - Using AWT Controls, Layout Managers, and Menus (Chapters 22-24)

Text Book:

1. Herbert Schildt, *Java - The Complete Reference, J2SE* Fifth Edition, Tata McGraw-Hill, 2005. ISBN-0-07-059878-9

CA326 OPERATING SYSTEMS**Credit: 4:0:0****Marks: 40+60****Unit I:**

Introduction - What Operating Systems Do – Computer System Organization Computer System Architecture – Operating System Structure – Operating System Operations – Process Management – Memory Management – Storage Management – Protection and Security – Distributed Systems – Special Purpose Systems - Computing Environments – Operating System Services – User Operating System Interface – System Calls – Types of System Calls – System Programs – Operating System Design and Implementation – Operating System Structure – Virtual Machines – Operating System Generation – System Boot.[Chapters 1,2]

Unit II

Process Concept – Process Scheduling – Operation on Processes – Interprocess Communication – Communication in Client Server Systems – Multithreaded Programming – Multithreading models – Thread Libraries - Threading Issues – Process Scheduling - Basic concepts – Scheduling Criteria – Scheduling Algorithms – Multiple Processor Scheduling – Thread Scheduling – Operating System Examples – Algorithm Evaluation.
[Chapters 3.1-3.4, 3.6, 4.1-4.4, 5]

Unit III

Synchronization – The Critical Section Problem – Peterson's Solution - Synchronization Hardware – Semaphores – Classic Problems of Synchronization – Monitors - Synchronization Examples – Atomic Transactions – System Model – Deadlock Characterization – Methods for Handling Deadlocks – Deadlock Prevention – Deadlock avoidance – Deadlock detection – Recovery from Deadlock – Memory management Strategies – Swapping – Contiguous memory Allocation – Paging – Structure of the Page Table – Segmentation.
[Chapters 6, 7, 8.1-8.6]

Unit IV

Virtual Memory Management – Demand Paging – Copy-on-Write - Page Replacement – Allocation of Frames – Thrashing – Memory-mapped Files – Allocating Kernel Memory - Other Considerations – Storage Management - File Concepts – Access Methods – Directory Structure – File System Mounting – File Sharing – Protection – Implementing File Systems - File System Structure – File System Implementation – Directory Implementation – Allocation Methods – Free Space Management – Efficiency and Performance – Recovery – Log Structured File Systems – NFS
[Chapters 9.1-9.9, 10, 11.1-11.9]

Unit V

Secondary Storage Structure – Overview of Mass Storage Structure – Disk Structure – Disk Attachment - Disk Scheduling – Disk Management – Swap-Space Management – RAID Structure – Stable-Storage Implementation – Tertiary Storage Structure - I/O Systems – I/O Hardware – Application I/O interface – Kernel I/O Subsystem – Transforming I/O Requests to Hardware Operations – Streams – Performance [Chapters 12,13]

Text Book

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, *Operating System Principles*, John Wiley & Sons, Seventh Edition, 2006 ISBN 9812-53-176-9.

CA327 BUSINESS DATA NETWORKS

Credit: 4:0:0

Marks: 40+60

Unit I:

Core Network Concepts: Introduction – Applications, Client Stations, and Servers – Transmission links – Switches – Quality of Service – Geographical scope – Internets, Intranets, and Extranets. Standards: Introduction – Layered communication – The physical, data link, and internet layers – Layer cooperation at the physical, data link and internet layers – The transport and application layers – Standard architectures. (Chapter 1,2)

Unit II:

Physical layer propagation: Introduction – Signaling – UTP signal propagation – Optical fiber transmission links – Radio signal propagation – Physical layer topologies. A small Ethernet PC network: Introduction – UTP transmission links – Hubs and Switches – Network Interface cards – Server services. (Chapter 3, 4)

Unit III:

Other LAN technologies: Introduction – larger ethernet standards – Wireless LANs – ATM LANs. Telephony: Internal and External: Introduction – Internal Telephony – The technology of PSTN – Analog and digital transmission in the PSTN – Cellular telephony. (Chapter 5-6)

Unit IV:

Wide Area Networks: Introduction – Telephone model communication – Leases line networks – Public Switch Data Networks. TCP/IP Networking: Introduction – Routing decisions. Security: Introduction – Attack prevention systems. (Chapter 7-9)

Unit V:

Network management and system administration: Introduction – Cost analysis – Administrative servers – Server management – Access permissions. Network Applications: Introduction – Traditional applications architecture – Electronic mail – the World Wide Web and E-Commerce – Web Services – Peer-to-Peer applications. (Chapter 10, 11)

Text Book:

1. Raymond R Panko, *Business Data Networks and Telecommunications*, Prentice hall of India, Fourth edition, 2004. ISBN: 81-203-2171-5.

CA328 SOFTWARE ENGINEERING

Credit: 4:0:0

Marks: 40+60

Unit I

Introduction to Software Engineering-- A system Approach – An Engineering Approach – Members of the development team - Modeling the Process and Life Cycle – the meaning – Software Process Models – Tools and Techniques - Practical Process modeling – Planning and Managing the project – tracking Progress – project personnel – Effort Estimation – Risk management – the project plan – process models and project management.

Unit II

Capturing the requirements – The Requirements process – types – Characteristics – prototyping requirements – requirements documentation – participants in the process – requirements validation – measuring – choosing a requirements specification – Designing the system – decomposition and modularity – architectural styles – issues – characteristics – techniques – evaluation and validation – documenting

Unit III

Concerning Objects – What is OO – the OO development process – use cases – UML – OO system design – OO program design – OO measurement – Writing the programs – standards and procedures – guidelines – documentation – Testing the programs – Software faults and failures – Testing issues – unit testing – integration testing – testing OO systems – test planning – automated testing tools.

Unit IV

Testing the system – principles of system testing – function testing – performance testing – reliability, availability, and maintainability – acceptance testing – installation testing – automated system testing – test documentation – testing safety-critical systems – delivering the system – training – documentation – maintaining the system – the changing system – nature – problems – measuring maintenance characteristics – techniques and tools – software rejuvenation

Unit V

Evaluating products, processes, and resources – approaches to evaluation – selecting an evaluation techniques – assessment vs prediction – evaluating products – evaluating processes – evaluating resources – Improving predictions, products, processes, and resources – improving prediction – improving products – improving processes – general improvement guidelines- Wasserman's steps to maturity-Future of Software Engineering-Technology transfer-Decision making software engineering

Text Book

1. Shari Lawrence Pfleeger, *Software Engineering – Theory and Practice*, Third Edition, Pearson Education, 2001. (Chapters 1-14)

Reference Book

1. James F.Peters, Witold Pedrycz, *Software Engineering – An Engineering Approach*, John Wiley and Sons, 2000.

CA329 C PROGRAMMING LAB

Credit: 0:0:2

Marks: 50+50

12 Experiments will be notified by the HOD from time to time

CA330 ADVANCED PC SOFTWARE AND INTERNET LAB

Credit: 0:0:2

Marks: 50+50

12 Experiments will be notified by the HOD from time to time

CA331 PROGRAMMING IN C++ LAB

Credit: 0:0:2

Marks: 50+50

12 Experiments will be notified by the HOD from time to time

CA332 DATABASE SYSTEMS LAB

Credit: 0:0:2

Marks: 50+50

12 Experiments will be notified by the HOD from time to time

CA333 FRONT END LAB

Credit: 0:0:2

Marks: 50+50

12 Experiments will be notified by the HOD from time to time

CA334 DATA STRUCTURES LAB

Credit: 0:0:2

Marks: 50+50

12 Experiments will be notified by the HOD from time to time

CA335 JAVA PROGRAMMING LAB

Credit: 0:0:2

Marks: 50+50

12 Experiments will be notified by the HOD from time to time

CA336 WIRELESS NETWORKS

Credit: 4:0:0

Marks: 40+60

Unit I:

Evolution of Wireless Networks, Challenges, Wireless communications Principles and Fundamentals: The Electromagnetic Spectrum, Wireless Propagation Characteristics and Modeling, Analog and Digital Data transmission, Modulation Techniques for Wireless Systems, The Cellular Concept, Wireless Services. [Chapter 1,2]

Unit II:

First Generation (1G) – Cellular Systems, Second Generation (2G) – Cellular Systems, Third Generation (3G) – Cellular Systems, Fourth Generation (4G) – Cellular Systems. [Chapter 3,4,5,6]

Unit III:

Satellite Networks: Introduction, Satellite Systems, VSAT Systems, Examples of Satellite-based Mobile Telephony Systems, Satellite-based Internet Accesss. Fixed Wireless Access Systems: Wireless Local Loop versus Wired Access, Wireless Local Loop, Wireless Local Loop Subscriber Terminals (WLL), Wireless Local Loop Interfaces to the PSTN, IEEE 802.16 Standards.[Chapter 7,8]

Unit IV:

Wireless Local Area Networks: Introduction, Wireless Lan Topologies, Wireless LAN Requirements, The Physical Layer, The Medium Access Control (MAC) Layer, Latest Developments. Wireless ATM and Ad Hoc Routing: Introduction, Wireless ATM Architecture, HIPERLAN 2: An ATM Compatible WLAN, Routing in Wireless Ad Hoc Networks. [Chapter 9, 10]

Unit V:

Personal Area Networks: Introduction to PAN Technology and Applications, Commercial Alternatives: Bluetooth, Commercial Alternatives: HomeRF. Security Issues in Wireless Systems: The Need for Wireless Network Security, Attacks on Wireless Networks, Security Services, Wired Equivalent Privacy (WEP) Protocol, Mobile IP, Weaknesses in the WEP Scheme, Virtual Private Network (VPN) [Chapter 11,12].

Text Book:

1. P.Nicopolitidis, M.S. Obaidat, G.I Papadimitriou, A.S. Pomportsis, *Wireless Networks*, John Wiley & Sons, Ltd., 2003,ISBN 9812-53-033-9..

CA337 ELECTRONIC COMMERCE

Credit: 4:0:0

Marks: 40+60

Unit I:

What Is E- Commerce? – Advantages and Limitations of E- Commerce – The Role of Strategy in E- Commerce – Value Chains in E- Commerce – Integrating E – Commerce – Managerial Implications. The Internet and The World Wide Web: The Internet Today – In the beginning – Unique Benefits of the Internet – Searching Online – Bulletin Board Systems

(BBSs) and Pay Services – Some Web Fundamentals – The Language of the Internet – Managerial Implications. (Chapter 1-2)

Unit II:

Launching a Business on the Internet: The Life Cycle Approach – The Business Planning and Strategizing Phase – Hardware, Software, Security, and Setup Phase - The Design Phase – The Marketing Phase – The Fulfillment Phase – The Maintenance and Enhancement Phase. Internet Architecture: What Is a Network? – Information Transfer – Network Hardware – Designing a Network – Managing the Network – Management Implications. (Chapter 3-4)

Unit III:

Payment Systems: Getting the Money: From Barter to Money – Requirements for Internet-Based Payments – Electronic Payment Credit Cards, Debit Cards, Smart Cards. E-Security: Security in Cyberspace – Designing for Security – How Much Risk Can You Afford? – The Virus: Computer Enemy Number One – Security Protection and Recovery – How to Secure Your System. (Chapters 8-9)

Unit IV:

Encryption: A Matter of Trust: What Is Encryption? – The Basic Algorithm System – Authentication and Trust – Key Management – Internet Security Protocols and Standards – Other Encryption Issues. Marketing on the Internet: The Pros and Cons of Online Shopping – Internet Marketing Techniques – The E- Cycle of Internet Marketing – Marketing Your Presence – Attracting Customers to Your Site – Tracking Customers – Customer Service – Managing Implication. (Chapters 10-11)

Unit V:

Implementation and Maintenance: Implementation Strategies – Managing Implementation – Maintenance Strategies – Management Implications. Web-Based Business –to-Business E-Commerce: What Is B2B E- Commerce? – B2B Models – B2B Tools – EDI – Beyond B2B:A2Z – Management Applications. (Chapters 12-13)

Text Book:

1. Elias M. Awad, *Electronic Commerce*, Prentice-Hall of India, 2003. ISBN: 81-203-2133-2.

CA338 PROGRAMMING IN J2EE

Credit: 4:0:0

Marks: 40+60

Unit I:

Overview – Distributed multitiered applications – J2EE containers – Web services support – Packaging applications – Development roles – J2EE 1.4 platform APIs – Understanding XML – Introduction to XML – Generating XML data – Designing an XML data structure – Getting started with web applications – Web application life cycle – Web modules – Configuring web applications – Accessing database from web applications.

Unit II:

Java Servlet Technology – What is a servlet – Example servlets – Servlet lifecycle – Sharing information – Initializing a servlet – Writing service methods – Filtering request and

response – Invoking other web resources – Accessing the web context – Maintaining client state – Finalizing the servlet. What is a JSP page – Example JSP pages – Life cycle of a JSP page – Creating static content – Creating dynamic content – Expression language – Java beans components using custom tags – Reusing content in JSP – Transferring content to another web component – Including an applet – Setting properties for groups of JSP pages.

Unit III:

Java Server Pages documents – Example JSP documents – Creating a JSP document – Identifying JSP document to the container – JSP standard tag library – Using JSTL – Core tag library – XML tag library – Internationalization tag library – SQL tag library – Functions – Custom tag in JSP – What is a custom tag – Types of tags – Encapsulating reusable content using tag files – Library descriptors = Programming simple tag handlers.

Unit IV:

Scripting in JSP pages – Using scripting – Disabling scripting – Declarations – Scriptlets – Expressions – Programming the tag that accepts scripting elements – Enterprise beans – Enterprise bean – Session bean – Entity bean – Message driven bean – Defining client access with enterprises – Contents of an enterprise bean – Life cycle of enterprise bean – Getting started with enterprise beans.

Unit V:

Session bean examples – The Cart bean example – Other enterprise bean features – Using the timer service – Handling exceptions – Bean managed persistence examples – Saving account bean example – Mapping table relationships for bean managed persistence – Primary key for bean managed persistence – Container managed persistence examples – The player bean code – Primary keys for container managed persistence – Message driven bean example.

Text Book:

1. Stephanie Bodoff, Eric Armstrong, Jennifer Ball, Debbie Bode Carson, Ian Evans, Dale Green Kim, Haase Eric Jendrock, *The J2EE Tutorial*, Second Edition, Pearson Education, 2004. ISBN 81-297-0934-1

CA339 C# PROGRAMMING

Credits 4:0:0

Marks: (40 + 60)

Unit – I

The Philosophy of .NET – C# Language Fundamentals – Object Oriented Programming (Chapters 1, 3 and 4)

Unit- II

Understanding Object Life Time-Understanding Structured Exception Handling-Interfaces and Collections-Callback Interfaces Delegates, and Events-Advanced C# Type Construction Techniques-Introducing .NET Assemblies (up to Configuring Shared Assemblies) (Chapters 5, 6,7,8,9 and 11)

Unit-III

Processes, AppDomains, Contexts and CLR Hosts and Building Multithreaded Applications- Understanding Object Serialization-The .NET Remoting Layer (up to Building Your First Distributed Application) (Chapters 13, 14, 17 and 18)

Unit-IV

Building a Better Window with System.Windows.Forms-Programming with Windows Forms Controls (Chapters 19 and 21)

Unit-V

Database Access with ADO.NET (Chapter 22)

Text Book:

1. Andrew Troelsen, *Pro C# 2005 and the .NET 2.0 Platform*, Springer Private Limited, 2005.ISBN: 81-8128-376-7

CA340 SYSTEM SIMULATION

Credit: 4:0:0

Marks: 40+60

Unit I:

Introduction to simulation: Advantages and disadvantages of simulation – areas of application – Systems and system environment – Components of a system – Discrete and continuous system – Models of a system – Types of models – Discrete event system simulation – steps in simulation study. Simulation examples: Simulation of queuing systems – Simulation on inventory systems – Other examples of simulation. (Chapter 1, 2)

Unit II:

General Principles: Concepts in discrete-event simulation – List processing. Statistical models in simulation: Review of terminology and concepts – useful statistical models – Discrete distributions – Continuous distributions – Poisson process – Empirical distributions. (Chapter 3, 5)

Unit III:

Queuing models: Characteristics – Queuing notation – Long-run measures of performance of queuing systems – Steady-state behaviors of infinite-population markovian models – Steady-state behavior of finite-population models – Network of Queues (Chapter 6)

Unit IV:

Random-Number Generation: properties – Generation of Pseudo-Random numbers – Techniques for generating random numbers – Tests for random numbers. (Chapter 7)

Unit V:

Random-Variate Generation: Inverse transforms technique – Direct transformation for the normal and lognormal – Convolution method – Acceptance-Rejection technique. Input modeling: Data collection – Identifying the distribution with data – Parameter estimation – Goodness-of-fit tests – Selecting input models without data – Multivariate and time-series input models. (Chapter 8, 9)

Text Book:

1. Jerry Banks, John S Carson II, Barry L. Nelson, David M. Nicol, *Discrete-Event System Simulation*, Prentice hall of India private limited, Third edition, 2003. ISBN: 81-203-2071-9.

CA341 DATA WAREHOUSING

Credit: 4:0:0

Marks: 40+60

Unit I:

Introduction: Background – Delivery Process – System process - Process Architecture (Chapter 1-4)

Unit II:

Database Schema – Partitioning strategy – Aggregations (Chapters 5-7)

Unit III:

Data Marking - Metadata – System and data warehouse process managers. (Chapters 8-10)

Unit III:

Hardware and operational design: Hardware architecture – Physical layout – Security. (Chapters 11-13)

Unit IV:

Backup and Recovery – Service level agreement – Operating the data warehouse - Capacity planning. (Chapters 14-17)

Unit V:

Tuning the data warehouse - Testing the data warehouse. (Chapters 18-19)

Text Book:

1. Sam Anohory, Dennis Murray, *Data Warehousing in the Real World*, Addison Wesley, First Edition, 2000. ISBN: 981-235-967-2.

Reference Book:

1. W H Inmon, *Building the data warehouse*, Wiley Computer Publishing, Third edition, 2002. ISBN: 0-471-08130-2.

CA342 DATA MINING TECHNIQUES

Credit: 4:0:0

Marks: 40+60

Unit I:

Introduction – Data Mining – Functionalities – Classification of data mining systems – Major issues in data minin. Data warehouse and OLAP technology for data mining: What is a data warehouse – A Multi dimensional model – Data Warehouse Archiecture – Data Warehouse Implementation – Furure development of Data cube technlogy. (Chapter 1,2)

Unit II:

Data preprocessing: Data cleaning – Data integration and transformation – Data reduction – Discretization and concept hierarchy generation. Data Mining Primitives: What defines a data mining tasks. (Chapter 3, 4 [Section 4.18])

Unit III:

Mining Association Rules in Large Databases: Association rule mining – Mining single dimensional Boolean association rule from transactional databases Mining Multidimensional association rules from relational databases and data warehouses. (Chapter 6 [Page 225 - 250])

Unit IV:

Classification and Prediction: What is classification – Issues regarding classification – Classification by decision tree induction – Bayesian classification (Chapter 7 [Page 279 – 302])

Unit V:

Cluster Analysis: Types of data in cluster analysis – Categorization of major clustering methods – Partioning methods – Hierarchical Methods (Chapter 8 [Page 335 – 362])

Text Book:

1. Jiawei Han, Micheline Kamber, *Data Mining – Concepts and Techniques*, Morgan Kaufmann Publishers, First Edition, 2003. ISBN: 81-8147-049-4.

Reference Book:

1. Michael J A Berry, Gordon S Linoff, *Data Mining Techniques*, Wiley Publishing Inc, Second Edition, 2004. ISBN: 81-265-0517-6.

**SCHOOL OF
SCIENCE & HUMANITIES**

ADDITIONAL SUBJECTS

Subject Code	Subject Name	Credits
CA343	Programming in C	3:1:0
CA344	Programming in C++	3:1:0
CA345	Software Testing	4:0:0
CA346	Programming in J2EE	3:1:0
CA347	Programming in J2ME	3:1:0
CA348	Web Technology	3:1:0
CA349	Web Services	4:0:0
CA350	Software Project Management	4:0:0
CA351	Security in Computing	4:0:0
CA352	System Simulation	4:0:0
CA353	Mobile Communication Systems	4:0:0
CA354	Microprocessors	4:0:0
CA355	PHP Programming	3:1:0
CA356	Linux Administration	3:1:0
CA357	Database Administration	4:0:0
CA358	Programming with C#.NET	3:1:0
CA359	Programming with ASP.NET using VB	3:1:0
CA360	Programming with ASP.NET using C#	3:1:0
CA361	AJAX Programming using ASP.NET	3:1:0
CA362	Grid Computing and Applications	4:0:0
CA363	Health Care Information Systems	4:0:0
CA364	Banking Technology	4:0:0
CA365	Advanced Data Mining	4:0:0
CA366	Research Methodology	4:0:0
CA367	Computing Technologies and Chemistry	4:0:0
CA368	CASE Tools Lab	0:0:2
CA369	Linux Administration Lab	0:0:2
CA370	PHP Programming Lab	0:0:2
CA371	Software Development Lab	0:0:2
CA372	Advanced Web Programming Lab	0:0:2
CA373	Web Technology Lab	0:0:2
CA374	Software Testing Lab	0:0:2
CA375	C#.NET Programming Lab	0:0:2
CA376	ASP.NET Programming Lab	0:0:2
CA377	.NET Technologies Lab	0:0:2
CA378	J2EE Programming Lab	0:0:2
CA379	J2ME Programming Lab	0:0:2
CA380	Data Mining Lab	0:0:2
CA381	Open Source Technologies Lab	0:0:2
CA382	Database Administration Lab	0:0:2

CA343 PROGRAMMING IN C

Credit: 3:1:0

Objectives:

- i. To gain experience about structured programming
- ii. To help students to understand the implementation of C language
- iii. Elaborately discuss the various features in C

Unit I: Introduction:

Computers- Classification of Computers- System Software- Software Lifecycle – Algorithms – Flowcharts – Pseudo code – Structured programming – Compilers – Operating Systems – Running C programs – Linker – Preprocessor – Standard Input Output devices – Popular features of C - Tour of C. **Variables and Expressions:** Introduction – Character set – Identifiers and keywords – Variables – Characters and Character strings – Qualifiers – Typedef statement – Constants – Operators and Expressions – Operator Precedence and associativity. **Basic Input-Output:** Introduction – Single character Input-Output – String Input and Output – Types of characters in format strings – Scanf width specifier – Format specifiers for scanners – Input fields for scanf.

Unit II: Control Structures:

Introduction – If statement – Multiway decision – Compound statements – Loops – Break switch continue and Goto statements. **Functions:** Introductions – Function main – Functions accepting more than one parameter – User defined and Library functions – Functions parameters – Return values – Recursion – Variable length argument lists. **Scope and Extent:** Introduction – Scope – Extent

Unit III: Arrays and Strings:

Introduction – How arrays are useful – Multidimensional arrays – Strings -Arrays of strings – Functions in string.h. **Structures and Unions:** Introduction – Declaring and using structures – Structure Initialization – Operation on Structures – Array of Structures – Pointers to structures – Structures and functions – Unions – Operations on a Union – Scope of a Union. **Dynamic Memory Allocation:** Introduction – Library functions for DMA – Dynamic multi-dimensional arrays – Self referential structures.

Unit IV: Pointers:

Introduction – Definition and users of pointers – Address operator & - Pointer variables – Dereferencing pointers – Void pointers – Pointer Arithmetic – Pointers to Pointers – Pointers and arrays – Pointers and functions – Accessing arrays inside functions – Array of pointers – Pointers and Strings - Pointers to constant objects.

Unit V Files:

Introduction – File structure – File handling functions – file types – Error handling – Low level file I/O – Redirection and piping – Directory functions – Dos and Bios file disk I/O.

Text Book

K R Venugopal S R Prasad, *Mastering in C*. Tata McGraw Hill Publishing Company Limited, 2nd reprint 2007. ISBN:

CA344 PROGRAMMING IN C++

Credit: 3:1:0

Objectives:

- i. To gain experience about object oriented programming
- ii. To help students to understand the implementation of object-oriented approaches
- iii. Elaborately discuss the various features in C++
- iv. To write a simple application using Programming in C++ using object-oriented approaches

Unit I:

Object Oriented Paradigm – Moving from C to C++ - C++ At a Glance – Data Types, Operators and Expressions

Unit II:

Control Flow - Arrays and Strings – Modular Programming with Functions – Structures and Unions – Pointers and Runtime Binding.

Unit III:

Classes and Objects – Object Initialization and Cleanup – Dynamic Objects

Unit IV:

Operator Overloading - Inheritance – Virtual Functions

Unit V:

Generic Programming with Templates - Streams Computation with Console – Stream Computation with Files – Exception Handling.

Text Book:

K.R. Venugopal, Rajkumar Buyya, T.Ravishankar, *Mastering C++*, Tata McGraw Hill Publishing Company Limited, 28th reprint 2007, ISBN-13: 978-0-07-463454-7, ISBN-10: 0-07-463454-2.

References:

1. D. Ravichandran, *Programming with C++*, Tata McGraw Hill Publishing Company Limited, Second Edition, 11th reprint 2007, ISBN-13: 978-0-07-049488-6, ISBN-10: 0-07-0494488-6
2. Robert Lafore, *Object Oriented Programming in Turbo C++*, Galgotia Publications Pvt. Ltd, Reprint 2008. ISBN 81-85623-22-8
3. Herbert Schildt, *The Complete Reference in C++*, Tata McGraw Hill Publishing Company Limited, Fourth Edition, 19th reprint 2008. ISBN:978-0-07-053246-5

CA345 SOFTWARE TESTING

Credit: 4:0:0

Objectives:

- i. To discuss the need of software testing
- ii. To elaborately discuss various software testing techniques and processes
- iii. Writing test plans, test cases

Unit I:

Assessing software testing capabilities and staff competencies: Multiple roles of testing – Defect – Business perspective for testing. Building a Software Testing Strategy: Computer system strategic risks – Economics of testing – Common computer problems – Economics of SDLC testing – Testing issue – Testing policy – Structured approach – Test strategy – Testing methodology – Status of software testing. Establish a Software Testing Methodology: Defects – Cost of testing – Verification and validation – Functional and structural testing – work bench concept – eight considerations in developing testing methodologies.

Unit II:

Determining Software Testing Techniques: Testing techniques/Tool selection process – Structural system testing techniques – Functional system testing techniques – Unit Testing techniques – Functional testing and analysis – Functional testing – Test factor/test technique matrix. Eleven Steps Software Testing Process Overview: Cost of computer testing – Life cycle testing concept – Verification and validation in Software – Eleven-step software-testing process.

Unit III:

Assess Project Management Development Estimate and Status – Develop Test Plan – Requirements Phase Testing – Design Phase Testing [Overview, Objective, Concerns, Workbench, Input, Do procedure, Check Procedure, Output]

Unit IV:

Program Phase Testing – Execute Test and Record Results – Acceptance Test – Report Test Results. [Overview, Objective, Concerns, Workbench, Input, Do procedure, Check Procedure, Output]

Unit V:

Testing Software Installation – Test Software Changes – Evaluate Test Effectiveness. [Overview, Objective, Concerns, Workbench, Input, Do procedure, Check Procedure, Output]

Text Book:

William E Perry, *Effective Methods for Software Testing*, John Wiley & Sons”, Second Edition, 2005. ISBN: 9971–51–345–5.

Reference Book:

Illene Burnstien, *Practical Software Testing*, Springer International Edition, First Edition, 2004. ISBN: 81-8128-089-X.

CA346 PROGRAMMING IN J2EE**Credit: 3:1:0****Objectives:**

- i. To discuss the need of Enterprise JAVA applications
- ii. Discussion about various J2EE components such as Servlets, JDBC, JavaBeans and RMI
- iii. To develop simple applications using J2EE components

Unit I: Introducing J2EE:

J2EE Advantage – Enterprise architecture types – Architecture of J2Ee – J2EE Components – Developing J2EE applications. **J2EE Multitier Architecture:** Distributive Systems – The Tier – Multi-Tier Architecture - **J2EE Best Practices:** Enterprise application strategy – The Enterprise application – Clients- Session management – We-Tier and JavaServer Pages – Enterprise JavaBeans Tier.

Unit II: Java Servlets:

A simple Java servlet – Anatomy of java servlets – Reading data from a client – Reading HTTP request headers – Sending data to a client and writing the HTTP response header – Working with Cookies – Tracking sessions. **Java Server Pages:** JSP- JSP tags – Tomcat – Request string – User sessions – Cookies – Session object.48.

Unit III: JDBC Objects:

Overview – Database connection –Associating with the database – Statement objects – ResultSet – Transaction Processing – Metadata – Data types – Exceptions. **JDBC and Embedded SQL:** Tables - Indexing – Inserting data into tables – Selecting data from a table – Metadata – Updating tables – Deleting data from a table – Joining tables – Calculating data – Grouping and ordering data.

Unit IV: Enterprise Java Beans:

Deployment descriptions –Session Java Bean – Entity Java Bean – Message Driven Bean. **Java Mail API:** Protocols – Exceptions – Send E-mail messages – Retrieving E-mail messages – Deleting E-mail messages – Replying to and forwarding an E-mail message – Forwarding an E-mail message – receiving Attachments.

Unit V: Remote Method Invocation:

Concept- Server side – Client side. **Java Message Service:** JMS fundamentals – Components of JMS – Messages – Message Selector – Sending and Receiving message to and from a queue – Compiling and running queue programs. **Security:** Concepts – JVM security – Management – Java API security – Browser security – Web Services Security.

Text Book

James Keogh, *J2EE-The Complete Reference*, Tata McGraw Hill, Sixteenth Reprint 2006, Edition 2002, ISBN: 0-07-052912-4

Reference Books

1. Kogent Solutions Inc, *J2EE 1.4 Projects*, Dream Tech Press, 2007. ISBN: 81-7722-737-8.
2. Michael Girdley, Rob Woollen, Sandra Emerson, *J2EE Applications and BEA WebLogic Server*, Prentice Hall, 2001.

CA347 PROGRAMMING IN J2ME

Credit: 3:1:0

Objectives:

- i. To discuss the need of J2ME and its relevance
- ii. To discuss elaborately about J2ME interfaces, Data management and concepts, and Networking
- iii. To develop a simple application in a mobile environment using J2ME

Unit I:

J2ME Overview – Small Computing Technology – J2ME Architecture and Development Environment

Unit II:

J2ME User Interface – Command, Items and Event Processing – High Level Display Screens – Low Level Display: Canvas

Unit III:

J2ME Data Management – Record Management System – J2ME Database Concepts

Unit IV:

JDBC and Embedded SQL – J2ME Personal Information Manger Profile

Unit V:

J2ME Networking and Web Services – Generic Connection Framework – Web Services

Text Book:

James Koegh, *J2ME – The Complete Reference*, Tata McGraw Hill Edition, 2003. ISBN: 0-07-053415-2

Reference Book:

Kim Topley, *J2ME – In a Nutshell*, O'Reilly publications, 2002. ISBN: 81-7366-343-2

CA348 WEB TECHNOLOGY

Credit: 3:1:0

Objectives:

- i. To discuss various tools needed for professional we development
- ii. Detailed discussion about VBScript, ASP and XML
- iii. Develop an interlinked multipage application
- iv. Produce a web site which utilizes all the tools

Unit I:

VBScript Language Elements: Constants - Variables and Data Types - Mathematical

Operations - Logical Operators - Looping and Decision Structures.VBScript Functions and Objects: Data Conversion Functions - Mathematical Functions - Data Formatting Functions - Text Manipulation Functions - Date and Time Functions - Built-in Objects.

Unit II:

ASP fundamentals: Using Server – Side Includes- Learning the SSI Directives – Creating Modular ASP Code. Using the Request Object: Using Form Information - Using Query String Information – Using Server Variables. Using the Response Object: Create Output – Managing Output – Managing the Connection.

Unit III:

Using Cookies: Introduction to Cookies – Cookies and Your Browser – Creating a Cookie – Modifying and removing Cookies – Tracking Preferences with Cookies Using the Application, Session, and Server Objects: The application Object - The Session Object – The Server Object – Using the global .asa file - Active Data Objects Essentials: Microsoft’s Universal Data Access Strategy – The Connection Object – The Record set and Field Objects – The Command and Parameter Objects – Using the Errors Collection.

Unit IV:

Introducing XML: What is XML - Why are Developers Excited About XML? – The Life of an XML documents - Related technologies- XML Applications: XML Applications – XML for XML – Behind the Scene Uses of XML-Your First XML Document: Hello XML – Exploring the Simple XML Document – Assigning Meaning to XML Tags – Writing a Style Sheet for an XML Document – Attaching a Style Sheet to an XML Document - Structuring Data: Examining the Data – XML izing the Data – The advantages of the XML Format - Preparing a Style Sheet for Document Display.

Unit V:

Attributes, Empty tags & XSL: Attributes – Attributes versus Elements – Empty Elements and Empty Element Tags – XSL-DTDs and Validity: Document Type Definitions - Element Declarations – DTD Files – Document Type Declarations – Validating Against a DTD- Element Declarations - Entity Declarations: What Is an Entity – Internal General Entities – External General Entities – Internal Parameter Entities – External Parameter Entities – Building a Document from Pieces.

Text Books:

- 1.Eric A. Smith, *ASP 3 Programming Bible*, Wiley-Dreamtech India (P) Ltd, 2002. ISBN 81-265-0049-2
- 2.Elliott Rusty Harold, *XML Bible*, 2nd edition, IDG Books India (P) Ltd, 2001. ISBN 81-265-0212-6

CA349 WEB SERVICES

Credit: 4:0:0

Objectives:

- i. To gain experience about various web services
- ii. Elaborate discussion about SOAP, XML messaging and Java API

Unit I: Introduction to Web Services:

Motivation and Characteristics- uses- Basic operational model of web services-core web service standards – Other Industry Standards Supporting Web Services- Known challenges in Web Services. **Building the Web Services Architecture:** Web Services Architecture and Its core Building Blocks- Tools of trade- Web Services Communication Models

Unit II: Developing Web Services Using SOAP:

XML –Based Protocols and SOAP – Anatomy of a SOAP Message – SOAP Encoding – SOAP Message Exchange Model – SOAP communication – SOAP Messaging – SOAP Bindings for Transport Protocols – SOAP Security. **Description and Discovery of Web Services:** Web Services Description Language – Universal Description, Discovery and Integration

Unit III: Introduction to the Java Web Services Developer Pack:

Java Web Services Developer Pack. **XML Processing and Data Binding With java API:** Extensible markup Language basics – Java API for XML Processing – Java Architecture for XML Binding.

Unit IV: XML Messaging Using JAXM and SAAJ :

Role of JAXM in Web Services – JAXM API Programming model - Basic Programming Steps for Using JAXM – JAXM Deployment Model – Developing JAXM based Web Services – JAXM Inter operability – JAXM in J2EE1.4. **Building RPC web Services with JAX RPC :** The Role of JAX RPC in Web Services - JAX RPC APIs and Implementation model - JAX RPC Supported Java/XML Mappings- Developing JAX RPC Based Web Services - JAX RPC Inter operability - JAX RPC in J2EE1.4.

Unit V: Java API for XML Registries:

Introduction to JAXR – JAXR Architecture - JAXR Information Model – JAXR Registry Services API – JAXR Support in JWSDP1.0. **Web Services Security:** Challenges of Securing Web Services – XML Encryption – XML Signatures – XML Key Management Specification – Security assertions Markup Language – XML Access Control Markup Language

Text Book:

Ramesh Nagappan, Robert Skoczylas and Rima Patel Sriganesh, *Developing Java Web Services*, Wiley Publishing Inc., 2005. ISBN: 81-65-0499-4.

Reference Book:

Sandeep Chatterjee, James Webber, *Developing Enterprise Web Services*, Pearson Education, 2004

CA350 SOFTWARE PROJECT MANAGEMENT

Credit: 4:0:0

Objectives:

- i. To discuss about the professional way of managing software projects
- ii. To plan and execute software projects by means of activity planning, managing risk and allocating resources
- iii. Discussion about software project team management

Unit I:

Introduction to Software Project Management, Step Wise: an Overview of Project Planning, Project Evaluation: Introduction

Unit II:

Selection of an appropriate project approach, Software effort estimation.

Unit III:

Activity Planning, Risk Management.

Unit IV:

Resource Allocation, Monitoring and control, managing contracts.

Unit V:

Managing people and organizing teams, Small Projects

Text Book

Bob Hughes, Mike Cotterell, *Software and Project Management*, Tata McGraw-Hill Publishing Company Limited, Third Edition, 2004. ISBN: 0-07-709834-X.

Reference Book

Walker Royce, *Software Project Management*, Addison-Wesley, 1998. ISBN: 0-20-1309580.

CA351 SECURITY IN COMPUTING

Credit: 4:0:0

Objectives:

- i. To discuss about various computer security threats
- ii. Elaborate discussion about programs security, database security
- iii. Study of 'secure' behavior on the operation of computers

Unit I:

Security problems in computing: Attacks – Meaning of Computer Security – Computer Criminals – Methods of Defense. Elementary Cryptography: Terminology and background –

Substitution ciphers – Transpositions – Encryption algorithms- Data encryption standard – AES Encryption algorithm – Public key encryption – Uses of encryption.

Unit II:

Programs Security: Secure programs – Nonmalicious program errors – Viruses and other malicious code – Targeted malicious code – Controls against program threats.

Unit III:

Database Security: Introduction to databases – Security requirements – Reliability and integrity – Sensitive data – Inference – Multilevel databases – Proposals for multilevel security.

Unit IV:

Security in Networks: Network concepts – Threats in Network – Network security controls – Firewalls – Intrusion detection systems - Secure E-mail.

Unit V:

Administering Security: Security in planning – Risk analysis – Organisational security policies – Physical Security.

Text Book:

Charles P. Pfleeger, Shari Lawrence Pfleeger, *Security in Computing*, Pearson Education Asia, Third edition, 2003. ISBN: 81-297-0042-5.

CA352 SYSTEM SIMULATION

Credit: 4:0:0

Objectives:

- i. Elaborate discussion about the system simulation and various types of simulation systems
- ii. To discuss an integrated approach for information management
- iii. To study the modeling of systems that rely on human factors that possess a large proportion of uncertainty, such as social, economic or commercial systems.

Unit I:

Introduction to simulation: Advantages and disadvantages of simulation – areas of application – Systems and system environment – Components of a system – Discrete and continuous system – Models of a system – Types of models – Discrete event system simulation – steps in simulation study. Simulation examples: Simulation of queueing systems – Simulation on inventory systems – Other examples of simulation.

Unit II:

General Principles: Concepts in discrete-event simulation – List processing. Statistical models in simulation: Review of terminology and concepts – useful statistical models – Discrete distributions – Continuous distributions – Poisson process – Empirical distributions.

Unit III:

Queueing models: Characteristics – Queueing notation – Long-run measures of performance of queueing systems – Steady-state behaviors of infinite-population markovian models – Steady-state behavior of finite-population models – Network of Queues

Unit IV:

Random-Number Generation: Properties – Generation of Pseudo-Random numbers – Techniques for generating random numbers – Tests for random numbers.

Unit V:

Random-Variate Generation: Inverse transforms technique – Acceptance-Rejection technique. Input modeling: Data collection – Identifying the distribution with data – Parameter estimation – Goodness-of-fit tests – Selecting input models without data – Multivariate and time-series input models

Text Book:

Jerry Banks, John S Carson II, Barry L. Nelson, David M. Nicol, *Discrete-Event System Simulation*, Pearson Education, Fourth Edition, 2007. ISBN: 81-775-8591-6

CA353 MOBILE COMMUNICATION SYSTEMS

Credit: 4:0:0

Objectives:

- i. To discuss about the main concepts of Global System for Mobile communications (GSM: originally from Group Special Mobile)
- ii. To have a clear idea and focus on the communication networks.
- iii. Details study about radio engineering, data communications, computer networks, distributed systems, information management, and applications.

Unit I:

Introduction, Wireless Transmission : Frequencies for Radio Transmission, Signals, Antenna, Signal Propagation, Multiplexing, Modulation, Spread Spectrum, Cellular Systems

Unit II:

Medium Access Control: Motivation for Specialized MAC, SDMA, FDMA, TDMA, CDMA, Comparison of S/T/F/CDMA. Telecommunication Systems : GSM, DECT, TETRA, UMTS and IMT-2000

Unit III:

Satellite Systems: History, Applications, Basics: GEO, LEO, MEO, Routing, Localisation, Handover. Broadcast Systems: Overview, Cyclic repetition of data, Digital Audio Broadcasting, Digital Video Broadcasting

Unit IV:

Wireless LAN: Infrared VS Radio Transmission, Infrastructure and Ad-Hoc networks, IEEE 802.11, HIPERLAN, Bluetooth

Unit V:

Support for Mobility: File systems, World Wide Web, Wireless Application Protocol

Text Book:

Jochen Schiller, *Mobile Communications*, Second Edition, Pearson Education, Ltd., 2003
ISBN 81-297-0350-5.

CA354 MICROPROCESSORS**Credit: 4:0:0****Objectives:**

- i. To analyze how the microprocessor incorporates the functions of a central processing unit (CPU) on a single integrated circuit (IC).
- ii. To understand the features of the microprocessor because it is the heart of any normal computer, whether it is a desktop machine, a server or a laptop.
- iii. Writing and memory mapping of simple 8085 assembly language programs

Unit I:

Microprocessors, Microcomputers and Assembly Language, Introduction to 8085 Assembly language programming, Microprocessor Architecture and Microcomputer Systems

Unit II:

8085 Microprocessor Architecture and Memory Interfacing, Interfacing I/O Devices

Unit III:

Introduction to 8085 Instructions, Programming Techniques with Additional Instructions

Unit IV:

Counters and Time Delays, Stack and Subroutines, Interrupts

Unit V:

General-Purpose Programmable Peripheral Devices- 8255A PPI, 8254 PIT, 8259APIC, 8237 DMA Controller

Text Book:

Ramesh S Gaonkar, *Microprocessor Architecture, Programming, and Applications with the 8085*, Fifth Edition, Penram International Publishing, 1999

CA355 PHP PROGRAMMING

Credit: 3:1:0

Objectives:

- i. To learn about PHP-a server side scripting language that can be used on a host of web servers and platforms
- ii. Detailed study about the direct connectivity with the relational databases using full featured internal functions
- iii. Developing simple PHP applications using MySQL

Unit I: Why PHP and MySQL:

What is PHP? - What is MySQL - The History of PHP-The History of MySQL - Reasons to Love PHP and MySQL. **Server –Side Web Scripting:** Static HTML - Client-Side Technologies - Server-side scripting - What Is Server-side Scripting Good for - Adding PHP to HTML. **Syntax and Variables:** PHP's Syntax is C-Like - Comments-Variables - Types in PHP - The simple Types-Output. **Control and Functions:** Boolean Expressions - Branching-Looping – Using Functions -Function Documentation - Defining Your own Functions - Functions and variable Scope - Function Scope

Unit II: Passing Information between Pages:

HTTP is stateless - GET Arguments - A better Use for GET - Style URLs – POST Arguments - Formatting Form Variables - PHP Super global Arrays. **String:** Strings in PHP – String Functions. **Arrays and Array Functions:** The Uses of Arrays - Creating Arrays - Retrieving Values - Multidimensional Arrays - Inspecting Arrays-Deleting from Arrays – Iteration. **Numbers:** Numerical Types - Mathematical Operators - Simple Mathematical Functions - Randomness

Unit III: Basic PHP Gotchas:

Installation Related Problems-Rendering Problems-Failures to Load page-Parse Errors-File Permissions-Missing Includes-Unbound Variables –Overwritten Variables-Function Problems-Math Problems-Time outs. **Object Oriented Programming with PHP:** What is Object –Oriented Programming-Basic PHP Constructs for OOP-Advanced OOP Features-Introspection Functions-Gotchas and Troubleshooting-OOP style in PHP. **Advanced Array Functions:** Transformation of Arrays-Stacks and Queues-Translating between variables and Arrays-Sorting-Printing Functions for Visualizing Arrays. **String and Regular Expression Functions:** Tokenizing and parsing Functions-Why Regular Expressions-Perl-Compatible Regular Expressions-Example-Advanced String Functions.

Unit IV: File system and System Functions:

Understanding PHP File Permissions - File Reading and Writing Functions - File system and Directory Functions - Network Functions - Date and time Functions - Calendar Conversion Functions. **Sessions, Cookies, and HTTP:** What is a Session - Home Grown Alternatives - How session Work in PHP - Sample Session Code - Session Functions - Configuration Issues –Cookies - Sending HTTP Headers - Gotchas and Troubleshooting. **Types and Type Conversions:** Take Round up – Resources - Type Testing - Assignment and Coercion. **Advanced Use of Functions:** Variable Numbers of Arguments-Call- by-Value-Call-by-Reference - Variable Function Names.

Unit V: Choosing a Database for PHP:

What is a Database? Why a Database? Choosing Database - Advanced Features to Look for - PHP Supported Databases - Database Abstraction. **PHP/MYSQL Functions:** Connecting to MySQL - Making MySQL Queries - Fetching Data Sets - Getting Data about Data - Multiple Connections - Building in Error Checking – Creating MySQL Databases with PHP - MySQL Functions. **Displaying Queries in Tables:** HTML Tables and Database Tables - Complex mapping -Creating the sample Tables. **Building Forms from Queries:** TML Forms-Basic Form Submission to a Database - Self Submission - Editing Data with an HTML Form. **PHP/MySQL Efficiency:** Connections -Indexing and Table Design - Making the Database Work for You

Text Book:

Tim Converse and Joyce Park with Clark Morgan, *PHP 5 and MySQL Bible*, Wiley India Pvt.Ltd.,2008,ISBN 10:81-265-0521-4.

Reference Books:

1. W.Jason Gilmore, Beginning PHP and MySQL from Novice to Professional Second Edition, Apress, 2007, ISBN 978-81-8128-673-4.
2. Michael K.Glass,Yann Lee Scourarnec,Elizabeth Naramore,Gary Mailer,Jeremy Stolz,Jason Gerner,Programming PHP,Apache,MySQL Web Development,WILEY, First Edition,2004,ISBN-81-265-0501-X
3. Rasmus Lerdorf and Kevin Tatro, Programming in PHP, O'Reilly and Associates, 2002.
4. Robert Sheldon, Geoff Moes , My SQL, WILEY, First Edition, 2005, ISBN: 81-265-0592-3.

CA356 LINUX ADMINISTRATION

Credit: 3:1:0

Objectives:

- i. To learn about Linux - a true 32-bit operating system that runs on a variety of different platforms.
- ii. Administering a LINUX based client/server
- iii. Discussion about the TCP/IP networking and system configuration basics.

Unit I: Introduction:

Linux's relationship to Unix-Linux and Unix history-Linux distributors-Notation and typographical conventions-Where to go for information-How to find and install software-Essential tasks of the system administrator-System administration under duress. **Booting and Shutting Down:** Bootstrapping-Booting PCS-Boot loaders: LILO and GRUB-Booting single user mode-Startup scripts-Rebooting and shutting down. **Rootly Powers:** Ownership of files and processes-The super user-Choosing a root password-becoming root-other pseudo-users.

Unit II: Controlling Processes:

Components of a process-The life cycle of a process-signals-process states-Runaway processes. **The File System:** Pathnames-Mounting and unmounting file systems-the

organization of the file tree-File Types-File attributes. **Adding New Users:** The/etc/passwd file-The/etc/shadow file-The /etc/group file-Adding users-Removing users.

Unit III: Serial Devices:

Serial standards –Alternative connectors-Hard and soft carrier-Hardware flow control-Cable length-Serial device files-setserial-Software configuration for serial devices-Configuration of hardwired terminals-Special characters and the terminal driver-How to unwedge a terminal-Modems-Debugging a serial line-other common I/O ports. **Adding a Disk:** Disk interfaces-Disk geometry-An overview of the disk installation procedure-The ext2 and ext3 file systems-fsck: check and repair file systems-Adding a disk to Linux. **Periodic Processes:** cron: schedule commands-The format of crontab files-Crontab management-Some common users for cron.

Unit IV: Backups :

Motherhood and apple pie – Backup devices and media – Setting up an increment backuregime with dump – Restoring from dumps with restore – Dumping and restoring for upgrades – Using other archiving programs – Using multiple files on a single tape – Amanda - Commercial backup products. **Syslog and log files :** Logging policies – Linux log files – logrotate – Syslog – Condensing log files to useful information. **Drivers and the Kernel:** Kernel adaption – Why configure the kern4el? – Configuration methods – Tuning a Linux Kernel – Adding a device driver – Device files – Loadable kernel modules – Building a Linux Kernel

Unit V: The Network File System:

General information about NFS – Server side NFS – Client – side NFS – Automating mounting – automount – amd. **Sharing System Files** – Copying Files around NIS, NIS+, LDAP. **Network Management and Debugging** – Trouble shooting a Network – Ping, Trace Route, Net Stat, Packets Sniffers, Network Management Protocol, SNMP, The NET-SMNP, Network Management Applications. **Coperating with windows:** File and Print Sharing – Secure terminal emultion with SSH – X windows emulators – PC mail clients – PC backups – Dual booting – Running Windows application under Linux – PC hardware.

Text Book

Evi Nemeth, Garth Snyder and Trent R. Hein, Linux Administration Handbook, Prentice – Hall of India, 2002.

Reference Book

Christopher, Red Hat Linux 9 Bible, Wiley Publishing, 2003.

CA357 DATABASE ADMINISTRATION

Credit: 4:0:0

Objectives:

- i. To help the database administrator to efficiently use the Oracle database.
- ii. To learn about a database administrator (DBA) who is responsible for the environmental aspects of a database
- iii. To have a clear idea about the database parameters like database security, integrity, recoverability.

Unit I: The Oracle Architecture:

Oracle Memory Structures – Oracle Background process – Oracle Disk Utilization Structures
Getting started with oracle saner

Managing an Oracle Instance: Starting and stopping the Oracle instance – Selecting an authentication method – starting the Oracle instance and opening the database – shutting down the oracle instance - changing database availability and restricting login.

Creating a Database: Entity Relationships and Database objects – Creating a Database in Oracle – Creating the Oracle Data Dictionary.

Unit II: Managing the Physical Database Structure:

Maintaining the control file - Maintaining the Redo log file. **Accessing the Updating Data:**
Steps in SQL statement processing – The benefits of shared SQL Area – the function and contents of the Buffer cache – Role of the server process - Role of the DBWR process – Events triggering DBWR Activity.

Managing Transaction Currency: The Log Writer process – Components and purpose of checkpoints – Data Concurrency and statement – Level Read consistency.
Managing the Database structure: Database storage allocation – customizing the database structure – preparing accessory table spaces – The different type of segments
Managing storage Allocation: Allocating extents to Database objects – Database storage allocation parameters – using space utilization parameters – Displaying database storage information.

Unit III: Database Storage:

Managing Database Objects – Roll back segment concept and function – creating and sizing roll back segments – storage and performance trade – offs – Determining the number of roll back segments
Managing Table spaces and Data files – **Managing Tables and Indexes:** Sizing Tables – Sizing Indexes – Understanding storage and performance trade offs – Reviewing space usage.

Managing clusters: Identifying the advantages & Disadvantages of clusters – Creating Index cluster – Creating Hash cluster
Managing Data Integrity Constraints:- Types of Declarative integrity constraints – constraints in Action – Managing Constraint violations - Viewing information about constraints.

Unit IV: Managing Database Usage:

Managing Users: Creating New Data base users – Altering and dropping existing users – Monitoring information about existing users – termination user sessions. **Managing Resource Usage:** Understanding Oracle Resource Usage – Managing profiles created for

system – creating and assigning user profiles.
Managing Database Access and Roles: Creating and Controlling System privileges – Object privileges explained – creating and controlling roles.

Unit V: Back up and Recovery:

Overview of Backup and Recovery – Backup and Recovery Motives: Importance of Backups – Importance of Business Requirements – Disaster Recovery Issues – Management Involvement Importance of Testing backup and strategy.
Backup Methods: Logical Vs Physical Backups – Mechanics of taking a good backup – Backup strategies – Implications of Achieving – Backup and Recovery in 24 X 7 operations – Implications of Recovery Time – Implications of Backup time – Back up and recovery on Read only table spaces.
Logical Backup and Recovery: Failure scenarios – Statement failure – User process failure – Instance failure – User Error – Media Error.
Logical Backups – Using Export – Export Modes – Using Export for Backups – Using Import – Read consistency and database export – Using export direct path – using right character set – Export, Import and achieved Redo Logs.

Text Book:

Jason S. Couchman DBA *Certification Exam Guide*. Tata McGraw-Hill Publishing Company Ltd. 2001 Edition

CA358 PROGRAMMING WITH C#.NET

Credits : 3:1:0

Objective:

- i. To get a thorough understanding of Programming in C# and the .NET framework.
- ii. To work with the advanced object oriented concepts in C#.
- iii. To enable the students to develop a full-fledged application using C#.

Unit I

The Creation of C# - An Overview of C# [Excluding Handling Syntax Errors – A Small Variation – A Second Simple Program – Another Data Type – Two Control Statements – Using Blocks of Code – Semicolons, Positioning and Indentation] - Data Types, Literals and Variables – Operators - Program Control Statements.

Unit II

Introducing Classes and Objects – Arrays and Strings – A Closer Look at Methods and Classes – Operator Overloading [Excluding another Example of Operator Overloading].

Unit III

Indexers and Properties - Inheritance – Interfaces, Structures and Enumerations [Excluding the .NET standard interfaces, An Interface Case Study] – Exception Handling [Excluding The Consequences of an Uncaught Exception, Exceptions Let You Handle Errors Gracefully, Using Multiple catch Statements, A Closer Look at Exception] – Using I/O [Excluding Redirecting the Standard Streams, Reading and Writing Binary Data, Random Access Files,

Using Memory Stream, Using StringReader and StringWriter, Converting Numeric Strings to Their Internal Representation].

Unit IV

Delegates and Events – Generics – Unsafe Code, Pointers, Nullable Types and Miscellaneous Topics.

Unit V

Multithreaded Programming – Collections, Enumerators and Iterators [Excluding Storing User-defined Classes in Collections, Implementing IComparable, Using an IComparer, Accessing a Collection via an Enumerator, Implementing IEnumerable and IEnumerator, Using Iterators]- Networking through the Internet [Excluding Minicrawler, Using Web Client] – Building Components [Excluding Overriding Dispose, Employing the Using Statement, Containers, Are Components the Future of Programming] – Creating Form-Based Windows Applications [Excluding A Brief History of Windows Programming, Two ways to Write a Form-Based Windows Application, How Windows Interacts with the User, What Next].

Text Book:

Herbert Schildt, *The Complete Reference C# 2.0*, Tata McGraw-Hill Publishing Company Limited, 6th reprint 2007, ISBN-13: 978-0-07-061139-9, ISBN-10: 0-07-061139-4.

References:

1. Charles Wright, *C# Tips & Techniques*, Tata McGraw-Hill Publishing Company Limited, 2002, ISBN 0-07-049920-9
2. Andrew Troelsen, *C# and the .NET Platform*, Second Edition, Springer (India) Private Limited, 2003

CA359 PROGRAMMING WITH ASP.NET USING VB

Credit: 3:1:0

Objectives:

- i. To gain experience about developing dynamic websites with ASP.NET
- ii. To help students to understand how ASP.NET works at a higher level to deal with full featured web controls
- iii. Elaborately discuss the various features in ASP.NET using VB

Unit I: Developing ASP.NET Applications – Visual Studio:

Creating Websites- Designing a Webpage- The anatomy of a Web Form – Writing Code – Visual Studio Debugging. **Web Form Fundamentals:** The anatomy of an ASP.NET Application – Introducing Server Controls – Improving the Currency Converter – A Deeper Look at HTML Control Classes – The Page Class – Application Events – ASP.NET Configuration. **Web Controls:** Stepping Up to Web Controls – Web Control Classes – List Controls – Table Controls – Web Control Events and AutoPostBack – A Simple Webpage.

Unit II: State Management:

The problem of State – View State – Transferring Information between Pages – Cookies – Session State – Session State Configuration – Application State – An Overview of State Management Choices. **Error Handling, Logging, and Tracing:** Common Errors – Exception Handling – Handling Exceptions – Throwing Your Own Exceptions – Logging Exceptions – Error Pages – Page Tracing. **Deploying ASP.NET Applications:** ASP.Net Applications and the Web Server – Internet Information Services (IIS) – Managing Websites with IIS Manager – Deploying a Simple Site – Deploying with Visual Studio.

Unit III: Building Better WebForms - Validation:

Understanding Validation – The Validation Controls. **Rich Controls:** The Calendar – The AdRotator – Pages with Multiple Views. **User Controls and Graphics:** User Controls – Dynamic Graphics. **Styles, Themes, and Master Pages:** Styles – Themes – Master Page Basics – Advanced Master Pages.

Unit IV: Website Navigation:

Site Maps – The SiteMapPath Control – The Tree View Control – The Menu Control. **Working With Data - ADO.NET Fundamentals:** Understanding Data Management – Configuring Your Database – SQL Basics – ADO.NET Basics – Direct Data Access – Disconnected Data Access.

Unit V: Data Binding:

Introducing Data Binding – Single-Value Data Binding – Repeated-Value Data Binding – Data Source Controls. **The Data Controls :** The GridView – Formatting the GridView – Selecting a GridView Row – Editing with the GridView – Sorting and Paging the GridView – Using GridView Templates – The DetailsView and FormView.

Text Book

Matthew MacDonald, *Beginning ASP.NET 3.5 in VB 2008*. Apress, Berkeley, CA, USA, Second Edition. ISBN: 978-81-8128-868-4

CA360 PROGRAMMING WITH ASP.NET USING C#**Credit: 3:1:0****Objectives:**

- i. To gain experience about developing dynamic websites with ASP.NET
- ii. To help students to understand about State Management, Building Web forms, Website navigations, data bindings etc.
- iii. Elaborately discuss the various features in ASP.NET using C#

Unit I: Developing ASP.Net Applications – Visual Studio:

Creating Websites- Designing a Webpage- The anatomy of a Web form – Writing Code – Visual Studio Debugging. **Web Form Fundamentals:** The anatomy of an ASP.Net application – Introducing Server Controls – Improving the Currency Converter – A Deeper Look at HTML Control Classes – The Page Class – Application Events – ASP.Net

Configuration. **Web Controls:** Steeping up to Web Controls – Web Control Classes – List Controls – Table Controls – Web Control Events and AutoPostBack – A Simple Webpage.

Unit II: State Management:

The problem of State – View State – Transferring Information between Pages – Cookies – Session State – Session State Configuration – Application State – An Overview of State Management Choices. **Error Handling, Logging, and Tracing:** Common Errors – Exception Handling – Handling Exceptions – Throwing Your Own Exceptions – Logging Exceptions – Error Pages – Page Tracing. **Deploying ASP.Net Applications:** ASP.Net Applications and the Web Server – Internet Information Services (IIS) – Managing Websites with IIS Manager – Deploying a Simple Site – Deploying with Visual Studio.

Unit III: Building Better Web Forms - Validation:

Understanding Validation – The Validation Controls. **Rich Controls:** The Calendar – The AdRotator – Pages with Multiple Views. **User Controls and Graphics:** User Controls – Dynamic Graphics **Styles, Themes, and Master Pages:** Styles – Themes – Master Page Basics – Advanced Master Pages.

Unit IV: Website Navigation:

Site Maps – The SiteMapPath Control – The Tree View Control – The Menu Control. **Working With Data - ADO.NET Fundamentals:** Understanding Data Management – Configuring Your Database – SQL Basics – ADO.NET Basics – Direct Data Access – Disconnected Data Access.

Unit V Data Binding:

Introducing Data Binding – Single-Value Data Binding – Repeated-Value Data Binding – Data Source Controls. **The Data Controls :** The GridView – Formatting the GridView – Selecting a GridView Row – Editing with the GridView – Sorting and Paging the GridView – Using GridView Templates – The DetailsView and FormView.

Text Book

Matthew MacDonald, *Beginning ASP.NET 3.5 in C# 2008*. Apress, Berkeley, CA, USA, Second Edition. ISBN: 978-81-8128-902-5

CA361 AJAX PROGRAMMING USING ASP.NET

Credit: 3:1:0

Objectives:

- i. To gain experience about a strong comprehension of the new concepts and development techniques that ASP.NET AJAX brings to ASP.NET
- ii. To help students to understand the AJAX features and techniques

Unit I: ASP.NET AJAX Basics – Introducing ASP.NET AJAX:

What is Ajax?- ASP.NET AJAX architecture - ASP.NET AJAX in action. **First Steps with the Microsoft Ajax library:** A quick overview of the library – The Application model – Working with the DOM – Making development with JavaScript easier. **JavaScript for Ajax Developers:** Working with objects – Working with JSON – Classes in JavaScript –

Understanding inheritance – Understanding interfaces and enumerations – Using type reflection – Working with events.

Unit II: Exploring the Ajax server extensions:

Ajax for ASP.NET developers – Enhancing an existing ASP.NET site – ScriptManager: the brains of an Ajax page – Partial-page updates. **Making asynchronous network calls:** Working with ASP.NET Web Services – The asynchronous communication layer – Consuming external Web Services – Using ASP.NET application services. **Partial-page rendering with UpdatePanels:** With great power comes great responsibility – Getting to know the UpdatePanel – Triggers – Advanced techniques – Live GridView filter.

Unit III: ADVANCED Techniques-Under the hood of the UpdatePanel:

The PageRequestManager: The unsung hero – A client-side event viewer – UpdatePanel cookbook – Caveats and limitations. **ASP.NET AJAX client components:** The client component model – Working with client components – Behaviors – Controls.

Unit IV: Building Ajax-enabled controls:

Script descriptors – Introduction to Ajax-enabled controls – Extenders - Script controls. **Developing with the Ajax Control Toolkit:** A world of extenders – The Ajax Control Toolkit API – Animations.

Unit V ASP.NET AJAX Futures - XML Script:

XML Script basics – Actions – Bindings **Dragging and dropping:** The drag-and-drop engine – A drag-and-drop shopping cart.

Text Book

Alessandro Gallo, David Barkol, Rama Krishna Vavilala, *ASP.NET AJAX IN ACTION*. Dreamtech Press, 2008. ISBN 10: 81-7722-778-5, ISBN 13: 978-81-77-22-778-9

Reference Book:

Chrisrain Wenz, *Programming ASP.Net AJAX*, O'Reilly, First Indian Reprint, 2007. ISBN 10: 81-8404-383-X, ISBN 13: 978-81-8404-383-9.

CA362 GRID COMPUTING AND APPLICATIONS

Credit: 4:0:0

Objectives:

- i. To know about grid and the distributed computing resources available over a local or wide area network that appears to an end user or application as one large virtual computing system.
- ii. To discuss about grid computing by applying the resources of many computers in a network to a single problem at the same time.
- iii. To learn about the grid computing parameters such as load balancing, cost effectiveness, pervasive computing.

Unit I: Basic values of grid computing: Introduction

Business values – Risk Analysis – Grid market place. Grid Computing Technology – An Overview: Introduction – History – High performance computing – Cluster computing – Peer-to-Peer Computing – Internet Computing – Grid Computing Model – Grid Protocols – Globus Toolkit – Open Grid Services Architecture - Types of Grids

Unit II: Desktop Grids:

Introduction – Background – Grid value proposition – Challenges – Suitability – Grid Server – Role of Desktop grids in an enterprise computing infrastructure – Practical uses of desktop grids. **Cluster Grids:** Introduction – Clusters – Industry Examples – Cluster grids.

Unit III: HPC Grids:

Introduction – Five steps to scientific insight – Applications and Architectures – HPC application development environment – Production HPC Reinvented – HPC Grids. **Data Grids:** Introduction – Data grids – Alternatives to data grids – Avaki data grid – Data grid architecture.

Unit IV: The Open Grid Architecture:

Introduction – An analogy for OGSA – the evolution of OGSA – OGSA overview – Building on the OGSA Platform – Implementing OGSA based grids. **Creating and Managing Grid Services:** Introduction – Services and the grid – Converting existing software – Service discovery – Operational requirements – Tools and Toolkits – Support in UDDI – UDDI and OGSA.

Unit V:

Desktop Supercomputing: Native programming for grids – Grid-Enabling Software Applications – Managing Grid Environments – Grid computing adoption in Research and Industry.

Text Book:

Ahmar Abbas, *GRID Computing: A Practical guide to technology and applications*, Firewall Media, 2008. ISBN: 81-7008-626-4.

CA363 HEALTH CARE INFORMATION SYSTEMS

Credit: 4:0:0

Objectives:

- i. To discuss about the impact of Information Technology (IT) in the health care
- ii. To provide a theoretical framework and architecture with sound methodological approaches with numerous cases
- iii. Elaborate discussion about the new and emerging technologies such as mobile health, virtual reality, and the future of health care information systems.

Unit I: Introduction:

Approach – Other Sources. **Health Care Industry Standards:** History of Health Care Industry – Structural Model – Generic categories – Use of Information systems – Other industries.

Unit II: Health Care Information Systems:

History – Technology adoption (Leads and Lags) – Impacting the industry through Information Technology – Approached to IT Management – IT Management learning center – Architecture. **Business Architecture:** Aligning business with strategy – Management Discussion – Technical discussion.

Unit III: Data Architecture:

Industry Change and data – Data management – Management discussion - Technical discussion. **Technical Architecture:** Fit with the business process – Technology evolution – Business processes and standards – Levels of Standards – Potential Counter Arguments - Management Discussion – Technical discussion

Unit IV: Control Architecture:

Control Architecture and data processing Eras – Control Architecture and Seven S's – Variation in Control Architecture – Control Architecture and Organization type. **Abbreviated Methodology:** Methodology – Sample Outputs.

Unit V: Future Issues for Health Care Systems Architecture:

Health care industry trends – Technology trends – Common Threads – Impact on Hospital value chains.

Text Book:

Michael K. Bourke, *Strategy and Architecture of Health Care Information Systems*, Springer-Verlag, 2007. ISBN: 0-387-97982-24.

CA364 BANKING TECHNOLOGY**Credit: 4:0:0****Objective:**

- i. To study the technology aspects used in banking applications
- ii. Elaborate discussion about the role of wireless networks in financial services
- iii. To discuss about Internet banking, ATMS, Financial Services and VPNs

Unit I: Banking: Grab a Ringside Seat for the Best of Banking Technology – Banking Technology in Emerging Markets – Going Global – Systems Issues for Servicing a Global Business – A Brief Case History in Internet Banking – How “Internet Bill Presentment” Changes the Deployment Strategy Home banking on Online Payment.

Unit II:

The Self-Service Revolution: Harnessing the Power of Kiosks and ATMs – Checking It Twice: Check Imaging Systems Offers Greater Flexibility and Efficiency – Internet Banking: Leveling the Playing Field for Community Banks – Straight Talk on SET: Challenges and Opportunities from a Business Perspective.

Unit III: Technology Trends in Financial Services:

Distributed Integration: An Alternative to Data Warehousing – Distributed Solutions in n-Tier Design in the Financial Services Industry – Windows Distributed internet architecture for Financial Services - Customer Profiling for Financial Services – A History of Knowledge-Based Systems in Financial Services

Unit IV:

The Unfolding of Wireless Technology in the Financial Services Industry – Personal Financial Appliances – VPNs for Financial Services – Designing a High- Availability Network Infrastructure – Organizations: Key Issues and Critical Needs – Voice over ATM – Toward a More Perfect Union: The European Monetary Conversion and Its Impact on Information Technology

Unit V:

Multimedia – Based Training (MBT) for financial Services – Law (or the Lack of It) on the Web: A Primer for Financial Services Technology for Online Marketing, Sales and Support of Financial Services.

Text Book:

Jessica Keyes, *Banking Technology Handbook*, CRC Press, 1999. ISBN: 08493-9992-0.

CA365 ADVANCED DATA MINING

Credit: 4:0:0

Objectives:

- i. To give an insight about advanced data mining concepts with research perspective
- ii. Detailed discussion about computational approaches to data modeling (finding patterns), data cleaning, and data reduction of high-dimensional large databases.

Unit I: Introduction:

Data Mining – Functionalities – Classification of data mining systems – Major issues in data mining. **Mining frequent patterns, Associations, and Correlations:** basic concepts and a Road map, Efficient and Scalable Frequent Itemset Mining Methods- Mining various kinds of Association rules, From Association Mining to Correlation Analysis- Constraint-Based Association Mining.

Unit II: Classification and Prediction:

Issues regarding classification and prediction-classification by decision tree induction-Bayesian classification-Rule based classification-Other classification methods-Prediction

Unit III: Cluster Analysis

Types of data in cluster analysis-A Categorization of major clustering methods-Partitioning methods, Hierarchical methods, Density-based methods, Grid-Based methods, Outlier analysis

Unit IV: Mining Stream, time-series, and Sequence Data:

Mining Data Streams- Mining time series data- Mining Sequence Patterns in Transactional Databases- Mining sequence patterns in biological data.

Unit V: Mining Object, Spatial, Multimedia, text and web data:

Multidimensional analysis and descriptive mining of complex data objects, spatial data mining, multimedia data mining, text mining, mining the world wide web. **Applications and Trends in Data Mining:** Data mining applications, Data Mining System products and research prototypes, Additional themes on data mining- Social impacts of data mining- trends in data mining

Text Book:

Jiawei Han, Micheline Kamber, *Data Mining – Concepts and Techniques*, Morgan Kaufmann Publishers, Second Edition, 2006. Indian reprint ISBN-13:978-81-312-0535-8.

Reference Book:

1. David Hand, Heikki Mannila, Padhraic Smyth, *Principles of Data Mining*, A Bradford Book, The MIT Press, Cambridge, Massachusetts London, England, 2001. ISBN: 0-262-08290-X.
2. Michael J A Berry, Gordon S Linoff, *Data Mining Techniques*, Wiley Publishing inc, Second Edition, 2004. ISBN: 81-265-0517-6.

CA366 RESEARCH METHODOLOGY

Credit: 4:0:0

Objectives:

- i. Deals about the introduction to research, literature review
- ii. Detailed discussion about research designs and data analysis and various problem solving methods
- iii. Presents a clear way of how to write doctoral dissertations, research papers and the presentation methodology

Unit I: Introduction to Research:

Introduction- Scientific Investigation - Research Process- Broad Problem Area, Preliminary Problem Identification and analysis-design of research sources, and complete the Research Methodology.

Unit II: Literature Review:

Introduction- Aim- Content- Surveying- Synthesizing-Critical Analysis-Reading materials- Reviewing- Rethinking-Selection of Sources-Critical evaluation-interpretation-Academic language- Advantages.

Unit III: Research Design and Data Analysis:

Research design, qualitative and quantitative research, sources of data, data collection procedures, measurement strategies, content analysis, literature surveys, information databases, statistical techniques, evaluation development of a research program.

Problem Solving Methods: Methods for problem solving-Analytical methods-numerical methods-computer simulation-experimental methods- Development of a Research Question- Sharpening objectives-Identifying a problem- Critical Review of published literature- Time management and management by crisis –Budget management

Unit IV: Doctoral Research Dissertation:

Dissertation- Objective- Course Requirement - Definitions- Length- Format- abstract- Introduction-Statement of the Problem- Methods, Scope and Limitations-Literature Review - Procedures-Research Process-Theoretical Framework-Research Design-Experimental Design-Data Gathering- Data Analysis- Interpretation- Measurement Variables- numerical results –Simulations-Reliability-Validity-Results- Conclusion and summation- Acknowledgments-Bibliography-Appendices.

Unit V: Presentation and Research Paper Writing:

Technical Paper Writing - MS Office and Typing exercises- Data base- Computer graphics – charts, diagrams- Net surfing and literature search -Introduction to power point – Power point presentation- Multiple regression exercise- Analyze data-Excel worksheets-Chart preparation

Text Book:

Burns,R, *Introduction to Research Methods*, Addison Wesley Longman, Third Edition, 1997.

CA367 COMPUTING TECHNOLOGIES AND CHEMSITRY

Credit: 4:0:0

Objectives:

- i. Deals about the introduction to MS-Office package, Internet fundamentals
- ii. To discuss about programming fundamentals in C

Unit I:

Getting started - About OS - Types of OS - Introduction to MS-Office Tools and Techniques: Simple exercises using MS-Word, MS-PowerPoint, MS-Excel & MS-Access.

Unit II:

Understanding the Internet - Overview of the Internet - Connect to the net - Internet addresses - Mail. (Chapter 1-5)

Unit III:

Introduction to C Programming - Operators and Expressions – Data Input and Output – Preparing and running a complete C program. (Chapter 2-5)

Unit IV:

Control Statements: Branching – Looping – Nested Control Structures – The switch, break, continue, comma statements – The goto Statement – Functions: Defining a Function –

Accessing a Function – Function Prototypes – Passing Arguments to a Function (Chapter 6-7)

Unit V:

Web Site Analysis: Analysis and study of some important websites for applications of Chemistry.

Text Book

1. Nelson, *Office 2007-The Complete Reference*, Tata McGraw Hill Publishers, 2007. (Unit I)
2. Harley Hahn, *Teaches the Internet*, Prentice Hall of India, Eastern Economy Edition, 1999. ISBN: 81-203-1537-5. (Unit II)
3. Byron S. Gottfried, *Programming With C*, Second Edition, Tata McGraw Hill, 2006, ISBN: 0-07-059369 (Unit III, IV)

CA368 CASE TOOLS LAB

Credit: 0:0:2

10 Experiments will be notified by the HOD from time to time

CA369 LINUX ADMINISTRATION LAB

Credit: 0:0:2

10 Experiments will be notified by the HOD from time to time

CA370 PHP PROGRAMMING LAB

Credit: 0:0:2

10 Experiments will be notified by the HOD from time to time

CA371 SOFTWARE DEVELOPMENT LAB

Credit: 0:0:2

10 Experiments will be notified by the HOD from time to time

CA372 ADVANCED WEB PROGRAMMING LAB

Credit: 0:0:2

10 Experiments will be notified by the HOD from time to time

CA373 WEB TECHNOLOGY LAB

Credit: 0:0:2

10 Experiments will be notified by the HOD from time to time

CA374 SOFTWARE TESTING LAB

Credit: 0:0:2

10 Experiments will be notified by the HOD from time to time

CA375 C#.NET PROGRAMMING LAB

Credit: 0:0:2

10 Experiments will be notified by the HOD from time to time

CA376 ASP.NET PROGRAMMING LAB

Credit: 0:0:2

10 Experiments will be notified by the HOD from time to time

CA377 .NET TECHNOLOGIES LAB

Credit: 0:0:2

10 Experiments will be notified by the HOD from time to time

CA378 J2EE PROGRAMMING LAB

Credit: 0:0:2

10 Experiments will be notified by the HOD from time to time

CA379 J2ME PROGRAMMING LAB

Credit: 0:0:2

10 Experiments will be notified by the HOD from time to time

CA380 DATA MINING LAB

Credit: 0:0:2

10 Experiments will be notified by the HOD from time to time

CA381 OPEN SOURCE TECHNOLOGIES LAB

Credit: 0:0:2

10 Experiments will be notified by the HOD from time to time

CA382 DATABASE ADMINISTRATION LAB

Credit: 0:0:2

10 Experiments will be notified by the HOD from time to time

Karunya

**SCHOOL
OF
SCIENCE AND HUMANITIES**

Karunya University

ADDITIONAL SUBJECTS

Code	Subject Name	Credits
09CA201	Software Engineering	3:0:0
09CA301	Data Structures	3:1:0
09CA302	Embedded Systems	4:0:0
09CA303	Multimedia Communications	4:0:0
09CA304	Cluster Computing	4:0:0
09CA305	Wireless Security	4:0:0

09CA201 SOFTWARE ENGINEERING**Credits: 3:0:0****Objectives:**

1. To provide an introduction to software engineering concepts and practices
2. To provide an insight into how to build high quality products that perform useful functions
3. To find ways to improve the quality of products and productivity of those who build them

Unit I:

Introduction to Software Engineering-- A system Approach – An Engineering Approach – Members of the development team - Modeling the Process and Life Cycle – The meaning – Software Process Models – Tools and Techniques - Practical Process modeling – Planning and Managing the project – Tracking Progress – Project personnel – Effort Estimation – Risk management – The project plan – Process models and Project management.

Unit II:

Capturing the requirements – The Requirements process – Types – Characteristics – Prototyping requirements – Requirements documentation – participants in the process – Requirements validation – Measuring – Choosing a requirements specification – Designing the system – Decomposition and modularity – Architectural styles – Issues – Characteristics – Techniques – evaluation and validation – Documenting

Unit III:

Concerning Objects – What is OO – The OO development process – Use cases – UML – OO system design – OO program design – OO measurement – Writing the programs – Standards and procedures – Guidelines – Documentation – Testing the programs – Software faults and failures – Testing issues – Unit testing – Integration testing – Testing OO systems – Test planning – Automated testing tools .

Unit IV:

Testing the system – Principles of system testing – function testing – Performance testing – Reliability, availability, and maintainability – Acceptance testing – Installation testing – Automated system testing – Test documentation – Testing safety–Critical systems – Delivering the system – Training – Documentation – maintaining the system – The changing system – nature – Problems – Measuring maintenance characteristics – Techniques and tools – Software rejuvenation

Unit V:

Evaluating products, processes, and resources – approaches to evaluation – Selecting an evaluation techniques – Assessment vs prediction – Evaluating products – Evaluating processes – Evaluating resources – Improving predictions, products, processes, and resources – Improving prediction – Improving products – Improving processes – General improvement guidelines- Wasserman’s steps to maturity-Future of Software Engineering-Technology transfer-Decision making software engineering

Text Book

Shari Lawrence Pfleeger, *Software Engineering – Theory and Practice*, Third Edition, Pearson Education, 2001. (Chapters 1-14)

Reference Book

James F.Peters, Witold Pedrycz, *Software Engineering – An Engineering Approach*, John Wiley and Sons, 2000.

09CA301 DATA STRUCTURES

Credit: 3:1:0

Objectives:

- i. Introduce abstract concepts about various data structures
- ii. Shows how these concepts are useful in various applications

Unit I:

Introduction to data structures-Information and Meaning, Arrays, Structures; Stack-Definition and Examples, Representing Stacks, Example Infix, postfix and prefix ; Queues and lists- Queue and its Sequential Representation, Single Linked List, Doubly Linked List and Circular linked list ,List in C, Other List Structures

Unit II:

Trees-Binary Trees, Binary Tree Representations, Huffman Algorithm An Example, Representing Lists as Binary Trees, Trees and their applications

Unit III:

Sorting- General Background ,Exchange sorts , Selection and Tree Sorting, Insertion Sorts – Merge and Radix Sorts

Unit IV:

Searching-- Basic Search Techniques, – Tree Searching – General Search Trees – Hashing

Unit V:

Graphs And Their Applications- Graphs, a flow Problem, Linked representation of Graphs, Graph Traversal and spanning forest

TEXTBOOK

Aaron S Tenenbaum, Yedidyah Langsam, Moshe J Augenstein, *Data Structures using C*, Prentice Hall of India 2008, ISBN: 978-81-203-0696-7.

REFERENCEBOOKS

1. Bhagat Singh and Thomas L. Naps, *Introduction to Data Structures*, Tata McGraw-Hill 1986
2. Robert Kruse, C.L.Tondo and Bruce Leung, *Data Structures and Program Design in C*, Second Edition, Prentice-Hall India 1997

09CA302 EMBEDDED SYSTEMS

Credit: 4:0:0

Objectives:

- i. To provide a strong base in Embedded Systems, its design and framework
- ii. Writing Embedded Programs in C, C++, Java
- iii. To provide the knowledge in embedded systems programming, real time operating systems.

Unit I:

Introduction to Embedded Systems: Embedded Systems-Processor Embedded into a system, Embedded hardware units and devices in a system-Embedded software in a system- Examples of embedded system- Embedded system-on-chip (Soc) and Use of VLSI Circuit Design Technology- Complex systems design and processors- Design process in embedded system- Formalization of system design- Design process and Design Examples- Classification of Embedded Systems- Skills Required for an Embedded system Designer.

Unit II:

Programming Concepts and Embedded Programming in C, C++ and Java: Software Programming in Assembly Language and in High-Level Language 'C'-C Program Elements: Header and Source Files and PreProcessor Directives, Program Elements: Macros and Functions, Data Types, Data Structures, Modifiers, Statements, Loops and Printers, Object-Oriented Programming, Embedded Programming in C++, Embedded Programming in Java- Program Modeling Concepts: UML Modeling

Unit III:

Interprocess Communication and Synchronization of Processes, Threads and Tasks: Multiple Processes in an Application- Multiple Threads in an Application- Tasks- Task Status- Task and Data – Clear-cut Distinction between functions, ISRS and Tasks by their characteristics- Concept

of Semaphores –Shared data – Interprocess Communication – Signal Function – Semaphore Functions – Message queue Functions- Mailbox Functions- Pipe Functions- Socket Functions- RPC Functions.

Unit IV:

Real Time Operating Systems: OS Services – Process Management – Timer Functions –Event Functions – Memory Management – Device, File and IO Sub systems Management- Interrupt Routines in RTOS Environment and Handling of Interrupt Source Calls- Real time Operating systems- Basic Design using RTOS – RTOS Task Scheduling models, Interrupt Latency and Response of the Tasks as Performance Metrics- OS Security Issues.

Unit V:

Case study of a mobile phone software for key inputs-Embedded Software development Process and Tools: Introduction to Embedded software development process and tools- Host and Target Machines –Linking and Locating software- Getting embedded software into the target system- Issues in hardware-software design and co-design.

Text Book:

Raj Kamal, *Embedded Systems Architecture, Programming , Programming and Design* , Second Edition, Tata McGraw-Hill, ISBN-13:978-0-07-066764-8, First reprint 2008.

Reference Books:

1. Frank Vahid , Tony Givargis *Embedded System Design: A Unified Hardware/Software Introduction*, 2002 ,ISBN 04-7138-678-2
2. Tammy Noergaard, *Embedded System Architecture-A comprehensive guide for Engineers and Programmers*,Elsevier,2005 ISBN 81-8147-997-1

09CA303 MULTIMEDIA COMMUNICATIONS**Credit: 4:0:0****Objectives:**

- i. To discuss about various Multimedia Representations
- ii. To provide strong knowledge in various audio, video, text and image compression techniques

Unit I:

Introduction-Multimedia Information Representation- Multimedia Networks- Multimedia Applications and Networking Terminology.

Unit II:

Multimedia Information Representation- Introduction- Digitization principles- text- images-audio- video.

Unit III:

Text and Image Compression – Introduction – Compression Principles – Text Compression-Image Compression.

Unit IV:

Audio and Video Compression – Introduction – Audio Compression – Video Compression.

Unit V:

Standards for Multimedia Communications- Introduction – Reference Models – Standards relating to interpersonal Communications - Standards relating to interactive applications over the internet- standards for entertainment applications.

Text Book:

Fred Halsall, *Multimedia Communications Applications, Networks, Protocols and Standards*, Pearson Education, Fourth Indian Reprint, 2004, ISBN 81-7808-532-1.

Reference Books:

1. Ze-Nian Li, Mark S.Drew, *Fundamentals of Multimedia*, Pearson Education, 2004 ISBN: 81-7758-823-0
2. John F. Koegel Buford, *Multimedia Systems*, Pearson education, 1994 ISBN 81-7808-162-8

09CA304 CLUSTER COMPUTING

Credits: 4:0:0

Objectives:

- i. It focuses on Cluster Computing requirements, Single System image, High Performance and wide- area Computing
- ii. It covers system area networks, light-weight communication protocols
- iii. It discusses techniques and algorithms of process scheduling, migration and load balancing.

Unit-1:

Cluster Computing at a Glance: Introduction- Scalable Parallel Computer Architectures-Towards Low Cost Parallel Computing and Motivations- Windows of opportunity- A Cluster Computer and its Architecture- Clusters Classifications-Commodity Components for Clusters-Network Services/Communication SW-Cluster middleware and Single System Image (SSI) - Resource Management and Scheduling (RMS)- Programming Environments and Tools- Cluster Applications-Representative Cluster Systems- Cluster of SMPs (CLUMPS).**Cluster Setup and its Administration:**-Introduction- Setting up the Cluster Security- System Monitoring- System Tuning. **Constructing Scalable Services**-Introduction-Environment- Resource Sharing-Resource Sharing enhanced Locality- Prototype Implementation and Extension.

Unit-2:

Dependable Clustered Computing:-Introduction- Two Worlds Converge-Dependability Concepts- Cluster Architectures- Detecting and Masking Faults-Recovering from Faults- The

Practice of Dependable Clustered Computing. **Deploying a High Throughput Computing Cluster:-**Introduction- Condor Overview- Software Development- System Administration- **Performance Models and Simulation:-**Introduction- New Performance Issues- A Cost Model for Effective Parallel Computing.

Unit-3:

High Speed Networks:-Introduction- Design Issues- Fast Ethernet- High Performance Parallel Interface (HiPPI)- Asynchronous Transfer Mode (ATM)-Scalable Coherent Interface (SCI)- ServerNet- Myrinet- Memory Channel-Synfinity. **Lightweight Messaging Systems:-**Introduction- Latency/Bandwidth Evaluation of Communication Performance- Traditional Communication Mechanisms for Clusters- Lightweight Communication Mechanisms- Kernel-level Lightweight Communications- User- level Lightweight Communications- A Comparison among Message Passing Systems.

Unit-4:

Job and Resource Management Systems:-Motivation and Historical Evolution-Components and Architecture of Job and Resource Management Systems- The State- of – the-Art in RMS.- Challenges for the present and the future. **Scheduling Parallel Jobs on Clusters:-**Introduction- Background- Rigid Jobs with Process Migration- Malleable Jobs with Dynamic Parallelism- Communication – Based Co scheduling- Batch Scheduling. **Load Sharing and Fault Tolerance Manager:-**Introduction- Load Sharing in Cluster Computing- Fault Tolerance by Means of Check pointing- Integration of Load Sharing and Fault Tolerance.

Unit-5:

Parallel Program Scheduling Techniques:-Introduction- The Scheduling Problem for Network Computing Environments- Scheduling Tasks to Machines Connected via Fast Networks- Scheduling Tasks to Arbitrary Processors Networks- CASCH: A Parallelization and Scheduling Tool. **Customized Dynamic Load Balancing:-**Introduction- Dynamic Load Balancing (DLB)- DLB Modeling and Decision Process- Compiler and Runtime Systems- Experimental Results. **Mapping and Scheduling on Heterogeneous systems:-**Introduction- Mapping and Scheduling- The Issues of Task Granularity and Partitioning- Static Scheduling and Dynamic Scheduling- Load Balancing Issues.

Text Book:

Rajkumar Buyya, *High performance Cluster Computing*, Volume-1, Pearson education, Second Impression, 2008. ISBN 978-81-317-1693-9.

Reference Books:

1. Prabhu C.S.R. ,*Grid And Cluster Computing*, First Edition 2008, ISBN :978-81-203-3428-1
2. Karl Heinz Hoffmann, Arnd Meyer ,*Parallel Algorithms and cluster computing:Implementations,Algorithms and Applications*, Springer, ISBN: 978-3-540-33539-9

09CA305 WIRELESS SECURITY

Credits: 4:0:0

Objectives:

- i. To explore vast array of wireless technologies, techniques and methodologies

- ii. Provide relevant analysis and understanding of wireless security issues.

Unit I:

Wireless Information Warfare - Wireless Information Warfare (IW) – A Classification scheme based on network architecture Circuit- switched networks and packet-switched networks- Information theory- Decision theory- A model for Cost-effective risk management-performance measures and key design tradeoffs- A taxonomy of attack operations- Electromagnetic capture threads.

Unit II:

Telephone system vulnerabilities-Interception/Ease of Interception- Unintentional Interrupts-Natural hazards - International interruptions – Cell Phone vulnerabilities-Satellite Communications- History-Satellite orbits-communications - Earth sensing - Satellite spectrum issues - Computer crime - Framework for dealing with policy issues - Security of information systems - Balancing information technology, national security - Information vulnerability-Importance of information.

Unit III:

Cryptographic security - Speech cryptology – Threads - Writing systems - Two dimensional scramblers.

Unit IV:

The Wireless Local Area Network (WLAN)- Wireless transmission Media- WLAN products and standards- Securing WLANs Countermeasures-The Infamous WEP-Physical Security -Wireless Application Protocol(WAP)-Comparison of the TCP/IP,OSI and WAP Models- WAP Security Architecture- Marginal Security.

Unit V:

Wireless Transport Layer Security (WTLS)- Secure Socket Layer-Wireless Transport layer security and WAP-Bluetooth-Voice Over Internet protocol .

Text Book:

Randall K. Nichols, Panos C. Lekkas, *Wireless Security*, Tata McGraw-Hill Edition 2006, Second Reprint 2007, ISBN: 0-07-061884-4.

Reference Books:

1. Tara M. Swaminatha, Charles R. Elden , *"Wireless Security and Privacy"*, Addison Wesley,ISBN-0-201-760347.
2. John R. Vacca, *"Guide to Wireless Network Security"*, Springer Science and Business Media LLC, 2006, ISBN - 13:978-0-387-95425-7.

SCHOOL OF SCIENCE & HUMANITIES

DEPARTMENT OF COMPUTER
APPLICATIONS

REVISED AND NEW SUBJECTS

Subject Code	Subject Name	Credits
10CA301	Database Management Systems	3:0:0
10CA302	Computer Networks	4:0:0
10CA303	Design and Analysis of Algorithms	3:0:0
10CA304	Network Security	4:0:0
10CA305	Network Simulation Lab	0:0:2
10CA306	Internetworking Lab	0:0:2
10CA307	Network Security Lab	0:0:2
10CA308	Data and File Structures	4:0:0
10CA309	Object Oriented Programming in C++	3:1:0
10CA310	Operating System Concepts	4:0:0
10CA311	Software Engineering	4:0:0
10CA312	High Speed Networks and Internets	4:0:0
10CA313	Internetworking	4:0:0
10CA314	Distributed Operating system	4:0:0
10CA315	Client Server Computing	3:0:0
10CA316	Enterprise Resource Planning Fundamentals	4:0:0
10CA317	Database Design and Tuning	4:0:0
10CA318	Business Intelligence in Data Mining	4:0:0
10CA319	Text Mining	4:0:0
10CA320	Data Mining in Grid Computing	4:0:0
10CA321	Web Mining	4:0:0
10CA322	Rapidminer Lab	0:0:2
10CA323	Polyanalyst Lab	0:0:2
10CA201	Basics of Computer & Programming	3:1:0
10CA202	Fundamentals of Java	4:0:0
10CA203	System Simulation for Nanoscience	3:0:0
10CA204	Fundamentals of Java Lab	0:0:2
10CA205	Nanoscience Simulation Lab	0:0:2

10CA301 DATABASE MANAGEMENT SYSTEMS

Credit: 3:0:0

Objectives:

1. To understand the database design process.
2. To study about SQL and relational algebra.
3. To understand the internal storage structures.

Outcomes:

1. Familiarized with database design.
2. Conceptual understanding on transaction management.
3. Knowledge on internal storage structures.

Unit I

Introduction: Database-System Application, Purpose of Database System, View of Data, Database Language, Relational Database, Database Design, Database Architecture, Database Users and Administrators. Relational Model: Structure of Relational Databases, Fundamental Relational-Algebra operations, Additional Relational-Algebra operations, Extended Relational Algebra, Null value, Modification of the Database.

Unit II

SQL: Background, Data Definition, Basic Structure of SQL Queries, Set Operations, Aggregate functions, Null values, Nested sub queries, Complex Queries, Views, Modification of Database. Advanced SQL: SQL Data Types and Schema, Integrity Constraint, Authorization, Embedded SQL, Dynamic SQL.

Unit III

Database Design and E-R Model: Overview of the design process, E-R model, Constraints, E-R Diagram, E-R Design Issues, Weak Entity, Extended E-R Features, Database Design for Banking Enterprise, Reduction to Relational Schema.

Unit IV

Relational Database Design: Features of good Relational Design, Atomic Domains and normalization Application Design and Development: Triggers, Authorization in SQL. Storage and File Structure: File organization, Organization of records in files, Data Dictionary Storage.

Unit V

Transaction Management-Transactions: Concept, State, Implementation of Atomicity and Durability, Concurrent Execution-Concurrency Control: Lock-Based protocols, Dead Lock Handling.

Text Book:

1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan, *Database System Concepts*, Fifth Edition, Mc Graw-Hill International Edition, 2006, ISBN 007-124476-X.

Reference Books:

1. Ramez Elmasri, Durvasula V.L.N. Somayajulu, Shamkant B. Navathi and Shyam K.
2. Gupta, *Fundamentals of Database Systems*, Pearson Education, 2006, ISBN 81-7758-476-6.
3. Ramez Elmasri and Shamkant B. Navathe, *Fundamental Database Systems*, Third Edition, Pearson Education, 2003, ISBN 0-321-36957-2.
4. Rajesh Narang, *Database Management System*, Prentice Hall of India, 2004, ISBN-81-203-2645-8.

10CA302 COMPUTER NETWORKS

Credit 4:0:0

Objectives:

1. To understand the concepts of data communications with networking models.
2. To study the functions of different layers of the network.

Outcomes:

1. Expertise in terminology and concepts of the OSI and the TCP/IP reference model.
2. Enable to master the concepts of protocols, network interface, and Design / performance in networks.

Unit I

Data Communications: Components, Data Representation, Data Flow, Networks –The Internet-Protocols and Standards –Layered Tasks-The OSI model – Layers in the OSI Model-TCP/IP Protocol Suite- Addressing-Guided Media-Unguided Media: Wireless- Circuit Switched Networks.

Unit II

Error Detection and Correction: Introduction-Block Coding-Linear Block Codes –Cyclic Codes-Check sum-Framing-Flow and Error Control-Protocols-Noiseless Channels-Noisy Channels -Random Access-Controlled Access-Channelization-SONET/SDH Architecture-SONET Layers.

Unit III

Network Layer: Logical Addressing: IPv4 Addresses-IPV6 Addresses- Internetworking-IPv4-IPv6-Transition from IPv4 to IPv6-Address Mapping-ICMP-IGMP-Network Layer: Delivery, Forwarding, and Routing: Unicast Routing Protocols-Multicast Routing Protocols.

Unit IV

Process-to-Process Delivery: UDP, TCP, and SCTP: Process- to-Process Delivery-User Datagram Protocol-TCP-SCTP-Data Traffic-Congestion-Congestion Control-Quality of Service-Techniques to improve Qos-Integrated Services.

Unit V

Domain Name System: Namespace-Domain Name Space-Distribution of Name Space-DNS in the Internet-Resolution-DNS Messages-Types of Records-Remote Logging, Electronic Mail and File Transfer: Remote Logging, Electronic Mail, File Transfer.

Text Book:

1. Behrouz A. Forouzan, *Data communication and Networking*, Tata McGraw-Hill, Fourth Edition, 2006, ISBN NO: 0-07-063414-9.

Reference Books:

1. James F.Kurose and Keith W.Ross, *Computer Networking A Top–Down Approach Featuring the Internet*, Pearson Education, 2002, ISBN:-81-7808-247-0.
2. Andrew S.Tanenbaum, *Computer Networks*, Fourth Edition, PHI, 2003, ISBN: 0-13-066102-3.
3. William Stallings, *Data and Computer Communication*, Eight Edition, Pearson Education, 2007, ISBN: 0.13-243310.9.

10CA303 DESIGN AND ANALYSIS OF ALGORITHMS

Credit: 3:0:0

Objectives:

1. To introduce classic algorithms in network domain.
2. To analyze algorithm complexities.
3. To learn design ideas of algorithms for various problems in network domain.

Outcomes:

1. Enable to prove the correctness and analyze the running time of the algorithms for classic problems in various domains.
2. Apply the algorithms and design techniques to solve problems.
3. Enable to compute complexities of algorithms in different domains.

Unit I

Introduction – What is Algorithm - Fundamentals of Algorithmic Problem Solving - Important Problem Types - Fundamental Data Structures- Fundamentals of the Analysis of Algorithm Efficiency : Analysis Framework - Mathematical Analysis of Non recursive Algorithms - Mathematical Analysis of Recursive Algorithms -Example: Fibonacci Numbers.

Unit II

Brute Force: Selection Sort and Bubble Sort - Exhaustive Search. Divide-and-Conquer - Merge sort – Quick sort - Binary Search - Decrease-and-Conquer: Insertion Sort - Depth-First Search and Breadth-First Search - Topological Sorting.

Unit III

Transform and Conquer: Balanced Search Trees - Heaps and Heap sort. Space and Time Tradeoffs: Hashing - B-Trees - Dynamic Programming: Warshall's and Floyd's Algorithms - Optimal Binary Search Trees - The Knapsack Problem and Memory Functions.

Unit IV

Greedy Technique: Prim's Algorithm - Kruskal's Algorithm - Dijkstra's Algorithm - Huffman Trees. Iterative Improvement: The Simplex Method - The Maximum-Flow Problem.

Unit V

Limitations of Algorithm Power: Lower-Bound Arguments - Decision Trees - P , NP , and NP -complete Problems. Coping with the Limitations of Algorithm Power: Backtracking - Branch-and-Bound - Approximation Algorithms for NP -hard Problems -Algorithms for Solving Nonlinear Equations.

Text Book:

1. Anany V.Levitin , *Introduction to the Design and Analysis of Algorithms: Second Edition*, Pearson Education, 2008, ISBN:978-81-317-1837-7

Reference Books:

1. Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, *Fundamentals of Computer Algorithms*, Universities Press(India) Pvt. Ltd.,1998
2. T.H. Cormen, C.E. Leiserson, R.L. Rivest and C. Stein, *Introduction to Algorithms*, PHI Pvt. Ltd., 2001.
3. Sara Baase, Allen Van Gelder, *Computer Algorithms – Introduction to Design and Analysis*, 3rd Edition, Pearson Education, 2000.

10CA304 NETWORK SECURITY**Credit: 4:0:0****Objectives:**

1. To give a clear insight into cryptography, authentication and emerging security standards.
2. To impart knowledge on network security protocols.

Outcomes:

1. Students acquire thorough knowledge about cryptography, techniques for access control and E-mail security.
2. Enable the students to develop security algorithms in the network.

Unit I

Introduction to Cryptography: Cryptography, Breaking Encryption schemes, Type of cryptographic Functions, Secret Key cryptography, Public Key cryptography
Secret Key Cryptography: Generic Block Encryption, Data encryption Standards, Advanced encryption Standards.

Unit II

Modes of Operation: Encrypting a Large message. Hashes and Message Digest: Introduction, Encryption with Message Digest, MD2, MD4, SHA-1 and HMAC.

Unit III

Public Key Algorithms: Modular Arithmetic, RSA, Diffie-Hellman, Digital Signature Standard, Security of RSA and Diffie-Hellman.

Unit IV

Overview of Authentication System: Password-Based Authentication, Address Based Authentication, and Cryptographic Authentication Protocol, Passwords as cryptographic Keys, Eavesdropping and server database Reading, Trusted Intermediaries, Session key Establishment and Delegation.

Kerberos V4: Tickets and ticket granting Tickets, Configuration, Logging into network, Replicated KDCs, Realms, Interrealm authentications, Key version Numbers, Encryption for privacy and Integrity, Encryption for Integrity only, Network Layer Address in Tickets, Message formats.

Unit V

Electronic Mail Security: Distribution List, Store and Forward, Security Services, Establishing Keys, Privacy, Authentication of Source, Message Integrity, Non Repudiation, Proof of submission, Proof of Delivery, Message flow confidentiality, Verifying when Message was really sent.

Firewalls: Packet filters, Application Level gateway, Encrypted Tunnel, Comparisons, Why firewalls don't work, Denial of Service attacks. Intruders: Intrusion Detection, Password Management. Malicious Software: Viruses and related threats, Virus countermeasures.

Text Books:

1. Charlie Kafuman, Radia Perlman, Mike Spenciner, *Network Security Private Communication in Private world*, Second Edition, Prentice Hall India 2002, ISBN:81-203-2213-4.
2. William Stallings, *Cryptography and network security: principles and practice*, Fourth Edition, Pearson Education Inc. 2006.

Reference Books:

1. Chris Brenton, Cameron Hunt, *Mastering network security*, Second Edition, Sybex inc. publishing, 2003.
2. Eric Cole, Ronald Krutz, James W. Conley, *Network Security Bible*, Wiley India, 2000, ISBN:81-2650576-1.
3. Roberta Bragg, Mark Rhodes-Ousley, Keith Strassberg, *Network security: The complete reference*, McGraw-Hill, 2004, ISBN: 0072226978.

10CA305 NETWORK SIMULATION LAB

Credit: 0:0:2

Objectives:

1. To understand the concepts of networking through networking simulation tool.
2. To learn about the network simulation tool in detail.

10 experiments will be notified by HOD from time to time

Outcomes:

1. Enables to simulate any networking protocol using networking simulation tool.
2. Helps to acquire indepth knowledge about network simulation tool.

10CA306 INTERNETWORKING LAB

Credit: 0:0:2

Objectives:

1. To understand the concepts of internetworking through networking simulation tool.
2. To acquire adequate knowledge about various TCP/IP communication.

10 experiments will be notified by HOD from time to time

Outcomes:

1. Helps to simulate any TCP/IP communication using various techniques.
2. Gains thorough knowledge about internetworking concepts.

10CA307 NETWORK SECURITY LAB

Credit: 0:0:2

Objectives:

1. To clearly understand the security issues of computer networking.
2. To learn to simulate the network security algorithms

10 experiments will be notified by HOD from time to time

Outcomes:

1. Enable to simulate any security algorithms in the network.
2. Acquire thorough knowledge about network security concepts.

10CA308 DATA AND FILE STRUCTURES

Credit: 4:0:0

Objectives:

1. To get clear understanding about the basic data structures and their operations.
2. To understand the concepts of algorithms.

Outcomes:

1. Students will gain an understanding of the basic data structures.
2. Knowledge on basic search and sort algorithms.
3. Adequate knowledge to choose appropriate data structure and algorithm to solve a problem.

Unit I

Arrays: Concepts - representation of arrays - simple applications. Stack: Fundamentals - Operation - Application of Stack - evaluation of expression.

Queue: Fundamentals - Operation - Application of Queue - Multiple Stacks and Queues - Concepts – Operations.

Unit II

Linked Lists - Singly Linked List - Concepts - Operations - Linked Stacks and Queues - The storage pool - Application - Polynomial addition - Equivalence relation – Sparse Matrices
Doubly Linked Lists - Concepts - Operations - Applications - Dynamic Storage Management - Garbage Collection and Compaction.

Unit III

Trees - Basic Terminology - Binary Trees - Binary Tree Representation - Binary Tree Traversal - Threaded Binary Tree - Application of Trees. Graphs - Graph Representation - Traversal - Connected Components and Spanning Trees - Shortest Path - Transitive Closure.

Unit IV

Searching - Binary Search - Sequential Search - Sorting: Internal sorting - Insertion, Quick, Merge, Heap sorts - Bubble Sort - External Sorting - Sorting with Tape and Sorting with Disk. Symbol tables: - Static Tree tables – Dynamic Tree Tables- Hash Tables.

Unit V

Files - External Storage Devices - Magnetic Drum - Magnetic Disk - Mass Storage Devices - File organization - Sequential File - Concepts – Indexing Techniques – Hashed Indexes- Tree Indexing – B trees – Tree Indexing - Indexed Sequential Access Method (ISAM) - Random File Organization - Concepts - Direct Addressing - Directory Lookup - Linked Organization - Multilist Inverted Files - Cellular Partitions.

Text Book:

1. Ellis Horowitz & Sartaj Sahni, “*Fundamentals of Data Structures*”, Computer science press India, 2000 ISBN 091-489-420X

Reference Books:

1. Ellis Horowitz & Sartaj Sahni, “*Fundamentals of Computer Algorithms*” Computer Science Press,
2. Tremblay & Sorenson, “*An Introduction to Data structures with Applications*” (II Edition) Tata McGraw Hill Company, 2002.
3. Robert Sedgewick, “*Algorithms in C*”, Addison Wesley, 2001.

10CA309 OBJECT ORIENTED PROGRAMMING IN C++

Credit: 3:1:0

Objectives:

1. To get a clear understanding of object-oriented concepts.
2. To understand object oriented programming through C++.

Outcomes:

1. Gain the basic knowledge on Object Oriented concepts.
2. Ability to develop applications using Object Oriented Programming Concepts.
3. Ability to implement features of object oriented programming to solve real world problems.

Unit I

Introduction to Object Oriented Programming: Need for Object Oriented Programming - Characteristics of Object Oriented Languages – Comparison of C and C++ - Structures: Structures - Enumerations – Functions: Simple Functions – Passing Arguments to Functions – Returning Values from Functions – Reference Arguments - Overloaded Functions – Recursion – Inline Functions – Default Arguments – Scope and Storage Class – Returning by Reference – const Function Arguments.

Unit II

Objects and Classes: A Simple Class – C++ Objects as Physical Objects – C++ Objects as Data Types - Constructors – Objects as Function Arguments - Copy Constructor – Structures and Classes – Classes, Objects and Memory - Static class data – Constant Member functions and constant objects - Arrays and Strings: Array Fundamentals – Arrays as Class Member Data – Array of Objects – C-Strings – The Standard C++ String Class.

Unit III

Operator Overloading: Overloading Unary Operators – Overloading Binary Operators - Data Conversion – explicit and mutable keywords – Inheritance: Derived Class and Base Class – Derived Class Constructors – Overriding Member Functions – Which Function is Used – Class Hierarchies – Public and Private Inheritance – Levels of Inheritance- Multiple Inheritance – Ambiguity – Containership: Classes within classes.

Unit IV

Pointers: Address and Pointers – The Address of Operator - Pointers and Arrays – Pointers and Functions – Pointers and C-type Strings – Memory Management – Pointers to Objects – Pointers to Pointers - Virtual Functions: Virtual Functions - Friend Functions – Static Functions – Assignment and Copy Initialization – The this pointer – Dynamic Type Information.

Unit V

Streams and Files: Stream Classes – Stream Errors – Disk File I/O with Streams – File Pointers – Error Handling in File I/O – File I/O with Member Functions – Overloading Extraction and Insertion Operators - Templates and Exceptions: Function Templates – Class Templates – Exceptions.

Text Book:

1. Robert Lafore, *Object Oriented Programming In C++*, Fourth Edition, Tech Media, 2002. ISBN 0-672-32308-7

Reference Books:

1. Stanley B. Lippman, Josee Lajoie, *C++ Prime*, Third Edition, Pearson Education. ISBN 81-7808-048-6
2. Bjarne Stroustrup, *Programming: Principles and Practice Using C+*, Addison Wesley, Pearson Education.
3. K.R. Venugopal, Rajkumar Buyya, T.Ravishankar, *Mastering C++*, Tata McGraw Hill Publishing Company Limited 1999,ISBN-13: 978-0-07-463454-7, ISBN-10: 0-07-4634542.
4. Herbert Schildt, *C++ The Complete Reference*, Fourth Edition, Tata McGraw – Hill, 2003 ISBN 0-07-053246-X.

10CA310 OPERATING SYSTEM CONCEPTS

Credit: 4: 0: 0

Objectives:

1. To introduce concepts of Operating Systems.
2. To describe process concept and its scheduling algorithms.
3. To describe about file system, mass storage and I/O in a modern computer system.

Outcomes:

1. Familiarize with the concepts of the operating systems.
2. Gain knowledge about the fundamental concepts and algorithms used in exiting commercial operating systems.
3. Knowledge on various process scheduling algorithms and IPC.

Unit I

Introduction: What Operating Systems Do – Computer System Organization – Computer System Architecture – Operating System Structure – Operating System Operations – Process Management Memory Management – Storage Management – Protection and Security – Distributed Systems – Special Purpose Systems - Computing Environments – Open-Source Operating Systems – Operating System Services: User Operating System Interface – System Calls – Types of System Calls – System Programs – Operating System Design and Implementation – Operating System Structure – Virtual Machines – Operating System Generation – System Boot.

Unit II

Processes: Process Concept – Process Scheduling – Operation on Processes – Interprocess Communication –Communication in Client Server Systems – Multithreaded Programming:Multithreading models – Thread Libraries - Threading Issues – CPU Scheduling - Basic concepts – Scheduling Criteria – Scheduling Algorithms – Thread Scheduling - Multiple Processor Scheduling – Algorithm Evaluation.

Unit III

Process Synchronization : The Critical Section Problem – Peterson’s Solution - SynchronizationHardware – Semaphores – Classic Problems of Synchronization – Monitors - Atomic Transactions – Deadlocks: System Model – Deadlock Characterization – Methods for Handling Deadlocks – Deadlock Prevention – Deadlock avoidance – Deadlock detection – Recovery from Deadlock – Memory management: Main Memory: Swapping – Contiguous memory Allocation – Paging – Structure of the Page Table – Segmentation.

Unit IV

Virtual Memory: Demand Paging – Copy-on-Write - Page Replacement – Allocation of Frames – Thrashing – Memory-mapped Files – Allocating Kernel Memory - File System Implementation : File System Structure – File System Implementation – Directory Implementation –Allocation Methods – Free Space Management – Efficiency and Performance – Recovery – NFS.

Unit V

Mass Storage Structure – Overview of Mass Storage Structure – Disk Structure – Disk Attachment - Disk Scheduling – Disk Management – Swap-Space Management – RAID

Structure – Stable-Storage Implementation – I/O Systems: Overview – I/O Hardware – Application I/O interface – Kernel I/O Subsystem – Transforming I/O Requests to Hardware Operations – Introduction - History - The Shell - The File System - Process Management - Memory Management – The Input/Output System – The SunOS Operating System- Distributed UNIX Systems- UNIX Systems –Standardization and Open Systems – The Future of UNIX Systems.

Text Books:

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, *Operating System Principles*, John Wiley & Sons, Eighth Edition, 2009 ISBN 978-0-470-12872-5.
2. H.M. Deitel, *Operating Systems*, Pearson Education Inc, Second Edition, 2002, ISBN: 81-7808-035-4.

Reference Books:

1. James L.Paterson, Abraham Silberschatz, *Operating systems concepts*, Addison wesley Publishing Co., Second Eciition, 1985.
2. Andrew S. Tanenbaum, Albert S. Woodhull *Operating Systems: Design and Implementation*, Third Edition, Pearson Education.
3. Milen Milan Kovic, *Operating Systems Concepts and Design*, Mc Graw Hill ISE, 1987.

10CA311 SOFTWARE ENGINEERING

Credit: 4:0:0

Objectives:

1. To understand the concepts of software products and software processes.
2. To know the importance of software engineering and professional responsibilities.
3. To understand the process involved to develop quality product and increase the productivity.

Outcomes:

1. Enable to define project management plan, tabulate testing plans and reproduce effective procedures.
2. Enable to design computer-human interfaces and manage time and physical resources.

Unit I

Introduction: A Generic View of Process – Process Models-The Waterfall Model-Incremental Model-Evolutionary Model-Specialized Model-The Unified Process–Agile Process – Agile Models – Software Cost Estimation – Planning – Risk Analysis and management – Software Project Scheduling.

Unit II

Requirement Analysis: System Engineering Hierarchy – System Modeling – Requirements Engineering: Tasks- Initiating the Requirement Engineering Process-Eliciting Requirements-enveloping Use Cases- Negotiating Requirements-Validating Requirements – Building the Analysis Models: Concepts.

Unit III

Software Design :Design Concepts – Design Models – Pattern Based Design – Creating an Architectural Design – Software Architecture – Data Design – Architectural Styles and Patterns – Architectural Design – Assessing Alternative Architectural Designs – Mapping Data flow into a Software Architecture – Modeling Component Level Design – Component – Class Based And Conventional Components Design – User Interface – Analysis and Design.

Unit IV

Software Testing: Software Testing – Strategies: Conventional - Object Oriented – Validation Testing: Validation Test Criteria – Alpha & Beta Testing- System Testing: Recovery Testing – Security Testing – Stress Testing – Performance Testing - Testing Tactics: Software Testing Fundamentals – Black Box Testing – White Box Testing – Basis Path Testing - Control Structure Testing.

Unit V

Software Configuration Management(SCM) & Quality Assurance: Software Configuration Management – SCM Features – SCM Process – Software Quality Concepts – Quality Assurance – Software Review – Technical Reviews – Formal Approach To Software Quality Assurance – Reliability – Quality Standards – Software Quality Assurance Plan.

Text Book:

1. Roger S. Pressman, *Software Engineering: A Practitioner's Approach*, Sixth Edition, McGraw- Hill, 2005. ISBN: 007-124083-7.

Reference Books:

1. Sommerville, *Software Engineering*, Eighth Edition: Addison Wesley, 2007. ISBN: 032- 131379-8.
2. James F Peters, Witold Pedrycz, *Software Engineering-An Engineering Approach*, John Witold Pedrycz, 2004. ISBN: 997-1513099.
3. P. Fleeger, *Software Engineering*, Third Edition, Prentice Hall, 1999. ISBN: 013-146913-4

10CA312 HIGH SPEED NETWORKS AND INTERNETS

Credit: 4:0:0

Objectives:

1. To provide an overview about ATM and frame relay.
2. To acquire knowledge about the techniques that support real-time traffic and congestion control.

Outcomes:

1. Familiarized with high speed networking technologies.
2. Enabled to optimize and troubleshoot high-speed network.
3. Demonstrate the knowledge of network planning and optimization.

Unit I

High Speed Networks: Frame Relay: Packet-Switching Networks, Frame relay Networks Asynchronous Transfer Mode: ATM Protocol Architecture, ATM Logical Connections, ATM cells, ATM Service Categories, ATM Adaptation Layer. High-Speed LANs: Ethernet, Fibre Channel, Wireless LAN.

Unit II

Congestion Control in Data Networks and Internets: Effects of Congestion, Congestion Control , Traffic Management ,Congestion Control in Packet Switching Networks, Frame Relay Congestion Control. Link-Level Flow and Error Control: The Need for Flow and Error Control-Link Control Mechanisms- ARQ Performance.

Unit III

TCP Traffic Control: TCP Flow control, TCP Congestion Control, Performance of TCP over ATM. Traffic and Congestion Control in ATM Networks: Requirements for ATM traffic and Congestion control, ATM Traffic Related attributes, Traffic Management Frame work, Traffic Control, ABR traffic Management, GFR traffic management.

Unit IV

Internet Routing: Interior Routing Protocols-Internet Routing Principles, Distance-Vector Protocol: RIP, Link-State Protocol: OSPF. Exterior routing Protocols and Multicast: Path-Vector Protocols: BGP and IDRP, Multicasting.

Unit V

Integrated and Differential Services: Integrated Services Architecture, Queuing Discipline, Random Early Detection, Differentiated Services. Protocols for Qos Support: Resource Reservation: RSVP, Goals & Characteristics, Multiprotocol Label Switching – Operations, Label Stacking, Real-Time Transport Protocol (RTP).

Text Book:

1. William Stallings, *High-Speed Networks And Internets* , Pearson Education, Second Edition, 2002. ISBN: 81-7808-578-X

Reference Books:

1. Warland & Pravin Varaiya, *High Performance Communication Networks*, Jean Harcourt Asia Pvt. Ltd., II Edition, 2001.
2. William Stallings, *Data and Computer Communications*, Prentice-Hall, Fifth edition, 1991.
3. Douglas E Comer, *Computer Networks and Internets*, Prentice Hall, 2nd edition, 1999.

10CA313 INTERNETWORKING

Credit 4:0:0

Objectives:

1. To focus on the concept of internetworking and TCP/IP internet technology.

2. To review the architecture of network interconnections and principles of protocols.
3. To study the limitations of the internet approach.

Outcomes:

1. Able to explain common networking concepts and terminology.
2. Enabled to describe the operation of the major transport layer protocols.
3. Posses Knowledge to describe architecture of the internet.

Unit I

Introduction and overview-Review of underlying network technology-Internetworking concept and Architectural model-Classful Internet addresses- Mapping Internet Addresses to physical addresses.

Unit II

Internet protocol: connectionless datagram delivery-Internet protocol: forwarding IP datagrams-Internet protocol: Error and control messages-Classless and Subnet Address Extensions

Unit III

Protocol Layering-User Datagram Protocol-Reliable Stream Transport Service-Routing Architecture: Cores, Peers and Algorithms.

Unit IV

Internet Multicasting-IP Switching and MPLS-Mobile IP-Private Network Interconnection-Bootstrap and Auto Configuration.

Unit V

The Domain Name System-Remote Login and Desktop-File Transfer and Access-Electronic mail-World Wide Web- Voice and Video over IP.

Text Book:

1. Douglas E. Comer, *Internetworking with TCP/IP – Principles, Protocols and Architecture*, Pearson Education, Fifth Edition, 2006, ISBN: 81-203-2998-8.

Reference Books:

1. W. Richard Stevens, *TCP/IP Illustrated Volume – I, The Protocols*, Pearson Education, 2000, ISBN: 81-7808-101-6.
2. Charles M. Kozierok, *The TCP/IP guide: a comprehensive, illustrated Internet protocols reference*, No starch Press Inc.2005,ISBN:1-59327-047-x.
3. Behrouz A. Forouzan, *TCP/IP protocol suite*, Third Edition, McGraw Hill, 2005, ISBN: 0071115838

10CA314 DISTRIBUTED OPERATING SYSTEM

Credit 4:0:0

Objectives:

1. To provide fundamental concepts and design principles of distributed operating

- systems.
2. To provide an overview of various communication techniques that facilitate to exchange information among distributed computing systems.

Outcomes:

1. Able to describe various communication techniques used for exchange of information.
2. Enables student to recognize CPU Scheduling, synchronization, and deadlock.
3. Able to describe OS support for processes and threads.
4. Enable to describe algorithms for handling synchronization, deadlock, and election related to distributed systems.
5. Able to identify security and protection issues in distributed systems.

Unit I

Fundamentals- Distributed Computing system, Evolution, Distributed Communicating System Models, Popularity, Distributed Operating System, Issues in designing Distributed Operating System, Distributed computing Environment. Computer Networks –Network types, LAN Technologies, WAN Technologies, Communication Protocols, Internetworking, ATM Technology.

Unit II

Message Passing-Features of Good message passing System, Issues in IPC by message passing, Synchronization, Buffering, Multidatagram Messages, Encoding and decoding of message data, Process addressing, Failure Handling, Group Communication, Case study. Remote procedure Calls- RPC Model, Transparency of RPC, Implementing RPC mechanism, Stub Generation ,RPC Messages, Marshaling Arguments and Results, Server Management, Parameter Passing Semantics, Call Semantics, Communication protocols for RPCs, Complicated RPCs, Client Server Binding, Exception Handling, Security, Special Types of RPCs, RPC in Heterogeneous Environments, Lightweight RPC.

Unit III

Distributed Shared Memory-Architecture, Design and Implementation Issues, Granularity, Structure of Shared Memory Space, Consistency Model, Replacement Strategy, Thrashing, Other Approaches, Heterogeneous DSM, Advantages of DSM. Synchronization- Clock Synchronization, Event ordering, Mutual Exclusion, Deadlock, Election Algorithms.

Unit IV

Resource Management- Features of global scheduling algorithm, Task Assignment Approach, Load Balancing Approach, Load Sharing Approach. Process Management-Process Migration,Threads.

Unit V

Distributed File Systems- Features, File Models, File Accessing Models, File Sharing Semantics, File Caching Schemes, File Replication, Fault Tolerance, Atomic Transactions, Design Principles. Naming- Features, Terminologies and concepts, System Oriented Names,

Object locating mechanisms, Human Oriented Names, Name Caches, Naming and Security.

Text Book:

1. Pradeep K Sinha, *Distributed Operating Systems: Concepts and Design*, Prentice Hall of India, 2007, ISBN: 978-81-203-1380-4.

Reference Books:

1. Andrew S. Tanenbaum, *Distributed Operating System*, Prentice Hall, 1995, ISBN: 0132199084.
2. George Coulouris, Jean Dollimore, Tim Kindberg, *Distributed Systems: Concepts and Design*, Pearson Education Ltd., 2001, ISBN: 81-7808-462-7.
3. Yakup Paker, Jean-Pierre Banatre, Müslim Bozyigit, *Distributed operating systems: theory and practice*, Springer-Verlag, 1987, ISBN: 3540176993.

10CA315 CLIENT SERVER COMPUTING

Credit: 3:0:0

Objectives:

1. To understand the components of client/server applications and systems development.
2. To acquire adequate knowledge in client/server Technologies.
3. To understand CORBA, System Oriented Technologies.

Outcomes:

1. Understanding on client-server components & architecture
2. Knowledge on client server systems development.
3. Master the core of OMG CORBA and know the CORBA services.

Unit I

Introduction: Driving forces and Major issues – Single System Image – Client/server Computing – Advantages of Client/Server Computing - Technology Revolution – Connectivity – User Productivity – Ways to improve performance –Reducing Network Traffic – Vendor Independence – Faster Delivery of systems.

Unit II

Components of Client/ Server applications – The Client – Request for service –The Server – Server Functionality – The Network Operating System – Available platforms –Server Operating System – System Application Architecture (SAA).

Unit III

Components of Client/ Server applications - Connectivity – Open System Interconnect – Communication Interface Technology – Interprocess Communication – Wide Area Network Technologies – Network Management – Client/Server Systems Development – Software - Factors Driving Demand for Application Development.

Unit IV

Client /Server Systems Development – Hardware – Hardware Components – Service and Support -

Client/Server Systems Development – Training – Training Advantages of GUI Applications – Systems Administrator Training – Database Administrator Training – End-user Training – Training Delivery Technology – The future of Client/Server Technology.

Unit V

An Introduction to CORBA: CORBA overview – CORBA concepts. CORBA Interface Definition Language: An Overview of CORBAidl. The CORBA2 Standard: An overview of CORBA2- Standard Object Model – The CORBA Architecture – CORBA clients and Object Implementation. CORBA Services: Views of OMA – ORBOS Architecture.

Text Books:

1. Patrick Smith, Steve Guengerich, *Client / Server Computing*, II nd Edition, Prentice Hall of India Private Ltd., 2002. ISBN 81-203-0937-5.
2. Thomas J. Mowbray,William A.Ruh. *Inside CORBA – Distributed Object Standards and Applications*, Addison Wesley Longman, Inc. 2000. ISBN: 81-7808-051-6.

Reference Books:

1. Robert Orfali,Dan Harkey ,Jeri Edwards, *The Essential Client/Server Survival Guide*, Galgotia Publication pvt. Ltd., 2004. ISBN 81-7515-129-3
2. M.Tamer, Patrick Valduriez, S.Sridhar, *Principles of Distributed Database Systems*, Pearson Education, Inc., 2006.ISBN 81-7758-177-5.
3. Pradeep K Sinha, *Distributed Operating Systems: Concepts and Design*, Prentice Hall of India, 2007, ISBN:978-81-203-1380-4.

10CA316 ENTERPRISE RESOURCE PLANNING FUNDAMENTALS

Credit: 4:0:0

Objectives:

1. To understand the basics of Enterprise-wide Information Systems.
2. To understand the importance of Information Technology's support for business processes.
3. To learn the methods to implement and maintain ERP packages.
4. To learn about the common modules of ERP.
5. To learn about the technology and managerial aspects involved in ERP implementation and maintenance.

Unit I

Overview – Benefits of ERP – ERP and Related Technologies – Business Process Reengineering – Data Warehousing – Data Mining – On–line Analytical Processing – Supply Chain Management-Advanced Technology and ERP Security.

Unit II

ERP Implementation Lifecycle : Pre-evaluation screening, package valuation, project planning phase, Gap Analysis, Reengineering, Configuration, Team training, Testing, Going live, End-user Training, Post Implementations, Role of Vendors, consultants and user's, Cost of ERP Implementation.

Unit III

Business Modules in an ERP Package – Finance – Manufacturing – Human Resource – Plant Maintenance – Materials Management – Quality Management – Sales and Distribution.

Unit IV

Turbo Charge the ERP System – EIA – ERP and E-Commerce – ERP and Internet – Future Directions in ERP.

Unit V

ERP Market Place – SAP – PeopleSoft – Baan Company – JD Edwards World Solutions Company – Oracle Corporation – QAD – System Software Associates - Case studies on popular ERP packages viz. SAP, Baan, Ramco Marshal, Movex & Microsoft Dynamics.

Outcomes:

1. Students will be able to understand the basics of ERP package.
2. Will be able to understand the technical and managerial issues involved in ERP Planning, Development, Implementation and Maintenance.

Text Book:

1. Alexis Leon, *ERP Demystified*, Tata McGraw Hill, 2008, ISBN (10): 0-07-065664-9 ISBN (13): 978-0-07-065664-2.

Reference Books:

1. Vinod Kumar Garg and N.K .Venkata Krishnan, Enterprise Resource Planning – concepts and Planning, Prentice Hall, 1998.
2. Jose Antonio Fernandez, The SAP R /3 Hand book, Tata McGraw Hill, 1998.
3. Fu, SAP BW: A Step by Step Guide, First Edition, Pearson Education, 2003.

10CA317 DATABASE DESIGN AND TUNING

Credit: 4:0:0

Objective:

To introduce the concepts of database design and tuning

Outcome:

Students are enabled to demonstrate the concepts of database design and tuning

Unit I

Basic principles: The Power of Principles, Five Basic Principles, Principles and Knowledge, Tuning the guts: Goal of Chapter, Locking and Concurrency Control, Logging and the Recovery Subsystem, Operating System Considerations, Hardware Tuning.

Unit II

Index tuning: Goal of Chapter, Types of Queries, Key Types, Data Structures, Sparse Versus Dense Indexes, To Cluster or Not to Cluster, joins, Foreign Key Constrains, and Indexes, Avoid Indexes on Small Tables.

Unit III

Tuning relational systems: Goal of Chapter, Table Schema and Normalization, Clustering Two Tables, Aggregate Maintenance, Record Layout, Query Tuning, Triggers.

Unit IV

Communication with the outside: Talking to the world, client-Server mechanisms, Objects, Applications tools and performance, Tuning the application interface, Bulk loading Data, Accessing Multiple Database.

Unit V

Tuning E-Commerce Applications: Goal, E-Commerce Architecture, tuning the E-commerce Architecture, Case study for shop comparison portal, capacity planning in nutshell.

Text Book:

1. Dennis Shasha & Philippe Bonnet, *Database Tuning: Principles, Experiments, and Troubleshooting Techniques*, Elsevier Publications-2003, ISBN 81-8147-324-8.

Reference Books:

1. Toby Teorey, Sam Lightstone, Tom Nadeau, *Database Modeling and Design*, Elsevier Publication -2006, ISBN 978-0-12-685352-0.
2. Sitansu S. Mitra, *Database performance Tuning and Optimization*, Springer Publication 2003, ISBN 0-387-95393-0.

10CA318 BUSINESS INTELLIGENCE IN DATA MINING

Credit 4:0:0

Objectives:

1. To know the components of the decision making process.
2. To understand the mathematical models and methods needed for incorporating business intelligence.
3. To have real-time experience on business intelligence applications using case studies.

Outcomes:

1. Students will be able to execute the mathematical models and methods needed for

- incorporating business intelligence
2. To evaluate various classification models and their existing problems.
 3. Enable to have real time experience on business intelligence applications.

Unit I

Business Intelligence: Effective and timely decisions – Data, information and knowledge – The role of mathematical models – Business intelligence architectures – Ethics and business intelligence. Decision support systems: Definition of a system – Representation of the decision-making process – Evolution of information systems – Definition of decision support system – Development of a decision support system.

Unit II

Data Warehousing: Definition of data warehouse – Data warehouse architecture – Cubes and multidimensional analysis. Mathematical models for decision making: Structure of mathematical models – Development of a model – Classes of models. Data Mining: Definition of data mining – Representation of input data – Data mining process.

Unit III

Data Preparation - Data validation – Data transformation – Data reduction - Data Exploration – Regression.

Unit IV

Classification: Classification problems – Evaluation of classification models – Classification trees – Bayesian methods – Neural networks. Association Rules: Motivation and structure of association rules – Single-dimension association rules – Apriori algorithm – General association rules. Clustering: Clustering methods – Partition methods – Hierarchical methods – Evaluation of clustering models.

Unit V

Marketing Models: Relational marketing – Salesforce management. Logistic and Production models: Supply chain optimization – Optimization models for logistics planning – Revenue management systems. Data Envelopment analysis: Efficiency measures – Efficient frontier – The CCR model – Identification of good operating practices.

Text Book:

1. Carlo Vercellis, *Business Intelligence: Data Mining and Optimization for Decision Making*, John Wiley & Sons Ltd, 2009.

Reference Books:

1. Colleen McCue, *Data Mining and Predictive Analysis*, Elsevier, 2007.
2. Efraim turban, Ramesh Sharada, and Dursun Delen, *Decision Support and Business Intelligence Systems*, 9th Edition, 2010.

10CA319 TEXT MINING

Credit 4:0:0

Objectives:

1. To solve the crisis of information overload by combining techniques from data mining, machine learning, information retrieval, and knowledge management.
2. To provide an in-depth knowledge of core text mining concepts.
3. To learn advanced pre-processing techniques, knowledge representation considerations, and visualization approaches.
4. To explore the real-world applications of text mining.

Outcomes:

1. Will gain the basic knowledge of Pre-processing techniques, information extraction and analysis techniques.
2. Ability to understand the problems associated with managing unstructured text
3. Know the importance of text mining in real world applications
4. Ability to mine the information available on the Web using text mining software

Unit I

Introduction to Text Mining - Defining Text Mining - General Architecture of Text Mining Systems - Core Text Mining Operations - Core Text Mining Operations - Using Background Knowledge for Text Mining - Text Mining Query Languages - Text Mining Preprocessing Techniques - Task-Oriented Approaches.

Unit II

Categorization - Applications of Text Categorization - Definition of the Problem - Document Representation - Knowledge Engineering Approach to TC - Clustering - Clustering Tasks in Text Analysis - The General Clustering Problem - Clustering Algorithms - Clustering of Textual Data - Information Extraction - Historical Evolution of IE: The Message Understanding Conferences and Tipster - Architecture of IE Systems - Anaphora Resolution - Inductive Algorithms for IE.

Unit III

Probabilistic Models for Information Extraction - Hidden Markov Models - Stochastic Context-Free Grammars - Maximal Entropy Modeling - Maximal Entropy Markov Models Preprocessing Applications Using Probabilistic and Hybrid Approaches - Applications of HMM to Textual Analysis - Using MEMM for Information Extraction - Applications of CRFs to Textual Analysis - Presentation-Layer Considerations for Browsing and Query Refinement – Browsing - Accessing Constraints and Simple Specification Filters at the Presentation Layer - Accessing the Underlying Query Language.

Unit IV

Visualization Approaches - Architectural Considerations - Common Visualization Approaches for Text Mining - Visualization Techniques in Link Analysis - Text Mining Applications - Corporate Finance: Mining Industry Literature for Business Intelligence - A “Horizontal” Text Mining Application: Patent Analysis Solution Leveraging a Commercial Text Analytics Platform.

Unit V

Starting RapidMiner – Database Access – Feature Selection – Splitting up processes – Parameter and Performance Analysis – Operator Reference – Basic Operators – Core Operators – Input / Output Operators - Integrating Rapid Miner into your Application.

Text Books:

1. Ronen Feldman, James Sanger., *The Text Mining Handbook: Advanced Approaches in Analyzing Unstructured Data*, Cambridge; New York: Cambridge University Press, 2007.
2. The RapidMiner 4.5, User Guide, Operator Reference, Developer Tutorial

Reference Books:

1. Weiss, S. M.; Indurkha, N.; Zhang, T.; Damerou, F. *Text Mining: Predictive Methods for Analyzing Unstructured Information*, Springer, XII, 236 p. 76, 2005, ISBN: 978-0-387-95433-2.
2. A. Zanasi, *Text Mining and its Applications to Intelligence, CRM, and Knowledge Management*, Southampton, UK ; Boston : WIT Press, c2005, 185312995X .
3. Manu Konchady, *Text Mining Application Programming (Programming Series)*, Publisher: Charles River Media, Inc. Rockland, MA, USA . 2006, ISBN:1584504609 ,

10CA320 DATA MINING IN GRID COMPUTING.

Credit: 4:0:0

Objectives:

1. To learn the data mining concepts in a grid computing environment.
2. To explore the networking techniques for knowledge discovery.

Outcomes:

Students are enabled to

1. Gain knowledge on data mining in the context of grid computing.
2. Understand grid enabled data mining applications with networking concepts

Unit I

Data Mining meets grid computing: Introduction-Data Mining-Grid Computing- Data Mining Grid Mining Grid Data-Data Analysis Services in the Knowledge Grid: Introduction-Approach-Knowledge Grid Services- Data Analysis Services- Design of Knowledge Grid Applications.

Unit II

Grid Miner: An Advanced Support for E-science Analytics: Introduction-Rationale Behind the Design and Development of Grid Miner-Use case- Knowledge Discovery Process and its support by the Grid Miner- Graphical Interfaces- Future Developments. Scientific Data Mining in the Service Oriented Architecture Paradigm (ADaM Services): Introduction-ADaM System Overview- ADaM Toolkit Overview- Mining in a Service Oriented Architecture- Mining Web Services- Mining Grid Services.

Unit III

Mining for Mis-configured Machines in Grid Systems: Introduction – Preliminaries and Related Works- Acquiring, Pre-processing and Storing data-Data Analysis – The GMS – Evaluation- Federated Analysis Environment for Heterogeneous Intelligent Mining (FAEHIM): Introduction- Requirements of a Distributed Knowledge Discovery Framework- Work- Flow Based Knowledge Discovery- Data Mining Toolkit – Data Mining Service Framework –Distributed Data Mining Services – Data Manipulation Tools – Availability- Empirical Experiments.

Unit IV

Specification of Distributed Data Mining Workflows with Data Mining Grid: Introduction - Data Mining Grid Environment- Operations for Work flow Constructions- Extensibility- Case Studies. Service Oriented Data Mining (Anteater): Introduction- Architecture- Runtime Framework- Parallel Algorithms for Data Mining- Visual Metaphors.

Unit V

A Generic Brokering Based Data Mining Grid Architecture (DMGA): Introduction- DMGA Overview- Horizontal Composition – Vertical Composition – Need for Brokering – Brokering Based Data Mining Grid Architecture- Use Cases. Grid Based Data Mining with the Environmental Scenario Search Engine (ESSE).Environmental Data Source: NCEP/NCAR Re-analysis Dataset- Fuzzy Search Engine- Software Architecture- Applications.

Text Book:

1. Werner Dubitzky, *Data Mining Techniques in Grid Computing Environments*, Wiley Blackwell Edition 2008, ISBN- 9780470512586.

Reference Books:

1. Ahmar Abbas, “Grid Computing: A Practical Guide to technology and applications”, Published by Firewall Media, New Delhi. Edition 2008. ISBN: 81-7008-626-4.
2. Fren Berman, Geoffery Fox, Antony J.G.Hey, “Grid Computing: Making the Global Infrastructure a reality”, Published by John Wiley & Sons Ltd, Edition 2003(Reprint 2005).ISBN 0470-85319-0.

10CA321 WEB MINING

Credit 4:0:0

Objectives:

1. To introduce the basic concepts of web mining
2. To know the information retrieval from web based paradigms
3. To measure and model the web
4. To do Web log analysis and to make further predictions and decisions.

Outcomes:

Students are enabled to

1. Appreciate the basic concepts of web mining
2. Gain knowledge on web based paradigms
3. Measure and model the web

Unit I

Introduction: Crawling and Indexing, Topic Directories, Clustering and Classification, Hyperlink Analysis, Resource Discovery and Vertical Portals, Structured vs Unstructured Data Mining. Infrastructure - Crawling the Web: HTML and HTTP Basis, Crawling Basics, Engineering Large – Scale Crawlers, putting together a Crawler.

Unit II

Web Search and Information Retrieval: Boolean queries and the inverted Index, Relevance Ranking, Similarity Search, Learning - Similarity and Clustering: Formulations and Approaches, Bottom – Up and Top – Down Partitioning Paradigms, Clustering and Visualization via Embeddings, Probabilistic Approaches to clustering , Collaborative Filtering.

Unit III

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 states – searching with partial information.

Unit IV

Applications Social Network Analysis: Social Sciences and Bibliometry, PageRank and HITS, Shortcomings of the Coarse – Grained Graph Model, Enhanced Models and Techniques, Evaluation of Topic Distillation, Measuring and Modeling the Web.

Unit – V

Resource Discovery: Collecting Important Pages Preferentially, Similarity Search using link Topology, Topical Locality and Focused Crawling, Discovering Communities. The Future of Web Mining: Information Extraction.

Text Books:

1. Soumen Chakrabarti, *Mining the Web – Discovering Knowledge from Hypertext Data*, Elsevier Science – 2003.
2. Stuart Russell, Peter Norvig, *Artificial Intelligence – A Modern Approach*, 2nd Edition, Pearson Education / Prentice Hall of India, 2004.

Reference Books:

1. R. Agarwal, J.Gehrke, D. Gunopulos, and P.Raghavan. Automatic Subspace clustering of High dimensional data for data mining applications.
2. J. Allan. Automatic Hypertext link typing in 7th ACM Conference on Hypertext, Hypertext '96, Pages 42-51, 1996
3. J. Allen. Natural Language Understanding. Benjamin Cummings, 1987,1995
4. Nils J. Nilsson, “Artificial Intelligence: A new Synthesis”, Harcourt Asia Pvt. Ltd., 2000.
5. Elaine Rich and Kevin Knight, “Artificial Intelligence”, 2nd Edition, Tata McGraw-Hill, 2003.
6. George F. Luger, “Artificial Intelligence-Structures And Strategies For Complex Problem Solving”, Pearson Education / PHI, 2002.

10CA322 RAPIDMINER LAB

Credit 0:0:2

Objectives:

1. To have a practical idea on the concepts and algorithms in data mining.
2. To motivate the students in building models by extracting knowledge.

10 experiments will be notified by HOD from time to time

Outcomes:

1. Makes the students execute the basic algorithms in data mining
2. Provide a solution to interpret the knowledge analyzed.

10CA323 POLYANALYST LAB

Credit 0:0:2

Objectives:

1. To make a clear statistical analysis of the dataset.
2. To learn the algorithms in data mining.

10 experiments will be notified by HOD from time to time

Outcomes:

1. Could analyze the algorithms in data mining for knowledge extraction
2. Makes the students to visualize the results through different charts.

10CA201 BASICS OF COMPUTER & PROGRAMMING

Credit 3:1:0

Objectives:

1. To know the basic concepts and technologies in computers.
2. To know the fundamentals of Programming concepts.

Outcomes:

1. To gain knowledge on the basic concepts of computers.
2. To make the non computer science people understand the computer technologies.

Unit I

Introduction – characteristics of computers – the evolution of computers–the computer generation – classification of computers – basic computer organization – number systems

Unit II

Computer codes – computer arithmetic – binary arithmetic – addition –subtraction - multiplication – division – computer software – types of software – logical system architecture – software development steps

Unit III

Planning the computer program – purpose – algorithm – flowcharts – pseudocode – application software packages – word processing – spreadsheet – graphics – personal assistance.

Unit IV

Overview of C – constants, variables and data types – operators and expression – managing input and output operators – decision making and branching – decision making and looping.

Unit V

User-defined functions -Arrays – handling of character strings – structures and unions - files

Text Books:

1. Pradeep k.sinha and priti sinha, *computer fundamentals: concepts, systems and applications*, Third edition, Bpb publications, 2003.
2. Yashwant kanitkar, *Let us c*, Fifth edition BPB Publications, 2004

Reference Books:

1. Allen b.tucker et.al, *Fundamentals of computing*, Third edition, New Delhi, 1998.
2. V.rajaraman, *Fundamentals of Computers*, Third edition, Prentice – Hall of India, 2002.
3. Herbert Schidt. *C made easy*, Second edition McGraw Hill.

10CA202 FUNDAMENTALS OF JAVA

Credit 4:0:0

Objectives:

1. To learn the basic concepts of Java
2. To solve problems using object-oriented paradigm
3. To develop applications using swing.

Outcomes:

1. To implement Java classes from specifications
2. To effectively create and use objects from predefined class libraries
3. To use interfaces, inheritance, and polymorphism as programming techniques
4. To use exceptions and multithreading
5. To use GUI based controls

Unit I

An Introduction to Java: Java as a Programming Platform-The Java “White Paper” Buzzwords-Java Applets and the Internet -A Short History of Java, Common Misconceptions about Java.

Fundamental Programming Structures in Java: A Simple Java Program-Comments-Data Types Variables-Operators- Strings-Input and Output-Control Flow-Big Numbers Arrays

Unit II

Objects and Classes: Introduction to Object-Oriented Programming-Using Predefined Classes Defining Your Own Classes-Static Fields and Methods -Method Parameters-Object Construction -Packages -The Class Path -Documentation Comments.

Inheritance: Classes, Super classes, and Subclasses-Object: The Cosmic Super class-Generic Array Lists-Object Wrappers and Auto boxing-Methods with a Variable Number of Parameters- Enumeration Classes –Reflection

Unit III

Interfaces and Inner Classes: Interfaces - Object Cloning -Interfaces and Callbacks -Inner Classes

Proxies.Graphics Programming: Introducing Swing -Creating a Frame -Positioning a Frame-Displaying Information in a Component -Working with 2D Shapes -Using Color -Using Special Fonts for Text -Displaying Images.

Unit IV

Event Handling: Basics of Event Handling-Actions- Mouse Events-The AWT Event Hierarchy

User Interface Components with Swing: Swing and the Model-View-Controller Design Pattern-Introduction to Layout Management -Text Input- Choice Components –Menus-Sophisticated Layout Management -Dialog Boxes.

Unit V

Exceptions, Logging, Assertions, and Debugging: Dealing with Errors-Catching Exceptions

Multithreading: What Are Threads-Interrupting Threads-Thread States -Thread Properties - Synchronization Blocking Queues -Threads and Swing.

Text Book:

1. Cay S. Horstmann, Gary Cornell, *Core Java Volume I--Fundamentals*, Prentice Hall, 2008,ISBN:0132354764.

Reference Books:

1. Deitel H.M, Deitel P.J, *Java How to program*, Sixth Edition, Prentice Hall India,2005
2. C.Thomas Wu, *An Introduction To Object Oriented Programming With Java* ,Fifth Edition,Mc Graw Hill,2009.
3. Herbert Schildt, *Java - The Complete Reference*, J2SE Fifth Edition, Tata McGraw-Hill, 2005.ISBN-0-07-059878-9.

10CA203 SYSTEM SIMULATION FOR NANOSCIENCE

Credit 3:0:0

Objectives:

1. To provide an interdisciplinary education to students with a broad understanding of basic sciences, engineering sciences, information sciences.
2. To know about the applications of nanotechnology in various domains.

Outcomes:

1. Will gain knowledge about the simulation in computers.
2. Practical exposure on the nano science concepts learnt.

Unit I

Background to nanotechnology - Scientific revolutions, Types of nanotechnology and nanomachines, The periodic table, Atomic Structure, Molecules and phases, Energy, Molecular and atomic size, Surfaces and dimensional space, Top down and bottom up. Molecular nanotechnology – Atoms by inference, Electron microscopes, Scanning electron microscope, Modern transmission electron microscopy, Scanning probe microscope, Scanning tunneling microscope, Nanomanipulator, Nanotweezers, Atom manipulation

Unit II

Nanoelectronics – Introduction- What will nanoelectronics do for us, The birth of electronics, The tools of micro and nanofabrication, Classical to quantum physics, Quantum electronic devices, Quantum information and quantum computers, Experimental implementations of quantum computing

Unit III

Introduction to ATK , Introduction to NanoLanguage, Python basics – importing modules ,Lists, Tuples, Dictionaries, For Loops , Objects, Functions & Arguments, NumPy

Unit IV

Calculating molecular properties, Bulk materials, Two probe systems, Tutorial on Geometry of Water Molecule, Calculating Molecular Properties.

Unit V

Case studies : Spin Polarized Oxygen, Band structure of Bulk Silicon, L_1 - H_2 - L_1 Two probe system, Optimizing a Two probe system.

Text Books:

1. Mick Wilson, Kamali Kannangara, Geoff Smith, Michelle Simmons, Burkhard Raguse *Nanotechnology: Basic Science and Emerging Technologies*- First Edition Reprint 2004.

10CA204 FUNDAMENTALS OF JAVA LAB

Credit 0:0:2

Objectives:

1. To solve problems using object-oriented paradigm
2. To develop applications and applet programming.

Outcomes:

1. To implement Java classes from specifications.
2. To effectively create and use objects from predefined class libraries.
3. To use interfaces, inheritance, and polymorphism as programming techniques.
4. To use exceptions and multithreading.
5. To use applets and GUI based controls.

List of Experiments:

1. To determine the sum of the following harmonic series for a given value of 'n'
 $1 + \frac{1}{2} + \frac{1}{3} + \dots + \frac{1}{n}$
2. Exception called "Out of Bounds" to be thrown if mark greater than 100.
3. To shuffle the list elements using all the possible permutations
4. Package called "Arithmetic" for methods to deal with all arithmetic operations.
5. Program to design a simple calculator.
6. Read a text and count all the occurrences of a word and display their positions
7. Event Handling
8. Method Overriding
9. Applet program to insert a text in a specified position
10. Threading in Java

10CA205 NANOSCIENCE SIMULATION LAB

Credit 0:0:2

Objectives:

1. To give a practical implementation of the nanotechnology concepts.
2. To simulate real world applications

Outcomes:

1. Students get to know the concepts of nanotechnology.
2. Get to know about the Atomistix Toolkit.

List of Experiments:

1. Usage of Python
2. Dictionary
3. Objects
4. Calculating Molecular Properties
5. Two probe system
6. Geometry of water molecule
7. Spin Polarized Oxygen
8. Band structure of Bulk Silicon
9. L_1 - H_2 - L_1 Two probe system
10. Optimization of Two probe system

**SCHOOL OF SCIENCE &
HUMANITIES**

DEPARTMENT OF COMPUTER
APPLICATIONS

ADDITIONAL SUBJECTS

Subject code	Subject Name	Credits
10CA201	Basics of Computer and Programming	3:1:0
10CA324	Business Intelligence and its Applications	4:0:0
10CA325	Information Storage and Management	4:0:0
10CA326	Software Architecture and Design	4:0:0
10CA327	Software Quality Assurance	4:0:0
10CA328	Software Testing	4:0:0
10CA329	Design Patterns	4:0:0
10CA330	Text Mining	4:0:0
10CA331	Software Architecture Lab	0:0:2
10CA332	Business Intelligence Lab	0:0:2

10CA201 BASICS OF COMPUTER & PROGRAMMING

Credit 3:1:0

Objectives:

1. To know the basic concepts and technologies in computers.
2. To know the fundamentals of Programming concepts.

Outcomes:

1. To gain knowledge on the basic concepts of computers.
2. To make the non computer science people understand the computer technologies.

Unit I

Introduction – Characteristics of Computers – The Evolution of Computers–The Computer Generation – Classification of Computers – Basic Computer Organization – Number Systems

Unit II

Computer Codes – Computer Arithmetic – Binary Arithmetic – Addition –Subtraction - Multiplication – Division – Computer Software – Types of Software – Logical System Architecture – Software Development Steps

Unit III

Planning The Computer Program – Purpose – Algorithm – Flowcharts – Pseudocode – Application Software Packages – Word Processing – Spreadsheet – Graphics – Personal Assistance.

Unit IV

Overview of C – Constants, Variables and Data Types – Operators and Expression – Managing Input and Output Operations – Decision Making and Branching – Decision Making and Looping.

Unit V

User-Defined Functions -Arrays – Handling of Character Strings – Structures and Unions - Files

Text Books:

1. Pradeep K.Sinha and Priti Sinha, *Computer Fundamentals: Concepts, Systems and Applications*, Fourth Edition, BPB Publications, 2007.
2. Yashwant Kanetkar, *Let us C*, Sixth revised and Updated edition BPB Publications, 2005

Reference Books:

1. Allen B.Tucker et.al, *Fundamentals of Computing*, Third Edition, New Delhi, 1998.
2. V.Rajaraman, *Fundamentals of Computers*, Third Edition, Prentice – Hall of India, 2002.
3. Herbert Schildt. *C Made Easy*, Second Edition McGraw Hill.

10CA324 BUSINESS INTELLIGENCE AND ITS APPLICATIONS**Credits 4:0:0****Objective:**

1. To apply Business intelligence (BI) for a broad category of applications and technologies for gathering, storing, analyzing, and providing access to data to help enterprise users make better business decisions.
2. To enhance the BI applications by including the activities of decision support systems, query and reporting, online analytical processing (OLAP), statistical analysis, forecasting, and data mining.

Outcomes:

Putting BI to Work for You by

1. Applying the BI process across the organization
2. Making predictive analytics work for your bottom line
3. Blending BI process into daily management activities

Unit 1

Equipping the organization for effective decision making- Making the most of what You've got – using Business Intelligence- Seeking the Source- the source of Business Intelligence – First Steps Beginning the development of Business Intelligence. Chapter 1, 2, 3, 5)

Unit II

Defining business intelligence structures: Building Foundations – Creating Data Marts. (Chapter 6)

Unit III

Analyzing Cube Content – Cubism- measures and Dimensions- Writing a New script- MDX Scripting. (Chapter 9,11)

Unit IV

MDX Queries: The MDX SELECT Statement –Additional MDX Syntax. Panning for Gold- Introduction to Data Mining – What is Data Mining?- Data Mining Algorithms. (Chapter 12, 13)

Unit V

Building the Mine – Working with the Data Mining Model- Data Mining structure-Mining Model Viewer-Spelunking- Exploration using Data Mining- On Report- Delivering Business Intelligence with Reporting Services. Excel Pivot Tables and Pivot Charts (Chapter 14,15,16,17)

Text Book

1. Brain Larson, *Delivering Business Intelligence with Microsoft SQL server 2008*, McGraw-Hill,2008, ISBN: 978-0071549448

Reference Books

1. Lynn Langit, *Foundations of SQL Server 2005 Business Intelligence* , Apress 2007 , ISBN 978-1590598344
2. Mike Biere, *Business intelligence for the enterprise*, IBM Press 2003, ISBN: 978-0131413030

10CA325 INFORMATION STORAGE AND MANAGEMENT

Credits 4:0:0

Objectives:

1. Evaluate storage architecture; understand logical and physical components of a storage infrastructure including storage subsystems
2. Describe storage networking technologies such as FC-SAN, NAS, IP-SAN and data archival solution – CAS
3. Identify different storage virtualization technologies and their benefits
4. Understand business continuity solutions including, backup and recovery technologies, and local and remote replication solutions

Outcomes:

Upon successful completion of this course, students will be able to:

1. Design and evaluate the performance of the storage architecture for a Business
2. Identify the suitable storage networking technology and virtualization technology for ISM implementation
3. Provide an articulate business continuity solutions

Unit I: Storage Systems

Introduction to Information Storage and Management: Information storage – Evolution of storage technology and architecture – Data centre Infrastructure – Key challenges in managing information - Information life cycle

Storage System Environment: Components of a storage system environment – disk drive components – disk drive performance – Logical components of the Host. RAID - implementation of RAID – RAID array components – RAID levels – RAID Comparison – Hot spares. Intelligent storage System – Components –intelligent storage array.

Unit II: Storage Networking Technologies

Direct-Attached storage and introduction to SCSI: Types of DAS – DAS benefits and limitations

– Disk Drive Interfaces – Introduction to Parallel SCSI – SCSI command model.

Storage Area Network – Fibre channel – SAN evolution – SAN components – FC Connectivity – Fibre channel ports – Fibre Channel Architecture – Zoning – Fibre Channel login types – FC Topologies. Benefits of NAS – NAS file I/O – Components of NAS – NAS implementation – NAS file sharing protocols – NAS I/O operations

Unit III: Advanced Storage Networking and Virtualization

iSCSI – FCIP – Fixed content and archives – Types of archives – features and benefits of CAS – CAS architecture – Object storage and retrieval in CAS – CAS Examples

Storage Virtualization: Forms of Virtualization – SNIA Storage virtualization taxonomy – storage virtualization configurations – storage virtualization challenges – Types of storage virtualization

Unit IV: Business Continuity

Introduction to Business continuity: Information availability – BC terminology – BC planning life cycle – Failure analysis – Business impact analysis – BC technology solutions – concept in practice

Backup and Recovery : Backup purpose – considerations – granularity – recovery considerations – backup methods – backup process- backup and restore operations - backup topologies – backup in NAS – backup technologies – concepts in practice

Unit V: Replication

Local replication: Source and target – uses of local replicas – data consistency – local replication technologies – restore and restart considerations – creating multiple replicas – management interfaces – concepts in practice

Remote replications – modes of remote replication – remote replication technologies – network infrastructure – concepts in practice

Text book:

1. EMC Corporation, *Information Storage and Management*, Wiley India,2010, ISBN:978-81-265-2147-0.

Reference Books:

1. Robert Spalding, *Storage Networks: The Complete Reference*, Tata McGraw Hill, Osborne, 2003.
2. Marc Farley, *Building Storage Networks*, Tata McGraw Hill, Osborne, 2001.
3. Meeta Gupta, *Storage Area Network Fundamentals*, Pearson Education Limited, 2002.
4. Dr. Arun Kumar R, *Easy Oracle Automation-Oracle 10g, Automatic Storage, Memory and Diagnostic Features*,2004, ISBN 0-9745993-6-0.

10CA326 SOFTWARE ARCHITECTURE AND DESIGN

Objectives:

1. To know the basic concepts and technologies of software architecture

2. To know the concepts of reusing architectures.

Outcomes:

1. Students will be able to develop a software project with appropriate data integration.

Unit I

Introduction to Software Architecture-The Software Product Life Cycle-The Architecture Design Process

Unit II

Software Architecture Concepts-Introduction to software design-Models and Knowledge Representation

Unit III

Architecture Representation-Quality Models and Quality Attributes

Unit IV

Architectural Design Principles-Appling Architectural Styles and Patterns-Understanding Met models

Unit V

Creating Architectural Descriptions-Using Architecture Frameworks-Software Architecture Quality.

List of case studies -

- Architect and designing of a standalone application
- Architect and design of a 3 tier web application
- Architect and designing enterprise integration applications

Text Book

1. Albin, Stephen T, The Art of Software Architecture: Design Methods and Techniques, Wiley, 2003.

Reference Book

1. Len bass, Paul Clements, Rick kazman, *Software Architecture in Practice*, Pearson Education, ISBN-81-7808-546-1.
2. Applied Software Architecture ,Christine Hofmeister, Robert Nord, Deli Soni, Addison-Wesley Professional; 1st edition (November 4, 1999)
3. Pattern-Oriented Software Architecture Volume 1, 2, 3, 4, 5 by Frank Buschmann, Hans Rohnert, Kevin Henney, Douglas C. Schmidt, Publisher: Wiley; 1 edition
4. Wolfgang pree, " Design patterns for object Oriented Software Development ", Addison Wesley, 1995.
5. Software Architecture: Foundations, Theory, and Practice by R. N. Taylor, N. Medvidovic, and E. M. Dashofy.

10CA327 SOFTWARE QUALITY ASSURANCE

Credit: 4:0:0

Objectives:

1. To discuss about the importance of software quality assurance in Information Technology
2. To discuss about the barriers in successful implementation of Quality Management System
3. It discuss on product quality, process improvement, quality control

Outcomes:

1. Develop a process oriented approach to establish software quality assurance

Unit I

Software quality in Business context: The meaning of “Quality” defining quality – The Quality Challenge – Why is Quality Important – Quality control v/s Quality Assurance - Quality Assurance at each phase of SDLC - Quality Assurance in Software Support Projects – The SQA Function. **Managing Software Quality in an Organization:** Quality Management System in an Organization – Quality management system: Various Expectations – Quality assurance: Some Diagnostic Questions – The need for the SQA Group in an organization. **Planning for Software Quality Assurance:** Software Quality Assurance Plans - Software Quality Assurance organizational level Initiatives - Quality Planning – Some Interesting Dilemmas and Observations.

Unit II

Product Quality and Process Quality: Introduction – Software Systems Evolution – Product quality – Models for Software Product quality – Process Quality – **Software Measurement Metrics:** Overview – Introduction – Measurement during Software life cycle Context – Defect Metrics – Metrics for Software Maintenance - Classification of Software metrics – Requirements related metrics – Measurements and process improvement – Measurement Principles – Identifying Appropriate Measures and Metrics for projects – Metrics Implementation in projects – Benefits of measurement and Metrics for Project Tracking and Control – Earned Value analysis – Planning for Metrics program – Issues in software Measurement & metrics program Implementation – Object Oriented Metrics : An Overview.

Unit III

Walkthroughs and Inspections: Overview – Introduction – Structured Walkthroughs – Inspections – Various roles and responsibilities involved in reviews / Inspections – Some Psychological Aspects of Reviews – Making Reviews and Inspections Effective – Comparison of review techniques – Inspection related Checklists. **Software Configuration Management:** Overview – Configuration Management Why and What – Software Configuration Management Activities – Standards for Configuration Audit functions – Personnel is SCM Activities – Software Configuration Management : Some Pitfalls.

Unit IV

ISO 9001 : Overview – What is ISO 9000 – The origins of ISO 9000 – How does ISO (as an Organization) carry out its works – ISO Standards Development process – How the ISO 9000 family of Standards work – ISO 9001 : 2000 – Why do organization Need ISO 9000 – ISO Certification – Assessment / Audit Preparation - The Assessment process – Surveillance Audits / Re – Certification / Re –Assessment Audits – ISO Consulting Services and Consultants. **Software CMM and other Process Improvement Models :** Overview – The Capability

Maturity Model for Software: An Overview – Practices Followed at “ Mature Organizations” – CMM and ISO (Comparative Analysis) – Types of Capability Maturity Models (CMMs) – The CMM integrated Model (CMM – I) – Other Models for Software Process – Improvement and Performance Excellence – The People Maturity Model (P – CMM).

Unit V

Careers in Quality: Overview – Introduction- P- CMM and Careers – Some important “People Issues” – Finding a mentor to shape your career – Roles for Quality professionals
Quality Certifications.

Causal analysis and Resolution – Introduction – Purpose of causal analysis – Defect Prevention – Problem Prevention - Role of SQA in CAR

Case Study

- Case Study 1 - Software Quality Assurance - Defect Prevention Analysis
- Case Study 2 - Software Quality Assurance - Problem Prevention Analysis

Text Book

1. Nina S Godbole , *Software Quality Assurance Principles and Practice*, NAROSA PUBLISHING HOUSE, 2004, ISBN: 81 – 7319 – 550 –1
2. Causal Analysis - CMMI for Development (CMMI-DEV), Version 1.2, CMU/SEI-2006-TR-008ESC-TR-2006-008, *Improving processes for better products*, CMMI Product Team, August 2006

Reference Book

1. Ronald A Radice , *Software Inspections. How to cut costs, Improve Quality and Shorten Time Cycles of Software Projects*, Tata McGRAW Hill , Second Edition, 2003. ISBN: 0–07–048340 - X.
2. Mordechai Ben – Menachem , Garry S. marliss, *Software Quality Producing Practical , consistent Software*, Thomson Learning , Fourth Reprint 2004. ISBN: 981-240-204-7.
3. Stephen H.Kan, *Metrics and Models In Software Quality Engineering*, Pearson Education, Second edition. ISBN: 81-297-0175-8.

10CA328 SOFTWARE TESTING

Credit: 4:0:0

Objectives:

1. To learn how to detect software failures so that defects may be uncovered and corrected.
2. To learn about examination of code as well as execution of that code in various environments and conditions
3. To learn about various roles for testing team members

Outcomes:

1. Students can create, execute and perform complex maintenance related operations and all the types of testing.

Unit I

Principles of Testing - Software Development Lifecycle Models: – Phases of software project – Quality, Quality Assurance and Quality Control – Testing verification and validation – Process model to represent different phases – life cycle models - Spiral or Iterative model - The V Model - Modified V Model – Comparison of Various life cycle models.

Unit II

Software Testing Types: - **White box testing** – What is white box testing – Static testing – Structural testing – Challenges in White box testing. **Black box testing** - What is black box testing – Why black box testing – When to do black box testing – How to do black box testing - **Integration testing** - What is integration testing integration testing as a type of testing - integration testing as a phase of testing – Scenario testing – Defect batch. **System and acceptance testing** – System testing overview – Functional Versus Non Functional testing – Functional System testing – Non Functional testing - Acceptance testing – Summary of testing Phases - **performance testing** – Factors Governing Performance testing - Methodology for Performance testing – Tools for Performance testing – Process for Performance testing - **Regression testing** – What is regression testing – Types of regression testing – When to do regression testing – How to do regression testing – Best practices in regression testing.

Unit IV

Common People Issues – Perceptions and Misconceptions about testing – Comparison between testing and development functions – Providing career paths for testing professionals – The role of the Ecosystem and a call for action. **Organization Structures for testing teams** - Dimensions of organization structures - structures in single product companies - structures for multi product companies – Effects of globalization and geographically distributed teams on product testing - Testing services Organizations.

Unit V

Test Planning, Management, Execution and reporting – Introduction – Test planning - Test management – Test Process – Test reporting – Best practices. **Test metrics and Measurements** – What are Metrics and measurement - Why Metrics in testing – Types of Metrics - Project Metrics – Progress Metrics – Productivity Metrics – Release Metrics.

Case Study: Software Testing in Development and Maintenance of Enterprise Banking application

Text Book:

1. Srinivasan Desikan and Gopalaswamy Ramesh, *Software Testing Principle and Practices*, Sixth Impression, 2008. ISBN: 978 – 81 – 7758 – 121 – 8.

Reference Book:

1. William E Perry, *Effective Methods for Software Testing*, John Wiley & Sons”, Second Edition, 2005. ISBN: 9971–51–345–5.
2. Illene Burnstien, *Practical Software Testing*, Springer International Edition, First Edition, 2004. ISBN: 81-8128-089-X.

10CA329 DESIGN PATTERNS

Credit 4:0:0

Objectives:

1. To learn the purpose of design patterns
2. To learn about the ways that design patterns are documented and classified
3. To learn about the various solution that has developed and evolved over time

Outcomes:

1. To describe simple and elegant solutions to specific problems in object oriented software design
2. To make the designs more flexible, modular, reusable and understandable.

Unit -1

Introduction:-Design Pattern,Design Patterns in Smalltalk MVC,Describing design Patterns, The catalog of Design Patterns, Organising the Catalog, How design patterns solve Design problems,How to select Design pattern, How to use design pattern

Unit II

A case Study: Designing a Document Editor: Design problem, Document Structure, Formatting, Embellishing the user Interface,Supporting the Multiple Look-and –Feel Standards, Supporting Multiple Window Systems, User Operations,Spelling Checking and hyphenation

Unit III

Creational Patterns: Abstract Factory,Builder,Factory Method,Prototype,Singleton

Unit IV

Structural Patterns: Adapter, Bridge, Composite, Decorator, Façade, Flyweight, Proxy

Unit V

Behavioral Patterns: Chain of Responsibility, Command, Interpreter, Iterator, Mediator, Memento, Observer, State, Strategy, Template Method, Visitor

Text Book:

Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides, Design Patterns:Elements of Reusable object oriented Sftware, Addison Wesley,1995, ISBN 0-201-45563-3

Reference Book

1. Alan Shalloway, James Trott *Design patterns explained: a new perspective on object-oriented design*, Addison Wesley 2002, ISBN 0-201-71594-5
2. James William Cooper, *Java Design Pattern: A tutorial* ,Addison Wesley,2000, ISBN 0-201-48539-7
3. Eric T Freeman, Elisabeth Robson, Bert Bates, Kathy Sierra,Head First Design Patterns,O'Reilly Media,October 2004

10CA330 TEXT MINING

Credit 3:1:0

Objectives:

1. To solve the crisis of information overload by combining techniques from data mining, machine learning, information retrieval, and knowledge management.
2. To provide an in-depth knowledge of core text mining concepts.
3. To learn advanced pre-processing techniques, knowledge representation considerations, and visualization approaches.
4. To explore the real-world applications of text mining.

Unit I

Introduction: Origins of Text Mining – Understanding Text – Applications – An Architecture for Text Mining Applications – Mathematics Background – Least Square Method – Entropy – Hypothesis Testing – Chi-Square Test. Exploring Text:-Words: Tokens Assembly – Word Stems – Base Words – Word and Meaning Relationships – Patterns in Words and Letters – Word Statics – Indexing Document Text – Frequency-Based – Stopwords.

Unit II

Hidden Markov Models – Observation Probability – State Sequence – Parameter Estimation- POS Taggers: Rule Based Taggers – Brills Taggers – Training a Tagger – Information Extraction: IE Application – Entity Extraction – HMMS for Entity Extraction – Implementation of an Entity Extraction – Implementation of an Entity Extraction – IE Systems- Fastus – Rapier – Phrase Extraction.

Unit III

Early Search Engine – Midline – Dialog – Indexing Text for Search - Implementation in Text Mine - Google Index – Queries – Boolean Queries – Multimedia Queries – Relevance Feed Back – Searching an Index – Google Search – Evaluation – Searching the Web: Search Engine coverage – Web Directories – A Distributed Search – Web Communities – Hidden Web – Crawlers: Web Search Engine Crawlers: DNS Caching – Parallel Crawlers – Periodic Crawls – - Text Mine Crawlers – Crawl Parameter – Crawl Visualization .

Unit IV

Clustering Documents: Cluster Organization – Cluster Parameters – Cluster-Based Search – Searching with a Taxonomy – Linking Methods – Clustering Methods: K-means – Genetic Algorithms – Text Categorization: Text Categorization Problem – Filtering Email – A Bayesians Email Filter – Feature of Spam – Requirements for a Spam Detector – An Email Archive: Email Categorization – Email Monitor – Personal Email Network – Chain Email – Categorization Methods: Decision Tree – Nearest Neighbor – Perceptrons – Support Vector Machines.

Unit V

Introduction to Rapid miner 5 – Operators: Store Operator – Retrieve Operator – Importing and Exporting the data set – Prediction by Applying a Model – Cross Validation – Models: Bayesian Modeling – Decision Tree – Neural Net Training – ID3 Algorithm.

Outcomes:

1. Ability to understand the problems associated with managing unstructured text
2. Know the importance of text mining in real world applications
3. Ability to mine the information available on the Web using text mining software

Text Books:

1. Manu Konchady., *The Text Mining Application Programming*, Cambridge; Career & Professional Group , a part of Cengage Learning , 2006
2. The RapidMiner 5, User Guide, Operator Reference, Developer Tutorial

Reference Books:

1. Thomas W.Miller . *Data and Text Mining , A Business Application Approach*, 2005

10CA331 SOFTWARE ARCHITECTURE LAB

Credit 0:0:2

10 experiments will be notified by the HOD from time to time

10CA332 BUSINESS INTELLIGENCE LAB

Credit 0:0:2

10 experiments will be notified by the HOD from time to time

ADDITIONAL SUBJECTS:

Sub. Code	Name of the Subject	Credits
11CA301	Computer Organization and Architecture	4:0:0
11CA302	Financial and Management Accounting	3:1:0
11CA303	Programming in C	3:1:0
11CA304	Database Systems	4:0:0
11CA305	Compiler Design	3:0:0
11CA306	Business Data Networks	4:0:0
11CA307	Java Programming	4:0:0
11CA308	Object Oriented Analysis and design	4:0:0
11CA309	Wireless Networks	4:0:0
11CA310	Programming in JavaEE	3:1:0
11CA311	Mobile communication Systems	4:0:0
11CA312	Data Warehousing	4:0:0
11CA313	Data Mining Techniques	4:0:0
11CA314	Database Administration	4:0:0
11CA315	Web Services	4:0:0
11CA316	Software Project Management	4:0:0
11CA317	Programming with ASP.Net Using VB	3:1:0
11CA318	Programming with ASP.Net Using C#	3:1:0
11CA319	C# Programming	4:0:0
11CA320	Web Technology	4:0:0
11CA321	System Simulation	4:0:0
11CA322	Computing Technologies and Chemistry	4:0:0
11CA323	Electronic Commerce	4:0:0
11CA324	PHP Programming	3:1:0
11CA325	Banking Technology	4:0:0
11CA326	Security in Computing	4:0:0
11CA327	Linux Administration	4:0:0
11CA328	Grid Computing and Applications	4:0:0
11CA329	AJAX programming using ASP.Net	3:1:0
11CA330	Ad hoc Networks	4:0:0
11CA331	Network Analysis, Architecture and Design	4:0:0
11CA332	Programming in JavaME	4:0:0
11CA333	Neural Networks and its Applications	3:0:0
11CA334	Network Management	4:0:0
11CA335	Satellite Communications	3:0:0
11CA336	Virtual Private Networks	3:0:0
11CA337	Wireless LAN	3:0:0
11CA338	Cloud Computing	4:0:0
11CA339	Research Methodology	4:0:0
11CA340	Advanced Data Mining	4:0:0
11CA341	Internetworking	4:0:0
11CA342	Programming in C Lab	0:0:2

11CA343	Front End Lab	0:0:2
11CA344	Database Systems Lab	0:0:2
11CA345	Data Structures Lab	0:0:2
11CA346	Programming in C++ Lab	0:0:2
11CA347	Java Programming Lab	0:0:2
11CA348	Unix/Linux Lab	0:0:2
11CA349	Case Tools Lab	0:0:2
11CA350	Software Testing Lab	0:0:2
11CA351	Web Services Lab	0:0:2
11CA352	Programming in JavaEE Lab	0:0:2
11CA353	Database Administration Lab	0:0:2
11CA354	PHP Programming Lab	0:0:2
11CA355	Web Technology Lab	0:0:2
11CA356	C#.NET Programming Lab	0:0:2
11CA357	ASP.NET using C# Programming Lab	0:0:2
11CA358	ASP.NET using VB Programming Lab	0:0:2
11CA359	J2ME Programming Lab	0:0:2

11CA301 COMPUTER ORGANIZATION AND ARCHITECTURE

Credits: 4:0:0

Course Objectives:

- To have a thorough understanding of the basic structure and operation of a digital computer.
- To discuss in detail the operation of the arithmetic unit including the algorithms & implementation of fixed-point and floating-point addition, subtraction, multiplication & division.
- To study the different ways of communicating with I/O devices and standard I/O interfaces.
- To study the hierarchical memory system including cache memories and virtual memory.

Unit I:

Digital Logic Circuits: Digital computers – Logic gates – Boolean algebra – Map simplification – Combinational circuits – Flip-flops – Digital Components: Integrated circuits – Decoders – Multiplexers – Registers.

Unit II:

Data Representation: Data types – Complements – Fixed point representation – Floating point representation. Register Transfer and Microoperations: Register transfer language – Register transfer – Bus and memory transfers – Arithmetic microoperations – Logic Microoperations – Shift Microoperations – Arithmetic logic shift unit.

Unit III

Basic Computer Organization and Design: Instruction codes – Computer registers – Computer instructions – Timing and control – Instruction cycle – Memory reference Instructions – Input-

output and interrupt – Central Processing Unit: Introduction – General register organization – Stack organization – Instruction formats – Addressing modes – Data transfer and manipulation – Program control

Unit IV:

Computer Arithmetic: Introduction – Addition and subtraction – Multiplication algorithms – Division algorithms – Floating-point arithmetic operations – Input-Output Organization: Peripheral devices – Input output interface – Asynchronous data transfer – Modes of transfer – Priority interrupt – Direct memory Access, Input-Output Processor

Unit V:

Memory Organization: Memory Hierarchy – Main memory – Auxiliary memory – Associative memory – Cache memory – Virtual memory – Memory management hardware.

Course Outcomes:

Students will have thorough knowledge about

- Basic structure of a digital computer
- Arithmetic operations of binary number system
- The organization of the Control unit, Arithmetic and Logical unit, Memory unit and the I/O unit.

Text Book:

M. Morris Mano, Computer System Architecture, Prentice Hall of India Pvt Ltd, Third edition, 2002. ISBN: 81-203-0855-7.

Reference Books:

1. William Stallings, Computer Organization and Architecture – Designing for Performance, 6th Edition, Pearson Education, 2003.
2. Nicholas Carter, Schaum's outline of Computer Architecture, Tata McGraw Hill, 2006,
3. John L. Hennessy and David A Patterson, Computer Architecture A quantitative Approach, Morgan Kaufmann / Elsevier, Fourth Edition, 2007

11CA302 FINANCIAL AND MANAGEMENT ACCOUNTING

Credits 3:1:0

Course Objectives:

- This course aims to develop the principles and techniques of accounting and focus on application of financial, cost and management accounting.

Unit – I: Basics of Understanding Corporate Financial Statements - Relevant terms - Corporate Balance Sheet and Profit and Loss Account - Notes to the accounts - Schedules - Window Dressing.

Unit-II: Introduction - Financial statements - Significance and limitations of financial statements – Analyzing the Balance Sheet using Excel- Work sheet – Formatting – Audit tool bar – Graphics Viewing Formula - Financial statement analysis – Common size and comparative statement - Decision making relationship with FS & FSA -
Ratio analysis of software companies – Profitability – Solvency – Activity ratios

Unit – III: Cash Flows - Preparation and analysis of Cash flow - Funds flow – statement of Changes in Working capital-Fund from operations- Fund flow statements.

Unit – IV: Cost Concepts and Classification - Cost Determination in Manufacturing and Service Organizations – Preparation of cost sheet.

Marginal costing and break even analysis - its assumptions and limitations.

Unit – V: A General view of Business plan – Cash Budget – Flexible Budget – Types and Techniques of Budgeting.

Course Outcomes:

- Student will be clear on understanding and analyzing the financial statement of the companies.
- Students are exposed to prepare cash flow statements and to prepare Budgets for corporate.

Text Books:

1. Grewal T.X., Double Entry Book-keeping, Sultan Chand & Sons, 2003.

Reference Books:

1. Ruzbeh J. Bodhanwala, Understanding and Analyzing Balance Sheets using Excel Worksheet, PHI Private Limited, New Delhi,2004
2. Maheswari S.N., Management Accounting, Sultan Chand, NewDelhi.2004

11CA303 PROGRAMMING IN C

Credits: 3:1:0

Course Objectives:

- To gain experience about structured programming
- To help students to understand the implementation of C language
- To understand various features in C

Unit I:

Introduction: Computers- Classification of Computers- System Software- Software Lifecycle – Algorithms – Flowcharts – Pseudo code – Structured programming – Compilers – Operating Systems – Running C programs – Linker – Preprocessor – Standard Input Output devices – Popular features of C - Tour of C. **Variables and Expressions:** Introduction – Character set – Identifiers and keywords – Variables – Characters and Character strings – Qualifiers – Typedef statement – Constants – Operators and Expressions – Operator precedence and associativity. **Basic Input/Output:** Introduction – Single character Input-Output – String Input and Output – Types of characters in format strings – scanf width specifier – Format specifiers for scanners – Input fields for scanf.

Unit II:

Control Structures: Introduction – If statement – Multiway decision – Compound statements – Loops – break switch continue and goto statements. **Functions:** Introductions – Function main – Functions accepting more than one parameter – User defined and Library functions – Functions parameters – Return values – Recursion – Variable length argument lists. **Scope and Extent:** Introduction – Scope – Extent

Unit III:

Arrays and Strings: Introduction – How arrays are useful – Multidimensional arrays – Strings - Arrays of strings – Functions in string.h. **Structures and Unions:** Introduction – Declaring and using structures – Structure Initialization – Operation on Structures – Array of Structures – Pointers to structures – Structures and functions – Unions – Operations on a Union – Scope of a Union. **Dynamic Memory Allocation:** Introduction – Library functions for DMA – Dynamic multi-dimensional arrays – Self referential structures.

Unit IV:

Pointers: Introduction – Definition and users of pointers – Address operator & - Pointer variables – Dereferencing pointers – Void pointers – Pointer Arithmetic – Pointers to Pointers – Pointers and arrays – Pointers and functions – Accessing arrays inside functions – Array of pointers – Pointers and Strings - Pointers to constant objects.

Unit V

Files: Introduction – File structure – File handling functions – file types – Error handling – Low level file I/O – Redirection and piping – Directory functions – DOS and BIOS file disk I/O.

Course Outcomes:

At the end of the course students will be able to

- Solve the given problem using the syntactical structures of C language
- Develop , execute and document computerized solution for various problems using the features of C language
- To read and write C program that uses pointers, structures and files

Text Book:

K R Venugopal, S R Prasad, Mastering in C. Tata McGraw Hill Publishing Company Limited, 2nd reprint 2007.

Reference Books:

1. Yeshwant kanetkar, Let us C, Sixth Edition, BPB Publication 2005
2. Herbert Schildt, Turbo C: The Complete Reference, Mc Graw-Hill,1998,ISBN: 9780078813467

11CA304 DATABASE SYSTEMS**Credits 4:0:0****Course Objectives:**

To understand

- relational database designs
- normalization
- indexing and hashing

UNIT 1 : Introduction & Relational Model

Database Systems Applications, Purpose of Database System, View of Data, Database language Relational Database, Database Design, Object Based and Semi Structured databases, Data Storage and Querying, Transaction Management, Data Mining and Analysis, Database Architecture, Database Users and Administrators.

Structure of Relational Databases, Fundamental Relational Algebra operations. Additional Relational Algebra operations, Extended Relational Algebra, Null Value, Modification of the Database.

UNIT 2 : SQL & advanced SQL

Background, Data Definition, Basic Structure of SQL queries. Set Operations, Aggregate Functions, Null Values, Nested Sub queries, Complex queries, Views, Modification of Database, SQL Data types and Schema, Integrity Constraints, Authorization, Embedded SQL, Dynamic SQL.

UNIT 3 : Database Design , E-R Model, Database System Architecture

Overview of the design process, E-R Model, Constraints, E-R Diagram, E-R Design issues, Weak Entity, Extended E-R Features, Database Design for Banking Enterprise, Reduction to Relational Schema. Centralized and Client - Server Architecture, Server System Architecture

UNIT 4 : Relational Database Design And Application Design And Development

Features of good Relational Design, Atomic Domains and First Normal Form, Decomposition using Functional Dependencies, Multivalued Dependencies, More Normal Forms, Database Design Process, Modeling Temporal Data, Triggers, Authorization in SQL, Storage and File Structure: File Organization, Organization of records in files, Data Dictionary Storage.

UNIT 5 : INDEXING AND HASHING, TRANSACTIONS

Basic Concepts, Ordered Indices, B+ Tree Index Files, B-Tree Index Files, Multiple-Key Access, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing. Transaction Concepts, Transaction State, Implementation of Atomicity and durability, Concurrent executions, Serialization.

Course Outcomes:

At the end of the course students will be able to

- Write queries by using DDL and DML statements.
- Create database designs with E-R diagrams.
- Normalize tables and check for functional dependencies.
- Use triggers in SQL

Text Books

Abraham Silberschatz, Henry F. Korth, Sudarshan, Database System Concepts, Fifth Edition, 2006

Reference Books:-

1. Ramesh Elmasri, Durvasulu V.L.N Somayajulu, Shamkant B. Navathi and Shyam K. Gupta, Fundamentals of Database Systems, Pearson Education. 2006.
2. C. J. Date , An Introduction to Database Systems June(2009), 8th Edition

11CA305 COMPILER DESIGN

Credits: 3:0:0

Course Objectives:

- To introduce the major concept areas of language translation and compiler design
- To develop an awareness of the function and complexity of modern compilers.
- To introduce various phases of compiler design.

UNIT I

Introduction to Compilers: Translators-Compilation and Interpretation – The phases of Compiler-Errors encountered in different phases-The grouping of phases – cousins of the Compiler- Compiler construction tools – A simple one-pass compiler– Context Free Grammars-Derivation – Reduction and Ambiguity.

UNIT II

Lexical Analysis: Need and role of lexical analyzer – Lexical errors-Expressing tokens by Regular Expression – Converting regular expression to DFA – Minimization of DFA – Language for specifying lexical analyzers – LEX.

UNIT III

Syntax Analysis: Need and role of the parser – Context Free Grammars – Top Down parsing – General strategies – Recursive Descent Parser – Predictive Parser – LL(1) Parser – Shift Reduce Parser – LR Parser – LR (0) item – Construction of SLR Parsing table – Introduction to LALR Parser – Error handling and recovery in syntax analyzer – YACC

UNIT IV

Syntax Directed Translation and Type Checking: Definitions – Construction of syntax trees – Bottom-up evaluation of S-attributed and L-attributed definitions – Top down translation – Bottom up evaluation – Forms of intermediate code – Translation of Assignment, Boolean Expression and Control statements – Backpatching -Type systems – Specification of a simple type checker – equivalence of type expressions – Type conversions.

UNIT V

Code Optimization and Code Generation: Principal sources of Optimization – DAG – Optimization of basic blocks – Global data flow analysis – Efficient data flow algorithms – Source language issues – Storage organization – Symbol tables – Dynamic storage allocation – Issues in design of a code generator – A simple code generator algorithm.

Course Outcomes:

- Students will have a concrete view on the theoretical and practical aspects of compiler design
- Students will be able to apply ideas and techniques discussed to various software design

Text Books:

1. Alfred V Aho, Ravi Sethi and Jeffrey D Ullman, Compilers – Principles, Techniques and Tools, Pearson Education, Sixth Indian Reprint, 2001. ISBN: 81-7808-046-X.

Reference Books:

1. Dick Grone, Henri E Bal, Cerial J H Jacobs and Koen G Langendoen, Modern Compiler Design, John Wiley and Sons, USA, 2000. ISBN-10: 0-471-97697-0.
2. Santanu Chattopadhyay, Compiler Design , PHI,2005. ISBN: 81-203-2725-X

11CA306 BUSINESS DATA NETWORKS

Credits: 4:0:0

Course Objectives:

- To know about the core network concepts

- To understand the functionalities of different layers of the network
- To know more about the network management and systems management

Unit I:

Core Network Concepts: Introduction – Applications, Client Stations, and Servers –Transmission links – Switches – Quality of Service – Geographical scope – Internets, Intranets, and Extranets. Standards: Introduction – Layered communication – The physical, data link, and internet layers – Layer cooperation at the physical, data link and internet layers – The transport and application layers – Standard architectures.

Unit II:

Physical layer propagation: Introduction – Signaling – UTP signal propagation – Optical fiber transmission links – Radio signal propagation – Physical layer topologies. A small ethernet PC network: Introduction – UTP transmission links – Hubs and Switches – Network Interface cards – Server services.

Unit III:

Other LAN technologies: Introduction – larger ethernet standards – Wireless LANs – ATM LANs. Telephony: Internal and External: Introduction – Internal Telephony – The technology of PSTN – Analog and digital transmission in the PSTN – Cellular telephony.

Unit IV:

Wide Area Networks: Introduction – Telephone model communication – Leases line networks – Public Switch Data Networks. TCP/IP Networking: Introduction – Routing decisions. Security: Introduction – Attack prevention systems.

Unit V:

Network management and system administration: Introduction – Cost analysis – Administrative servers – Server management – Access permissions. Network Applications: Introduction – Traditional applications architecture – Electronic mail – the World Wide Web and E-Commerce – Web Services – Peer-to-Peer applications.

Course Outcomes:

The students will understand

- The core concepts of the network
- The layered strategy, the work carried out at different layers
- The difference on network management and systems management

Text Book:

Raymond R Panko, Business Data Networks and Telecommunications, Prentice hall of India, Fourth edition, 2004. ISBN: 81-203-2171-5.

Reference Books

Douglas E Comer, Computer Networks and Internets, Pearson Education, 5th Edition, 2008

11CA307 JAVA PROGRAMMING

Credits: 4:0:0

Course Objectives:

Academic Information

- To learn basic concepts of java
- To solve problems using Object Oriented Paradigm
- To learn about Networking Concepts in java

Unit I

The History and evolution of Java - An Overview of Java - Data Types, Variables and Arrays – Operators - Control Statements

Unit II

Introducing Classes –A Closer look at Methods and Classes - Inheritance - Packages and Interfaces

Unit III

Exceptions Handling - Multithreaded Programming –Autoboxing –I/O, Applets, and other Topics

Unit IV

Java.util Package- The Collection Framework- Networking - The Applet Class- Event Handling

Unit V

Introducing the AWT: Working with Windows, Graphics and Text – Using AWT Controls, Layout Managers, and Menus

Course Outcomes:

- Ability to develop applications Using Object Oriented Programming concepts
- To use exception handling and Multithreading
- To develop GUI Applications

Text Book:

Herbert Schildt, Java - The Complete Reference, J2SE Fifth Edition, Tata McGraw-Hill, 2005.ISBN-0-07-059878-9

Reference Books:

1. C. Thomas Wu, An Introduction to Object Oriented Programming with Java, Fifth Edition ,Mc Graw Hill,2009.
2. Cay S. Horstmann, Garry Cornell, Core Java, Volume 1- Fundamentals, Eighth Edition,2008,Pearson Education, 978-81-317-1945-9

11CA308 OBJECT ORIENTED ANALYSIS AND DESIGN

Credits: 4:0:0

Course Objectives:

- To learn the concept of Object Oriented Software Development Process
- To get acquainted with UML Diagrams
- To understand Object Oriented Analysis Processes

Unit I:

Object Basics, Object oriented philosophy, objects, classes, attributes, object behavior and methods, encapsulation and information hiding, class hierarchy, polymorphism, object relationships and associations, aggregations and object containment, case study, object identity,

persistence.. Object oriented systems development life cycle: Software development process, building high quality software, use- case driven approach, reusability.

Unit II : Object Oriented Methodologies

Rumbaugh et al.'s object modeling technique, Booch methodology, Jacobson et al methodologies, patterns, frameworks, the unified approach. Unified modeling language: Static and dynamic models, UML diagrams, UML class diagrams, use-case diagrams, UML dynamic modeling, packages, UML extensibility and UML meta model.

Unit III : Object Oriented Analysis Process

Business object analysis, use-case driven object oriented analysis, business process modeling, use-case model, developing effective documentation, case study. Classification: Classification theory, noun phrase approach, common class patterns approach, use-case driven approach, classes, responsibilities, and collaborators, naming classes.

Unit IV : Identifying Object Relationships, Attributes And Methods

Association, super-subclass relationships, a-part of relationships, case study, class responsibility, defining attributes for vianet bank objects, object responsibility, defining methods for vianet bank objects Design process and design axioms: Corollaries, design patterns.

Unit V : Designing Classes

UML object constraint languages, designing classes, class visibility, refining attributes for the vianet bank objects, designing methods and protocols, designing methods for the vianet bank objects, packages and managing classes. Designing access layer, case study. Designing view layer, macro level process.

Course Outcomes:

- Understand Object Oriented Software Development Process
- Gain exposure to Object Oriented Methodologies & UML Diagrams
- To apply Object Oriented Analysis Processes for projects

Text Book

1. Ali Bahrami, Object Oriented Systems Development using the Unified Modeling Language, McGraw Hill, Reprint 2009.

Reference Book

1. Bernd Oestereich, Developing Software with UML, Object-Oriented Analysis and Design in Practice, Addison-Wesley, 2000.
2. James Rumbaugh, Ivar Jacobson, Grady Booch, The Unified Modeling Language Reference Manual, Second edition, Addison Wesley, 2005

11CA309 WIRELESS NETWORKS

Credits: 4:0:0

Course Objectives:

- To impart knowledge about the wireless communication principles and fundamentals
- To equip the students with various kinds of wireless networks and its operations
- To know about various generations of wireless networks

Unit I:

Evolution of Wireless Networks, Challenges, Wireless communications Principles and Fundamentals: The Electromagnetic Spectrum, Wireless Propagation Characteristics and Modeling, Analog and Digital Data transmission, Modulation Techniques for Wireless Systems, The Cellular Concept, Wireless Services.

Unit II:

First Generation (1G) – Cellular Systems: Advanced Mobile Phone System (AMPS), Nordic Mobile Telephony (NMT), Second Generation (2G) – Cellular Systems: GSM, Data Operations, Cordless Telephony, Third Generation (3G) – Cellular Systems: 3G Spectrum Allocation, Third Generation Service Classes and Applications, Fourth Generation (4G) – Cellular Systems: 4G Services and Applications, Challenges: Predicting the Future of Wireless Systems

Unit III:

Satellite Networks: Introduction, Satellite Systems, VSAT Systems, Examples of Satellite based Mobile Telephony Systems, Satellite-based Internet Access. Fixed Wireless Access Systems: Wireless Local Loop versus Wired Access, Wireless Local Loop, Wireless Local Loop Subscriber Terminals (WLL), Wireless Local Loop Interfaces to the PSTN, IEEE 802.16 Standards.

Unit IV:

Wireless Local Area Networks: Introduction, Wireless Lan Topologies, Wireless LAN Requirements, The Physical Layer, The Medium Access Control (MAC) Layer, Latest Developments. Wireless ATM and Ad Hoc Routing: Introduction, Wireless ATM Architecture, HIPERLAN 2: An ATM Compatible WLAN, Routing in Wireless Ad Hoc Networks.

Unit V:

Personal Area Networks: Introduction to PAN Technology and Applications, Commercial Alternatives: Bluetooth, Commercial Alternatives: HomeRF. Security Issues in Wireless Systems: The Need for Wireless Network Security, Attacks on Wireless Networks, Security Services, Wired Equivalent Privacy (WEP) Protocol, Mobile IP, Weaknesses in the WEP Scheme, Virtual Private Network (VPN).

Course Outcomes:

- * Expertise in various techniques and operations of wireless networks
- * Able to design a simple wireless network
- * Familiarized in wireless security and applications

Text Book:

P.Nicopolitidis, M.S. Obaidat, G.I Papadimitriou, A.S. Pomportsis, Wireless Networks, John Wiley & Sons, Ltd., 2003, ISBN 9812-53-033-9.

Reference Books:

1. Jochen Schiller, Mobile Communications, Second Edition, Pearson Education, Ltd., 2003 ISBN 81-297-0350-5.

11CA310 PROGRAMMING IN JavaEE

Credits: 3:1:0

Course Objectives:

- To know the need of Enterprise JAVA applications
- To know about various JEE components such as Servlets, JDBC, JavaBeans and RMI
- To develop simple applications using JEE components

Unit I:

Introducing J2EE: J2EE Advantage – Enterprise architecture types – Architecture of J2EE – J2EE Components – Developing J2EE applications. **J2EE Multitier Architecture:** Distributive Systems – The Tier – Multi-Tier Architecture – **J2EE Best Practices:** Enterprise application strategy – The Enterprise application – Clients- Session management – Web-Tier and Java Server Pages – Enterprise JavaBeans Tier.

Unit II:

Java Servlets: A simple Java servlet – Anatomy of java servlets – Reading data from a client – Reading HTTP request headers – Sending data to a client and writing the HTTP response header – Working with Cookies – Tracking sessions. **Java Server Pages:** JSP- JSP tags – Tomcat – Request string – User sessions – Cookies – Session object.

Unit III:

JDBC Objects: Overview – Database connection –Associating with the database – Statement objects – ResultSet – Transaction Processing – Metadata – Data types – Exceptions. **JDBC and Embedded SQL:** Tables - Indexing – Inserting data into tables – Selecting data from a table – Metadata – Updating tables – Deleting data from a table – Joining tables – Calculating data – Grouping and ordering data.

Unit IV:

Enterprise Java Beans: Deployment descriptions –Session Java Bean – Entity Java Bean – Message Driven Bean. **Java Mail API:** Protocols – Exceptions – Send E-mail messages – Retrieving E-mail messages – Deleting E-mail messages – Replying to and forwarding an E-mail message – Forwarding an E-mail message – receiving Attachments.

Unit V:

Remote Method Invocation: Concept- Server side – Client side. **Java Message Service:** JMS fundamentals – Components of JMS – Messages – Message Selector – Sending and Receiving message to and from a queue – Compiling and running queue programs. **Security:** Concepts – JVM security – Management – Java API security – Browser security – Web Services Security.

Course Outcomes:

- Able to develop application with JavaEE components
- Acquire knowledge about enterprise architecture
- Acquire knowledge about Security measures in JavaEE

Text Book

James Keogh, J2EE-The Complete Reference, Tata McGraw Hill, Sixteenth Reprint 2006, Edition 2002, ISBN: 0-07-052912-4

Reference Books

1. Kogent Solutions Inc, J2EE 1.4 Projects, Dream Tech Press, 2007. ISBN: 81-7722-737-8.
2. Michael Girdley, Rob Woollen, Sandra Emerson, J2EE Applications and BEA Web Logic Server, Prentice Hall, 2001.

11CA311 MOBILE COMMUNICATION SYSTEMS

Credits: 4:0:0

Course Objectives:

- To know about the main concepts of Global System for Mobile communications
- To have a clear idea and focus on the communication networks.
- To gain knowledge in radio engineering, data communications, computer networks, distributed systems, information management, and applications.

Unit I:

Introduction, Wireless Transmission: Frequencies for Radio Transmission, Signals, Antenna, Signal Propagation, Multiplexing, Modulation, Spread Spectrum, Cellular Systems

Unit II:

Medium Access Control: Motivation for Specialized MAC, SDMA, FDMA, TDMA, CDMA, Comparison of S/T/F/CDMA. Telecommunication Systems : GSM, DECT, TETRA, UMTS and IMT-2000

Unit III:

Satellite Systems: History, Applications, Basics: GEO, LEO, MEO, Routing, Localization, Handover. Broadcast Systems: Overview, Cyclic repetition of data, Digital Audio Broadcasting, Digital Video Broadcasting

Unit IV:

Wireless LAN: Infrared VS Radio Transmission, Infrastructure and Ad-Hoc networks, IEEE 802.11, HIPERLAN, Bluetooth

Unit V:

Support for Mobility: File systems, World Wide Web, Wireless Application Protocol

Course Outcomes:

- Gains knowledge in Mobile environment fundamentals.
- Familiarize in 2G Technologies for future Generation wireless and mobile communications.

Text Book:

Jochen Schiller, Mobile Communications, Second Edition, Pearson Education, Ltd., 2003 ISBN 81-297-0350-5.

Reference Books

1. James F. Kurose, Computer Networking - A Top-Down Approach Featuring The Internet, Third Edition -Fifth Reprint, Pearson Education 2009.
2. Nicopolitidis P., Wireless Networks , First Edition Reprint 2009, Wiley Publishers

11CA312 DATAWAREHOUSING

Credits: 4:0:0

Course Objectives:

- To know about the architecture/technology of Data Warehousing
- To know more about the operational and analytical environment of Data Warehousing
- To know the need for Data Warehouse

Unit 1

Evolution of Decision Support System – The Data Warehouse Environment – The Data Warehouse and Design.

Unit 2

Granularity in the Data Warehouse – The Data Warehouse and Technology – The Distributed Data Warehouse

Unit 3

Executive Information Systems and the Data Warehouse – External Data and the Data Warehouse – Migration to the architected Environment

Unit 4

The Data Warehouse and the Web – Unstructured Data and the Data Warehouse – The Really Large Data Warehouse

Unit 5

The Relational and the Multidimensional Models as a Basis for Database Design – Data Warehouse Advanced Topics – Cost Justification and Return on Investment for a Data Warehouse

Course Outcomes:

At the end of the course, the students will understand

- The need for Data Warehouse
- The working environment/architecture of a Data Warehouse
- The multiple levels of building a Data Warehouse

Text Book

1. William H Inmon, Building the Data Warehouse, Wiley India, 4th Edition, 2005, ISBN: 81-265-0645-8

Reference Books

1. Sam Anahory and Dennis Murray, Data Warehousing in the Real World: A Practical Guide for Building Decision Support Systems, Pearson Education – Asia, Fourth Indian Reprint, 2002, ISBN: 81-7808-387-6
2. Paulraj Ponniah, Data Warehousing Fundamentals for IT Professionals, John Wiley & Sons, 2010, 2nd Edition

11CA313 DATA MINING TECHNIQUES

Credits 4:0:0

Course Objectives:

- To introduce the basic concepts and techniques of Data Mining.
- To understand the application of data mining techniques for real world problem
- To develop skills for solving practical problems using Data Mining algorithms.

Unit I:

Introduction – Data Mining – Functionalities – Classification of data mining systems – Major issues in data mining. Data warehouse and OLAP technology for data mining: What is a data warehouse – A Multi dimensional model – Data Warehouse Architecture – Data Warehouse Implementation – Future development of Data cube technology.

Unit II:

Data preprocessing: Data cleaning – Data integration and transformation – Data reduction – Discretization and concept hierarchy generation. Data Mining Primitives: What defines a data mining tasks.

Unit III:

Mining Association Rules in Large Databases: Association rule mining – Mining single dimensional Boolean association rule from transactional databases Mining Multidimensional association rules from relational databases and data warehouses.

Unit IV:

Classification and Prediction: What is classification – Issues regarding classification – Classification by decision tree induction – Bayesian classification

Unit V:

Cluster Analysis: Types of data in cluster analysis – Categorization of major clustering methods – Partitioning methods – Hierarchical Methods

Course Outcomes:

- Students will be able to develop data mining algorithm for various applications
- Students could build up data mining model for diverse applications
- To solve problems using data mining algorithms

Text Book:

1. Jiawei Han, Micheline Kamber, Data Mining – Concepts and Techniques, Morgan Kaufmann Publishers, First Edition, 2003. ISBN: 81-8147-049-4.

Reference Book:

1. Michael J A Berry, Gordon S Linoff, Data Mining Techniques, Wiley Publishing Inc, Second Edition, 2004. ISBN: 81-265-0517-6.

11CA314 DATABASE ADMINISTRATION

Credits: 4:0:0

Course Objectives:

- To have a clear overview of the Oracle Database Architecture
- To enable to create, monitor, configure the Database
- To gain knowledge of how to backup and recovery process of a database

Unit –I

Getting Started with Oracle Architecture: An Overview of Database and Instances-Oracle Logical Storage Structures-Oracle Logical Database Structures-Oracle Physical Storage Structures-Multiplexing Database Files-Oracle Memory Structures-Backup Recovery Overview-Security Capabilities- Real Application Clusters-Oracle Streams-Oracle Enterprise Manager-Oracle Initialization Parameters. **Upgrading to Oracle Database 11g:** Choosing an Upgrade Method-Before Upgrading-Using the Database Upgrade Assistant-Performing a Manual Direct Upgrade-Using Export and Import-Using the Data Copying Method –After Upgrading

Unit-II

Planning and Managing Tablespaces: Tablespace Architecture-Oracle Installation Tablespaces-Oracle Installation Tablespaces-Segment Segregation. **Physical Database Layouts and Storage Management:** Traditional Disk Space Storage-Automatic Storage Management

Unit –III

Monitoring Space Usage: Common Space Management Problems-Oracle Segments, Extends and Blocks-Data Dictionary Views and Dynamic Performance Views-Space Management Methodologies. **Managing Transactions with Undo Tablespaces:** Transaction Basics-Undo Basics-Managing Undo Tablespaces-Flashback Features-Migrating to Automatic Undo Management.

Unit –IV

Database Security and Auditing: Non-Database Security-Database Authentication Methods-Database Authorization Methods-Auditing.

Unit-V

Backup and Recovery Options: Capabilities-Logical Backups-Physical Backups-Using Data Pump Export and Import-Data Pump Import Options-Integration of backup Procedures

Course Outcomes :

- Able to secure and recover the database
- Able to perform backup services effectively
- Able to perform a new installation, upgrade from previous versions, configure hardware and software for maximum efficiency, and employ bulletproof security

Text Book

Bob Bryla, Kevin Loney, Oracle Database 11g DBA Handbook, The McGraw-Hill Companies, 2008, ISBN -0-07-159579-1

Reference Book

1. Iggy Fernandez. Beginning oracle Database 11g Administration from Novice to Professional, 2009, ISBN-978-81-8489-216-1

11CA315 WEB SERVICES

Course Objectives:

- To gain knowledge to develop the web services
- To Elaborate discussion about SOAP, XML messaging and Java API
- To understand web service standards and build architecture for web communication

Unit I:

Introduction to Web Services: Motivation and Characteristics- uses- Basic operational model of web services-core web service standards – Other Industry Standards Supporting Web Services- Known challenges in Web Services. **Building the Web Services Architecture:** Web Services Architecture and Its core Building Blocks- Tools of trade- Web Services Communication Models

Unit II:

Developing Web Services Using SOAP: XML –Based Protocols and SOAP – Anatomy of a SOAP Message – SOAP Encoding – SOAP Message Exchange Model – SOAP communication – SOAP Messaging – SOAP Bindings for Transport Protocols – SOAP Security. **Description and Discovery of Web Services:** Web Services Description Language – Universal Description, Discovery and Integration

Unit III:

Introduction to the Java Web Services Developer Pack: Java Web Services Developer Pack. **XML Processing and Data Binding With java API:** Extensible markup Language basics – Java API for XML Processing – Java Architecture for XML Binding.

Unit IV:

XML Messaging Using JAXM and SAAJ : Role of JAXM in Web Services – JAXM API Programming model - Basic Programming Steps for Using JAXM – JAXM Deployment Model – Developing JAXM based Web Services – JAXM Inter operability – JAXM in J2EE1.4. **Building RPC web Services with JAX RPC :** The Role of JAX RPC in Web Services - JAX RPC APIs and Implementation model - JAX RPC Supported Java/XML Mappings- Developing JAX RPC Based Web Services - JAX RPC Inter operability - JAX RPC in J2EE1.4.

Unit V:

Java API for XML Registries: Introduction to JAXR – JAXR Architecture - JAXR Information Model – JAXR Registry Services API – JAXR Support in JWSDP1.0. **Web Services Security:** Challenges of Securing Web Services – XML Encryption – XML Signatures – XML Key Management Specification – Security assertions Markup Language – XML Access Control Markup Language

Course Outcomes:

- Adopt the web service standards and build architecture for web communication
- Describe and discover the web services using SOAP and UDDI
- Develop and deploy JAXM and JAX RPC based web services
- Secure web services for reliable communication

Text Book:

Ramesh Nagappan, Robert Skoczylas and Rima Patel Sriganesh, Developing Java Web Services, Wiley Publishing Inc., 2005. ISBN: 81-65-0499-4.

Reference Book:

Sandeep Chatterjee, James Webber, Developing Enterprise Web Services, Pearson Education, 2004

11CA316 SOFTWARE PROJECT MANAGEMENT

Credits: 4:0:0

Course Objectives:

- To discuss about the professional way of managing software projects
- To plan and execute software projects by means of activity planning, managing risk and allocating resources
- Discussion about software project team management

Unit I:

Introduction to Software Project Management, Step Wise: an Overview of Project Planning, Project Evaluation: Introduction

Unit II:

Selection of an appropriate project approach, Software effort estimation.

Unit III:

Activity Planning, Risk Management.

Unit IV:

Resource Allocation, Monitoring and control, managing contracts.

Unit V:

Managing people and organizing teams, Small Projects

Outcomes:

The students will understand

- The overview of project planning
- Effort estimation and risk management in software projects
- How to manage people and organize team

Text Book

Bob Hughes, Mike Cotterell, Software and Project Management, Tata McGraw-Hill Publishing Company Limited, Third Edition, 2004. ISBN: 0-07-709834-X.

Reference Book

Walker Royce, Software Project Management, Addison-Wesley, 2004 ISBN: 0-20-1309580.

11CA317 PROGRAMMING WITH ASP.NET USING VB

Credits: 3:1:0

Course Objectives:

- To gain experience about developing dynamic websites with ASP.NET
- To help students to understand how ASP.NET works at a higher level to deal with full featured web controls
- Elaborately discuss the various features in ASP.NET using VB

Unit I:

The .NET Framework: The Evolution of Web Development-The .NET Framework **Developing ASP.NET Applications – Visual Studio:** Creating Websites- Designing a Webpage- The anatomy of a Web Form – Writing Code – Visual Studio Debugging. **Web Form Fundamentals:** The anatomy of an ASP.NET Application – Introducing Server Controls – Improving the Currency Converter – A Deeper Look at HTML Control Classes – The Page Class – Application Events – ASP.NET Configuration.

Unit II:

Web Controls: Stepping Up to Web Controls – Web Control Classes – List Controls – Table Controls – Web Control Events and AutoPostBack – A Simple Webpage. **State Management:** The problem of State – View State – Transferring Information between Pages – Cookies – Session State – Session State Configuration – Application State – An Overview of State Management Choices. Common Errors – Exception Handling – Handling Exceptions – Throwing Your Own Exceptions.

Unit III:

Building Better WebForms - Validation: Understanding Validation – The Validation Controls. **Rich Controls:** The Calendar – The AdRotator – Pages with Multiple Views. **User Controls and Graphics:** User Controls – Dynamic Graphics. **Styles, Themes, and Master Pages:** Styles – Themes – Master Page Basics – Advanced Master Pages.

Unit IV:

Website Navigation: Site Maps – The SiteMapPath Control – The Tree View Control – The Menu Control. **Working With Data - ADO.NET Fundamentals:** Understanding Data Management –Configuring Your Database – SQL Basics – ADO.NET Basics – Direct Data Access –Disconnected Data Access.

Unit V:

The Data Controls : The GridView – Formatting the GridView – Selecting a GridView Row – Editing with the GridView – Sorting and Paging the GridView – Using GridView Templates – The DetailsView and FormView.

Membership: The Membership Data Store- The Security Controls-Role – Based Security.

Outcomes:

- To understand the concept of .NET framework
- To Know about GUI controls in ASP.NET
- To develop application in ASP.NET

Text Book

Matthew MacDonald, Beginning ASP.NET 3.5 in VB 2008. Apress, Berkeley, CA, USA, Second Edition. ISBN: 978-81-8128-868-4

Reference Books

1. Jesse Liberty, Dan Hurwitz and Dan Mabarry , ASP.NET 3.5 , O'Reilly, 2008.
2. Dino Esposito, Programming Microsoft ASP.NET, Tata MCGraw-Hill, 2003.

11CA318 PROGRAMMING WITH ASP.NET USING C#

Credits: 3:1:0

Course Objectives:

- To develop simple web pages using ASP.NET
- To understand about State Management in web applications
- To build full-fledged web applications

Unit I:

The .NET Framework – Visual Studio – Web Form Fundamentals – Web Controls

Unit II:

State Management – Error Handling (excluding logging, error pages and tracing) – Validation

Unit III:

Rich Controls – User Controls and Graphics – Styles, Themes and Master Pages

Unit IV:

Website Navigation – ADO.NET Fundamentals – The Data Controls

Unit V:

XML – Security Fundamentals – Membership

Outcomes:

- Developing simple web pages using ASP.NET
- Understanding state management in web applications
- Developing a full-fledged web application in ASP.NET

Text Book

Matthew MacDonald, Beginning ASP.NET 3.5 in C# 2008. Apress, Berkeley, CA, USA, Second Edition. ISBN: 978-81-8128-902-5

Reference Book

Jesse Liberty, Dan Hurwitz & Dan Maharry, Programming ASP.NET 3.5, O'Reilly, 4th Edition, 2008, ISBN 13: 978-81-8404-611-3

11CA319 C# PROGRAMMING

Credits 4:0:0

Course Objectives:

- To get a clear understanding of the .NET framework
- To understand the object oriented programming concepts of C#

- To develop stand alone applications using C#

Unit I

The Philosophy of .NET – Core C# Programming Constructs, Part I and Part II

Unit II

Defining Encapsulated Class Types – Understanding Inheritance and Polymorphism – Understanding Structured Exception Handling - Understanding Object Lifetime

Unit III

Working with Interfaces – Collections and Generics - Delegates, Events and Lambdas

Unit IV

Understanding Indexer Methods - .NET Assemblies – Processes, AppDomains and Object Contexts - Building Multithreaded Applications

Unit V

ADO.NET Part I: The Connected Layer – ADO.NET Part II: The Disconnected Layer

Outcomes

- Understanding of the concepts of .NET framework
- Deep understanding of the object oriented programming concepts of C#
- Able to develop stand alone applications in C#

Text Book:

Andrew Troelsen, Pro C# 2008 and the .NET 3.5 Platform, Apress, Springer(India) Private Limited, Fourth Edition, 2007, ISBN 978-81-8128-955-1

Reference Book

Herbert Schildt, The Complete Reference C# 2.0, Tata McGraw-Hill Publishing Company Limited, 6th reprint 2007, ISBN-13: 978-0-07-061139-9, ISBN-10: 0-07-061139-4.

11CA320 WEB TECHNOLOGY

Credits: 4:0:0

Objectives:

- To learn the usage of scripts in web applications.
- To know about various ASP objects
- To learn the concepts of XML and Web services.

UNIT I

ASP Basics : ASP code construction- Script Within Script- ASP code in Use. **Request Objects**: ASP Object Model and Hierarchy- Getting Information from the Visitor- Request Object Property- Request Object Method- Request Object in Action. **Response Objects** : Sending information back to visitors- Response Object Collection- Response Object Properties- Response Object Methods- Response Object in Action.

UNIT II

Server Object: Getting in at the top- Server Object Property – Server Object Method – Server Object in Action. **The Session Object, the Application Object and the global.asa File**: ASP

UNIT II

Fundamentals of XML: Introduction to XML Syntax- XML Document Structure- XML Content Models- Rules of XML structure- Well-Formed and Valid Documents. **Validating XML with the Document Type Definition (DTD):** Document Type Definitions – Some simple DTD examples- Structure of a Document type Definition. **Creating XML Schemas:** Introduction to the W3C XML Schema recommendation- Creating XML Schemas: Declaring Attributes- Declaring Simple Types.

UNIT IV

Transforming XML with XSL: XSL Technologies- XSLT for Document Publishing - **Integrating XML with Databases :** XML Database Solutions **Interactive Graphical Visualizations with SVG :** Vector Graphics to Complement Bitmap Graphics- SVG:An XML standard for Vector Graphics- Creating an Interactive Graphical Visualization

UNIT V

Web Services Building Blocks : SOAP : Introduction to SOAP – Basic SOAP Syntax- Sending SOAP messages – SOAP implementations. **Web Services Building Blocks: WSDL and UDDI :** Introduction to WSDL, Basic WSDL Syntax- SOAP Binding- WSDL implementations **Leveraging XML in Visual Studio.NET :** The .NET Strategy- ADO.NET.

Outcomes:

- Able to develop interactive web pages
- Knowledge about XML documentation
- XML usage is explored by a web service.

Text Books

1. GregBuczek , ASP Developers Guide,Tata McGraw-Hill Edition 2000.
2. Ron Schmelzer, Travis Vandersypen, et al, XML ad Web Services, Pearson Education First Indian Reprint 2002.

Reference Books

1. Alex Homer , David Sussman et al, Professional Active Server Pages 3.0 ,Twelfth Indian Reprint July 2004.
2. Harvey M. Deitel, XML:How to program XML ,Prentice Hall 2001, ISBN:9780130284174
- 3.

11CA321 SYSTEM SIMULATION

Credits: 4:0:0

Course Objectives:

- Elaborate discussion about the system simulation and various types of simulation systems
- To discuss an integrated approach for information management.
- To study the modeling of systems that rely on human factors that possesses a large proportion of uncertainty, such as social, economic or commercial systems.

Unit I:

Introduction to Simulation: Advantages and Disadvantages of Simulation – Areas of Application – Systems And System Environment – Components of A System – Discrete and Continuous System – Models of a System – Types of Models – Discrete Event System Simulation – Steps In Simulation Study. Simulation Examples: Simulation of Queueing Systems– Simulation on Inventory Systems – Other Examples of Simulation.

Unit II

General Principles: Concepts in Discrete-Event Simulation – List processing. Statistical Models in Simulation: Review of Terminology and Concepts – Useful Statistical Models – Discrete Distributions – Continuous Distributions – Poisson Process – Empirical Distributions.

Unit III

Queueing models: Characteristics – Queueing Notation – Long-Run Measures of Performance of Queueing Systems – Steady-State Behaviors of Infinite-Population Markovian Models – Steady-State Behavior of Finite-Population models – Network of Queues-Random-Number Generation: Properties – Generation of Pseudo-Random numbers –Techniques for Generating Random numbers – Tests for Random numbers.

Unit IV

Random-Variate Generation: Inverse Transforms Technique – Acceptance-Rejection Technique. Input Modeling: Data Collection – Identifying the Distribution with Data – Parameter Estimation – Goodness-of-fit tests – Selecting input Models without Data – Multivariate And time-series Input models.

Unit V:

Verification and Validation of simulation Models: Model Building ,verification, and Validation- Verification of Simulation Models-Calibration and Validation of Models-Output Analysis for Single Model: Types of Simulation with respect to Output Analysis-stochastic Nature of Output data- Measures of Performance and their estimation- Output analysis for Terminating Simulations-Output Analysis for Steady –State Simulations.

Outcomes:

- An idea about the system simulation and various types of simulation systems
- Detailed knowledge about integrated approach for information management and the modeling of systems.

Text Book:

Jerry Banks, John S Carson II, Barry L. Nelson, David M. Nicol, Discrete–Event System Simulation, Pearson Education, Fourth Edition, 2007. ISBN: 81-775-8591-6.

Reference Book:

Geoffrey Gordon, System Simulation, Phi Learning Private Ltd, Second Edition, 2009.ISBN: 978-8120301405.

11CA322 COMPUTING TECHNOLOGIES AND CHEMSITRY

Credits: 4:0:0

Course Objectives:

- Deals about the introduction to MS-Office package, Internet fundamentals
- To learn about the fundamentals of Internet

- To discuss about programming fundamentals in C

Unit I:

Getting started - About OS - Types of OS - Introduction to MS-Office Tools and Techniques: Simple exercises using MS-Word, MS-PowerPoint, MS-Excel & MS-Access.

Unit II:

Understanding the Internet - Overview of the Internet - Connect to the net - Internet addresses - Mail.

Unit III:

Introduction to C Programming - Operators and Expressions – Data Input and Output – Preparing and running a complete C program.

Unit IV:

Control Statements: Branching – Looping – Nested Control Structures – The switch, break, continue, comma statements – The goto Statement – Functions: Defining a Function – Accessing a Function – Function Prototypes – Passing Arguments to a Function

Unit V:

Web Site Analysis: Analysis and study of some important websites for applications of Chemistry.

Outcomes:

- Gain knowledge about the basics of MS office package
- Gain ideas about the fundamentals of internet
- Able to write do simple C programs

Text Book

1. Nelson, Office 2007-The Complete Reference, Tata McGraw Hill Publishers, 2007.
2. Harley Hahn, Teaches the Internet, Hayden Books; 2nd Revised edition edition, 2000 ISBN: 978-0789720931.
3. Byron S. Gottfried, Programming With C, Second Edition, Tata McGraw Hill, 2006, ISBN: 0-07-059369

11CA323 ELECTRONIC COMMERCE

Credits: 4:0:0

Course Objectives:

- The scope of e-commerce in the realm of modern business.
- The technologies used to develop and deliver e-commerce applications.
- The marketing methods used in e-commerce.
- The security and implementation aspects of internet marketing.

Unit I:

What is E- Commerce? – Advantages and Limitations of E- Commerce – The Role of Strategy in E- Commerce – Value Chains in E- Commerce – Integrating E – Commerce – Managerial Implications. The Internet and The World Wide Web: The Internet Today – In the beginning – Unique Benefits of the Internet – Searching Online – Bulletin Board Systems (BBSs) and Pay Services – Some Web Fundamentals – The Language of the Internet – Managerial Implications

Unit II:

Launching a Business on the Internet: The Life Cycle Approach – The Business Planning and Strategizing Phase – Hardware, Software, Security, and Setup Phase - The Design Phase – The Marketing Phase – The Fulfillment Phase – The Maintenance and Enhancement Phase. Internet Architecture: What Is a Network? – Information Transfer – Network Hardware – Designing a Network – Managing the Network – Management Implications.

Unit III:

Payment Systems: Getting the Money: From Barter to Money – Requirements for Internet-Based Payments – Electronic Payment Credit Cards, Debit Cards, Smart Cards. ESecurity: Security in Cyberspace – Designing for Security – How Much Risk Can You Afford? – The Virus: Computer Enemy Number One – Security Protection and Recovery – How to Secure Your System.

Unit IV:

Encryption: A Matter of Trust: What Is Encryption? – The Basic Algorithm System – Authentication and Trust – Key Management – Internet Security Protocols and Standards – Other Encryption Issues. Marketing on the Internet: The Pros and Cons of Online Shopping – Internet Marketing Techniques – The E- Cycle of Internet Marketing – Marketing Your Presence – Attracting Customers to Your Site – Tracking Customers – Customer Service –Managing Implication

Unit V:

Implementation and Maintenance: Implementation Strategies – Managing Implementation – Maintenance Strategies – Management Implications. Web-Based Business –to-Business ECommerce: What Is B2B E- Commerce? – B2B Models – B2B Tools – EDI – Beyond B2B:A2Z – Management Applications

Outcomes:

Upon successful course completion, students will be have clear idea of

- Contemporary ecommerce concepts and terminology
- The processes and management decisions that are involved in launching, operating and managing business activity on the World Wide Web.
- Technologies used to deliver e-commerce applications.

Text Book:

1. Elias M. Awad, Electronic Commerce, Prentice-Hall of India, 2003. ISBN: 81-203-2133-2.

Reference Books:

1. Kenneth C. Laudon, Carol Guercio Traver, E-Commerce – Business, Technology, Society, Addison Wesley, Third Edition.2007,ISBN: 0-13-173516-0
2. Henry Chan, Raymond Lee, Tharam Dillon, E-commerce Fundamentals and Applications, John Wiley & Sons-2001, ISBN 978-81-265-1469-4

11CA324 PHP PROGRAMMING**Credit: 3:1:0****Course Objectives:***Academic Information*

- To learn about PHP-a server side scripting language that can be used on a host of web servers and platforms
- Detailed study about the direct connectivity with the relational databases using full featured internal functions
- Developing simple PHP applications using MySQL

Unit I:

Why PHP and MySQL: What is PHP? - What is MySQL - The History of PHP-The History of MySQL - Reasons to Love PHP and MySQL. **Server –Side Web Scripting:** Static HTML - Client-Side Technologies - Server-side scripting - What Is Server-side Scripting Good for - Adding PHP to HTML. **Syntax and Variables:** PHP’s Syntax is C-Like - Comments-Variables - Types in PHP - The simple Types-Output. **Control and Functions:** Boolean Expressions - Branching-Looping – Using Functions -Function Documentation - Defining Your own Functions - Functions and variable Scope - Function Scope

Unit II:

Passing Information between Pages: HTTP is stateless - GET Arguments - A better Use for GET - Style URLs – POST Arguments - Formatting Form Variables - PHP Super global Arrays. **String:** Strings in PHP – String Functions. **Arrays and Array Functions:** The Uses of Arrays - Creating Arrays - Retrieving Values - Multidimensional Arrays - Inspecting Arrays-Deleting from Arrays – Iteration. **Numbers:** Numerical Types - Mathematical Operators - Simple Mathematical Functions - Randomness

Unit III:

Basic PHP Gotchas: Installation Related Problems-Rendering Problems-Failures to Load page-Parse Errors-File Permissions-Missing Includes-Unbound Variables –Overwritten Variables-Function Problems-Math Problems-Time outs. **Object Oriented Programming with PHP:** What is Object –Oriented Programming-Basic PHP Constructs for OOP-Advanced OOP Features-Introspection Functions-Gotchas and Troubleshooting-OOP style in PHP. **Advanced Array Functions:** Transformation of Arrays-Stacks and Queues-Translating between variables and Arrays-Sorting-Printing Functions for Visualizing Arrays. **String and Regular Expression Functions:** Tokenizing and parsing Functions-Why Regular Expressions-Perl-Compatible Regular Expressions-Example-Advanced String Functions.

Unit IV:

File system and System Functions: Understanding PHP File Permissions - File Reading and Writing Functions - File system and Directory Functions - Network Functions - Date and time Functions - Calendar Conversion Functions. **Sessions, Cookies, and HTTP:** What is a Session - Home Grown Alternatives - How session Work in PHP - Sample Session Code - Session Functions - Configuration Issues –Cookies - Sending HTTP Headers - Gotchas and Troubleshooting. **Types and Type Conversions:** Take Round up – Resources - Type Testing - Assignment and Coercion. **Advanced Use of Functions:** Variable Numbers of Arguments-Call-by-Value-Call-by-Reference - Variable Function Names.

Unit V:

Choosing a Database for PHP: What is a Database? Why a Database? Choosing Database - Advanced Features to Look for - PHP Supported Databases - Database Abstraction. **PHP/MYSQL Functions:** Connecting to MySQL - Making MySQL Queries - Fetching Data Sets - Getting Data about Data - Multiple Connections - Building in Error Checking – Creating MySQL Databases with PHP - MySQL Functions. **Displaying Queries in Tables:** HTML Tables and Database Tables - Complex mapping -Creating the sample Tables. **Building Forms from Queries:** TML Forms-Basic Form Submission to a Database - Self Submission - Editing

Course Outcomes:

Students will be able to

- Write PHP code that is syntactically and technically correct
- Apply standards and procedures to code development for it to be easily maintain and extended
- Write PHP code to address a specific technical need or issue in web applications

Text Book:

Tim Converse and Joyce Park with Clark Morgan, PHP 5 and MySQL Bible, Wiley India Pvt.Ltd.,2008,ISBN 10:81-265-0521-4.

Reference Books:

1. W.Jason Gilmore, Beginning PHP and MySQL from Novice to Professional Second Edition, Apress, 2007, ISBN 978-81-8128-673-4.
2. Michael K.Glass,Yann Lee Scourarnec,Elizabeth Naramore,Gary Mailer,Jeremy Stolz,Jason Gerner,Programming PHP,Apache,MySQL Web Development,WILEY, First Edition,2004,ISBN-81-265-0501-X
3. Rasmus Lerdorf and Kevin Tatroe, Programming in PHP, O'Reilly and Associates, 2002.
4. Robert Sheldon, Geoff Moes , My SQL, WILEY, First Edition, 2005, ISBN: 81-265-0592-3.

11CA325 BANKING TECHNOLOGY

Credits: 4:0:0

Course Objectives:

- To study the technology aspects used in banking applications
- Elaborate discussion about the role of wireless networks in financial services
- To discuss about Internet banking, ATMS, Financial Services and VPNs

Unit I:

BANKING: Grab a Ringside Seat for the Best of Banking Technology – Banking Technology in Emerging Markets – Going Global – Systems Issues for Servicing a Global Business – A Brief Case History in Internet Banking – How “Internet Bill Presentment” Changes the Deployment Strategy Home banking on Online Payment.

Unit II:

The Self-Service Revolution: Harnessing the Power of Kiosks and ATMs – Checking It Twice: Check Imaging Systems Offers Greater Flexibility and Efficiency – Internet Banking: Leveling the Playing Field for Community Banks – Straight Talk on SET: Challenges and Opportunities from a Business Perspective.

Unit III:

Technology Trends in Financial Services: Distributed Integration: An Alternative to Data Warehousing – Distributed Solutions in n-Tier Design in the Financial Services Industry – Windows Distributed internet architecture for Financial Services - Customer Profiling for Financial Services – A History of Knowledge-Based Systems in Financial Services

Unit IV:

The Unfolding of Wireless Technology in the Financial Services Industry – Personal Financial Appliances – VPNs for Financial Services – Designing a High- Availability Network Infrastructure – Organizations: Key Issues and Critical Needs – Voice over ATM – Toward a More Perfect Union: The European Monetary Conversion and Its Impact on Information Technology

Unit V:

Multimedia – Based Training (MBT) for financial Services – Law (or the Lack of It) on the Web: A Primer for Financial Services Technology for Online Marketing, Sales and Support of Financial Services.

Course Outcomes:

- Acquire a strong knowledge about the latest technologies in banking industry
- Acquire knowledge to improve efficiency and security in banking industry

Text Book:

Jessica Keyes, Banking Technology Handbook, CRC Press, 1999. ISBN: 08493-9992-0.

Reference Books:

1. Firdos T. Shroff, Modern Banking Technology, Northern Book Centre, 2007
2. Vadlamani Ravi, Advances in Banking Technology and Management: Impacts of Ict And Crm, Information Science Publishing, 2007.

11CA326 SECURITY IN COMPUTING

Credits: 4:0:0

Course Objectives:

- To discuss about various computer security threats
- Elaborate discussion about programs security, database security
- Study of 'secure' behavior on the operation of computers

Unit I:

Security problems in computing: Attacks – Meaning of Computer Security – Computer Criminals – Methods of Defense. Elementary Cryptography: Terminology and background – Substitution ciphers – Transpositions – Encryption algorithms- Data encryption standard -AES Encryption algorithm – Public key encryption – Uses of encryption.

Unit II:

Programs Security: Secure programs – Non malicious program errors – Viruses and other malicious code – Targeted malicious code – Controls against program threats.

Unit III:

Database Security: Introduction to databases – Security requirements – Reliability and integrity – Sensitive data – Inference – Multilevel databases – Proposals for multilevel security.

Unit IV:

Security in Networks: Network concepts – Threats in Network – Network security controls – Firewalls – Intrusion detection systems - Secure E-mail.

Unit V:

Administering Security: Security in planning – Risk analysis – Organizational security policies – Physical Security.

Outcomes:

At the end of the course students will be able to understand

- Planning and exploring the information in a secured manner
- Applying the security methods to the database, programs and applications
- Different security categories

Text Book:

Charles P. Pfleeger, Shari Lawrence Pfleeger, Security in Computing, Pearson Education Asia, Third edition, 2003. ISBN: 81-297-0042-5.

Reference Book:

Rick Lehtinen, Deborah Russell, G.T. Gangemi Sr, Computer Security Basics, Second Edition. O'Reilly ,2007

11CA327 LINUX ADMINISTRATION

Credit: 4:0:0

Course Objectives:

- To learn about Linux operating system that runs on a variety of different platforms.
- Administering a LINUX based client/server
- Discussion about the TCP/IP networking and system configuration basics.

Unit I:

Introduction: Linux's relationship to Unix-Linux and Unix history-Linux distributors-Notation and typographical conventions-Where to go for information-How to find and install software-Essential tasks of the system administrator-System administration under duress. **Booting and Shutting Down:** Bootstrapping-Booting PCS-Boot loaders: LILO and GRUB-Booting single user mode-Startup scripts-Rebooting and shutting down. **Rootly Powers:** Ownership of files and processes-The super user-Choosing a root password-becoming root-other pseudo-users.

Unit II:

Controlling Processes: Components of a process-The life cycle of a process-signals-process states-Runaway processes. **The File System:** Pathnames-Mounting and unmounting file systems-the organization of the file tree-File Types-File attributes. **Adding New Users:** The/etc/passwd file-The/etc/shadow file-The /etc/group file-Adding users-Removing users.

Unit III:

Serial Devices: Serial standards –Alternative connectors-Hard and soft carrier-Hardware flow control-Cable length-Serial device files-setserial-Software configuration for serial devices-Configuration of hardwired terminals-Special characters and the terminal driver-How to unweedge a terminal-Modems-Debugging a serial line-other common I/O ports. **Adding a Disk:** Disk interfaces-Disk geometry-An overview of the disk installation procedure-The ext2 and ext3 file systems-fsck: check and repair file systems-Adding a disk to Linux. **Periodic Processes:** cron: schedule commands-The format of crontab files-Crontab management-Some common users for cron.

Unit IV:

Backups : Motherhood and apple pie – Backup devices and media – Setting up an increment backup regime with dump – Restoring from dumps with restore – Dumping and restoring for upgrades – Using other archiving programs – Using multiple files on a single tape – Amanda - Commercial backup products. **Syslog and log files :** Logging policies – Linux log files – logrotate – Syslog – Condensing log files to useful information. **Drivers and the Kernel:** Kernel adaption – Why configure the kernel? – Configuration methods – Tuning a Linux Kernel – Adding a device driver – Device files – Loadable kernel modules – Building a Linux Kernel

Unit V:

The Network File System: General information about NFS – Server side NFS – Client – side NFS – Automating mounting – automount – amd. **Sharing System Files** – Copying Files around NIS, NIS+, LDAP. **Network Management and Debugging** – Trouble shooting a Network – Ping, Trace Route, Net Stat, Packets Sniffers, Network Management Protocol, SNMP, The NET-SMNP, Network Management Applications. **Cooperating with windows:** File and Print Sharing – Secure terminal emulation with SSH – X windows emulators – PC mail clients – PC backups – Dual booting – Running Windows application under Linux – PC hardware.

Course Outcomes:

Students will have detailed information about

- The efficient use of linux in productive environment
- Linux Networking
- Various linux distributions

Text Book

Evi Nemeth, Garth Snyder and Trent R. Hein, Linux Administration Handbook, Prentice – Hall of India, 2002.

Reference Book

Christopher, Red Hat Linux 9 Bible, Wiley Publishing, 2003.

11CA328 GRID COMPUTING AND APPLICATIONS

Credits: 4:0:0

Course Objectives:

- To know about grid and the distributed computing resources available over a local or wide area network that appears to an end user or application as one large virtual computing system.
- To discuss about grid computing by applying the resources of many computers in a network to a single problem at the same time.
- To learn about the grid computing parameters such as load balancing, cost effectiveness, pervasive computing.

Unit I: Basic values of grid computing: Introduction

Business values – Risk Analysis – Grid market place. Grid Computing Technology – An Overview: Introduction – History – High performance computing – Cluster computing – Peer-to-Peer Computing – Internet Computing – Grid Computing Model – Grid Protocols – Globus Toolkit – Open Grid Services Architecture - Types of Grids

Unit II: Desktop Grids:

Introduction – Background – Grid value proposition – Challenges – Suitability – Grid Server– Role of Desktop grids in an enterprise computing infrastructure – Practical uses of desktop grids.
Cluster Grids: Introduction – Clusters – Industry Examples – Cluster grids.

Unit III: HPC Grids:

Introduction – Five steps to scientific insight – Applications and Architectures – HPC application development environment – Production HPC Reinvented – HPC Grids. **Data Grids:** Introduction – Data grids – Alternatives to data grids – Avaki data grid – Data grid architecture.

Unit IV: The Open Grid Architecture:

Introduction – An analogy for OGSA – the evolution of OGSA – OGSA overview – Building on the OGSA Platform – Implementing OGSA based grids. **Creating and Managing Grid Services:** Introduction – Services and the grid – Converting existing software – Service discovery – Operational requirements – Tools and Toolkits – Support in UDDI – UDDI and OGSA.

Unit V:

Desktop Supercomputing: Native programming for grids – Grid-Enabling Software Applications – Managing Grid Environments – Grid computing adoption in Research and Industry.

Outcomes:

- To promote the distributed applications in resource efficient manner
- To develop real-time applications using Grid environment

Text Book:

Ahmar Abbas, GRID Computing: A Practical guide to technology and applications, Firewall Media, 2008. ISBN: 81-7008-626-4.

Reference Book:

Janakiram D. Grid Computing -a Research Monograph, TATA McGraw-Hill Publications, 2005

11CA329 AJAX PROGRAMMING USING ASP.NET

Credits: 3:1:0

Course Objectives:

- To gain experience about a strong comprehension of the new concepts and development techniques that ASP.NET AJAX brings to ASP.NET
- To help students to understand the AJAX features and techniques

Unit I:

ASP.NET AJAX Basics – Introducing ASP.NET AJAX: What is Ajax?- ASP.NET AJAX architecture - ASP.NET AJAX in action. **First Steps with the Microsoft Ajax library:** A quick overview of the library – The Application model – Working with the DOM – Making development with JavaScript easier. **JavaScript for Ajax Developers:** Working with objects – Working with JSON – Classes in JavaScript – Understanding inheritance – Understanding interfaces and enumerations – Using type reflection – Working with events.

Unit II:

Exploring the Ajax server extensions: Ajax for ASP.NET developers – Enhancing an existing ASP.NET site – ScriptManager: the brains of an Ajax page – Partial-page updates. **Making asynchronous network calls:** Working with ASP.NET Web Services – The asynchronous communication layer – Consuming external Web Services – Using ASP.NET application services. **Partial-page rendering with UpdatePanels:** With great power comes great responsibility – Getting to know the UpdatePanel – Triggers – Advanced techniques – Live GridView filter.

Unit III:

ADVANCED Techniques-Under the hood of the UpdatePanel: The PageRequestManager: The unsung hero – A client-side event viewer – UpdatePanel cookbook – Caveats and limitations. **ASP.NET AJAX client components:** The client component model – Working with client components – Behaviors – Controls.

Unit IV:

Building Ajax-enabled controls: Script descriptors – Introduction to Ajax-enabled controls – Extenders - Script controls. **Developing with the Ajax Control Toolkit:** A world of extenders – The Ajax Control Toolkit API – Animations.

Unit V

ASP.NET AJAX Futures - XML Script: XML Script basics – Actions – Bindings **Dragging and dropping:** The drag-and-drop engine – A drag-and-drop shopping cart.

Outcomes:

- Students will be able to use AJAX features and techniques in web development

Text Book

Alessandro Gallo, David Barkol, Rama Krishna Vavilala, ASP.NET AJAX IN ACTION. Dreamtech Press, 2008. ISBN 10: 81-7722-778-5, ISBN 13: 978-81-77-22-778-9

Reference Book:

Christian Wenz, Programming ASP.Net AJAX, O'Reilly, First Indian Reprint, 2007. ISBN 10: 81-8404-383-X, ISBN 13: 978-81-8404-383-9.

11CA330 AD HOC NETWORKS**Credit: 4:0:0****Course Objective:**

- To gain adequate knowledge about the various protocols in ad hoc networks
- To develop and demonstrate a complete system of ad hoc networking that paves the way to new technologies, and applications for the future benefit of the research community and telecommunications Industry.
- To know the current technology trends for the implementation and deployment of wireless ad-hoc networks.

Unit I:

Ad Hoc Networking: An Introduction- Model of operation- Commercial Applications of Ad Hoc Networking- Technical and market Factors affecting Ad Hoc Networks – **A DoD Perspective on Mobile Ad Hoc Networks:** The Past- The Present- The Future.

Unit II:

DSDV: Routing over a Multihop Wireless Network of Mobile Computers: Introduction-overview of Routing Methods- Destination-Sequenced Distance Vector Protocol- Examples of DSDV in Operation- properties of DSDV Protocol- Comparison with other Methods- **Cluster-Based Networks:** Clustering for Transmission Management- Clustering for Backbone Formation- Clustering for Routing Efficiency.

Unit III:

DSR: The Dynamic Source Routing Protocol for Multihop Wireless Ad Hoc Networks: DSR Protocol Description- Overview and Important Properties-DSR Evaluation- **The Ad Hoc On-Demand Distance-Vector Protocol:** AODV Properties-Unicast Route Establishment- Multicast Route Establishment-Broadcast- Simulations-Optimizations and Enhancements.

Unit IV:

A Hybrid Framework for Routing in Ad Hoc Network: The Communication Environment and the RWN Model-The Zone Routing Protocol- ZRP-Formal Description-Evaluation of ZRP- Performance Results. **Link Reversal Routing:** The Gafni-Bertsekas Algorithm-The lightweight Mobile Routing Algorithm- The Temporally Ordered Routing Algorithm-Comparison of LRR Algorithms.

Unit V:

The Effects of Beaconing on the Battery Life of Ad Hoc Mobile Computers: Ad Hoc Wireless Networks-Associativity Based on Routing-Effects of Beaconing on Battery Life- Experimental Results and Observations-Beaconing with Neighbouring Nodes at Low **Bandwidth-Efficient Link-State Routing in Wireless Networks:** Updating Routes in Wireless Networks-STAR Description-Performance Evaluation.

Course Outcomes:

- Gain adequate knowledge about the fundamentals of ad hoc network technologies, protocols and realizations.
- Ability to develop a new routing protocol in ad hoc networks
- Gain adequate knowledge in designing MAC, routing and transport protocols for wireless ad-hoc networks

Text Book:

1. Charles E.Perkings, Ad Hoc Networking, Addison-Wesley, 2008, ISBN: 978-81-317-2096-

Reference Book:

1. C.K Toh, Ad Hoc Mobile Wireless Networks, 2007, Pearson Education, Inc. ISBN: 81-317-1510-8.
2. C. Siva Ram Murthy and B.S Manoj, Ad Hoc Wireless Networks Architectures and Protocols, Pearson Education, 2008. ISBN-978-81-317-0688

11CA331 NETWORK ANALYSIS, ARCHITECTURE, AND DESIGN**Credits: 4:0:0****Course Objectives:**

- To provide students with a comprehensive and structured view of network design from a theoretical and a practical perspective.
- Presents basic principles and methods for developing traffic characterization and optimization models for a subset of network design problems.
- It also aims at helping students to understand recent advances and to be exposed to research problems in network design.

Unit I: Introduction – Overview of Analysis, Architecture, and Design Processes – System Description – Service Description – Service Characteristics – Performance Characteristics

Requirement Analysis: Concepts – User Requirements – Application Requirements – Device Requirements – Network Requirements – The Requirement Specifications and Map.

Unit II: Requirement Analysis: Process – Gathering and Listing Requirements – Developing Service Metrics – Characterizing Behavior – Developing RMA Requirements – Developing Delay Requirements – Developing **Capacity Requirements** – Developing Supplemental Performance Requirements – Requirements for Predictable and Guaranteed Performance – Requirements Mapping – Developing the Requirements Specification.

Unit III: Flow Analysis: Flows – Identifying and Developing Flows – Data Sources and Sinks – Flow Models – Flow Prioritization – The Flow Specification. **Network Architecture:** Component Architecture – Reference Architecture – Architecture Models – Systems and Network Architectures.

Unit IV: Network Management Architecture: Defining Network Management – Network Management Mechanisms – Architectural Considerations. **Performance Architecture:** Developing Goals for Performance – Performance Mechanisms – Architectural Considerations.

Security and Privacy Architecture: Developing a Security and Privacy Plan – Security and Privacy Administration – Security and Privacy Mechanisms.

Unit V: Network Design: Design Concepts – Design Process – vendor, Equipment, and Service-Provider Evaluations – Network Layout – Design Traceability – Design Metrics.

Course Outcomes:

Upon completing this course, one should be able to:

- Become familiar with gathering, deriving, and defining real network requirements.
- Determine how and where addressing and routing, security, network management, and performance are implemented in the network.
- Evaluate and choose different network technologies.
- Determine where to apply performance mechanisms, including quality of service, service level agreements, and policies in the network.

Text Book:

McCabe James , Network Analysis, Architecture, and Design, Third Edition (2007). Morgan Kaufmann Publishers. An imprint of Elsevier Science, San Francisco, CA 94104-3205, USA, ISBN: 978-0-12-370480-1.

References:

1. William Stallings, Computer Networking with Internet Protocols and Technology, Pearson Prentice Hall, 2004, ISBN: 0-13-141098-9.

11CA332 PROGRAMMING IN JavaME**Credit: 4:0:0****Course Objectives:**

- To program mobile telephones using Java Technology
- To understand Mobile Information Device Profile (MIDP) and advanced concepts
- To acquire knowledge about networking using J2ME

Unit I:

Introduction: Understanding J2ME – Configuration – Profiles – Anatomy of MIDP applications – Advantages of MIDP – Building MIDlets – J2ME Development Environment – J2ME Architecture.

Unit II:

J2ME User Interface: Items and Event Processing – Command - **High Level Display: Creating a User Interface** – Lists and Forms - **Low Level Display: The Canvas Class**

Unit III:

Persistent Storage: MIDP Record Store – File Connection and PIM API

Unit IV:

J2ME Networking: Generic Connection Framework – Connection types – Wireless Messaging API - SMS – WMA API.

Unit V:

J2ME Networking: Bluetooth and OBEX – Protecting Network Data- **Multimedia-** sound, voice Video: MMAPI

Course Outcomes:

- Ability to integrate J2ME client applications with server-side applications.
- Enable to build and deploy J2ME based solutions.
- Enable to do mobile networking using J2ME techniques

Text Book:

1. Sing Li and Jonathan Knudsen, Beginning J2ME from Novice to Professional, Springer (India) Pvt. Ltd., 2006. ISBN 81-8128-292-2

Reference Books:

1. James Koegh, J2ME – The Complete Reference, Tata McGraw Hill Edition, 2003. ISBN : 0 -07-053415-2
2. Kim Topley, J2ME – In a Nutshell, O’Reilly publications, 2002. ISBN: 81-7366-343-2.

11CA333 NEURAL NETWORKS AND ITS APPLICATIONS

Credits: 3:0:0

Course Objectives:

- To introduce the basic concepts of Neural Networks
- To explore in pattern classification pattern association and back propagation
- To introduce back propagation architecture, algorithm and applications

Unit 1: Introduction – Neural Net – Applications of Neural Net – Uses of Neural Networks – History of Neural Networks – Architecture, Algorithm and Applications of Neural Net – the McCulloch Pitt Neuron.

Unit II: Simple Neural Nets for Pattern Classification: HebbNet – Perception – Adaline.
Pattern Association: Training Algorithm for Pattern Association – Hetroassociative Memory Neural Network – Autoassociative Net – Iterative Autoassociative Net – Bidirectional Associative Memory (BAM).

Unit III: Neural Networks Based on Competition: Fixed –Weight Competitive Nets – Kohonen Self – Organizing Maps – Learning Vector Quantization – Counter propagation.

Unit IV: Adaptive Resonance Theory: Introduction: Motivation – Basic Architecture – Basic Operation – ART1: Architecture – Algorithm – Applications – Analysis - ART2: Architecture – Algorithm – Applications – Analysis.

Unit V: Back Propagation Neural Net: Standard Back propagation: Architecture – Algorithm – Applications – Variation: Alternative Weight Update Procedures – Alternative Activation Functions – Strictly Local Back Propagation – Number of Hidden Layers.

A Sampler of other Neural Nets: Fixed Weight Nets for Constrained Optimization: Boltzmann Machine – Continuous Hopfield – Gaussian Machine – Cauchy Machine.

Course Outcomes:

- Gain adequate knowledge about the algorithms and theories of neural networks and applications
- Understand and use the appropriate Application of Neural Networks (ANN) methods and tools for specifying, designing, implementing neural network systems.
- Have a good knowledge of several types of ANN models.

Text Book:

Laurene Fausett, Fundamentals of Neural Networks Architecture, Algorithms, and Applications, Pearsons Education, 2005

Reference Books:

1. Simon Haykin, Neural Networks , Pearsons Education,2007
2. James A Freeman and Davis Skapura, Neural Networks, Pearson Education, 2002.

11CA334 NETWORK MANAGEMENT

Credits: 4:0:0

Course Objectives:

- To understand the fundamental concepts of network management
- To study network management protocols and Applications
- To familiarize with network management standards, models, tools and systems

Unit I

Introduction- Analogy of telephone network management- Data and Telecommunication network-Distributed Computing Environments-TCP/IP Based Networks-Communication Protocols and standards-Network Management: Goals, Organization and Functions-Network Management System Platform

Unit II

Basic Foundations: Standards, Models and Language: Network Management Standards, Network Management Model, Organization Model, Communication Model. **SNMPv1 Network Management Organization and Information Model:** History of SNMP Management, SNMP Model, Organization Model, System Overview, The Information Model

Unit III

SNMPv1 Network Management: Communication and Functional Models: The SNMP Communication Model, SNMP Architecture, Administrative Model, SNMP Protocol Specifications, SNMP Operations, SNMP MIB Group. **SNMP Management: SNMPv2:** SNMPv2 System Architecture, SNMPv2 Structure of Management Information, SNMPv2 Management Information Base, SNMPv2 Protocol.

Unit IV

Network Management Tools: Bit Error Rate Tester, Basic Software Tools, SNMP MIB Tools, The Protocol Analyzer. Network Statistics Measurement Systems. Network Management Systems: Functional Components, Multiple NMS Configurations, Network Management System Requirements

Unit V

Configuration Management, Fault Management, Performance Management, Event Correlation Techniques, Security Management

Outcomes:

- Able to manage the operation of modern data communication networks
- Enable to acquire depth knowledge about SNMP protocols, Remote monitoring and web management
- Able to manage network using network management tools and systems

Text Book

Mani Subramanian, Network Management Principles and Practice, Addison Wesley, 2000. ISBN: 81-7808-595-X

Reference Books

1. Stephen B. Morris, Network Management, MIBs and MPLS: Principles Design and Implementation, Pearson, 2003. ISBN-10:0131011138

2. Sebastian Abeck, Adrian Farrel, Network Management Know it all, Elsevier Morgan Kaufmann, 2008.

11CA335 SATELLITE COMMUNICATIONS

Credit: 3:0:0

Course Objectives:

- To understand operation of satellite systems
- To learn about the basic theory of digital radio transmission.
- To acquire knowledge in satellite applications and services

Unit I:

Introduction: Kepler's three laws of planetary Motion-Orbital Parameters-Orbital Perturbations-Orbit Types (LEO, MEO, GSO) – Regulatory Service.

Unit II:

Satellite Links: Transmission Losses – **Link power Budget calculation** – uplink – downlink – C/N ratio – Rain effects

Unit III:

Earth Station: Earth Station General Block diagram – Transmitter and Receiver – Antennas – Tracking system

Unit IV:

Satellite Access: Voice, data, video Transmission system – **Multiple Access Techniques:** FDMA – TDMA – CDMA -SPADE

Unit V:

Satellite Applications and services: Services: INTELSAT – INSAT-U.S DOMSAT-VSAT-GSM-GPS **Applications:** E-Mail – Mobile Services – Video Conferencing and Internet – DTH (cable TV) – Navigation – Remote Sensing.

Outcomes:

- Gain knowledge the satellite access, its applications and services
- Ability to discuss launch methods and technologies depending upon the orbital mechanic and characteristics of common orbits.
- Gains adequate knowledge about satellite access and multiple access techniques

Text Book:

1. Dennis Roddy, Satellite Communications, Mc Graw-Hill International, IIIrd Edition, 2001.

References:

1. Frenzel, Communication Electronics – Principles and Applications, IIIrd Edition, Tata McGraw Hill, 2008 Reprint
2. Wilbur L. Pritchard and Joseph A Sciulli, Satellite Communication Systems Engineering, Pearson Education, 2003.
3. Timothy Pratt and Charles W. Bostian, Satellite Communication, John Wiley and Sons, 2005.

11CA336 VIRTUAL PRIVATE NETWORKS

Credits: 3:0:0

Course Objective:

- To explain the role of a VPN that may perform in a security posture of an organization
- To analyze security requirements of an organization and to recommend an appropriate technical solution for a VPN
- To configure VPNs using diverse equipments such as routers, firewalls, clients and dedicated VPN termination equipment

UNIT I:

Introduction to VPN Technology: History of VPN – Components of VPN – Support and Growth of VPN – Needs for VPN in Organization and Business.

UNIT II:

Introduction to VPN Technology: VPN Architecture – Topologies of VPNs – Government restrictions on VPN Technology.

UNIT III:

VPN Implementation: The Basics – Installing a VPN – Troubleshooting VPN's.

UNIT IV:

The Security of VPN's: Cryptography – Encryption – Secure communication and Authentication – VPN operating System

UNIT V:

The Security of VPN's: VPN Security Attacks – Security toolset – Intrusion Detection and Security Scanning – Emerging Technologies for VPN's

Course Outcomes:

- Enable to configure VPNs using diverse equipment such as routers, firewalls, clients and dedicated VPN termination equipment
- Ability to configure a VPN solution using a Certificate Authority and digital certificates

Text Book

1. Steven Brown, Implementing Virtual Private Networks, Tata McGraw-Hill Edition 2000. ISBN 0 – 07 – 463780 -0

Reference Books

1. William Stallings, Cryptography and Network Security, Pearson Education, Second Edition, 2002. ISBN – 81-7808-605-0
2. Marcus Goncalves, Firewalls – A Complete Guide, Tata McGraw-Hill, 2000. ISBN 0-07-463972-2

11CA337 WIRELESS LAN

Credit 3:0:0

Course Objectives:

- To know about the network components of WLAN
- To know about the MAC Layer and frame types of the network
- To know about the authentication protocols of wireless networks
- To know about the installation and analysis procedures of the network

Unit I

Overview of 802.11 Networks: IEEE 802 Network Technology Family Tree- 802.11 Nomenclature and Design- 802.11 Network operations – Mobility Support. 802.11 MAC: – Challenges for the MAC –Mac Address modes and timing, Contention Based Access using DCF- Fragmentation and Reassembly, Frame Format, Encapsulation of Higher Layer Protocols, Contention based data Service

Unit II

Wired Equivalent Privacy: Cryptographic Background to WEP-WEP cryptographic operations- Problems with WEP –Extensible Authentication Protocol, 802.1x :Network Port Authentication 802.1x on Wireless LANs, Management Operations: Management Architecture- Scanning-Authentication- Association –Power Conservation-Timer Synchronization

Unit III

Contention Free Service with PCF : Contention Free Access using PCF –Detailed PCF Framing Power Management and PCF. Physical Layer Overview: Physical Layer Architecture, The Radio Link, RF and 802.11. Using 802.11 Access Points: General Functions of an Access point- ORiNOCO AP-1000 Access point-Nokia A032 Access point

Unit IV

802.11 Network Analysis: Use of Network Analyser-Network Analysers-Commercial Network Analyser, Ethereal, 802.11 Network Analysis Examples- AirSnort

Unit V

Network Deployment : The Topology Archetype-Project Planning-Site Survey-Installation. 802.11 Performance Tuning-Tuning Radio Management, Tuning Power Management, Timing Operations, Physical Operations, Tunable Parameters

Outcomes:

- Students learn about the working of 802.11 protocol
- Students learn about the security issues of WLAN
- Students learn to deploy and maintain wireless LAN network

Text Book:

Mathew S Gast, 802.11 Wireless Networks, The definitive Guide, O 'Reilly & Associates, 2002, ISBN 81-7366-442-0

Reference Books:

Neil Reid and Ron Seide, 802.1 wi-fi Networking Handbook, Tata McGraw-Hill,2003 ISBN 0-07-053143-9

11CA338 CLOUD COMPUTING**Credits: 4:0:0****Course Objectives:**

- To guide the student for building a virtualized -computing infrastructure using open source software.
- To urge the knowledge of the students in the area of cloud-oriented environments such as high-speed access to the internet, secure data storage, and various standardizations.
- To know about various applications of cloud computing

Unit I:

Introduction- The emergence of cloud computing- cloud-based service offerings-Grid computing or cloud computing-Cloud model reliability- benefits of using a cloud model-key characteristics of cloud computing-challenges for the cloud- The evolution of cloud computing:- Hardware evolution- Internet software evolution-server virtualization.

Unit II:

Web Services Delivered from the cloud: Communication-as-a-Service-infrastructure-as-a-Service-Monitoring-as-a-Service-Platform-as-a-Service-Software-as-a-Service Building Cloud Networks- The evolution from the MSP Model to cloud computing and software-as-a service- The cloud data center- collaboration- service-oriented Architectures as a step toward cloud computing- Basic approach to a Data center-based SOA-The role of Open source software in Data centers- Where Open source software is used.

Unit III:

Federation, Presence, identity, and Privacy in the Cloud: Federation in the cloud-Presence in the cloud- Privacy and its Relation to the Cloud-based Information Systems- Security in the cloud: Cloud Security Challenges-Software-as-a-Service Security

Unit IV:

Common Standards in cloud computing: The open Cloud Consortium-The distributed management Task force-Standards for Application Developers-Standards for Messaging-standards for security.

Unit V:

End-user Access to cloud computing: YouTube-YouTube API Overview – Zimbra-Facebook-Zoho-DimDim Collaboration- Mobile Internet Devices and the cloud:- Smartphone- Mobile Operating systems for smartphones-Mobile Platform Virtualization- Collaboration Applications for Mobile Platforms.

Outcomes:

- Students will be oriented to innovate the cloud services depends ultimately on acceptance of the application by the user community.
- Students will be intent to provide the transition from fixed devices connected to the internet to the new mobile device-empowered Internet.
- Gains adequate knowledge about the essential techniques in cloud computing

Text Book:

1. W. Rittinghouse, James F.Ransome ,Cloud Computing – Implementation, Management & Security, John, CRC Press, 2010, ISBN: 978-1-4398-0680-7.

Reference Books:

1. Judith Hurich, Robin Bloor, Marcia Kaufman, Fern Halper, Cloud Computing for Dummies, Wiley Publication inc., 2010.
2. George REESE, Cloud Application Architectures, O'REILLY,2009.
3. Tim Mather, Subra Kumarasamy, shahed Latif, Cloud Security and Privacy, O'REILLY, 2009.

11CA339 RESEARCH METHODOLOGY

Credits 4:0:0

Course Objectives:

- To describe the steps involved in research process
- To learn how to formalize research problems
- To impart knowledge on Plagiarism

UNIT I

Research - Application of Research – Definition and characteristic of Research - Types of Research-Paradigm of Research – Research Process: an eight step model

UNIT II

Formulating a Research problem – Reviewing the literature – Formulating a research problem – identifying variables – constructing hypothesis - Research Design – selecting a study design

UNIT III

Data Collection – selecting a method of data collection – collecting data considering ethical issues: research participants – researchers – sponsoring organization - Collection of – preprocessing the data – displaying the data

UNIT IV

Definition – Forms of Plagiarism – Consequences of Plagiarism- Unintentional Plagiarism- Copyright - Infringement-Collaborative work

UNIT V

Research proposal – preamble / introduction – problem and objective of the study – hypotheses to be tested – study design – setting – measurement procedures – sampling – analysis of data – structure of the report – problems and limitations – work schedule

Outcomes:

- Familiarize the research process and data collection techniques
- Enables to formulate the research problem
- Gains thorough knowledge on research proposal writing

Text Books:

1. Joseph Gibaldi - MLA Handbook for Writers of Research Papers – Sixth Edition – The Modern Language Association of America, 2003
2. Ranjit Kumar, Research Methodology: A Step by step guide for Beginners, 2008 Second Edition,Pearson Education

Reference Books:

1. Wayne Goddard & Stuart Melville, Research Methodology – An Introduction
2. Krishnaswamy, K.N., Sivakumar, Appa Iyer and Mathiranjani M, Management Research Methodology; Integration of Principles, Methods and Techniques, Pearson Education, New Delhi, 2006
3. Paneer Selvam, “Research Methodology”, Prentice Hall of India Pvt. Ltd / Pearson Education, 2007.
4. Dipak Kumar Bhattacharyya, Research Methodology Excel Books 2006

11CA340 ADVANCED DATA MINING**Credits: 4:0:0****Course Objectives:**

- To give an insight about advanced data mining concepts with research perspective
- Detailed discussion about computational approaches to data modeling (finding patterns), data cleaning, and data reduction of high-dimensional large databases.
- To inculcate the applications of mining

Unit I:

Introduction: Data Mining – Functionalities – Classification of data mining systems – Major issues in data mining.. **Mining frequent patterns, Associations, and Correlations:** basic concepts and a Road map, Efficient and Scalable Frequent Itemset Mining Methods- Mining various kinds of Association rules, From Association Mining to Correlation Analysis- Constraint-Based Association Mining.

Unit II:

Classification and Prediction: Issues regarding classification and prediction-classification by decision tree induction-Bayesian classification-Rule based classification-Other classification methods-Prediction

Unit III:

Cluster Analysis-Types of data in cluster analysis-A Categorization of major clustering methods-Partitioning methods, Hierarchical methods, Density-based methods, Grid-Based methods, Outlier analysis

Unit IV:

Mining Stream, time-series, and Sequence Data: Mining Data Streams- Mining time series data- Mining Sequence Patterns in Transactional Databases- Mining sequence patterns in biological data.

Unit V:

Mining Object, Spatial, Multimedia, text and web data: Multidimensional analysis and descriptive mining of complex data objects, spatial data mining, multimedia data mining, text mining, mining the world wide web. **Applications and Trends in Data Mining:** Data mining applications, Data Mining System products and research prototypes, Additional themes on data mining- Social impacts of data mining- trends in data mining

Course Outcome:

- Will be useful in taking up research work in advanced data mining technologies

Text Book:

Jiawei Han, Micheline Kamber, Data Mining – Concepts and Techniques, Morgan Kaufmann Publishers, Second Edition, 2006. Indian reprint ISBN-13:978-81-312-0535-8.

Reference Books:

1. David Hand, Heikki Mannila, Padhraic Smyth, Principles of Data Mining, A Bradford Book, The MIT Press, Cambridge, Massachusetts London, England, 2001. ISBN: 0-262-08290-X.
2. Michael J A Berry, Gordon S Linoff, Data Mining Techniques, Wiley Publishing inc, Second Edition, 2004. ISBN: 81-265-0517-6.

11CA341 INTERNETWORKING

Credits 4:0:0

Course Objectives:

- To focus on the concept of internetworking and TCP/IP internet technology.
- To review the architecture of network interconnections and principles of protocols.
- To study the limitations of the internet approach.

Unit I

Introduction and overview-Review of underlying network technology-Internetworking concept and Architectural model-Classful Internet addresses- Mapping Internet Addresses to physical addresses.

Unit II

Internet protocol: connectionless datagram delivery-Internet protocol: forwarding IP datagrams-Internet protocol: Error and control messages

Unit III

Classless and Subnet Address Extensions: Subnets, User Datagram Protocol-Reliable Stream Transport Service

Unit IV

Routing Architecture: Cores, Peers and Algorithms, Internet Multicasting-IP Switching and MPLS-Mobile IP-Private Network Interconnection:VPN

Unit V

The Domain Name System-Remote Login and Desktop-File Transfer and Access: FTP – Electronic mail -World Wide Web.

Outcomes:

- Able to explain common networking concepts and terminology.
- Enabled to describe the operation of the major transport layer protocols.
- Posses Knowledge to describe architecture of the internet.

Text Book:

1. Douglas E. Comer, Internetworking with TCP/IP – Principles, Protocols and Architecture, Pearson Education, Fifth Edition, 2006, ISBN: 81-203-2998-8.

Reference Books:

1. W. Richard Stevens, TCP/IP Illustrated Volume – I, The Protocols, Pearson Education, 2000, ISBN: 81-7808-101-6.
2. Charles M. Kozierok, The TCP/IP guide: a comprehensive, illustrated Internet protocols reference, No starch Press Inc. 2005, ISBN: 1-59327-047-x.
3. Behrouz A. Forouzan, TCP/IP protocol suite, Third Edition, McGraw Hill, 2005, ISBN: 0071115838

11CA342 PROGRAMMING IN C LAB

Credit: 0:0:2

Course Objectives:

- To make the students to understand the concepts of C Language and motivate them to develop the Coding.

List of Experiments:

1. Usage of input / output library functions
2. Usage of Operators
3. Usage of Branching Control Structures
4. Usage of Looping Control Structures
5. Usage of User Defined Functions
6. Pointers and Functions
7. Usage of One Dimensional Arrays
8. Usage of Two Dimensional Arrays
9. Arrays and Functions.
10. Array of Structures
11. Input & Output using Files
12. Files and Structures.

Outcomes:

The students are come up with the knowledge about

- Usage of Input/Output library functions, operators, branching and looping control structures, user defined functions, one dimensional and two dimensional arrays, pointers and dynamic memory allocation, structures and functions in C program

11CA343 FRONT END LAB

Credits: 0:0:2

Course Objectives:

- To give the student experience in writing simple programs, thereby developing skills in the principles of program methodology, design, coding, and debugging of graphical-user-interface applications.

- To introduce the student to Visual Basic .NET as an object-based, event-driven programming language

List of Experiments:

1. Basic Controls
2. Constants and Variables
3. Decision and Conditions
4. Multiple Forms
5. List Box and Combo Box

6. Graphics
7. Application with Menu
8. Usage of class modules
9. Creating a user Control
10. Database connectivity using data controls
11. Database connectivity using disconnected data access
12. Billing system

Outcomes:

Upon successful completion of the course, the student should be able to

- Demonstrate skills in using an interactive development and debugging environment to create programs having a graphical user interface
- Demonstrate skills in the use of objects, controls, events, constants, variables, properties, and methods
- Demonstrate a basic understanding of the methods and tools using objects to access information store in databases.

11CA344 DATABASE SYSTEMS LAB

Credits: 0:0:2

Course Objectives:

- To impart students with the knowledge of database system by using DDL and DML statements
- To facilitate students to understand the concept of sub queries, multiple sub queries and

List of Experiments

1. Usage of DDL Commands
2. Usage of DML commands
3. Usage of TCL commands
4. Multiple sub queries
5. Object creation
6. Array Manipulation
7. Correlated Sub queries
8. Aggregate functions
9. Integrity constraints
10. Triggers
11. PL/SQL operations
12. Procedures and Functions

Outcomes:

- The students will be able to write queries in DDL and DML statements
- Students will have an understanding of sub queries and multiple sub queries.
- Students will be able to perform normalization for all tables which they store it in database.
-

11CA345 DATA STRUCTURES LAB

Credits: 0:0:2

Course Objectives:

- To develop skills to design and analyze simple linear and non linear data structures
- To Strengthen the ability to identify and apply the suitable data structure for the given real world problem
- To Gain knowledge in practical applications of data structures

List of Experiments:

1. Implementation of Singly linked list.
2. Implementation of Doubly linked list.
3. Implementation of Multistack in a Single Array.
4. Implementation of Circular Queue
5. Implementation of Binary Search trees.
6. Implementation of Hash table.
7. Implementation of Heaps.
8. Implementation of Breadth First Search Techniques.
9. Implementation of Depth First Search Techniques.
10. Implementation of Prim's Algorithm.
11. Implementation of Dijkstra's Algorithm.
12. Implementation of Kruskal's Algorithm
13. Implementation of MergeSort
14. Implementation of QuickSort
15. Implementation of Data Searching using divide and conquer technique

Outcomes:

At the end of this lab session, the student will

- Be able to design and analyze the time and space efficiency of the data structure
- Be capable to identify the appropriate data structure for given problem
- Have practical knowledge on the application of data structures

11CA346 PROGRAMMING IN C++ LAB

Credits: 0:0:2

Course Objectives

- To implement the object oriented concepts to solve problems
- To develop an application applying the object oriented concepts

List of Experiments:

1. Classes and Objects
2. Constructors and Destructor
3. Static Members and Constant Methods
4. Aggregation and Inline Functions
5. Dynamic Memory Management

6. 'this' pointer
7. Function Overloading
8. Operator Overloading
9. Inheritance
10. Complete Class diagram (case study) implementation
11. Abstract Class, Overriding and Dynamic Binding
12. File Handling
13. Function Template
14. Class Template

Outcomes:

- Students will be able to implement object oriented concepts to solve problems
- Students will be able to develop applications using object oriented concepts

11CA347 JAVA PROGRAMMING LAB

Credits: 0:0:2

Course Objective:

- To develop software development skills in java programming.

List of Experiments:

I. Campus Management System

1. Maintaining Student Information Using Classes and Objects
2. Maintaining Student Information Using Array of Objects
3. Maintaining Students Personal and Academic Information Using Inheritance and Method Overriding
4. Maintaining Student Personal and Academic Information Using Packages
5. User Defined Exception and Packages for Staff Salary Details.
6. Passing the study material (File) from staff to student through networking.

II. Gas Automation System

7. Creating Frames and Menu for Gas Automation System.
8. Implementing Action Event in the Frame and Buttons for Order details to exit and clear operation.
9. Insert and update operation for order details using Database connectivity.
10. Select and Delete operation for Order details using Database connectivity.
11. Report Generation for transaction details in Gas Automation System using Database Connectivity.
12. Selecting all the information using sub query from customer and gas agency transaction detail

Outcome:

- Student will have the proficiency to develop projects in java programming.

11CA348 UNIX/ LINUX LAB

Credits: 0:0:2

Objectives:

- To familiarize students with the Linux environment
- To learn the fundamentals of shell scripting/programming
- To familiarize students with basic linux administration

List of Experiments:

1. Basic Shell Commands

Shell Programs:

2. Fibonacci Series
3. Designing Calculator
4. File Operations
5. Base conversion
6. Usage of cut and grep commands
7. Usage of user defined functions

Administration

8. Managing User Accounts
9. User Quota Management
10. Installation of RPM software and Zipping,tar
11. Configuring RAID
12. Configuring Web server

Outcomes:

After completion of the course students will be able to

- Work confidently in Unix/Linux environment
- Write shell scripts to automate various tasks
- Master the basics of linux administration

11CA349 CASE TOOLS LAB

Credits: 0:0:2

Course Objective:

- To introduce a CASE Tool – Rational Rose for drawing UML diagrams and performing Forward & Reverse Engineering

List of Experiments

Draw UML Diagrams & Perform Forward and Reverse Engineering operations for

- a. Subscription Information Management System of a Magazine Publishing House and
 - b. Courier Service Information System.
1. Use Case Diagram
 2. Class Diagram
 3. Sequence Diagram
 4. Collaboration Diagram
 5. State-Chart Diagram
 6. Activity Diagram
 7. Component Diagram
 8. Deployment Diagram
 9. Forward Engineering
 10. Reverse Engineering
 11. Case Study : Media Download Kiosk
 12. Case Study: Research and Consultancy Repository

Outcomes:

- Gain confidence in UML Diagrams and their notations.
- Get acquainted with a CASE tool for OOAD.
- Understand and appreciate the purpose of CASE Tools.

11CA350 SOFTWARE TESTING LAB**Credits: 0:0:2****Course Objectives:**

- To identify and document test cases for a given user interface design
- To identify and document test cases for a given functionality
- To understand how to test the software

List of Experiments:

1. Identifying test cases using Boundary value Analysis
2. Identifying test cases using Logic Coverage
3. Design Phase testing
4. Testing a Login Screen
5. Test to insert multiple records
6. Test to delete a record
7. Test to Search a Record
8. Testing Checkpoints
9. Database Testing
10. Logical Testing
11. Control Flow statements
12. Batch Testing

Outcomes:

- Students are enabled to document Test Cases
- Learn how to test a software

11CA351 WEB SERVICES LAB**Credits: 0:0:2****Course Objectives:**

- To develop skills to design and implement web services
- To enable to deploy the web service
- To build an interface and avail the web service facilities

List of Experiments:

Case study: Develop a web site for users seeking for computer support group.

1. Create an XML file for any domain with multiple sublevel complexity
2. Create a DTD and XML schema for the XML file.
3. Using the web technologies, build and deploy a web service to greet the user
4. Develop a web service for currency converter
5. Develop a web service for Temperature converter
6. Develop a web service for random verification code generation
7. Develop an interface for the web services available in the site.
8. Using the web technologies secure the web services available in the site.
9. Develop a web service for user registration via Database connectivity
10. Develop a web service to provide a statistical report for the given data set.
11. Develop a web service to facilitate online payment
12. Develop a web service to generate the bank account statement

Outcomes :

- Adopt the web service standards and build architecture for web communication
- Describe and discover the web services using SOAP and UDDI
- Develop and deploy JAXM and JAX RPC based web services
- Secure web services for reliable communication

11CA352 PROGRAMMING IN JavaEE LAB**Credits: 0:0:2****Course Objectives:**

- To enable the students implementing the concepts of Servlets and JSP by developing online applications.
- To make students use the data access process (JDBC) and understand the EJB procedure by creating and accessing various online transactions like Bank Mngt. System.

List of Experiments:**I. Case Study for online Banking system.**

1. Designing a Website Application for online Banking system using HTML.
2. Creating current /saving accounts for online transactions using HTML & SERVLETS.
3. Creating various transaction processes for current / saving accounts in online banking using HTML.
4. Designing a loan transaction processes using HTML.JSP, SERVLET & JDBC.
5. Designing an online Calculator using Session Beans.
6. Designing a mediclaim policy features for online banking customers using HTML, JSP & Entity Beans.
7. Designing a File transaction Process in a Bank using RMI.
8. Creating various online banking purchase schemes using Entity Beans.
9. Designing a Query answering process using RMI.
10. Designing a online payment schemes using Session Beans.

II. Case Study for online stationary management system.

1. Designing a Website Application for online stationary management system.
2. Creating a current/new customer accounts through online system using HTML & SERVLET.
3. Creating a stock process procedure using HTML, JSP & JDBC.
4. Designing an online purchase process using HTML, JSP, and SERVLET & JDBC.
5. Designing a online defect recovery process of an Item using HTML, JSP, JDBC.
6. Designing a Query answering Process using RMI.
7. Designing an online payment process using Entity Beans.
8. Designing a Calculator using Session Beans.
9. Creating a online chat Application using RMI.
10. Creating a automatic stock verification process of items using SERVLET & JDBC.

Outcomes:

- Students are well-versed in implementing the basic J2EE concepts.

- Students can create any online transaction involved applications and online Query answering system.

11CA353 DATABASE ADMINISTRATION LAB

Credits: 0:0:2

Course Objectives:

- To give an understanding of managing and upgrading the data base with necessary skills for day-today administration of the Oracle data base

List of Experiments

1. Installing the Oracle 11g Database
2. Upgrading to Oracle 11g Database (a)Manual Upgrade (b)Using DBUA
3. Administration Tools of the Oracle 11g Database
4. Creating the Database with DBCA
5. Configuring the Database using DBCA
6. Configuring the Database using OEM
7. Starting and Stopping the Database using OEM
8. Deleting and Dropping the Database
9. Administering Tablespaces
10. Administering Schema Objects –Tables and Views
11. Administering Schema Objects – Indexes and Sequences
12. Managing Database with users and privileges

Outcomes:

- To demonstrate skills in managing the oracle database

11CA354 PHP PROGRAMMING LAB

Credits: 0:0:2

Course Objective:

- To develop web based project skills to the students in PHP programming.

I. Case Study on Campus Management System

1. User interface input validation
2. Student Academic Information using Class and Object
3. Student Academic Information using Array of Object
4. Student Academic Information using Inheritance
5. File Manipulation for Student Information

II. Case Study on Inventory Control System

6. Maintaining Login Details using Session
7. Tracking User Visiting Web Pages using Cookies
8. Insert, Update and delete operations for inventory
9. Purchasing a Product
10. Generating Bill
11. Displaying product and customer details using sub query
12. Maintaining Product details using session and array

Outcomes:

- Student will have the proficiency to develop web based projects in PHP programming.

11CA355 WEB TECHNOLOGY LAB

Credits: 0:0:2

Course Objectives:

- To give an insight about creation of web pages.
- To create web pages by implementing all ASP and XML concepts

List of Experiments

1. Design an interactive webpage with basic HTML tags
2. Perform Validations using VBScript
3. Demonstration of Request and Response Objects in ASP
4. Demonstrate Query String and Cookies in the above web page.
5. Global.asa
6. Database connectivity
7. XML with CSS
8. XML with XSL
9. XML with DTD
10. Graphical visualizations with SVG
11. Integrating XML with Databases
12. Implementing a Simple Web Service

Outcomes:

- Students will be able to create interactive web pages.

11CA356 C#.NET PROGRAMMING LAB

Credits: 0:0:2

Course Objectives:

To develop an application using object oriented concepts in C#

List of Experiments:

1. Classes and Objects
2. Inheritance
3. Exception Handling
4. Delegates
5. Assemblies
6. Interfaces
7. Collections
8. Multithreading
9. Generics
10. Direct Data Access
11. Disconnected Data Access
12. Reports

Outcomes:

Student will develop an application using object oriented concepts in C#.

11CA357 ASP.NET USING C# PROGRAMMING LAB

Credits: 0:0:2

Course Objectives:

- To develop web pages using object oriented concepts using C#.

- To develop web pages using all the advanced GUI controls.

List of Experiments:

1. Design an interactive webpage with the basic controls
2. Perform Validations on the above
3. Create a master page to serve as a template for the Web site's pages.
4. Build the various Content Pages
5. Create a Global.asax file with Application variables cont, color1 and gotohp. Create a Session variable called cont1. Initialize cont as 0 and assign any color to color1. For the variable gotohp, give a hyperlink to any Website. Use the variables in a Web Form. Try these with the lock and unlock methods.
6. Write a program to display three images in a line. When any one of the images is clicked, it must be displayed below. On clicking the displayed image it must be cleared.
7. Demonstrate Query String & Cookies
8. Demonstrate Session
9. Database Connectivity
10. Usage of Rich Controls
11. Themes
12. Report Generation

Outcomes:

- Students will be able to create interactive web pages.

11CA358 ASP.NET USING VB PROGRAMMING LAB

Credits: 0:0:2

Course Objectives:

- To know how to create interactive web page
- To use the Controls in ASP.NET
- To Understand about the database connectivity using SQLServer

List of Experiments:

1. Designing of Home page
2. Designing of Content Page
3. Validation
4. Multiview
5. Table Design and Normalization
6. Login & Registration - Cookies
7. Database - Direct Data Access
8. Ad rotator & User Control
9. Database- Paramaterized Command
10. Database- Disconnected Data Access
11. Master page
12. Reports

Outcomes:

- Students are enabled to create a web site using ASP.NET
- Enable to use the GUI controls in ASP.net

11CA359 JavaME PROGRAMMINGLAB

Credits: 0:0:2

Course Objectives:

- To familiar with the basic components and programming issues of JavaME.
- To program mobile telephones, pagers, PDAs, and other small devices using Java

List of Experiments

1. Creating User Interface using Screen Classes
2. Creating User Interface using Canvas Class
3. Reading and Writing records using RMS
4. Sorting Records in RMS
5. Searching Records in RMS
6. Interaction of J2ME application with a Database
7. Creating Address Book using PIM API
8. Sending and Receiving SMS using Wireless Messaging API.
9. Generic Connection Framework using HTTP
10. Generic Connection Framework using FTP
11. Generic Connection Framework using Socket Connection
12. Remote Method Invocation using JavaME MIDlets

Outcomes:

- Students will be familiar about basic components and programming of JavaME
- Familiar with programming mobile telephones, pagers, PDAs, and other small devices using Java Technology

Sub. Code	Name of the Subject	Credits
11CA360	Wireless Adhoc and Sensor Networks	4:0:0

11CA360 WIRELESS ADHOC AND SENSOR NETWORKS

Credits: 4:0:0

Course Objectives:

- To gain depth knowledge about the ad hoc and sensor networking that paves the way to new technologies and applications for the future benefit of the research community and telecommunications industry.
- To explore different kinds of routing protocols in ad hoc networks
- To study about the network management models and design issues in wireless sensor networks

Course Outcomes:

- Gain adequate knowledge about the ad hoc networking technologies.
- Ability to develop a new routing protocol in ad hoc networks
- Familiarize with network management design issues, performance and traffic management in the wireless sensor networks

Unit 1

A Hybrid Framework for Routing in Ad hoc Networks: The Communication Environment and the RWN Model-The Zone Routing Protocol-ZRP- Formal Description - Evaluation of ZRP- Performance Results. **Link Reversal Routing:** The Gafni-Bertsekas Algorithm-The lightweight Mobile Routing Algorithm-The Temporally Ordered Routing Algorithm- Comparison of LRR Algorithms.

Unit 2

The Effects of Beaconing on the Battery Life of Ad Hoc Mobile Computers: Ad Hoc Wireless Networks - Associativity Based on Routing-Effects of Beaconing on Battery Life- Experimental Results and Observation- Beaconing with Neighbouring Nodes at Low Bandwidth- Efficient Link- **State Routing in Wireless Networks:** Updating Routes in Wireless Networks- STAR Description-Performance Evaluation.

Unit 3

Basic Wireless Sensor Technology: Introduction- Sensor Node Technology- Sensor Taxonomy- WN Operating Environment - WN Trends- **Wireless Transmission Technology and Systems:** Radio Technology Primer- Propagation and Propagation Impairments- Available Wireless Technologies- Campus Applications- MAN/WAN Applications.

Unit 4

Routing Protocols for Wireless Sensor Networks: Data Dissemination and Gathering- Routing Challenges and Design issues in Wireless Sensor Networks- Routing Strategies in Wireless Sensor Networks- **Transport Control Protocol for Wireless Sensor Networks:** Traditional

Transport Control Protocols- Transport Protocol Design Issues- Examples of Existing Transport Control Protocols- Performance of Transport Control Protocols- Middleware for Wireless Sensor Networks: WSN Middleware Principles- Middleware Architecture- Existing Middleware.

Unit 5

Network Management for Wireless Sensor Networks - Traditional Network Management Models - Network Management Design Issues - Example of Management Architecture: MANNA- Naming- Localization Operating System for Wireless Sensor Networks- Design Issues- Examples of Operating System Performance and Traffic Management – WSN Design issues- Performance Modelling of WSNs- Case Study Simple Computation of the System Life Span.

Text Books:

1. Charles E. Perkins, Ad Hoc Networking, Addison- Wesley, 2008, ISBN: 978-81-317-2096.
2. Kazem Sohraby, Daniel Minoli and Taieb Znati, wireless Sensor Networks: Technology, Protocols, And Applications, John Wiley & Sons, 2007, 978-0471743002.

Reference Books:

1. C. K. Toh, Ad Hoc Mobile Wireless Networks, 2007, Pearson Education, Inc. ISBN: 81-317-1510-8.
2. C. Siva Ram Murthy and B. S. Manoj, Ad Hoc Wireless Networks Architectures and Protocols, Pearson Education, 2008. ISBN- 978-81-317-0688.
3. Mohammad Ilyas and Imad MahGoub (Editors), Hand Book of Sensor Network: Compact Wireless and Wire Sensing System, CRC Press, 2005, ISBN 0- 8493-1968-4.
4. Holger Karl and Andreas Willig, Protocols and Architectures for Wireless Sensor Networks, John Wiley & Sons, 2007, 978-04717178161.

LIST OF SUBJECTS

Sub. Code	Name of the Subject	Credits
11CA201	Web Development	3:0:0
11CA360	Wireless Adhoc and Sensor Networks	4:0:0
12CA301	Computer Organization and Architecture	4:0:0
12CA302	Programming in C	3:1:0
12CA303	Software Engineering	4:0:0
12CA304	Database Systems	4:0:0
12CA305	Object Oriented Programming in C++	3:1:0
12CA306	Operating System Concepts	4:0:0
12CA307	Data and File Structures	4:0:0
12CA308	Business Data Networks	4:0:0
12CA309	Compiler Design	3:0:0
12CA310	Java Programming	4:0:0
12CA311	Object Oriented Analysis and Design	4:0:0
12CA312	Internet Programming	3:1:0
12CA313	Programming in C Lab	0:0:2
12CA314	Database Systems Lab	0:0:2
12CA315	Object Oriented Programming in C++ Lab	0:0:2
12CA316	Data Structures Lab	0:0:2
12CA317	Unix/Linux Lab	0:0:2
12CA318	Java Programming Lab	0:0:2
12CA319	Internet Programming Lab	0:0:2
12CA320	Multimedia Communications	4:0:0
12CA321	Network Security	4:0:0
12CA322	High Speed Networks and Internets	4:0:0
12CA323	Distributed Operating System	4:0:0
12CA324	Client Server Computing	3:0:0
12CA325	Wireless Networks	4:0:0
12CA326	Mobile Communication Systems	4:0:0
12CA327	Internetworking	4:0:0
12CA328	Database Design and Tuning	4:0:0
12CA329	Business Intelligence in Data Mining	4:0:0
12CA330	Text Mining	3:1:0
12CA331	Data Mining in Grid Computing	4:0:0
12CA332	Web Mining	4:0:0
12CA333	Business Intelligence and its Applications	4:0:0
12CA334	Data Warehousing	4:0:0
12CA335	Data Mining Techniques	4:0:0
12CA336	Database Administration	4:0:0

12CA337	Software Architecture and Design	4:0:0
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12CA338	Software Quality Assurance	4:0:0
12CA339	Software Testing	4:0:0
12CA340	Design Patterns	4:0:0
12CA341	Web Services	4:0:0
12CA342	Software Project Management	4:0:0
12CA343	Database Management Systems	3:0:0
12CA344	Computer Networks	4:0:0
12CA345	Design and Analysis of Algorithms	3:0:0
12CA346	Internetworking Lab	0:0:2
12CA347	Network Security Lab	0:0:2
12CA348	Network Simulation Lab	0:0:2
12CA349	Data Mining Lab 1	0:0:2
12CA350	Data Mining Lab 2	0:0:2
12CA351	Business Intelligence Lab	0:0:2
12CA352	Database Administration Lab	0:0:2
12CA353	Software Architecture Lab	0:0:2
12CA354	Case Tools Lab	0:0:2
12CA355	Software Testing Lab	0:0:2
12CA356	Web Services Lab	0:0:2
12CA357	Hardware and Servicing Lab	0:0:2
12CA358	Programming with ASP.Net Using VB	3:1:0
12CA359	Programming with ASP.Net Using C#	3:1:0
12CA360	C# Programming	4:0:0
12CA361	System Simulation	4:0:0
12CA362	Electronic Commerce	4:0:0
12CA363	Banking Technology	4:0:0
12CA364	Security in Computing	4:0:0
12CA365	Linux Administration	4:0:0
12CA366	Grid Computing and Applications	4:0:0
12CA367	AJAX programming using ASP.Net	3:1:0
12CA368	Ad hoc Networks	4:0:0
12CA369	Network Analysis, Architecture and Design	4:0:0
12CA370	Programming in JavaME	4:0:0
12CA371	Neural Networks and its Applications	3:0:0
12CA372	Network Management	4:0:0
12CA373	Satellite Communications	3:0:0
12CA374	Virtual Private Networks	3:0:0
12CA375	Wireless LAN	3:0:0
12CA376	Cloud Computing	4:0:0
12CA377	Programming in JavaEE	3:1:0
12CA378	Financial and Management Accounting	3:1:0
12CA379	Enterprise Resource Planning Fundamentals	4:0:0
12CA380	Wireless Security	4:0:0
12CA381	Cluster Computing	4:0:0
12CA382	Research Methodology	4:0:0
12CA383	Advanced Data Mining	4:0:0
12CA384	Computing Technologies and Chemistry	4:0:0

12CA385	Programming in JavaEE Lab	0:0:2
12CA386	C#.NET Programming Lab	0:0:2
12CA387	ASP.NET using C# Programming Lab	0:0:2
12CA388	ASP.NET using VB Programming Lab	0:0:2
12CA389	JavaME Programming Lab	0:0:2
12CA390	Professional Skills	0:0:2
12CA391	Advanced PC software and Internet Lab	0:0:2
12CA392	Wireless Adhoc and Sensor Networks	4:0:0
12CA201	Web Development	3:0:0
12CA202	Basics of Computer and Programming	3:1:0
12CA203	Fundamentals of Java	3:1:0
12CA204	Fundamentals of Java Lab	0:0:2

11CA201 WEB DEVELOPMENT

Credits: 3:0:0

Course Objective:

- To discover the basic components of how Web development like HTML and Cascading Style sheets.
- To design web pages that are consistent with good style and interactive multimedia elements in web pages.
- To discover elements of JavaScript to enhance web page interactivity
- To discover the elements of server side programming using PHP

Course Outcome:

After the completion of the course, students will be able to

- successfully code a basic web page
- include tables, frames, and interactive multimedia elements in web pages
- include elements of JavaScript to enhance web page interactivity
- use PHP to build dynamic web pages

Unit I

HTML BASICS: Introduction- HTML,XML and World Wide Web – HTML - Basic HTML, Document Body,Texts, Hyper Links,Adding Formatting, Lists,Tables,Using Color and images,Images

Unit II

HTML ADVANCED CONCEPTS AND CSS: HTML - Multimedia objects, Frames, Forms, The HTML document head,XHTML. Cascading Stylesheets - Using styles, Defining your own style,Properties and values in styles,Stylesheets-example, Formatting block of information, Layers

Unit III

JAVA SCRIPT: Introduction to java Script- Dynamic HTML, Java Script-Basics, Variables, String Manipulation, Mathematical Functions, Statements, Operators, Arrays, Functions. Objects in Java Script - Data and objects in java script, Regular expressions, Exception Handling, Built-in objects

Unit IV

DYNAMIC HTML WITH JAVA SCRIPT: Data Validation, Opening a new window, Message and confirmations, The status bar, Writing to a different frame, Rollover Buttons, Moving Images, Multiple Pages in single Download, Text-only Menu System, Floating Logos

Unit V

PHP: Introduction to PHP - Using PHP, Variable, Program Control, Built in Functions - Using PHP with SQL Databases (MySQL) - Working with MySQL, Connecting to a Database, Creating a Database in MySQL, Selecting a Database, Creating a Table in a Database, Inserting Records in a Table, Retrieving Information from a Table, Updating Information in a Table.

Text Books:

1. Chris Bates, “Web Programming: Building Internet Applications”, Wiley Dreamtech India (p)Ltd., Second Edition,2002.
2. Ashish Wilfred, Meeta Gupta, and Kartik Bhatnagar with NIT, “PHP Professional Projects”, Prentice- Hall of India,2002.

Reference Books:

1. Jason Gilmore, “Beginning PHP and MySQL 5, From Novice to Professional”, Apress, First Indian Reprint, 2007. ISBN 978-81-8128-673-4
2. Thomas A powell, “Web Design: The complete Reference”, Second Edition, Tata Mc Graw Hill 2003 ISBN:9780070582521

11CA360 WIRELESS ADHOC AND SENSOR NETWORKS**Credit: 4:0:0****Course Objective:**

- To gain depth knowledge about the ad hoc and sensor networking that paves the way to new technologies and applications for the future benefit of the research community and telecommunications industry.
- To explore different kinds of routing protocols in ad hoc networks
- To study about the network management models and design issues in wireless sensor networks

Course Outcome:

- Gain adequate knowledge about the ad hoc networking technologies.
- Ability to develop a new routing protocol in ad hoc networks
- Familiarize with network management design issues, performance and traffic management in the wireless sensor networks

Unit I

ROUTING IN AD HOC NETWORKS: A Hybrid Framework for Routing in Ad hoc Networks - The Communication Environment and the RWN Model-The Zone Routing Protocol-ZRP- Formal Description - Evaluation of ZRP-Performance Results. Link Reversal Routing - The Gafni-Bertsekas Algorithm-The lightweight Mobile Routing Algorithm-The Temporally Ordered Routing Algorithm- Comparison of LRR Algorithms.

Unit II

AD HOC WIRELESS NETWORKS: The Effects of Beacons on the Battery Life of Ad Hoc Mobile Computers - Ad Hoc Wireless Networks - Associativity Based on Routing-Effects of Beacons on Battery Life- Experimental Results and Observation- Beacons with Neighbouring Nodes at Low Bandwidth- Efficient Link- State Routing in Wireless Networks - Updating Routes in Wireless Networks- STAR Description-Performance Evaluation.

Unit III

WIRELESS SENSING AND TRANSMISSION TECHNOLOGY: Basic Wireless Sensor Technology - Introduction- Sensor Node Technology- Sensor Taxonomy- WN Operating Environment - WN Trends- Wireless Transmission Technology and Systems - Radio Technology Primer- Propagation and Propagation Impairments- Available Wireless Technologies- Campus Applications- MAN/WAN Applications.

Unit IV

ROUTING PROTOCOLS FOR WIRELESS SENSOR NETWORKS: Data Dissemination and Gathering- Routing Challenges and Design issues in Wireless Sensor Networks- Routing Strategies in Wireless Sensor Networks- Transport Control Protocol for Wireless Sensor Networks - Traditional Transport Control Protocols- Transport Protocol Design Issues- Examples of Existing Transport Control Protocols- Performance of Transport Control Protocols- Middleware for Wireless Sensor Networks: WSN Middleware Principles- Middleware Architecture- Existing Middleware.

Unit V

NETWORK MANAGEMENT FOR WIRELESS SENSOR NETWORKS: Traditional Network Management Models - Network Management Design Issues - Example of Management Architecture: MANNA- Naming- Localization Operating System for Wireless Sensor Networks- Design Issues- Examples of Operating System Performance and Traffic Management – WSN Design issues- Performance Modelling of WSNs- Case Study Simple Computation of the System Life Span.

Text Books:

1. Charles E. Perkins, “Ad Hoc Networking”, Addison- Wesley, 2008, ISBN: 978-81-317-2096.
2. Kazem Sohraby, Daniel Minoli and Taieb Znati, “Wireless Sensor Networks: Technology, Protocols, And Applications”, John Wiley & Sons, 2007, 978-0471743002.

Reference Books:

1. C. K. Toh, “Ad Hoc Mobile Wireless Networks”, Pearson Education, Inc. , 2007, ISBN: 81-317-1510-8.
2. C. Siva Ram Murthy and B. S. Manoj,”Ad Hoc Wireless Networks Architectures and Protocols”, Pearson Education, 2008. ISBN- 978-81-317-0688.
3. Mohammad Ilyas and Imad MahGoub (Editors), “HandBook of Sensor Network: Compact Wireless and Wire Sensing System”, CRC Press, 2005, ISBN 0- 8493-1968-4.
4. Holger Karl and Andreas Willig, “Protocols and Architectures for Wireless Sensor Networks”, John Wiley & Sons, 2007, 978-04717178161.

12CA301 COMPUTER ORGANIZATION AND ARCHITECTURE

Credits: 4:0:0

Course Objective:

- To have a thorough understanding of the basic structure and operation of a digital computer.
- To discuss in detail the operation of the arithmetic unit including the algorithms & implementation of fixed-point and floating-point addition, subtraction, multiplication & division.
- To study the different ways of communicating with I/O devices and standard I/O interfaces.
- To study the hierarchical memory system including cache memories and virtual memory.

Course Outcome:

Students will have thorough knowledge about

- basic structure of a Digital Computer.
- arithmetic operations of binary number system.
- organization of the Control unit, Arithmetic and Logical unit, Memory unit and the I/O unit.

Unit I

DIGITAL COMPUTERS AND COMPONENTS: Digital Logic Circuits - Digital computers – Logic gates – Boolean algebra – Map simplification – Combinational circuits – Flip-flops – Digital Components - Integrated circuits – Decoders – Multiplexers – Registers.

Unit II

DATA REPRESENTATION AND REGISTER TRANSFER: Data Representation - Data types – Complements – Fixed point representation – Floating point representation. Register Transfer and Microoperations - Register transfer language – Register transfer – Bus and memory transfers – Arithmetic microoperations – Logic Microoperations – Shift Microoperations – Arithmetic logic shift unit.

Unit III

BASIC COMPUTER ORGANIZATION AND DESIGN: Instruction codes – Computer registers – Computer instructions – Timing and control – Instruction cycle – Memory reference Instructions – Input-output and interrupt – Central Processing Unit - Introduction – General register organization – Stack organization – Instruction formats – Addressing modes – Data transfer and manipulation – Program control

Unit IV

COMPUTER ARITHMETIC AND I/O ORGANIZATION: Computer Arithmetic - Introduction – Addition and subtraction – Multiplication algorithms – Division algorithms – Floating-point arithmetic operations – Input-Output Organization - Peripheral devices – Input output interface – Asynchronous data transfer – Modes of transfer – Priority interrupt – Direct memory Access, Input-Output Processor

Unit V

MEMORY ORGANIZATION: Memory Hierarchy – Main memory – Auxiliary memory – Associative memory – Cache memory – Virtual memory – Memory management hardware.

Text Book:

1. M. Morris Mano, "Computer System Architecture", Prentice Hall of India Pvt Ltd, Third edition, 2002, ISBN: 81-203-0855-7.

Reference Books:

1. William Stallings, "Computer Organization and Architecture – Designing for Performance", 6th Edition, Pearson Education, 2003, ISBN: 0130351199.
2. Nicholas Carter, "Schaum's outline of Computer Architecture", Tata McGraw Hill, 2006.
3. John L. Hennessy and David A Patterson, "Computer Architecture A quantitative Approach", Morgan Kaufmann / Elsevier, Fourth Edition, 2007.

12CA302 PROGRAMMING IN C

Credits: 3:1:0

Course Objective:

- To gain experience about structured programming.
- To help students to understand the implementation of C language.
- To understand various features in C.

Course Outcome:

Students will be able to

- solve the given problem using the syntactical structures of C language.
- develop , execute and document computerized solution for various problems using the features of C language.
- to read and write C program that uses pointers, structures and files.

Unit I

INTRODUCTION TO COMPUTERS AND BASIC PROGRAMMING : Introduction: Computers- Classification of Computers- System Software- Software Lifecycle – Algorithms – Flowcharts – Pseudo code – Structured programming – Compilers – Operating Systems – Running C programs – Linker – Preprocessor – Standard Input Output devices – Popular features of C - Tour of C. Variables and Expressions: Introduction – Character set – Identifiers and keywords – Variables – Characters and Character strings – Qualifiers – typedef statement – Constants – Operators and Expressions – Operator precedence and associativity. **Basic Input/Output:** Introduction – Single character Input-Output – String Input and Output – Types of characters in format strings – scanf width specifier – Format specifiers for scanners – Input fields for scanf.

Unit II

CONTROL STRUCTURES AND FUNCTIONS: Introduction – if statements – Multiway decision – Compound statements – Loops – break- switch- continue and goto statements. Functions: Introductions – Function main – Functions accepting more than one parameter – User defined and Library functions – Functions parameters – Return values – Recursion – Variable length argument lists. Scope and Extent: Introduction – Scope – Extent.

Unit II

ADVANCED DATA TYPES AND MEMORY MANAGEMENT: Arrays and Strings: Introduction – How arrays are useful – Multidimensional arrays – Strings -Arrays of strings –

Functions in string.h. Structures and Unions: Introduction – Declaring and using structures – Structure Initialization – Operation on Structures – Array of Structures – Pointers to structures – Structures and functions – Unions – Operations on a Union – Scope of a Union. Dynamic Memory Allocation: Introduction – Library functions for DMA – Dynamic multi-dimensional arrays – Self referential structures.

Unit IV

POINTERS: Introduction – Definition and users of pointers – Address operator & - Pointer variables – Dereferencing pointers – Void pointers – Pointer Arithmetic – Pointers to Pointers – Pointers and arrays – Pointers and functions – Accessing arrays inside functions – Array of pointers – Pointers and Strings - Pointers to constant objects.

Unit V

FILES: Introduction – File structure – File handling functions – file types – Error handling – Low level file I/O – Redirection and piping – Directory functions – DOS and BIOS file disk I/O.

Text Book:

1. K R Venugopal, S R Prasad, “Mastering in C”. Tata McGraw Hill Publishing Company Limited, 2nd reprint 2007.

Reference Books:

1. Yeshwant kanetkar, “Let us C”, Sixth Edition, BPB Publication 2005
2. Herbert Schildt, “Turbo C: The Complete Reference”, Mc Graw-Hill,1998,ISBN: 9780078813467

12CA303 SOFTWARE ENGINEERING

Credits: 4:0:0

Course Objective:

- To understand the concepts of software products and software processes.
- To know the importance of software engineering and professional responsibilities.
- To understand the process involved to develop quality product and increase the productivity.

Course Outcome:

Students will be able to

- make effective project management plans, manage time and physical resources.
- analyze, design and develop any application.
- design test cases and effective testing procedures.
- design human-computer interfaces.

Unit I

PROCESS MODELS: A Generic View of Process: Software Engineering a Layered Approach- A Process Framework – The Capability Maturity Model Integration-Process Patterns-Process

Assessment –Personal and Team Process Models - Process Models : The Waterfall Model- Incremental Models-Evolutionary Process Models- Specialized Models- An Agile View of Process: What is Agility?-What is an Agile Process– Agile Process Models.

Unit II

SYSTEM ENGINEERING: System Engineering: The System Engineering Hierarchy – System Modeling – Requirements Engineering: Requirements Engineering Tasks - Initiating the Requirement Engineering Process-Eliciting Requirements-Developing Use Cases - Building the Analysis Model-Negotiating Requirements - Validating Requirements- Design Engineering: Design Concepts – The Design Model – Pattern Based Software Design.

Unit III

DESIGNING: Creating an Architectural Design: Software Architecture – Data Design – Architectural Styles and Patterns – Architectural Design – Assessing Alternative Architectural Designs – Mapping Data flow into a Software Architecture – Modeling Component - Level Design: What is a Component – Designing Class Based Components- Designing Conventional Components – Performing User Interface Design: User Interface Analysis and Design.

Unit IV

TESTING: Testing Strategies: A Strategic Approach to Software Testing- Strategic Issues – Test Strategies for Conventional Software – Testing Strategies for Object Oriented Software – Validation Testing – System Testing –Testing Tactics: White-Box Testing - Basis Path Testing – Control Structure Testing - Black Box Testing – Estimation : Software Project Estimation – Decomposition Techniques – Empirical Estimation Models.

Unit V

PROJECT SCHEDULING AND MANAGEMENT: Project Scheduling – Scheduling – Risk Management: Software Risks – Risk Identification – Risk Projection – Risk Refinement – Risk Mitigation, Monitoring and Management- Quality Management – Quality Concepts – Software Quality Assurance- Software Reviews – Formal Technical Reviews – Change Management: Software Configuration Management (SCM) - SCM Process.

Text Book:

1. Roger S. Pressman, “Software Engineering: A Practitioner's Approach”, Sixth Edition, McGraw- Hill, 2005. ISBN-13: 978-0-07-070113-7, ISBN-10:0-07-070113-X.

Reference Books:

1. Sommerville, ”Software Engineering”, Eighth Edition, Addison Wesley, 2007, ISBN: 032 - 131379-8.
2. James F Peters, Witold Pedrycz, “Software Engineering-An Engineering Approach”, John Witold Pedrycz, 2004, ISBN: 997-1513099.
3. P. Fleeger, “Software Engineering”, Third Edition, Pearson Prentice Hall, 2009, ISBN: 978-81-317-2098.

12CA304 DATABASE SYSTEMS

Credits: 4:0:0

Course Objective:

To understand

- relational database designs.
- normalization.
- indexing and hashing.

Course Outcome:

Students will be able to

- write queries by using DDL and DML statements.
- create database designs with E-R diagrams.
- normalize tables and check for functional dependencies.
- use triggers in SQL.

Unit I

RELATIONAL MODEL: Introduction & Relational Model: Database Systems Applications – Purpose of Database System–View of Data –Database language Relational Database – Database Design – Object Based and Semi Structured databases – Data Storage and Querying – Transaction Management – Data Mining and Analysis – Database Architecture – Database Users and Administrators. Structure of Relational Databases – Fundamental Relational Algebra operations. Additional Relational Algebra operations – Extended Relational Algebra – Null Value – Modification of the Database.

Unit II

STRUCTURED QUERY LANGUAGE: SQL & advanced SQL:, Data Definition – Basic Structure of SQL queries – Set Operations – Aggregate Functions – Null Values – Nested Sub queries – Complex queries – Views– Modification of Database – SQL Data types and Schema – Integrity Constraints – Authorization – Embedded SQL – Dynamic SQL.

Unit III

ER MODELING AND DATABASE DESIGNING: Database Design , E-R Model, Database System Architecture: Overview of the design process – E-R Model – Constraints – E-R Diagram – E-R Design issues – Weak Entity – Extended E-R Features – Database Design for Banking Enterprise – Reduction to Relational Schema. Centralized and Client-Server Architecture – Server System Architecture

Unit IV

RELATIONAL DATABASE DESIGN AND DEVELOPMENT: Features of good Relational Design – Atomic Domains and First Normal Form – Decomposition using Functional Dependencies – Multivalued Dependencies – More Normal Forms – Database Design Process – Modeling Temporal Data – Triggers – Authorization in SQL–, Storage and File Structure: File Organization– Organization of records in files – Data Dictionary Storage.

Unit V

INDEXING AND HASHING: Basic Concepts – Ordered Indices – B+ Tree Index Files – B-Tree Index Files – Multiple-Key Access – Static Hashing – Dynamic Hashing – Comparison of Ordered Indexing and Hashing. Transaction Concepts – Transaction State – Implementation of Atomicity and durability – Concurrent executions – Serialization.

Text Book:

1. Abraham Silberschatz, Henry F. Korth, Sudarshan, “Database System Concepts”, Fifth Edition, 2006.

Reference Books:

1. Ramesh Elmasri, Durvasulu V.L.N Somayajulu, Shamkant B. Navathi and Shyam K. Gupta, “Fundamentals of Database Systems”, Pearson Education, 2006.
2. C. J. Date , “An Introduction to Database Systems”, June(2009), 8th Edition.

12CA305 OBJECT ORIENTED PROGRAMMING IN C++**Credits: 3:1:0****Course Objective:**

- To get a clear understanding of object-oriented concepts.
- To understand object oriented programming through C++.

Course Outcome:

Students will be able to

- gain the basic knowledge on Object Oriented concepts.
- develop applications using Object Oriented Programming Concepts.
- implement features of object oriented programming to solve real world problems.

Unit I

INTRODUCTION TO OBJECT ORIENTED PROGRAMMING: Need for Object Oriented Programming - Characteristics of Object Oriented Languages – Comparison of C and C++ - Structures: Structures - Enumerations – Functions: Simple Functions – Passing Arguments to Functions– Returning Values from Functions – Reference Arguments - Overloaded Functions – Recursion – Inline Functions – Default Arguments – Scope and Storage Class – Returning by Reference – const Function Arguments.

Unit II

OBJECTS AND CLASSES: A Simple Class – C++ Objects as Physical Objects – C++ Objects as Data Types - Constructors – Objects as Function Arguments - Copy Constructor – Structures and Classes – Classes, Objects and Memory - Static class data – Constant Member functions and constant objects - Arrays and Strings: Array Fundamentals – Arrays as Class Member Data – Array of Objects – C-Strings – The Standard C++ String Class.

Unit III

FEATURES OF OBJECT ORIENTED LANGUAGES: Operator Overloading: Overloading Unary Operators – Overloading Binary Operators - Data Conversion – explicit and mutable keywords – Inheritance: Derived Class and Base Class – Derived Class Constructors – Overriding Member Functions – Which Function is Used – Class Hierarchies – Public and Private Inheritance – Levels of Inheritance- Multiple Inheritance – Ambiguity – Containership: Classes within classes.

Unit IV

POINTERS AND DYNAMIC MEMORY MANAGEMENT: Pointers: Address and Pointers – The Address of Operator - Pointers and Arrays – Pointers and Functions – Pointers and C-type Strings – Memory Management – Pointers to Objects – Pointers to Pointers - Virtual Functions: Virtual Functions - Friend Functions – Static Functions – Assignment and Copy Initialization – The this pointer – Dynamic Type Information.

Unit V

FILES AND ERROR HANDLING: Streams and Files: Stream Classes – Stream Errors – Disk File I/O with Streams – File Pointers – Error Handling in File I/O – File I/O with Member Functions – Overloading Extraction and Insertion Operators - Templates and Exceptions: Function Templates – Class Templates – Exceptions.

Text Book:

1. Robert Lafore, “Object Oriented Programming in C++”, Fourth Edition, Pearson Education, Sams Publishing, 2002, ISBN: 978-81-317-2282-4.

Reference Books:

1. Stanley B. Lippman, Josee Lajoie, “C++ Primer”, Third Edition, Pearson Education, ISBN: 81-7808-048-6
2. Bjarne Stroustrup, “Programming: Principles and Practice Using C++”, Addison Wesley, Pearson Education.
3. K.R. Venugopal, Rajkumar Buyya, T.Ravishankar, “Mastering C++”, Tata McGraw Hill Publishing Company Limited 1999, ISBN-13: 978-0-07-463454-7, ISBN-10: 0-07-4634542.
4. Herbert Schildt, “C++ The Complete Reference”, Fourth Edition, Tata McGraw – Hill, 2003, ISBN: 0-07-053246-X.

12CA306 OPERATING SYSTEM CONCEPTS

Credits: 4: 0: 0

Course Objective:

- To introduce concepts of Operating Systems.
- To describe process concept and its scheduling algorithms.
- To describe about file system, mass storage and I/O in a modern computer system.

Course Outcome:

Students will be able to

- familiarize with the concepts of the operating systems.
- gain knowledge about the fundamental concepts and algorithms used in existing commercial operating systems.
- gain knowledge on various process scheduling algorithms and IPC.

Unit I

INTRODUCTION TO OPERATING SYSTEMS: Introduction: What Operating Systems Do – Computer System Organization – Computer System Architecture – Operating System Structure – Operating System Operations – Process Management Memory Management – Storage Management – Protection and Security – Distributed Systems – Special Purpose Systems

- Computing Environments – Open-Source Operating Systems – Operating System Services: User Operating System Interface – System Calls – Types of System Calls – System Programs – Operating System Design and Implementation – Operating System Structure – Virtual Machines – Operating System Generation – System Boot.

Unit II

PROCESSES AND SCHEDULING: Processes: Process Concept – Process Scheduling – Operation on Processes – Interprocess Communication – Communication in Client Server Systems – Multithreaded Programming: Multithreading models – Thread Libraries - Threading Issues – CPU Scheduling - Basic concepts – Scheduling Criteria – Scheduling Algorithms – Thread Scheduling - Multiple Processor Scheduling – Algorithm Evaluation.

Unit III

PROCESS SYNCHRONIZATION AND MEMORY MANAGEMENT: The Critical Section Problem – Peterson’s Solution – Synchronization Hardware – Semaphores – Classic Problems of Synchronization – Monitors - Atomic Transactions – Deadlocks: System Model – Deadlock Characterization – Methods for Handling Deadlocks – Deadlock Prevention – Deadlock avoidance – Deadlock detection – Recovery from Deadlock – Memory management: Main Memory – Swapping – Contiguous Memory Allocation – Paging – Structure of the Page Table – Segmentation.

Unit IV

MEMORY MANAGEMENT AND FILE SYSTEMS: Virtual Memory: Demand Paging – Copy-on-Write - Page Replacement – Allocation of Frames – Thrashing – Memory-mapped Files – Allocating Kernel Memory - File System Implementation: File System Structure – File System Implementation – Directory Implementation – Allocation Methods – Free Space Management – Efficiency and Performance – Recovery – NFS.

Unit V

MASS STORAGE STRUCTURES AND I/O SYSTEMS: Mass Storage Structure: Overview of Mass Storage Structure – Disk Structure – Disk Attachment - Disk Scheduling – Disk Management – Swap-Space Management – RAID Structure – Stable-Storage Implementation – I/O Systems: Overview – I/O Hardware – Application I/O interface – Kernel I/O Subsystem – Transforming I/O Requests to Hardware Operations – Introduction - History - The Shell - The File System - Process Management - Memory Management – The Input/Output System – The SunOS Operating System- Distributed UNIX Systems - UNIX Systems –Standardization and Open Systems – The Future of UNIX Systems.

Text Books:

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, “Operating System Principles”, John Wiley & Sons, Eighth Edition, 2009 ISBN 978-0-470-12872-5.
2. H.M. Deitel, “Operating Systems”, Pearson Education Inc, Second Edition, 2002, ISBN: 81-7808-035-4.

Reference Books:

1. James L.Paterson, Abraham Silberschatz, “Operating Systems Concepts”, Addison Wesley Publishing Co., Second Edition, 1985.

2. Andrew S. Tanenbaum, Albert S. Woodhull, “Operating Systems: Design and Implementation”, Third Edition, Pearson Education.
3. Milen Milan Kovic, “Operating Systems Concepts and Design”, McGraw Hill ISE, 1987

12CA307 DATA AND FILE STRUCTURES

Credits: 4:0:0

Course Objective:

- To get clear understanding about the basic data structures and their operations.
- To understand the concepts of algorithms.

Course Outcome:

Students will be able to

- understand the basics of data structures.
- understand basic search and sort algorithms.
- choose appropriate data structure and algorithm to solve a problem.

Unit I

ARRAYS, STACKS AND QUEUES: Arrays: Concepts - representation of arrays - simple applications. Stack: Fundamentals - Operation - Application of Stack - evaluation of expression. Queue: Fundamentals - Operation - Application of Queue - Multiple Stacks and Queues - Concepts – Operations.

Unit II

LINKED LISTS: Singly Linked List - Concepts - Operations - Linked Stacks and Queues - The storage pool - Application – Polynomial addition – Equivalence relation – Sparse Matrices Doubly Linked Lists – Concepts – Operations – Applications – Dynamic Storage Management - Garbage Collection and Compaction.

Unit III

TREES AND GRAPHS: Trees: Basic Terminology - Binary Trees - Binary Tree Representation - Binary Tree Traversal - Threaded Binary Tree - Application of Trees. Graphs: Graph Representation - Traversal - Connected Components and Spanning Trees - Shortest Path - Transitive Closure.

Unit IV

SEARCHING: Binary Search - Sequential Search - Sorting: Internal sorting - Insertion, Quick, Merge, Heap sorts - Bubble Sort - External Sorting - Sorting with Tape and Sorting with Disk. Symbol tables: Static Tree tables – Dynamic Tree Tables- Hash Tables.

Unit V

FILES AND INDEXING: External Storage Devices - Magnetic Drum - Magnetic Disk - Mass Storage Devices - File organization - Sequential File - Concepts – Indexing Techniques – Hashed Indexes- Tree Indexing – B trees – Tree Indexing - Indexed Sequential Access Method (ISAM) – Random File Organization - Concepts - Direct Addressing - Directory Lookup - Linked Organization - Multilist Inverted Files - Cellular Partitions.

Text Book:

1. Ellis Horowitz & Sartaj Sahni, “Fundamentals of Data Structures”, Computer Science Press India, 2000 ISBN 091-489-420X.

Reference Books:

1. Ellis Horowitz & Sartaj Sahni, “Fundamentals of Computer Algorithms”, Computer Science Press, ISBN: 0-914894-22-6.
2. Jean-Paul Tremblay, Paul G. Sorenson, “An Introduction to Data structures with Applications” (II Edition), Tata McGraw-Hill Company, 2002, ISBN: 007065157.
3. Robert Sedgewick, “Algorithms in C”, Addison Wesley, 2001.

12CA308 BUSINESS DATA NETWORKS**Credits: 4:0:0****Course Objective:**

- To know about the core network concepts.
- To understand the functionalities of different layers of the network.
- To know more about the network management and systems management.

Course Outcome:

The students will understand

- the core concepts of the network.
- the layered strategy, the work carried out at different layers.
- the difference between network management and systems management.

Unit I

CORE NETWORK CONCEPTS: Introduction – Applications, Client Stations, and Servers – Transmission links – Switches – Quality of Service – Geographical scope – Internets, Intranets, and Extranets. Standards: Introduction – Layered communication – The physical, data link, and internet layers – Layer cooperation at the physical, data link and internet layers – The transport and application layers – Standard architectures.

Unit II

PHYSICAL LAYER PROPAGATION: Introduction – Signaling – UTP signal propagation – Optical fiber transmission links – Radio signal propagation – Physical layer topologies. A small ethernet PC network: Introduction – UTP transmission links – Hubs and Switches – Network Interface cards – Server services.

Unit III

OTHER LAN TECHNOLOGIES: Introduction – larger ethernet standards – Wireless LANs – ATM LANs. Telephony - Internal and External: Introduction – Internal Telephony – The technology of PSTN – Analog and digital transmission in the PSTN – Cellular telephony.

Unit IV

WIDE AREA NETWORKS AND SECURITY: Introduction – Telephone model communication – Leased line networks – Public Switch Data Networks. TCP/IP Networking: Introduction – Routing decisions. Security: Introduction – Attack prevention systems.

Unit V

NETWORK MANAGEMENT AND SYSTEM ADMINISTRATION: Introduction – Cost analysis – Administrative servers – Server management – Access permissions. Network Applications: Introduction – Traditional applications architecture – Electronic mail – the World Wide Web and E-Commerce – Web Services – Peer-to-Peer applications.

Text Book:

1. Raymond R Panko, “Business Data Networks and Telecommunications”, Prentice Hall of India, Fourth edition, 2004. ISBN: 81-203-2171-5.

Reference Book:

1. Douglas E Comer, “Computer Networks and Internets”, Pearson Education, 5th Edition, 2008.

12CA309 COMPILER DESIGN

Credits: 3:0:0

Course Objective:

- To introduce the major concept areas of language translation and compiler design
- To develop an awareness of the function and complexity of modern compilers.
- To introduce various phases of compiler design

Course Outcome:

- Students will have a concrete view on the theoretical and practical aspects of compiler design
- Students will have acquired the skills to understand, develop, and analyze recognizers for programming languages.
- Students will be able to apply ideas and techniques discussed to various software design

Unit I

INTRODUCTION TO COMPILING: Compilers-Analysis of the source program-The phases of a compiler- Cousins of the compiler-The grouping of phases-Compiler-construction tools. A Simple One-Pass Compiler: Overview-Syntax definition-Syntax Directed Translation-Parsing – Lexical analysis-Incorporating a symbol table.

Unit II

LEXICAL ANALYSIS: The role of the lexical analyzer-Input buffering-Specification of tokens-Recognition of tokens- Finite automata-From a regular expression to an NFA-Design of a lexical analyzer generator

Unit III

SYNTAX ANALYSIS: The role of the parser-Context-free grammars-Writing a grammar-Top down parsing-Bottom-up parsing-Operator-precedence parsing

Unit IV

SYNTAX-DIRECTED TRANSLATION AND TYPE CHECKING: Syntax-directed definitions-Construction of syntax trees- Top-down translation-.Type checking: Type systems-Specification of simple type checker-Equivalence of Type Expressions-Type Conversions-Overloading of Functions and Operators.

Unit V

CODE GENERATION: Intermediate Code Generation: Intermediate languages. Issues in the design of a code generator-Target machine-Runtime storage management -A simple code generator- Code Optimization: Introduction-The principal sources of optimization-Optimization of basic blocks

Text Book:

1. Alfred V Aho, Ravi Sethi and Jeffrey D Ullman, “Compilers – Principles, Techniques and Tools”, Pearson Education, Eleventh Indian Reprint, 2003. ISBN: 81-7808-046-X.

Reference Books:

1. Dick Grone, Henri E Bal, Cerial J H Jacobs and Koen G Langendoen, “Modern Compiler Design”, John Wiley and Sons, USA, 2000. ISBN-10: 0-471-97697-0.
2. Santanu Chattopadhyay, “Compiler Design”, PHI,2005. ISBN: 81-203-2725-X

12CA310 JAVA PROGRAMMING

Credits: 4:0:0

Course Objective:

- To learn basic concepts of java
- To solve problems using Object Oriented Paradigm
- To learn about Networking Concepts in java

Course Outcome:

Students will be able to

- develop applications Using Object Oriented Programming concepts
- use exception handling and Multithreading
- develop GUI Applications

Unit I

BASIC PROGRAMMING CONCEPTS IN JAVA: The History and evolution of Java - An Overview of Java - Data Types, Variables and Arrays – Operators - Control Statements

Unit II

OBJECTS AND CLASSES: Introducing Classes –A Closer look at Methods and Classes - Inheritance - Packages and Interfaces

Unit III

EXCEPTION HANDLING, THREADING AND APPLETS: Exceptions Handling - Multithreaded Programming –Autoboxing –I/O, Applets, and other Topics

Unit IV

COLLECTIONS AND EVENT HANDLING: Java.util Package- The Collection Framework- Networking - The Applet Class- Event Handling

Unit V

AWT: Introducing the AWT: Working with Windows, Graphics and Text – Using AWT Controls, Layout Managers, and Menus

Text Book:

1. Herbert Schildt, “Java - The Complete Reference”, J2SE Fifth Edition, Tata McGraw-Hill, 2005.ISBN-0-07-059878-9

Reference Books:

1. C. Thomas Wu, “An Introduction to Object Oriented Programming with Java”, Fifth Edition ,Mc Graw Hill,2009.
2. Cay S. Horstmann, Garry Cornell, “Core Java, Volume 1- Fundamentals”, Eighth Edition,2008,Pearson Education, ISBN 978-81-317-1945-9

12CA311 OBJECT ORIENTED ANALYSIS AND DESIGN

Credits: 4:0:0

Course Objective:

- To learn the concept of Object Oriented Software Development Process
- To get acquainted with UML Diagrams
- To understand Object Oriented Analysis Processes

Course Outcome:

Students will be able to

- understand Object Oriented Software Development Process
- gain exposure to Object Oriented Methodologies & UML Diagrams
- apply Object Oriented Analysis Processes for projects

Unit I

BASICS OF OBJECT ORIENTED DEVELOPMENT: Object Basics, Object oriented philosophy, objects, classes, attributes, object behavior and methods, encapsulation and information hiding, class hierarchy, polymorphism, object relationships and associations, aggregations and object containment, case study, object identity, persistence. Object oriented systems development life cycle: Software development process, building high quality software, use- case driven approach, reusability.

Unit II

OBJECT ORIENTED METHODOLOGIES: Rumbaugh et al.'s object modeling technique, Booch methodology, Jacobson et al methodologies, patterns, frameworks, the unified approach. Unified modeling language: Static and dynamic models, UML diagrams, UML class diagrams, use-case diagrams, UML dynamic modeling, packages, UML extensibility and UML meta model.

Unit III

OBJECT ORIENTED ANALYSIS PROCESS: Business object analysis, use-case driven object oriented analysis, business process modeling, use-case model, developing effective documentation, case study. Classification: Classification theory, noun phrase approach, common class patterns approach, use-case driven approach, classes, responsibilities, and collaborators, naming classes.

Unit IV

IDENTIFYING OBJECT RELATIONSHIPS, ATTRIBUTES AND METHODS: Association, super-subclass relationships, a-part of relationships, case study, class responsibility, defining attributes for vianet bank objects, object responsibility, defining methods for vianet bank objects Design process and design axioms: Corollaries, design patterns.

Unit V

DESIGNING CLASSES: UML object constraint languages, designing classes, class visibility, refining attributes for the vianet bank objects, designing methods and protocols, designing methods for the vianet bank objects, packages and managing classes. Designing access layer, case study. Designing view layer, macro level process.

Text Book:

1. Ali Bahrami, "Object Oriented Systems Development using the Unified Modeling Language", McGraw Hill, Reprint 2009, ISBN:9780071160902

Reference Books:

1. Bernd Oestereich, "Developing Software with UML, Object-Oriented Analysis and Design in Practice", Addison-Wesley, 2000, 020139826
2. James Rumbaugh, Ivar Jacobson, Grady Booch, "The Unified Modeling Language Reference Manual", Second edition, Addison Wesley, 2005, ISBN:020130998X

12CA312 INTERNET PROGRAMMING

Credits 3:1:0

Course Objective:

- To familiarize the basic components of how to develop a web page using HTML.
- To develop dynamic web pages using PHP.
- To develop web applications using PHP.

Course Outcome:

After the completion of the course, students will be able to

- develop a basic web page
- include format and personalize the web pages
- use PHP to build dynamic web pages

Unit I

BASIC HTML: HTML, XML and World Wide Web - Basic HTML, Document Body, Texts, Hyper Links, Adding Formatting, Lists, Tables, Using Color and images, Images

Unit II

BASICS OF PHP: An Introduction to PHP-PHP basics-Functions-Arrays- Object-oriented PHP- Advanced OOP Features

Unit III

FILE AND EXCEPTION HANDLING: Error and Exception handling - Strings and Regular Expressions- Working with the File and Operating System- Date and Time-Forms and navigation cues.

Unit IV

DATABASES AND SESSION HANDLERS: Authentication-Handling File uploads- Networking-Session Handlers- Introducing MySQL- MySQL Storage Engines and Datatypes

Unit V

ADVANCED DATABASE CONCEPTS: Securing MySQL- PHP's MySQL Extension-PHP's mysqli Extension-Stored Routines- Practical Database queries-Importing and Exporting Data.

Text Books:

1. Jason Gilmore, "Beginning PHP and MySQL 5, From Novice to Professional", Apress, First Indian Reprint, 2007. ISBN 978-81-8128-673-4
2. Chris Bates "Web Programming: Building Internet Applications", Wiley Dreamtech India (p)Ltd., Second Edition, 2002. ISBN 0471419028

Reference Books:

1. Tim Converse and Joyce Park with Clark Morgan, "PHP 5 and MySQL Bible", Wiley India Pvt.Ltd., 2008, ISBN 10:81-265-0521-4.
2. Rasmus Lerdorf and Kevin Tatroe, "Programming in PHP", O'Reilly and Associates, 2002, ISBN: 1-56592-610-2.
3. Robert Sheldon, Geoff Moes , "My SQL", WILEY, First Edition, 2005, ISBN: 81-265-0592-3.

12CA313 PROGRAMMING IN C LAB

Credits: 0:0:2

Course Objective:

- To make the students to understand the concepts of C Language and motivate them to develop the Coding.

Course Outcome:

The students will be able to develop C programs

- that are non-trivial with efficiency, readability and modularity
- utilizing various features like arrays pointers structures and files

List of Experiments:

1. Usage of input / output library functions
2. Usage of Operators
3. Usage of Branching Control Structures
4. Usage of Looping Control Structures
5. Usage of User Defined Functions
6. Pointers and Functions
7. Usage of One Dimensional Arrays
8. Usage of Two Dimensional Arrays
9. Arrays and Functions.
10. Array of Structures
11. Input & Output using Files
12. Files and Structures.

12CA314 DATABASE SYSTEMS LAB

Credits: 0:0:2

Course Objective:

- To impart students with the knowledge of database system by using DDL and DML statements
- To facilitate students to understand the concept of sub queries, multiple sub queries

Course Outcome:

Students will be able to

- write queries in DDL and DML statements
- have an understanding of sub queries and multiple sub queries.
- perform normalization for all tables which they store it in database.

List of Experiments:

1. Usage of DDL Commands
2. Usage of DML commands
3. Usage of TCL commands
4. Multiple sub queries

5. Object creation
6. Array Manipulation
7. Correlated Sub queries
8. Aggregate functions
9. Integrity constraints
10. Triggers
11. PL/SQL operations
12. Procedures and Functions

12CA315 OBJECT ORIENTED PROGRAMMING IN C++ LAB

Credits: 0:0:2

Course Objective:

- To implement the object oriented concepts to solve problems
- To develop an application using the object oriented concepts

Course Outcome:

Students will be able to

- implement object oriented concepts to solve problems
- develop applications using object oriented concepts

List of Experiments:

1. Classes and Objects
2. Constructors and Destructor
3. Static Members and Constant Methods
4. Aggregation and Inline Functions
5. Dynamic Memory Management
6. 'this' pointer
7. Function Overloading
8. Operator Overloading
9. Inheritance
10. Complete Class diagram (case study) implementation
11. Abstract Class, Overriding and Dynamic Binding
12. File Handling
13. Function Template
14. Class Template

12CA316 DATA STRUCTURES LAB

Credits: 0:0:2

Course Objective:

- To develop skills to design and analyze simple linear and non linear data structures
- To Strengthen the ability to identify and apply the suitable data structure for the given real world problem
- To Gain knowledge in practical applications of data structures

Course Outcome:

At the end of this lab session, the student will

- be able to design and analyze the time and space efficiency of the data structure
- be capable to identify the appropriate data structure for given problem.
- have practical knowledge on the application of data structures

List of Experiments:

1. Implementation of Singly linked list.
2. Implementation of Doubly linked list.
3. Implementation of Multistack in a Single Array.
4. Implementation of Circular Queue
5. Implementation of Binary Search trees.
6. Implementation of Hash table.
7. Implementation of Heaps.
8. Implementation of Breadth First Search Techniques.
9. Implementation of Depth First Search Techniques.
10. Implementation of Prim's Algorithm.
11. Implementation of Dijkstra's Algorithm.
12. Implementation of Kruskal's Algorithm
13. Implementation of MergeSort
14. Implementation of QuickSort
15. Implementation of Data Searching using divide and conquer technique

12CA317 UNIX/ LINUX LAB**Credits: 0:0:2****Course Objective:**

- To familiarize students with the Linux environment
- To learn the fundamentals of shell scripting/programming
- To familiarize students with basic linux administration

Course Outcome:

After completion of the course, students will be able to

- work confidently in Unix/Linux environment
- write shell scripts to automate various tasks
- do administrative tasks Linux system

List of Experiments:

1. Basic Shell Commands

Shell Programs:

2. Fibonacci Series
3. Designing Calculator
4. File Operations
5. Base conversion
6. Usage of cut and grep commands
7. Usage of user defined functions

Administration

8. Managing User Accounts
9. User Quota Management
10. Installation of RPM software and Zipping, tar
11. Configuring RAID
12. Configuring Web server

12CA318 JAVA PROGRAMMING LAB**Credits: 0:0:2****Course Objective:**

- To apply the object-oriented paradigm features of Java.
- To implement java concepts like interface, packages, multithreading etc.
- To develop graphic applications in applet and using AWT.

Course Outcome:

Students will be able to

- show competence in the use of Java programming.
- develop small to medium sized application programs of professional standards
- demonstrate their understanding of multithreaded and event driven programming.

List of Experiments:

1. Classes & Objects
2. Array of Objects
3. Inheritance & Method Overriding
4. Interface
5. Package
6. User Defined Exception
7. Multithreading
8. Graphical Objects Using Applet
9. Client Server Communication
10. File Transfer using UDP
11. AWT Controls

12. Database Connectivity

12CA319 INTERNET PROGRAMMING LAB

Credits: 0:0:2

Course Objective:

- To develop application development skills in PHP
- To familiarize in array, object oriented programming using PHP.
- To develop web applications using cookies and session.

Course Outcome:

- Students will have the proficiency to develop web based applications using PHP
- Students will be able to implement user interface validation procedures
- Students will be able to design and develop interactive , executable web applications

List of Experiments:

I. Case Study on Campus Management System

1. User interface input validation
2. Student Academic Information using Class and Object
3. Student Academic Information using Array of Object
4. Student Academic Information using Inheritance
5. File Manipulation for Student Information

II. Case Study on Inventory Control System

6. Maintaining Login Details using Session
7. Tracking User Visiting Web Pages using Cookies
8. Insert, Update and delete operations for inventory
9. Purchasing a Product
10. Generating Bill
11. Displaying product and customer details using sub query
12. Maintaining Product details using session and array

12CA320 MULTIMEDIA COMMUNICATIONS

Credits: 4:0:0

Course Objective:

- To discuss about various Multimedia Representations.
- To provide strong knowledge in various audio, video, text and image compression techniques.

Course Outcome:

At the end of the course, the students should be able to

- understand Multimedia Information Representation and Communication.
- understand Multimedia service creation and communication services.
- understand Securing Multimedia Communications.

Unit I

INTRODUCTION: Multimedia Information Representation - Multimedia Networks - Multimedia Applications and Networking Terminology.

Unit II

MULTIMEDIA INFORMATION REPRESENTATION: Introduction - Digitization principles – text – images – audio - video.

Unit III

TEXT AND IMAGE COMPRESSION: Introduction – Compression Principles – Text Compression-Image Compression.

Unit IV

AUDIO AND VIDEO COMPRESSION: Introduction – Audio Compression – Video Compression.

Unit V

STANDARDS FOR MULTIMEDIA COMMUNICATIONS: Introduction – Reference Models – Standards relating to interpersonal Communications - Standards relating to interactive applications over the Internet - standards for entertainment applications.

Text Book:

1. Fred Halsall, “Multimedia Communications Applications, Networks, Protocols and Standards”, Pearson Education, Fourth Indian Reprint, 2004, ISBN 81-7808-532-1.

Reference Books:

1. Ze-Nian Li, Mark S.Drew, “Fundamentals of Multimedia”, Pearson Education, 2004 ISBN: 81-7758-823-0.
2. John F. Koegel Buford , “Multimedia Systems”, Pearson education, 1994 ISBN 81-7808-162-8.

12CA321 NETWORK SECURITY

Credits: 4:0:0

Course Objective:

- To give a clear insight into cryptography, authentication and emerging security standards.
- To impart knowledge on network security protocols.

Course Outcome:

Students will have

- thorough knowledge about cryptography, techniques for access control and E-mail security.
- ability to develop security algorithms in the network.

Unit I

INTRODUCTION TO CRYPTOGRAPHY: Cryptography, Breaking Encryption schemes, Type of cryptographic Functions, Secret Key cryptography, Public Key cryptography Secret

Key Cryptography: Generic Block Encryption, Data encryption Standards, Advanced encryption Standards.

Unit II

MODES OF OPERATION: Encrypting a Large message. Hashes and Message Digest: Introduction, Encryption with Message Digest, MD2, MD4, SHA-1 and HMAC.

Unit III

PUBLIC KEY ALGORITHMS: Modular Arithmetic, RSA, Diffie-Hellman, Digital Signature Standard, Security of RSA and Diffie-Hellman.

Unit IV

OVERVIEW OF AUTHENTICATION SYSTEM: Password-Based Authentication, Address Based Authentication, and Cryptographic Authentication Protocol, Passwords as cryptographic Keys, Eavesdropping and server database Reading, Trusted Intermediaries, Session key Establishment and Delegation. Kerberos V4: Tickets and ticket granting Tickets, Configuration, Logging into network, Replicated KDCs, Realms, Interrealm authentications, Key version Numbers, Encryption for privacy and Integrity, Encryption for Integrity only, Network Layer Address in Tickets, Message formats.

Unit V

ELECTRONIC MAIL SECURITY: Distribution List, Store and Forward, Security Services, Establishing Keys, Privacy, Authentication of Source, Message Integrity, Non Repudiation, Proof of submission, Proof of Delivery, Message flow confidentiality, Verifying when Message was really sent. Firewalls: Packet filters, Application Level gateway, Encrypted Tunnel, Comparisons, Why firewalls don't work, Denial of Service attacks. Intruders: Intrusion detection, Password Management. Malicious Software: Viruses and related threats, Virus counter measures.

Text Books:

1. Charlie Kafuman, Radia Perlman, Mike Spenciner, "Network Security Private Communication in Private world", Second Edition, Prentice Hall India 2002, ISBN:81-203-2213-4.
2. William Stallings, "Cryptography and network security: principles and practice", Fourth Edition, Pearson Education Inc. 2006.

Reference Books:

1. Chris Brenton, Cameron Hunt, "Mastering Network Security", Second Edition, Sybex inc. Publishing, 2003.
2. Eric Cole, Ronald Krutz, James W. Conley, "Network Security Bible", Wiley India, 2000, ISBN:81-2650576-1.
3. Roberta Bragg, Mark Rhodes-Ousley, Keith Strassberg, "Network security: The complete reference", McGraw-Hill, 2004, ISBN: 0072226978.

12CA322 HIGH SPEED NETWORKS AND INTERNETS

Credits: 4:0:0

Course Objective:

- To provide an overview about ATM and frame relay.
- To acquire knowledge about the techniques that support real-time traffic and congestion control.

Course Outcome:

Students will be

- familiarized with high speed networking technologies.
- enabled to optimize and troubleshoot high-speed network.
- demonstrate the knowledge of network planning and optimization.

Unit I

HIGH SPEED NETWORKS: Frame Relay: Packet-Switching Networks, Frame relay Networks Asynchronous Transfer Mode: ATM Protocol Architecture, ATM Logical Connections, ATM cells, ATM Service Categories, ATM Adaptation Layer. High-Speed LANs: Ethernet, Fibre Channel, Wireless LAN.

Unit II

CONGESTION CONTROL IN DATA NETWORKS AND INTERNETS: Effects of Congestion, Congestion Control, Traffic Management, Congestion Control in Packet Switching Networks, Frame Relay Congestion Control. Link-Level Flow and Error Control: The Need for Flow and Error Control -Link Control Mechanisms - ARQ Performance.

Unit III

TCP TRAFFIC CONTROL: TCP Flow control, TCP Congestion Control, Performance of TCP over ATM. Traffic and Congestion Control in ATM Networks: Requirements for ATM traffic and Congestion control, ATM Traffic Related attributes, Traffic Management Frame work, Traffic Control, ABR traffic Management, GFR traffic management.

Unit IV

INTERNET ROUTING: Interior Routing Protocols-Internet Routing Principles, Distance-Vector Protocol: RIP, Link-State Protocol: OSPF. Exterior routing Protocols and Multicast: PathVector Protocols: BGP and IDRP, Multicasting.

Unit V

INTEGRATED AND DIFFERENTIAL SERVICES: Integrated Services Architecture, Queuing Discipline, Random Early Detection, Differentiated Services. Protocols for QoS Support: Resource Reservation: RSVP, Goals & Characteristics, Multiprotocol Label Switching – Operations, Label Stacking, Real-Time Transport Protocol (RTP).

Text Book:

1. William Stallings, "High-Speed Networks And Internets", Pearson Education, Second Edition, 2002, ISBN: 81-7808-578-X.

Reference Books:

1. Warland & Pravin Varaiya, "High Performance Communication Networks", Jean Harcourt Asia Pvt. Ltd., Second Edition, 2001.
2. William Stallings, "Data and Computer Communications", Prentice-Hall, Fifth Edition, 1991.

3. Douglas E Comer, “Computer Networks and Internets”, Prentice Hall, 2nd edition, 1999.

12CA323 DISTRIBUTED OPERATING SYSTEM

Credits: 4:0:0

Course Objective:

- To provide fundamental concepts and design principles of distributed operating systems.
- To provide an overview of various communication techniques that facilitate to exchange information among distributed computing systems.

Course Outcome:

Students will be able to

- describe various communication techniques used for exchange of information.
- recognize CPU Scheduling, synchronization, and deadlock.
- describe OS support for processes and threads.
- describe algorithms for handling synchronization, deadlock, and election related to distributed systems.
- able to identify security and protection issues in distributed systems.

Unit I

DISTRIBUTED COMPUTING ENVIRONMENTS AND COMPUTER NETWORKS:

Fundamentals - Distributed Computing system, Evolution, Distributed Communicating System Models, Popularity, Distributed Operating System, Issues in designing Distributed Operating System, Distributed computing Environment. Computer Networks – Network types, LAN Technologies, WAN Technologies, Communication Protocols, Internetworking, ATM Technology.

Unit II

MESSAGE PASSING AND REMOTE PROCEDURE CALLS: Message Passing - Features of Good message passing System, Issues in IPC by message passing, Synchronization, Buffering, Multidatagram Messages, Encoding and decoding of message data, Process addressing, Failure Handling, Group Communication, Case study. Remote procedure Calls - RPC Model, Transparency of RPC, Implementing RPC mechanism, Stub Generation, RPC Messages, Marshaling Arguments and Results, Server Management, Parameter Passing Semantics, Call Semantics, Communication protocols for RPCs, Complicated RPCs, Client Server Binding, Exception Handling, Security, Special Types of RPCs, RPC in Heterogeneous Environments, Lightweight RPC.

Unit III

DISTRIBUTED SHARED MEMORY: Architecture, Design and Implementation Issues, Granularity, Structure of Shared Memory Space, Consistency Model, Replacement Strategy, Thrashing, Other Approaches, Heterogeneous DSM, Advantages of DSM. Synchronization - Clock Synchronization, Event ordering, Mutual Exclusion, Deadlock, Election Algorithms.

Unit IV

RESOURCE MANAGEMENT AND PROCESS MANAGEMENT- Features of global scheduling algorithm, Task Assignment Approach, Load Balancing Approach, Load Sharing Approach. Process Management-Process Migration, Threads.

Unit V

DISTRIBUTED FILE SYSTEMS: Distributed File Systems - Features, File Models, File Accessing Models, File Sharing Semantics, File Caching Schemes, File Replication, Fault Tolerance, Atomic Transactions, Design Principles. Naming - Features, Terminologies and concepts, System Oriented Names, Object locating mechanisms, Human Oriented Names, Name Caches, Naming and Security.

Text Book:

1. Pradeep K Sinha, “Distributed Operating Systems: Concepts and Design”, Prentice Hall of India, 2007, ISBN: 978-81-203-1380-4.

Reference Books:

1. Andrew S. Tanenbaum, “Distributed Operating System”, Prentice Hall, 1995, ISBN:0132199084.
2. George Coulouris, Jean Dollimore, Tim Kindberg, “Distributed Systems:Concepts and Design”, Pearson Education Ltd., 2001, ISBN: 81-7808-462-7.
3. Yakup Paker, Jean-Pierre Banatre, Müslim Bozyigit, “Distributed operating systems: theory and practice”, Springer-Verlag, 1987, ISBN: 3540176993.

12CA324 CLIENT SERVER COMPUTING

Credits: 3:0:0

Course Objective:

- To understand the components of client/server applications and systems development.
- To acquire adequate knowledge in client/server Technologies.
- To understand CORBA, System Oriented Technologies.

Course Outcome:

Students will have

- adequate knowledge in client/server technologies
- knowledge about CORBA and System Oriented Technologies

Unit I

INTRODUCTION TO CLIENT/SERVER COMPUTING: Driving forces and Major issues – Single System Image – Client/server Computing – Advantages of Client/Server Computing – Technology Revolution – Connectivity – User Productivity – Ways to improve performance – Reducing Network Traffic – Vendor Independence – Faster Delivery of systems.

Unit II

COMPONENTS OF CLIENT/ SERVER APPLICATIONS: – The Client – Request for service –The Server – Server Functionality – The Network Operating System – Available platforms – Server Operating System – System Application Architecture (SAA).

Unit III

INTERPROCESS COMMUNICATION AND NETWORK MANAGEMENT: Connectivity – Open System Interconnect – Communication Interface Technology – Interprocess Communication – Wide Area Network Technologies – Network Management – Client/Server Systems Development – Software - Factors Driving Demand for Application Development.

Unit IV

CLIENT/SERVER SYSTEMS DEVELOPMENT: Hardware – Hardware Components – Service and Support - Client/Server Systems Development – Training – Training Advantages of GUI Applications – Systems Administrator Training – Database Administrator Training – End-user Training – Training Delivery Technology – The future of Client/Server Technology.

Unit V

AN INTRODUCTION TO CORBA: CORBA overview – CORBA concepts. CORBA Interface Definition Language: An Overview of CORBA idl. The CORBA2 Standard: An overview of CORBA2- Standard Object Model – The CORBA Architecture – CORBA clients and Object Implementation. CORBA Services: Views of OMA – ORBOS Architecture.

Text Books:

1. Patrick Smith, “Steve Guengerich, Client / Server Computing”, IInd Edition, Prentice Hall of India Private Ltd., 2002. ISBN 81-203-0937-5.
2. Thomas J. Mowbray, William A. Ruh. “Inside CORBA – Distributed Object Standards and Applications”, Addison Wesley Longman, Inc. 2000. ISBN: 81-7808-051-6.

Reference Books:

1. Robert Orfali, Dan Harkey, Jeri Edwards, “The Essential Client/Server Survival Guide”, Galgotia Publication pvt. Ltd., 2004. ISBN 81-7515-129-3
2. M. Tamer, Patrick Valduriez, S. Sridhar, “Principles of Distributed Database Systems”, Pearson Education, Inc., 2006. ISBN 81-7758-177-5.
3. Pradeep K Sinha, “Distributed Operating Systems: Concepts and Design”, Prentice Hall of India, 2007, ISBN: 978-81-203-1380-4.

12CA325 WIRELESS NETWORKS

Credits: 4:0:0

Course Objective:

- To impart knowledge about the wireless communication principles and fundamentals.
- To equip the students in various kinds of wireless networks and its operations.
- To know about various generations of wireless networks.

Course Outcome:

Students will

- expertise in various techniques and operations of wireless networks
- able to design a simple wireless network
- be familiarized in wireless security and applications

Unit I

WIRELESS NETWORK FUNDAMENTALS: Evolution of Wireless Networks, Challenges, Wireless communications Principles and Fundamentals: The Electromagnetic Spectrum, Wireless Propagation Characteristics and Modeling, Analog and Digital Data transmission, Modulation Techniques for Wireless Systems, The Cellular Concept, Wireless Services.

Unit II

GENERATIONS: First Generation (1G) – Cellular Systems: Advanced Mobile Phone System (AMPS), Nordic Mobile Telephony (NMT), Second Generation (2G) – Cellular Systems: GSM, Data Operations, Cordless Telephony, Third Generation (3G) – Cellular Systems: 3G Spectrum Allocation, Third Generation Service Classes and Applications, Fourth Generation (4G) – Cellular Systems: 4G Services and Applications, Challenges: Predicting the Future of Wireless Systems.

Unit III

SATELLITE NETWORKS AND FIXED WIRELESS ACCESS SYSTEMS : Introduction, Satellite Systems, VSAT Systems, Examples of Satellite based Mobile Telephony Systems, Satellite-based Internet Access. Fixed Wireless Access Systems: Wireless Local Loop versus Wired Access, Wireless Local Loop, Wireless Local Loop Subscriber Terminals (WLL), Wireless Local Loop Interfaces to the PSTN, IEEE 802.16 Standards.

Unit IV

WIRELESS LOCAL AREA NETWORKS: Introduction, Wireless LAN Topologies, Wireless LAN Requirements, The Physical Layer, The Medium Access Control (MAC) Layer, Latest Developments. Wireless ATM and Ad Hoc Routing: Introduction, Wireless ATM Architecture, HIPERLAN 2: An ATM Compatible WLAN, Routing in Wireless Ad Hoc Networks.

Unit V

PERSONAL AREA NETWORKS AND SECURITY: Introduction to PAN Technology and Applications, Commercial Alternatives: Bluetooth, Commercial Alternatives: Home RF. Security Issues in Wireless Systems: The Need for Wireless Network Security, Attacks on Wireless Networks, Security Services, Wired Equivalent Privacy (WEP) Protocol, Mobile IP, Weaknesses in the WEP Scheme, Virtual Private Network (VPN).

Text Book:

1. P.Nicopolitidis, M.S. Obaidat, G.I Papadimitriou, A.S. Pomportsis, “Wireless Networks”, John Wiley & Sons, Ltd., 2003, ISBN 9812-53-033-9.

Reference Books:

1. Jochen Schiller, “Mobile Communications”, Second Edition, Pearson Education, Ltd., 2003, ISBN: 81-297-0350-5.
2. T.S. Rappaport, “Wireless Communications: Principles and Practice”, Second Edition, Prentice Hall, 2002.

12CA326 MOBILE COMMUNICATION SYSTEMS

Credits: 4:0:0

Course Objective:

- To know about the main concepts of Global System for Mobile communications
- To have a clear idea and focus on the communication networks.
- To gain knowledge in radio engineering, data communications, computer networks, distributed systems, information management, and applications.

Course Outcome:

Students will

- gain knowledge in Mobile environment fundamentals.
- familiarize in 2G Technologies for future Generation wireless and mobile communications.

Unit I

INTRODUCTION TO COMMUNICATION: Introduction, Wireless Transmission: Frequencies for Radio Transmission, Signals, Antenna, Signal Propagation, Multiplexing, Modulation, Spread Spectrum, Cellular Systems

Unit II

MEDIUM ACCESS CONTROL AND TELECOMMUNICATION SYSTEMS: Medium Access Control: Motivation for Specialized MAC, SDMA, FDMA, TDMA, CDMA, Comparison of S/T/F/CDMA. Telecommunication Systems : GSM, DECT, TETRA, UMTS and IMT-2000

Unit III

SATELLITE AND BROADCAST SYSTEMS: Satellite Systems: History, Applications, Basics: GEO, LEO, MEO, Routing, Localization, Handover. Broadcast Systems: Overview, Cyclic repetition of data, Digital Audio Broadcasting, Digital Video Broadcasting

Unit IV

Wireless LAN: Infrared VS Radio Transmission, Infrastructure and Ad-Hoc networks, IEEE 802.11, HIPERLAN, Bluetooth

Unit V

SUPPORT FOR MOBILITY: File systems, World Wide Web, Wireless Application Protocol

Text Book:

1. Jochen Schiller, "Mobile Communications", Second Edition, Pearson Education, Ltd., 2003 ISBN 81-297-0350-5.

Reference Books:

1. James F. Kurose, "Computer Networking - A Top-Down Approach Featuring The Internet", Third Edition -Fifth Reprint, Pearson Education 2009.
2. Nicopolitidis P., "Wireless Networks" , First Edition Reprint 2009, Wiley Publishers.

12CA327 INTERNETWORKING

Credits 4:0:0

Course Objective:

- To focus on the concept of internetworking and TCP/IP internet technology.
- To review the architecture of network interconnections and principles of protocols.
- To study the limitations of the internet approach.

Course Outcome:

Students will be able to

- explain common networking concepts and terminology.
- describe the operation of the major transport layer protocols.
- describe architecture of the internet.

Unit I

OVERVIEW OF INTERNETWORKING: Review of underlying network technology-Internetworking concept and Architectural model-Classful Internet addresses- Mapping Internet Addresses to physical addresses.

Unit II

INTERNET PROTOCOL: connectionless datagram delivery-Internet protocol: forwarding IP datagrams-Internet protocol: Error and control messages.

Unit III

CLASSLESS AND SUBNET ADDRESS EXTENSIONS: Subnets, User Datagram Protocol-Reliable Stream Transport Service.

Unit IV

ROUTING ARCHITECTURE: Cores, Peers and Algorithms, Internet Multicasting-IP Switching and MPLS-Mobile IP-Private Network Interconnection: VPN.

Unit V

THE DOMAIN NAME SYSTEM: Remote Login and Desktop-File Transfer and Access: FTP –Electronic mail -World Wide Web.

Text Book:

1. Douglas E. Comer, “Internetworking with TCP/IP – Principles, Protocols and Architecture”, Pearson Education, Fifth Edition, 2006, ISBN: 81-203-2998-8.

Reference Books:

1. W. Richard Stevens, “TCP/IP Illustrated Volume – I, The Protocols”, Pearson Education, 2000, ISBN: 81-7808-101-6.
2. Charles M. Kozierok, “The TCP/IP guide: A Comprehensive, Illustrated Internet Protocols Reference”, No Starch Press Inc.2005, ISBN:1-59327-047-x.
3. Behrouz A. Forouzan, ”TCP/IP protocol suite”, Third Edition, McGraw Hill, 2005,ISBN: 0071115838.

12CA328 DATABASE DESIGN AND TUNING

Credits: 4:0:0

Course Objective:

- To introduce the concepts of database design and tuning

Course Outcome:

- Students are enabled to demonstrate the concepts of database design and tuning

Unit I

BASIC PRINCIPLES: The Power of Principles, Five Basic Principles, Principles and Knowledge, Tuning the guts: Goal of Chapter, Locking and Concurrency Control, Logging and the Recovery Subsystem, Operating System Considerations, Hardware Tuning.

Unit II

INDEX TUNING: Goal of Chapter, Types of Queries, Key Types, Data Structures, Sparse Versus Dense Indexes, To Cluster or Not to Cluster, joins, Foreign Key Constrains, and Indexes, Avoid Indexes on Small Tables.

Unit III

TUNING RELATIONAL SYSTEMS: Goal of Chapter, Table Schema and Normalization, Clustering Two Tables, Aggregate Maintenance, Record Layout, Query Tuning, Triggers.

Unit IV

COMMUNICATION WITH THE OUTSIDE: Talking to the world, client-Server mechanisms, Objects, Applications tools and performance, Tuning the application interface, Bulk loading Data, Accessing Multiple Database.

Unit V

TUNING E-COMMERCE APPLICATIONS: Goal, E-Commerce Architecture, tuning the E-commerce Architecture, Case study for shop comparison portal, capacity planning in nutshell.

Text Book:

1. Dennis Shasha & Philippe Bonnet, “Database Tuning: Principles, Experiments, and Troubleshooting Techniques”, Elsevier Publications-2003, ISBN 81-8147-324-8.

Reference Books:

1. Toby Teorey, Sam Lightstone, Tom Nadeau, “Database Modeling and Design” , Elsevier Publication -2006, ISBN 978-0-12-685352-0.
2. Sitansu S. Mitra, “Database performance Tuning and Optimization”, Springer Publication 2003, ISBN 0-387-95393-0.

12CA329 BUSINESS INTELLIGENCE IN DATA MINING**Credits: 4:0:0****Course Objective:**

- To know the components of the decision making process.
- To understand the mathematical models and methods needed for incorporating business intelligence.

- To have real-time experience on business intelligence applications using case studies.

Course Outcome:

Students will be able to

- execute the mathematical models and methods needed for incorporating business intelligence
- evaluate various classification models and their existing problems.
- have real time experience on business intelligence applications.

Unit I

BUSINESS INTELLIGENCE: Effective and timely decisions – Data, information and knowledge – The role of mathematical models – Business intelligence architectures – Ethics and business intelligence. Decision support systems: Definition of a system – Representation of the decision-making process – Evolution of information systems – Definition of decision support system – Development of a decision support system.

Unit II

DATA WAREHOUSING: Definition of data warehouse – Data warehouse architecture – Cubes and multidimensional analysis. Mathematical models for decision making: Structure of mathematical models – Development of a model – Classes of models. Data Mining: Definition of data mining – Representation of input data – Data mining process.

Unit III

DATA PREPARATION: Data validation – Data transformation – Data reduction - Data Exploration – Regression.

Unit IV

CLASSIFICATION: Classification problems – Evaluation of classification models – Classification trees – Bayesian methods – Neural networks. Association Rules: Motivation and structure of association rules – Single-dimension association rules – Apriori algorithm – General association rules. Clustering: Clustering methods – Partion methods – Hierarchical methods – Evaluation of clustering models.

Unit V

MARKETING MODELS: Relational marketing – Sales force management. Logistic and Production models: Supply chain optimization – Optimization models for logistics planning – Revenue management systems. Data Envelopment analysis: Efficiency measures – Efficient frontier – The CCR model – Identification of good operating practices.

Text Book:

1. Carlo Vercellis, “Business Intelligence: Data Mining and Optimization for Decision Making”, John Wiley & Sons Ltd, 2009.

Reference Books:

1. Colleen McCue, “Data Mining and Predictive Analysis”, Elsevier, 2007.

2. Efraim turban, Ramesh Sharada, and Dursun Delen, “Decision Support and Business Intelligence Systems”, 9th Edition, 2010.

12CA330 TEXT MINING

Credits: 3:1:0

Course Objective:

- To solve the crisis of information overload by combining techniques from data mining, machine learning, information retrieval, and knowledge management.
- To provide an in-depth knowledge of core text mining concepts.
- To learn advanced pre-processing techniques, knowledge representation considerations, and visualization approaches.
- To explore the real-world applications of text mining.

Course Outcome:

Students will be able to

- to understand the problems associated with managing unstructured text
- know the importance of text mining in real world applications
- mine the information available on the Web using text mining software

Unit I

OVERVIEW OF TEXT MINING: Origins of Text Mining – Understanding Text – Applications – An Architecture for Text Mining Applications – Mathematics Background – Least Square Method – Entropy – Hypothesis Testing – Chi-Square Test. Exploring Text:- Words: Tokens Assembly – Word Stems –Base Words – Word and Meaning Relationships – Patterns in Words and Letters – Word Statics – Indexing Document Text – Frequency-Based – Stopwords.

Unit II

HIDDEN MARKOV MODELS: Observation Probability – State Sequence – Parameter Estimation- POS Taggers: Rule Based Taggers – Brills Taggers – Training a Tagger – Information Extraction: IE Application – Entity Extraction – HMMS for Entity Extraction – Implementation of an Entity Extraction – Implementation of an Entity Extraction – IE Systems-Fastus – Rapier – Phrase Extraction.

Unit III

SEARCH ENGINES: Early Search Engine – Midline – Dialog – Indexing Text for Search - Implementation in Text Mine - Google Index – Queries – Boolean Queries – Multimedia Queries – Relevance Feed Back – Searching an Index – Google Search – Evaluation – Searching the Web: Search Engine coverage – Web Directories – A Distributed Search – Web Communities – Hidden Web – Crawlers: Web Search Engine Crawlers: DNS Caching – Parallel Crawlers – Periodic Crawlers – Text Mine Crawlers – Crawl Parameter – Crawl Visualization .

Unit IV

CLUSTERING AND CATEGORIZATION: Clustering Documents: Cluster Organization – Cluster Parameters – Cluster-Based Search – Searching with a Taxonomy – Linking Methods – Clustering Methods: K-means – Genetic Algorithms – Text Categorization: Text Categorization

Problem – Filtering Email – A Bayesians Email Filter – Feature of Spam – Requirements for a Spam Detector – An Email Archive: Email Categorization – Email Monitor – Personal Email Network – Chain Email – Categorization Methods: Decision Tree – Nearest Neighbour – Perceptrons – Support Vector Machines.

Unit V

INTRODUCTION TO RAPID MINER 5 – Operators: Store Operator – Retrieve Operator – Importing and Exporting the data set – Prediction by Applying a Model – Cross Validation – Models: Bayesian Modeling – Decision Tree – Neural Net Training – ID3 Algorithm.

Text Books:

1. Manu Konchady. "The Text Mining Application Programming", Cambridge; Career & Professional Group , a part of Cengage Learning , 2006.
2. The RapidMiner 5, User Guide, Operator Reference, Developer Tutorial.

Reference Book:

1. Thomas W.Miller . Data and Text Mining , A Business Application Approach, 2005.

12CA331 DATA MINING IN GRID COMPUTING

Credits: 4:0:0

Course Objective:

- To learn the data mining concepts in a grid computing environment.
- To explore the networking techniques for knowledge discovery.

Course Outcome:

Students are enabled to

- gain knowledge on data mining in the context of grid computing.
- understand grid enabled data mining applications with networking concepts

Unit I DATA MINING IN GRID COMPUTING: Introduction-Data Mining-Grid Computing- Data Mining Grid Mining Grid Data-Data Analysis Services in the Knowledge Grid: Introduction- Approach-Knowledge Grid Services- Data Analysis Services- Design of Knowledge Grid Applications.

Unit II

GRID MINER: An Advanced Support for E-science Analytics: Introduction-Rationale Behind the Design and Development of Grid Miner-Use case- Knowledge Discovery Process and its support by the Grid Miner- Graphical Interfaces- Future Developments. Scientific Data Mining in the Service Oriented Architecture Paradigm (ADaM Services): Introduction- ADaM System Overview- ADaM Toolkit Overview- Mining in a Service Oriented Architecture- Mining Web Services- Mining Grid Services.

Unit III

MINING FOR MIS-CONFIGURED MACHINES IN GRID SYSTEMS: Introduction – Preliminaries and Related Works- Acquiring, Pre-processing and Storing data-Data Analysis – The GMS – Evaluation- Federated Analysis Environment for Heterogeneous Intelligent Mining (FAEHIM): Introduction- Requirements of a Distributed Knowledge Discovery Framework - Work-Flow Based Knowledge Discovery- Data Mining Toolkit – Data Mining Service Framework –Distributed Data Mining Services – Data Manipulation Tools – Availability- Empirical Experiments.

Unit IV

SPECIFICATION OF DISTRIBUTED DATA MINING WORKFLOWS WITH DATA MINING GRID: Introduction - Data Mining Grid Environment- Operations for Work flow Constructions- Extensibility- Case Studies. Service Oriented Data Mining (Anteater): Introduction- Architecture- Runtime Framework- Parallel Algorithms for Data Mining- Visual Metaphors.

Unit V

DATA MINING GRID ARCHITECTURE: A Generic Brokering Based Data Mining Grid Architecture (DMGA): Introduction- DMGA Overview- Horizontal Composition – Vertical Composition – Need for Brokering – Brokering Based Data Mining Grid Architecture- Use Cases. Grid Based Data Mining with the Environmental Scenario Search Engine (ESSE).Environmental Data Source: NCEP/NCAR Re-analysis Dataset- Fuzzy Search Engine- Software Architecture- Applications.

Text Book:

1. Werner Dubitzky, “Data Mining Techniques in Grid Computing Environments”, Wiley Blackwell Edition 2008, ISBN- 9780470512586.

Reference Books:

1. Ahmar Abbas, “Grid Computing: A Practical Guide to technology and applications”, Published by Firewall Media, New Delhi. Edition 2008. ISBN: 81-7008-626-4.
2. Fren Berman, Geoffery Fox, Antony J.G.Hey, “Grid Computing: Making the Global Infrastructure a reality”, Published by John Wiley & Sons Ltd, Edition 2003(Reprint 2005).ISBN 0470-85319-0.

12CA332 WEB MINING

Credits: 4:0:0

Course Objective:

- To introduce the basic concepts of web mining
- To know the information retrieval from web based paradigms
- To measure and model the web
- To do Web log analysis and to make further predictions and decisions.

Course Outcome:

Students are able to

- understand the basic concepts of web mining

- gain knowledge on web based paradigms
- measure and model the web

Unit I

CRAWLING AND INDEXING: Crawling and Indexing, Topic Directories, Clustering and Classification, Hyperlink Analysis, Resource Discovery and Vertical Portals, Structured vs Unstructured Data Mining. Infrastructure - Crawling the Web: HTML and HTTP Basis, Crawling Basics, Engineering Large – Scale Crawlers, putting together a Crawler.

Unit II

WEB SEARCH AND INFORMATION RETRIEVAL AND CLUSTERING: Boolean queries and the inverted Index, Relevance Ranking, Similarity Search, Learning - Similarity and Clustering: Formulations and Approaches, Bottom – Up and Top – Down Partitioning Paradigms, Clustering and Visualization via Embeddings, Probabilistic Approaches to clustering, Collaborative Filtering.

Unit III

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 states – searching with partial information.

Unit IV

APPLICATIONS SOCIAL NETWORK ANALYSIS: Social Sciences and Bibliometry, PageRank and HITS, Shortcomings of the Coarse – Grained Graph Model, Enhanced Models and Techniques, Evaluation of Topic Distillation, Measuring and Modeling the Web.

Unit V

RESOURCE DISCOVERY AND FUTURE OF WEB MINING: Collecting Important Pages Preferentially, Similarity Search using link Topology, Topical Locality and Focused Crawling, Discovering Communities. The Future of Web Mining: Information Extraction.

Text Books:

1. Soumen Chakrabatri, “Mining the Web – Discovering Knowledge from Hypertext Data” Elsevier Science – 2003.
2. Stuart Russell, Peter Norvig, “Artificial Intelligence – A Modern Approach”, 2nd Edition, Pearson Education / Prentice Hall of India, 2004.

Reference Books:

1. R. Agarwal, J.Gehrke, D. Gunopulos, and P.Raghavan. “Automatic Subspace clustering of High dimensional data for data mining applications”.
2. J. Allan. Automatic Hypertext link typing in 7th ACM Conference on Hypertext, Hypertext '96, Pages 42-51, 1996
3. J. Allen. Natural Language Understanding, Benjamin Cummings, 1987,1995
4. Nils J. Nilsson, “Artificial Intelligence: A new Synthesis”, Harcourt Asia Pvt. Ltd., 2000.
5. Elaine Rich and Kevin Knight, “Artificial Intelligence”, 2nd Edition, Tata McGrawHill, 2003.
6. George F. Luger, “Artificial Intelligence-Structures and Strategies For Complex Problem Solving”, Pearson Education / PHI, 2002.

12CA333 BUSINESS INTELLIGENCE AND ITS APPLICATIONS

Credits: 4:0:0

Course Objective:

- To apply Business intelligence (BI) for a broad category of applications and technologies for gathering, storing, analyzing, and providing access to data to help enterprise users make better business decisions.
- To enhance the BI applications by including the activities of decision support systems, query and reporting, online analytical processing (OLAP), statistical analysis, forecasting, and data mining.

Course Outcome:

Students will be able to

- apply the BI process across the organization.
- make predictive analytics work for your bottom line.
- blend BI process into daily management activities.

Unit I

EFFECTIVE DECISION MAKING: Equipping the organization for effective decision making- Making the most of what You've got using Business Intelligence- Seeking the Source- the source of Business Intelligence – First Steps Beginning the development of Business Intelligence.

Unit II

DATA MARTS: Defining business intelligence structures: Building Foundations – Creating Data Marts.

Unit III

DATA CUBES AND MDX SCRIPTING: Analyzing Cube Content – Cubism- measures and Dimensions- Writing a New script- MDX Scripting.

Unit IV

MDX QUERIES: The MDX SELECT Statement –Additional MDX Syntax. Panning for Gold Introduction to Data Mining – What is Data Mining?- Data Mining Algorithms.

Unit V

BUILDING THE MINE: Building the Mine – Working with the Data Mining Model- Data Mining structure-Mining Model Viewer-Spelunking- Exploration using Data Mining- On Report- Delivering Business Intelligence with Reporting Services. Excel Pivot Tables and Pivot Charts.

Text Book:

1. Brain Larson, “Delivering Business Intelligence with Microsoft SQL server 2008”, McGraw-Hill,2008, ISBN: 978-0071549448.

Reference Books:

1. Lynn Langit, “Foundations of SQL Server 2005 Business Intelligence” , Apress 2007 , ISBN 978-1590598344.
2. Mike Biere, “Business intelligence for the Enterprise”, IBM Press 2003, ISBN: 978-0131413030.

12CA334 DATAWAREHOUSING

Credits: 4:0:0

Course Objective:

- To know about the architecture/technology of Data Warehousing
- To know more about the operational and analytical environment of Data Warehousing
- To know the need for Data Warehouse

Course Outcome:

At the end of the course, the students will understand

- the need for Data Warehouse
- the working environment/architecture of a Data Warehouse
- the multiple levels of building a Data Warehouse

Unit I

DATAWAREHOUSE AND DESIGN: Evolution of Decision Support System – The Data Warehouse Environment – The Data Warehouse and Design.

Unit II

DISTRIBUTED DATA WAREHOUSE: Granularity in the Data Warehouse – The Data Warehouse and Technology – The Distributed Data Warehouse

Unit III

EXECUTIVE INFORMATION SYSTEMS: Executive Information Systems and the Data Warehouse – External Data and the Data Warehouse – Migration to the architected Environment

Unit IV

THE DATA WAREHOUSE AND THE WEB: Unstructured Data and the Data Warehouse – The Really Large Data Warehouse

Unit V

DATA WAREHOUSE ADVANCED TOPICS: The Relational and the Multidimensional Models as a Basis for Database Design – Data Warehouse Advanced Topics – Cost Justification and Return on Investment for a Data Warehouse

Text Book:

1. William H Inmon, “Building the Data Warehouse”, Wiley India, 4th Edition, 2005, ISBN: 81-265-0645-8.

Reference Books:

1. Sam Anahory and Dennis Murray, "Data Warehousing in the Real World: A Practical Guide for Building Decision Support Systems", Pearson Education – Asia, Fourth Indian Reprint, 2002, ISBN: 81-7808-387-6.
2. Paulraj Ponniah, "Data Warehousing Fundamentals for IT Professionals", John Wiley & Sons, 2010, 2nd Edition.

12CA335 DATA MINING TECHNIQUES**Credits: 4:0:0****Course Objective:**

- To introduce the basic concepts and techniques of Data Mining.
- To understand the application of data mining techniques for real world problem
- To develop skills for solving practical problems using Data Mining algorithms.

Course Outcome:

Students will be able to

- develop data mining algorithm for various applications
- build up data mining model for diverse applications
- solve problems using data mining algorithms

Unit I**INTRODUCTION TO DATA MINING:** Data Mining – Functionalities – Classification of data mining systems – Major issues in data mining. Data warehouse and OLAP technology for data mining: What is a data warehouse – A Multi dimensional model – Data Warehouse Architecture – Data Warehouse Implementation – Future development of Data cube technology.**Unit II****DATA PREPROCESSING:** Data cleaning – Data integration and transformation – Data reduction – Discretization and concept hierarchy generation. Data Mining Primitives: What defines a data mining tasks.**Unit III****MINING ASSOCIATION RULES IN LARGE DATABASES:** Association rule mining – Mining single dimensional Boolean association rule from transactional databases Mining Multidimensional association rules from relational databases and data warehouses.**Unit IV****CLASSIFICATION AND PREDICTION:** What is classification – Issues regarding classification – Classification by decision tree induction – Bayesian classification**Unit V****CLUSTER ANALYSIS:** Types of data in cluster analysis – Categorization of major clustering methods – Partitioning methods – Hierarchical Methods

Text Book:

1. Jiawei Han, Micheline Kamber, “Data Mining – Concepts and Techniques”, Morgan Kaufmann Publishers, First Edition, 2003. ISBN: 81-8147-049-4.

Reference Book:

1. Michael J A Berry, Gordon S Linoff, “Data Mining Techniques”, Wiley Publishing Inc, Second Edition, 2004. ISBN: 81-265-0517-6.

12CA336 DATABASE ADMINISTRATION**Credits: 4:0:0****Course Objective:**

- To have a clear overview of the Oracle Database Architecture
- To enable to create, monitor, configure the Database
- To gain knowledge of how to backup and recovery process of a database

Course Outcome:

Students will be able to

- secure and recover the database
- perform backup services effectively
- perform a new installation, upgrade from previous versions, configure hardware and software for maximum efficiency, and employ bulletproof security

Unit I

ORACLE ARCHITECTURE: An Overview of Database and Instances-Oracle Logical Storage Structures-Oracle Logical Database Structures-Oracle Physical Storage Structures-Multiplexing Database Files-Oracle Memory Structures-Backup Recovery Overview-Security Capabilities-Real Application Clusters-Oracle Streams-Oracle Enterprise Manager-Oracle Initialization Parameters. Upgrading to Oracle Database 11g: Choosing an Upgrade Method-Before Upgrading-Using the Database Upgrade Assistant-Performing a Manual Direct Upgrade-Using Export and Import-Using the Data Copying Method –After Upgrading

Unit II

PLANNING AND MANAGING TABLESPACES: Tablespace Architecture-Oracle Installation Tablespaces-Oracle Installation Tablespaces-Segment Segregation. Physical Database Layouts and Storage Management: Traditional Disk Space Storage-Automatic Storage Management

Unit III

MONITORING SPACE USAGE AND TRANSACTION MANAGEMENT: Common Space Management Problems-Oracle Segments, Extends and Blocks-Data Dictionary Views and Dynamic Performance Views-Space Management Methodologies. Managing Transactions with Undo Tablespaces: Transaction Basics-Undo Basics-Managing Undo Tablespaces-Flashback Features-Migrating to Automatic Undo Management.

Unit IV

DATABASE SECURITY AND AUDITING: Non-Database Security-Database Authentication Methods-Database Authorization Methods-Auditing.

Unit V

BACKUP AND RECOVERY OPTIONS: Capabilities-Logical Backups-Physical Backups-Using Data Pump Export and Import-Data Pump Import Options-Integration of backup Procedures

Text Book:

1. Bob Bryla, Kevin Loney, "Oracle Database 11g DBA Handbook", The McGraw-Hill Companies, 2008, ISBN -0-07-159579-1.

Reference Book:

1. Iggy Fernandez. "Beginning Oracle Database 11g Administration from Novice to Professional", 2009, ISBN-978-81-8489-216-1.

12CA337 SOFTWARE ARCHITECTURE AND DESIGN

Credits: 4:0:0

Course Objective:

- To know the basic concepts and technologies of software architecture
- To know the concepts of reusing architectures.

Course Outcome:

- Students will be able to develop a software project with appropriate data integration.

Unit I

SOFTWARE PRODUCT LIFE CYCLE: Introduction to Software Architecture-The Software Product Life Cycle-The Architecture Design Process

Unit II

SOFTWARE ARCHITECTURE CONCEPTS: Introduction to software design-Models and Knowledge Representation

Unit III

ARCHITECTURE REPRESENTATION AND QUALITY MODELS: Architecture Representation-Quality Models and Quality Attributes

Unit IV

ARCHITECTURAL DESIGN PRINCIPLES: Applying Architectural Styles and Patterns-Understanding Met models

Unit V

ARCHITECTURE FRAMEWORKS: Creating Architectural Descriptions-Using Architecture Frameworks-Software Architecture Quality.

List of case studies :

- Architect and designing of a standalone application
- Architect and design of a 3 tier web application
- Architect and designing enterprise integration applications

Text Book:

1. Albin, Stephen T, “The Art of Software Architecture: Design Methods and Techniques”, Wiley, 2003.

Reference Books:

1. Len bass, Paul Clements, Rick kazman, “Software Architecture in Practice”, Pearson Education, ISBN-81-7808-546-1.
2. Christine Hofmeister, Robert Nord, Deli Soni, “Applied Software Architecture”, Addison Wesley Professional; 1st edition (November 4, 1999)
3. Frank Buschmann, Hans Rohnert, Kevin Henney, Douglas C. Schmidt, “Pattern-Oriented Software Architecture” Volume 1, 2, 3, 4, 5, Wiley; 1st Edition
4. Wolfgang pree, “Design patterns for object Oriented Software Development” , Addison Wesley, 1995.

12CA338 SOFTWARE QUALITY ASSURANCE

Credits: 4:0:0

Course Objective:

- To discuss about the importance of software quality assurance in Information Technology
- To discuss about the barriers in successful implementation of Quality Management System
- It discuss on product quality, process improvement, quality control

Course Outcome:

Students will be able to

- develop a process oriented approach to establish software quality assurance

Unit I

SOFTWARE QUALITY: Software Quality in Business Context - The meaning of “Quality” defining quality – The Quality Challenge – Why is Quality Important – Quality control v/s Quality Assurance - Quality Assurance at each phase of SDLC - Quality Assurance in Software Support Projects – The SQA Function. Managing Software Quality in an Organization: Quality Management System in an Organization – Quality management system: Various Expectations – Quality assurance: Some Diagnostic Questions – The need for the SQA Group in an

organization. Planning for Software Quality Assurance: Software Quality Assurance Plans - Software Quality Assurance organizational level Initiatives - Quality Planning – Some Interesting Dilemmas and Observations.

Unit II

PRODUCT QUALITY AND PROCESS QUALITY: Introduction – Software Systems Evolution – Product quality – Models for Software Product quality – Process Quality – Software Measurement Metrics: Overview – Introduction – Measurement during Software life cycle Context – Defect Metrics – Metrics for Software Maintenance - Classification of Software metrics – Requirements related metrics – Measurements and process improvement – Measurement Principles – Identifying Appropriate Measures and Metrics for projects – Metrics Implementation in projects – Benefits of measurement and Metrics for Project Tracking and Control – Earned Value analysis – Planning for Metrics program – Issues in software Measurement & metrics program Implementation – Object Oriented Metrics : An Overview.

Unit III

WALKTHROUGHS AND INSPECTIONS: Overview – Introduction – Structured Walkthroughs – Inspections – Various roles and responsibilities involved in reviews / Inspections – Some Psychological Aspects of Reviews – Making Reviews and Inspections Effective – Comparison of review techniques – Inspection related Checklists. Software Configuration Management: Overview – Configuration Management Why and What – Software Configuration Management Activities – Standards for Configuration Audit functions – Personnel is SCM Activities – Software Configuration Management : Some Pitfalls.

Unit IV

ISO 9001 : Overview – What is ISO 9000 – The origins of ISO 9000 – How does ISO (as an Organization) carry out its works – ISO Standards Development process – How the ISO 9000 family of Standards work – ISO 9001 : 2000 – Why do organization Need ISO 9000 – ISO Certification – Assessment / Audit Preparation - The Assessment process – Surveillance Audits / Re – Certification / Re –Assessment Audits – ISO Consulting Services and Consultants. Software CMM and other Process Improvement Models :Overview – The Capability Maturity Model for Software: An Overview – Practices Followed at “ Mature Organizations” –CMM and ISO (Comparative Analysis) – Types of Capability Maturity Models (CMMs) – The CMM integrated Model (CMM – I) – Other Models for Software Process – Improvement and Performance Excellence – The People Maturity Model (P – CMM).

Unit V

CAREERS IN QUALITY: Overview – Introduction- P- CMM and Careers – Some important “People Issues” – Finding a mentor to shape your career – Roles for Quality professionals Quality Certifications. Causal analysis and Resolution – Introduction – Purpose of causal analysis – Defect Prevention – Problem Prevention - Role of SQA in CAR

Case Study

- Case Study 1 - Software Quality Assurance - Defect Prevention Analysis
- Case Study 2 - Software Quality Assurance - Problem Prevention Analysis

Text Books:

1. Nina S Godbole , Software Quality Assurance Principles and Practice, NAROSA PUBLISHING HOUSE.2004,ISBN: 81 – 7319 – 550 –1.
2. Causal Analysis - CMMI for Development (CMMI-DEV), Version 1.2, CMU/SEI-2006-TR-008ESC-TR-2006-008, Improving processes for better products, CMMI Product Team, August 2006.

Reference Books :

1. Ronald A Radice , Software Inspections. How to cut costs, Improve Quality and Shorten Time Cycles of Software Projects, Tata McGRAW Hill , Second Edition, 2003.ISBN: 0-07-048340 - X.
2. Mordechai Ben – Menachem , Garry S. marliss, Software Quality Producing Practical, consistent Software, Thomson Learning , Fourth Reprint 2004. ISBN: 981-240-204-7.
3. Stephen H.Kan, Metrics and Models In Software Quality Engineering, Pearson Education, Second edition. ISBN: 81-297-0175-8.

12CA339 SOFTWARE TESTING**Credits: 4:0:0****Course Objective:**

- To learn how to detect software failures so that defects may be uncovered and corrected.
- To learn about examination of code as well as execution of that code in various environments and conditions
- To learn about various roles for testing team members

Course Outcome:

- Students will be able to create, execute and perform complex maintenance related operations and all the types of testing.

Unit I

SOFTWARE DEVELOPMENT LIFE CYCLE MODELS: Principles of Testing - Software Development Lifecycle Models: – Phases of software project – Quality , Quality Assurance and Quality Control – Testing verification and validation – Process model to represent different phases – life cycle models - Spiral or Iterative model - The V Model - Modified V Model – Comparison of Various life cycle models.

Unit II

TYPES OF TESTING I: Software Testing Types: - White box testing – What is white box testing – Static testing – Structural testing – Challenges in White box testing. Black box testing - What is black box testing – Why black box testing – When to do black box testing – How to do black box testing - Integration testing - What is integration testing integration testing as a type of testing -integration testing as a phase of testing – Scenario testing – Defect batch.

Unit III

TYPES OF TESTING II: System and acceptance testing – System testing overview – Functional Versus Non Functional testing – Functional System testing – Non Functional testing - Acceptance testing – Summary of testing Phases - performance testing – Factors Governing Performance testing - Methodology for Performance testing – Tools for Performance testing – Process for Performance testing - Regressing testing – What is regression testing – Types of regression testing – When to do regression testing – How to do regression testing – Best practices in regression testing.

Unit IV

ORGANIZATION STRUCTURES: Common People Issues – Perceptions and misconceptions about testing – Comparison between testing and development functions – Providing career paths for testing professionals – The role of the Ecosystem and a call for action. Organization Structures for testing teams – Dimensions of organization structures - structures in single product companies - structures for multi product companies – Effects of globalization and geographically distributed teams on product testing -Testing services Organizations.

Unit V

TEST PLANNING, METRICS AND MANAGEMENT: Test Planning, Management, Execution and reporting – Introduction – Test planning - Test management – Test Process – Test reporting – Best practices. Test metrics and Measurements – What are Metrics and measurement - Why Metrics in testing – Types of Metrics - Project Metrics – Progress Metrics – Productivity Metrics – Release Metrics. Case Study: Software Testing in Development and Maintenance of Enterprise Banking application

Text Book:

1. Srinivasan Desikan and Gopaldaswamy Ramesh, “Software Testing Principle and Practices”, Sixth Impression , 2008. ISBN: 978 – 81 – 7758 – 121 – 8.

Reference Books:

1. William E Perry, “Effective Methods for Software Testing”, John Wiley & Sons, Second Edition, 2005, ISBN: 9971–51–345–5.
2. Illene Burnstien, “Practical Software Testing”, Springer International Edition, First Edition, 2004. ISBN: 81-8128-089-X.

12CA340 DESIGN PATTERNS

Credits: 4:0:0

Course Objective:

- To learn the purpose of design patterns
- To learn about the ways that design patterns are documented and classified
- To learn about the various solution that has developed and evolved over time

Course Outcome:

Students will be able to

- describe simple and elegant solutions to specific problems in object oriented software design
- make the designs more flexible, modular, reusable and understandable.

Unit I

INTRODUCTION: Design Pattern, Design Patterns in Smalltalk MVC, Describing design Patterns, The catalog of Design Patterns, Organising the Catalog, How design patterns solve Design problems, How to select Design pattern, How to use design pattern

Unit II

A CASE STUDY: Designing a Document Editor: Design problem, Document Structure, Formatting, Embellishing the user Interface, Supporting the Multiple Look-and-Feel Standards, Supporting Multiple Window Systems, User Operations, Spelling Checking and hyphenation

Unit III

CREATIONAL PATTERNS: Abstract Factory, Builder, Factory Method, Prototype, Singleton

Unit IV

STRUCTURAL PATTERNS: Adapter, Bridge, Composite, Decorator, Façade, Flyweight, Proxy

Unit V

BEHAVIORAL PATTERNS: Chain of Responsibility, Command, Interpreter, Iterator, Mediator, Memento, Observer, State, Strategy, Template Method, Visitor

Text Book:

1. Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides, “Design Patterns: Elements of Reusable object oriented Software”, Addison Wesley, Reprint 2000, ISBN 0-201-45563-3

Reference Books :

1. Alan Shalloway, James Trott, “Design patterns explained: a new perspective on object oriented design”, Addison Wesley 2002, ISBN 0-201-71594-5
2. James William Cooper, “Java Design Pattern”: A tutorial ,Addison Wesley, 2000, ISBN 0-201-48539-7
3. Eric T Freeman, Elisabeth Robson, Bert Bates, Kathy Sierra, “Head First Design Patterns” , O'Reilly Media, October 2004

12CA341 WEB SERVICES**Credits: 4:0:0**

Course Objective:

- To gain knowledge to develop the web services
- To Elaborate discussion about SOAP, XML messaging and Java API
- To understand web service standards and build architecture for web communication

Course Outcome:

Students will be able to

- adopt the web service standards and build architecture for web communication
- describe and discover the web services using SOAP and UDDI
- develop and deploy JAXM and JAX RPC based web services
- secure web services for reliable communication

Unit I

WEB SERVICES OVERVIEW AND ARCHITECTURE: Motivation and Characteristics- uses- Basic operational model of web services-core web service standards – Other Industry Standards Supporting Web Services- Known challenges in Web Services. Building the Web Services Architecture: Web Services Architecture and Its core Building Blocks- Tools of trade- Web Services Communication Models

Unit II

DEVELOPING WEB SERVICES USING SOAP: XML –Based Protocols and SOAP – Anatomy of a SOAP Message – SOAP Encoding – SOAP Message Exchange Model – SOAP communication – SOAP Messaging – SOAP Bindings for Transport Protocols – SOAP Security. Description and Discovery of Web Services: Web Services Description Language – Universal Description, Discovery and Integration

Unit III

JWSDP: Introduction to the Java Web Services Developer Pack: Java Web Services Developer Pack. XML Processing and Data Binding With java API: Extensible markup Language basics – Java API for XML Processing – Java Architecture for XML Binding.

Unit IV

XML MESSAGING USING JAXM AND SAAJ, RPC WEB SERVICES : Role of JAXM in Web Services – JAXM API Programming model - Basic Programming Steps for Using JAXM – JAXM Deployment Model – Developing JAXM based Web Services – JAXM Inter operability – JAXM in J2EE1.4. Building RPC web Services with JAX RPC: The Role of JAX RPC in Web Services - JAX RPC APIs and Implementation model - JAX RPC Supported Java/XML Mappings- Developing JAX RPC Based Web Services - JAX RPC Inter operability - JAX RPC in J2EE1.4.

Unit V

JAVA APIS AND SECURITY: Java API for XML Registries: Introduction to JAXR – JAXR Architecture - JAXR Information Model – JAXR Registry Services API – JAXR Support in JWSDP1.0. Web Services Security: Challenges of Securing Web Services – XML Encryption

– XML Signatures – XML Key Management Specification – Security assertions Markup Language – XML Access Control Markup Language

Text Book:

1. Ramesh Nagappan, Robert Skoczylas and Rima Patel Sriganesh, “Developing Java Web Services”, Wiley Publishing Inc., 2005. ISBN: 81-65-0499-4.

Reference Book:

1. Sandeep Chatterjee, James Webber, “Developing Enterprise Web Services”, Pearson Education, 2004

12CA342 SOFTWARE PROJECT MANAGEMENT

Credits: 4:0:0

Course Objective:

- To discuss about the professional way of managing software projects
- To plan and execute software projects by means of activity planning, managing risk and allocating resources
- Discussion about software project team management

Course Outcome:

The students will have

- understanding about project planning
- knowledge about effort estimation and risk management in software projects
- understanding about managing people and organize team

Unit I

OVERVIEW OF SOFTWARE PROJECT MANAGEMENT: Introduction to Software Project Management, Step Wise: an Overview of Project Planning, Project Evaluation: Introduction

Unit II

EFFORT ESTIMATION: Selection of an appropriate project approach, Software effort estimation.

Unit III

RISK MANAGEMENT: Activity Planning, Risk Management.

Unit IV

RESOURCE MANAGEMENT: Resource Allocation, Monitoring and control, managing contracts.

Unit V

TEAM MANAGEMENT: Managing people and organizing teams, Small Projects

Text Book:

1. Bob Hughes, Mike Cotterell, "Software and Project Management", Tata McGraw-Hill Publishing Company Limited, Third Edition, 2004. ISBN: 0-07-709834-X.

Reference Book:

1. Walker Royce, "Software Project Management", Addison-Wesley, 2004 ISBN: 0-20-1309580.

12CA343 DATABASE MANAGEMENT SYSTEMS**Credits: 3:0:0****Course Objective:**

- To understand the database design process.
- To study about SQL and relational algebra.
- To understand the internal storage structures.

Course Outcome:

Students will

- be familiarized with database design.
- have conceptual understanding on transaction management.
- have knowledge on internal storage structures.

Unit I

DATABASE SYSTEMS AND RELATIONAL MODEL: Database-System Application, Purpose of Database System, View of Data, Database Language, Relational Database, Database Design, Database Architecture, Database Users and Administrators. Relational Model: Structure of Relational Databases, Fundamental Relational-Algebra operations, Additional Relational-Algebra operations, Extended Relational Algebra, Null value, Modification of the Database.

Unit II

STRUCTURED QUERY LANGUAGE: Background, Data Definition, Basic Structure of SQL Queries, Set Operations, Aggregate functions, Null values, Nested sub queries, Complex Queries, Views, Modification of Database. Advanced SQL: SQL Data Types and Schema, Integrity Constraint, Authorization, Embedded SQL, Dynamic SQL.

Unit III

DATABASE DESIGN AND E-R MODEL: Overview of the design process, E-R model, Constraints, E-R Diagram, E-R Design Issues, Weak Entity, Extended E-R Features, Database Design for Banking Enterprise, Reduction to Relational Schema.

Unit IV

RELATIONAL DATABASE DESIGN: Features of good Relational Design, Atomic Domains and normalization Application Design and Development: Triggers, Authorization in SQL. Storage and File Structure: File organization, Organization of records in files, Data Dictionary Storage.

Unit V

TRANSACTION MANAGEMENT AND CONTROL -Transactions: Concept, State, Implementation of Atomicity and Durability, Concurrent Execution - Concurrency Control: Lock-Based protocols, Dead Lock Handling.

Text Book:

1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan, “Database System Concepts”, Mc Graw-Hill International Edition, Fifth Edition, 2006, ISBN 007-124476-X.

Reference Books:

1. Ramez Elmasri, Durvasula V.L.N. Somayajulu, Shamkant B. Navathi and Shyam K. Gupta, “Fundamentals of Database Systems”, Pearson Education, 2006, ISBN 81-7758-476-6.
2. Ramez Elmasri and Shamkant B. Navathe, “Fundamental Database Systems”, Third Edition, Pearson Education, 2003, ISBN 0-321-36957-2.
3. Rajesh Narang, “Database Management System”, Prentice Hall of India, 2004, ISBN-81-203-2645-8.

12CA344 COMPUTER NETWORKS

Credits: 4:0:0

Course Objective:

- To understand the concepts of data communications with networking models.
- To study the functions of different layers of the network.

Course Outcome:

Students will

- expertise in terminology and concepts of the OSI and the TCP/IP reference model.
- master the concepts of protocols, network interface, and Design / performance in networks.

Unit I

DATA COMMUNICATIONS: Components, Data Representation, Data Flow, Networks –The Internet-Protocols and Standards –Layered Tasks-The OSI model – Layers in the OSI Model TCP/IP Protocol Suite- Addressing-Guided Media-Unguided Media: Wireless- Circuit Switched Networks.

Unit II

ERROR DETECTION AND CORRECTION: Introduction-Block Coding-Linear Block Codes –Cyclic Codes-Check sum-Framing-Flow and Error Control-Protocols-Noiseless Channels-Noisy Channels – Random Access-Controlled Access – Channelization - SONET/SDH Architecture SONET Layers.

Unit III

NETWORK LAYER: Logical Addressing: IPv4 Addresses-IPV6 Addresses- Internetworking- IPv4-IPv6-Transition from IPv4 to IPv6-Address Mapping-ICMP-IGMP-Network Layer: Delivery, Forwarding, and Routing: Unicast Routing Protocols-Multicast Routing Protocols.

Unit IV

PROCESS-TO-PROCESS DELIVERY: UDP, TCP, and SCTP: Process- to-Process Delivery- User Datagram Protocol-TCP-SCTP-Data Traffic-Congestion-Congestion Control-Quality of Service-Techniques to improve Qos-Integrated Services.

Unit V

DOMAIN NAME SYSTEM: Namespace-Domain Name Space-Distribution of Name Space-DNS in the Internet-Resolution-DNS Messages-Types of Records-Remote Logging, Electronic Mail and File Transfer: Remote Logging, Electronic Mail, File Transfer.

Text Book:

1. Behrouz A. Forouzan, “Data communication and Networking”, Tata McGraw-Hill, Fourth Edition, 2006, ISBN NO: 0-07-063414-9.

Reference Books:

1. James F.Kurose and Keith W.Ross, “Computer Networking A Top-Down Approach Featuring the Internet”, Pearson Education, 2002, ISBN:-81-7808-247-0.
2. Andrew S.Tanenbaum, “Computer Networks”, Fourth Edition, PHI, 2003, ISBN: 0-13-066102-3.
3. William Stallings, “Data and Computer Communication”, Eight Edition, Pearson Education, 2007, ISBN: 0.13-243310.9.

12CA345 DESIGN AND ANALYSIS OF ALGORITHMS

Credits: 3:0:0

Course Objective:

- To introduce classic algorithms in network domain.
- To analyze algorithm complexities.
- To learn design ideas of algorithms for various problems in network domain.

Course Outcome:

At the end of the course, students are

- enabled to prove the correctness and analyze the running time of the algorithms for classic problems in various domains.
- able to apply the algorithms and design techniques to solve problems.
- enabled to compute complexities of algorithms in different domains.

Unit I

INTRODUCTION TO ALGORITHMS: What is Algorithm - Fundamentals of Algorithmic Problem Solving - Important Problem Types - Fundamental Data Structures- Fundamentals of the Analysis of Algorithm Efficiency : Analysis Framework - Mathematical Analysis of Non recursive Algorithms - Mathematical Analysis of Recursive Algorithms -Example: Fibonacci Numbers.

Unit II

SORTING AND SEARCHING: Brute Force: Selection Sort and Bubble Sort - Exhaustive Search. Divide-and-Conquer - Merge sort – Quick sort - Binary Search - Decrease-and-Conquer: Insertion Sort – Depth First Search and Breadth-First Search - Topological Sorting.

Unit III

TREES: Transform and Conquer: Balanced Search Trees - Heaps and Heap sort. Space and Time Tradeoffs: Hashing - B-Trees - Dynamic Programming: Warshall's and Floyd's Algorithms - Optimal Binary Search Trees - The Knapsack Problem and Memory Functions.

Unit IV

GREEDY TECHNIQUE: Prim's Algorithm - Kruskal's Algorithm - Dijkstra's Algorithm - Huffman Trees. Iterative Improvement: The Simplex Method - The Maximum-Flow Problem.

Unit V

LIMITATIONS OF ALGORITHM POWER: Lower-Bound Arguments - Decision Trees - P, NP, and NP-complete Problems. Coping with the Limitations of Algorithm Power: Backtracking - Branch-and-Bound - Approximation Algorithms for NP-hard Problems - Algorithms for Solving Nonlinear Equations.

Text Book:

1. Anany V.Levitin , “Introduction to the Design and Analysis of Algorithms”, Pearson Education, Second Edition, 2008, ISBN:978-81-317-1837-7

Reference Books:

1. Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, “Fundamentals of Computer Algorithms”, Universities Press(India) Pvt. Ltd.,1998.
2. T.H. Cormen, C.E. Leiserson, R.L. Rivest and C. Stein, “Introduction to Algorithms”, PHI Pvt. Ltd., 2001.
3. Sara Baase, Allen Van Gelder, “Computer Algorithms – Introduction to Design and Analysis”, 3rd Edition, Pearson Education, 2000.

12CA346 INTERNETWORKING LAB

Credits: 0:0:2

Course Objective:

- To understand the concepts of internetworking through networking simulation tool.
- To acquire adequate knowledge about various TCP/IP communication.

Course Outcome:

Students will be able to

- simulate any TCP/IP communication using various techniques.
- describe about internetworking concepts.

List of Experiments:

1. IP Address of the System
2. Remote IP Address of the system
3. One way Communication using Datagram for Factorial
4. Two way Communication using Datagram for Fibonacci
5. One way Communication using Frames
6. Two way Communication using Frames
7. Broadcasting
8. Multicasting
9. One way Communication using TCP/IP
10. Two way Communication using TCP/IP
11. One way Cryptography using Datagram
12. Two way Cryptography using Datagram
13. File Transfer

12CA347 NETWORK SECURITY LAB**Credits: 0:0:2****Course Objective:**

- To clearly understand the security issues of computer networking.
- To learn to simulate the network security algorithms

Course Outcome:

At the end of the course,

- students are enabled to simulate any security algorithms in the network.
- students acquire thorough knowledge about network security concepts

List of Experiments:

1. Retrieving Network Details
2. One Time Padding
3. Cyclic Redundancy Check(CRC)
4. Verifying Authentication using Message Digest
5. Substitution Cipher
6. File Encryption And Decryption
7. Hash Based Message Authentication Code(HMAC)
8. RSA
9. Diffie Hellman Key Exchange
10. Frequency Analysis Of Cipher Text
11. Digital Signature Standards(DSS)
12. Transposition Technique

12CA348 NETWORK SIMULATION LAB

Credits: 0:0:2

Course Objective:

- To understand the concepts of networking using network simulation tools.
- To learn about the network simulation tool in detail.
- To gain hands on experience by simulating networking concepts

Course Outcome:

Students will

- be enabled to simulate any networking protocol using networking simulation tools.
- attain practical exposure of the various networking concepts.

List of Experiments:

1. TCL script and OTCL
2. TCL Script for Simple Topology
3. Creating a Topology with Forwarding Node
4. Unicast Routing
5. Multicast Routing
6. Ad-Hoc Network with DSDV Routing Protocol
7. Throughput Calculation
8. Bandwidth Calculation Using Loss Monitor
9. Performance Evaluation of Routing Protocols
10. Network Performance with Queue And Buffer Size
11. Ethernet in OPNET
12. LAN in OPNET

12CA349 DATA MINING LAB 1

Credits: 0:0:2

Course Objective:

- To know how to use a Data Mining Tool.
- To test the dataset with several Data Mining algorithms.
- To visualize the working mechanisms of different methods.

Course Outcome:

- The students will have proficiency to work on a data mining tool.
- The students know the different data mining algorithms and test them with dataset.
- The students will be able to visualize the working of different methods.

List of Experiments:

1. Importing Dataset Into Rapid Miner
2. Storing and Retrieving Data
3. Graphical Representation of Dataset
4. Replacing of Missing Values in a Dataset
5. Applying A Model For Prediction
6. Implementation of Naive Bayes Model
7. Optimizing The Dataset
8. Splitting of Dataset by Condition Using Decision Tree
9. Clustering With Numerical Data
10. Text Mining
11. Web Mining
12. Simulation of Websites

12CA350 DATA MINING LAB 2**Credits: 0:0:2****Course Objective:**

- To create data mining model.
- To provide statistical analysis of data.
- To cluster the data set.

Course Outcome:

At the end of the course, students will be able to

- find the functional dependency of attributes.
- mine the data.
- to represent the data in graphical form.

List of Experiments:

1. Loading the data using Poly Analyst
2. Graphical representation of the data
3. Statistical Analysis of data set
4. Find the functional dependency of attributes
5. Create Market basket analysis
6. Create Transaction basket analysis
7. Create Decision tree
8. Randomize and Split the data
9. Create Decision forest
10. Create Data Mining model using Regression
11. Cluster the data
12. Statistical analysis of purified and split data set

12CA351 BUSINESS INTELLIGENCE LAB

Credits: 0:0:2

Course Objective:

- To apply the principles of business intelligence and to draw conclusions from large datasets.
- To create and integrate data mart with values and derive intelligence from the data mart.

Course Outcome:

After completing this lab, students will be able to

- create data mart, using Integration services they will populate the data mart with required values .
- deploy datamart using Analysis Services and Mine the data mart

List of Experiments:

1. Creating Maxmin manufacturing Datamart
2. Creating Maxmin Sales Datamart
3. Using Integration Services To Populate Maxmin Manufacturing Datamart
4. Building An OLAP Cube For Maxmin Manufacturing Data Mart
5. Creating Calculated Measures
6. Creating Dimension Hierarchy And Relating Dimension To Measure Group
7. MDX Scripting And Setting Security Within OLAP Cube
8. Time Based Analysis
9. Deploying the Maxmin sales Data Mart Project Using the Analysis Services Deployment Wizard
10. Creating A Singleton Query
11. Deploying reports using the Report Designer
12. Creating a Report Model

12CA352 DATABASE ADMINISTRATION LAB

Credits: 0:0:2

Course Objective:

- To give an understanding of managing and upgrading the data base with necessary skills for day-today administration of the Oracle data base

Course Outcome:

- To demonstrate skills in managing the oracle database

List of Experiments:

1. Installing the Oracle 11g Database
2. Upgrading to Oracle 11g Database (a)Manual Upgrade (b)Using DBUA
3. Administration Tools of the Oracle 11g Database

4. Creating the Database with DBCA
5. Configuring the Database using DBCA
6. Configuring the Database using OEM
7. Starting and Stopping the Database using OEM
8. Deleting and Dropping the Database
9. Administering Tablespaces
10. Administering Schema Objects –Tables and Views
11. Administering Schema Objects – Indexes and Sequences
12. Managing Database with users and privileges

12CA353 SOFTWARE ARCHITECTURE LAB

Credits: 0:0:2

Course Objective:

- To impart the knowledge about the various software architecture tools
- To understand and to develop different software architecture model

Course Outcome:

Upon completing the course, the student will be able to

- Handle various software architecture tools
- Develop the Business process model using Enterprise Architect

List of Experiments:

1. Tired Architecture of a Web-Based Application Using ArchStudio 4
2. Dataflow For Content Publishing Application Using ArchStudio 4
3. Business Process Model Using Enterprise Architect
4. Business Process Model Using ALTOVA U Model Architect
5. Content Publishing Activity Diagram Using DIA
6. Hierarchical Architecture of CA Department Website Using DIA
7. Stack Architecture of ANDROID Operating system Using DIA
8. Stack Architecture of Windows 2000 Operating System Using DIA
9. Three Tier Architecture of an ERP Application Using DIA
10. Information Flow of ERP Architecture Using DIA
11. Architecture of Eclipse Plug-In Using DIA
12. Deployment Diagram for mobile ATM

12CA354 CASE TOOLS LAB

Credits: 0:0:2

Course Objective:

- To introduce a CASE Tool – Rational Rose for drawing UML diagrams and performing Forward & Reverse Engineering

Course Outcome:

At the end of this lab, students

- gain confidence in UML diagrams and their notations.
- get acquainted with a CASE tool for OOAD.
- understand and appreciate the purpose of CASE Tools.

List of Experiments:

Draw UML Diagrams & Perform Forward and Reverse Engineering operations for

- a. Subscription Information Management System of a Magazine Publishing House and
 - b. Courier Service Information System.
1. Use Case Diagram
 2. Class Diagram
 3. Sequence Diagram
 4. Collaboration Diagram
 5. State-Chart Diagram
 6. Activity Diagram
 7. Component Diagram
 8. Deployment Diagram
 9. Forward Engineering
 10. Reverse Engineering
 11. Case Study : Media Download Kiosk
 12. Case Study: Research and Consultancy Repository

12CA355 SOFTWARE TESTING LAB

Credits: 0:0:2

Course Objective:

- To identify and document test cases for a given user interface design
- To identify and document test cases for a given functionality
- To understand how to test the software

Course Outcome:

- Students are enabled to document Test Cases
- Learn how to test a software

List of Experiments:

1. Testing of GUI form using TSL
2. Testing of inserting Multiple Records
3. Test to Search a Record
4. Synchronizing Tests
5. GUI Checkpoints
6. Logical Testing

7. Database Checkpoints
8. Comparison of predefined and Manual Calculation
9. Control flow Statements
10. Batch Testing
11. Testing the performance of a webpage
12. Testing the performance of a Database Server

12CA356 WEB SERVICES LAB

Credits: 0:0:2

Course Objective:

- To develop skills in designing and implementing web services.
- To enable to deploy the web service.
- To build an interface and avail the web service facilities.

Course Outcome:

Students will be able to

- adopt the web service standards and build architecture for web communication.
- describe and discover the web services using SOAP and UDDI .
- develop and deploy JAXM and JAX RPC based web services.
- secure web services for reliable communication.

List of Experiments:

Case study: Develop a web site for users seeking for computer support group.

1. Create an XML file for any domain with multiple sublevel complexity
2. Create a DTD and XML schema for the XML file.
3. Using the web technologies, build and deploy a web service to greet the user
4. Develop a web service for currency converter
5. Develop a web service for Temperature converter
6. Develop a web service for random verification code generation
7. Develop an interface for the web services available in the site.
8. Using the web technologies secure the web services available in the site.
9. Develop a web service for user registration via Database connectivity
10. Develop a web service to provide a statistical report for the given data set.
11. Develop a web service to facilitate online payment
12. Develop a web service to generate the bank account statement

12CA357 HARDWARE AND SERVICING LAB

Credits: 0:0:2

Course Objective:

- To setup the BIOS and partitioning the Hard Disk

- To impart the knowledge about Firewall, LAN and Routers.

Course Outcome:

Upon completion of the subject, students are able to

- set up BIOS and Partition the hard disk to install multiple OS
- configure and test the Local Area Network
- configure the network interface

List of Experiments:

1. Formatting the stand alone system
2. BIOS Setup
3. Partitioning the Hard Disk and Installing Dual OS
4. Installing security software (Antivirus Software)
5. Setting up the Firewall (Windows, Gateway Firewall)
6. Connecting the stand alone system in a Network
7. Database System Installation
8. Configuring and testing of the LAN
9. Windows Active Directory/DHCP/DNS Administration
10. Static (Manual) Configuration of Routing
11. Configure the Network Interface, The Default Router And DNS
12. Basic Router and Switch Configuration

12CA358 PROGRAMMING WITH ASP.NET USING VB

Credits: 3:1:0

Course Objective:

- To gain experience in developing dynamic websites with ASP.NET.
- To help students to understand how ASP.NET works at a higher level to deal with full featured web controls.
- To discuss the various features in ASP.NET using VB.

Course Outcome:

Students will be able to

- understand the concept of .NET framework.
- know about GUI controls in ASP.NET.
- develop applications in ASP.NET.

Unit I

THE .NET FRAMEWORK AND WEB FORM FUNDAMENTALS: The Evolution of Web Development-The .NET Framework Developing ASP.NET Applications – Visual Studio: Creating Websites- Designing a Webpage- The anatomy of a Web Form – Writing Code – Visual Studio Debugging. Web Form Fundamentals: The anatomy of an ASP.NET Application – Introducing Server Controls – Improving the Currency Converter – A Deeper Look at HTML Control Classes – The Page Class – Application Events – ASP.NET Configuration.

Unit II

WEB CONTROLS AND STATE MANAGEMENT: Stepping Up to Web Controls – Web Control Classes – List Controls – Table Controls – Web Control Events and AutoPostBack – A Simple Webpage. State Management: The problem of State – View State – Transferring Information between Pages – Cookies –Session State – Session State Configuration – Application State – An Overview of State Management Choices. Common Errors – Exception Handling – Handling Exceptions – Throwing Your Own Exceptions.

Unit III

BUILDING BETTER WEBFORMS - Validation: Understanding Validation – The Validation Controls. Rich Controls: The Calendar – The AdRotator – Pages with Multiple Views. User Controls and Graphics: User Controls – Dynamic Graphics. Styles, Themes, and Master Pages: Styles – Themes – Master Page Basics – Advanced Master Pages.

Unit IV

WEBSITE NAVIGATION AND ADO.NET FUNDAMENTALS: Site Maps – The SiteMapPath Control – The Tree View Control – The Menu Control. Working With Data - ADO.NET Fundamentals: Understanding Data Management –Configuring Your Database – SQL Basics – ADO.NET Basics – Direct Data Access –Disconnected Data Access.

Unit V

DATA CONTROLS AND SECURITY : The GridView – Formatting the GridView – Selecting a GridView Row – Editing with the GridView – Sorting and Paging the GridView – Using GridView Templates – The DetailsView and FormView. Membership: The Membership Data Store- The Security Controls-Role – Based Security.

Text Book:

1. Matthew MacDonald, “Beginning ASP.NET 3.5 in VB 2008”. Apress, Berkeley, CA, USA, Second Edition. ISBN: 978-81-8128-868-4

Reference Books:

1. Jesse Liberty, Dan Hurwitz and Dan Mabarry , “ASP.NET 3.5” , O’Reilly, 2008.
2. Dino Esposito,” Programming Microsoft ASP.NET”, Tata MCGraw-Hill, 2003.

12CA359 PROGRAMMING WITH ASP.NET USING C#

Credits: 3:1:0

Course Objective:

- To develop simple web pages using ASP.NET
- To understand about State Management in web applications
- To build full-fledged web applications

Course Outcome:

- Developing simple web pages using ASP.NET
- Understanding state management in web applications
- Developing a full-fledged web application in ASP.NET

Unit I

THE .NET FRAMEWORK AND WEB CONTROLS: The .NET Framework – Visual Studio – Web Form Fundamentals – Web Controls

Unit II

STATE MANAGEMENT AND ERROR HANDLING: State Management – Error Handling (excluding logging, error pages and tracing) – Validation

Unit III

ADVANCE WEB DESIGNING: Rich Controls – User Controls and Graphics – Styles, Themes and Master Pages

Unit IV

NAVIGATION CONTROLS AND ADO.NET FUNDAMENTALS: Website Navigation – ADO.NET Fundamentals – The Data Controls

Unit V

SECURITY FUNDAMENTALS: XML – Security Fundamentals – Membership

Text Book:

1. Matthew MacDonald, “Beginning ASP.NET 3.5 in C# 2008”. Apress, Berkeley, CA, USA, Second Edition. ISBN: 978-81-8128-902-5.

Reference Book:

1. Jesse Liberty, Dan Hurwitz & Dan Maharry, “Programming ASP.NET 3.5”, O’Reilly, 4th Edition, 2008, ISBN 13: 978-81-8404-611-3.

12CA360 C# PROGRAMMING

Credits: 4:0:0

Course Objective:

- To get a clear understanding of the .NET framework.
- To understand the object oriented programming concepts of C#.
- To develop stand alone applications using C#.

Course Outcome:

- Understanding of the concepts of .NET framework
- Deep understanding of the object oriented programming concepts of C#
- Able to develop stand alone applications in C#

Unit I

THE .NET FRAMEWORK: The Philosophy of .NET – Core C# Programming Constructs, Part I and Part II

Unit II

OBJECT ORIENTED PROGRAMMING CONCEPTS: Defining Encapsulated Class Types
– Understanding Inheritance and Polymorphism – Understanding Structured Exception Handling
- Understanding Object Lifetime

Unit III

INTERFACES, COLLECTIONS, GENERICS AND DELEGATES: Working with Interfaces – Collections and Generics - Delegates, Events and Lambdas

Unit IV

ASSEMBLIES AND MULTITHREADING: Understanding Indexer Methods - .NET Assemblies – Processes, AppDomains and Object Contexts - Building Multithreaded Applications

Unit V

ADO.NET: ADO.NET Part I: The Connected Layer – ADO.NET Part II: The Disconnected Layer

Text Book:

1. Andrew Troelsen, “Pro C# 2008 and the .NET 3.5 Platform”, Apress, Springer(India) Private Limited, Fourth Edition, 2007, ISBN 978-81-8128-955-1

Reference Book:

1. Herbert Schildt, “The Complete Reference C# 2.0”, Tata McGraw-Hill Publishing Company Limited, 6th reprint 2007, ISBN-13: 978-0-07-061139-9, ISBN-10: 0-07-061139-4.

12CA361 SYSTEM SIMULATION

Credits: 4:0:0

Course Objective:

- To discuss about the system simulation and various types of simulation systems
- To discuss an integrated approach for information management.
- To study the modeling of systems that rely on human factors that possesses a large proportion of uncertainty, such as social, economic or commercial systems.

Course Outcome:

- An idea about the system simulation and various types of simulation systems
- Detailed knowledge about integrated approach for information management and the modeling of systems.

Unit I

INTRODUCTION TO SIMULATION: Advantages and disadvantages of simulation – areas of application – Systems and system environment – Components of a system – Discrete and continuous system – Models of a system – Types of models – Discrete event system simulation – steps in simulation study. Simulation examples: Simulation of Queueing systems– Simulation on inventory systems – Other examples of simulation.

Unit II

GENERAL PRINCIPLES: Concepts in discrete-event simulation – List processing. Statistical models in simulation: Review of terminology and concepts – useful statistical models – Discrete distributions – Continuous distributions – Poisson process – Empirical distributions.

Unit III

QUEUEING MODELS: Characteristics – Queueing notation – Long-run measures of performance of Queueing systems – Steady-state behaviors of infinite-population Markovian models – Steady-state behavior of finite-population models – Network of Queues-Random-Number Generation: Properties – Generation of Pseudo-Random numbers –Techniques for generating random numbers – Tests for random numbers.

Unit IV

RANDOM-VARIATE GENERATION: Inverse transforms technique – Acceptance-Rejection technique. Input modeling: Data collection – Identifying the distribution with data – Parameter estimation – Goodness-of-fit tests – Selecting input models without data – Multivariate and time-series input models.

Unit V

VERIFICATION AND VALIDATION OF SIMULATION MODELS: Model Building ,verification, and Validation-verification of simulation Models-Calibration and Validation of Models-Output Analysis for Single Model: Types of Simulation with respect to Output Analysis-stochastic Nature of Output data- Measures of Performance and their estimation- Output analysis for Terminating Simulations-Output Analysis for Steady –State Simulations.

Text Book:

1. Jerry Banks, John S Carson II, Barry L. Nelson, David M. Nicol, “Discrete–Event System Simulation”, Pearson Education, Fourth Edition, 2007. ISBN: 81-775-8591-6.

Reference Book:

1. Geoffrey Gordon, “System Simulation, Phi Learning Private Ltd”, Second Edition, 2009.ISBN: 978-8120301405.

12CA362 ELECTRONIC COMMERCE

Credits: 4:0:0

Course Objective:

- The scope of e-commerce in the realm of modern business.
- The technologies used to develop and deliver e-commerce applications.
- The marketing methods used in e-commerce.
- The security and implementation aspects of internet marketing.

Course Outcome:

Upon successful course completion, students will be have clear idea of

- contemporary ecommerce concepts and terminology
- the processes and management decisions that are involved in launching, operating and managing business activity on the World Wide Web
- technologies used to deliver e-commerce applications.

Unit I

INTRODUCTORY CONCEPTS: What is E- Commerce? – Advantages and Limitations of E-Commerce – The Role of Strategy in E- Commerce – Value Chains in E- Commerce – Integrating E – Commerce – Managerial Implications. The Internet and The World Wide Web: The Internet Today – In the beginning – Unique Benefits of the Internet – Searching Online – Bulletin Board Systems (BBSs) and Pay Services – Some Web Fundamentals – The Language of the Internet – Managerial Implications

Unit II

LIFE CYCLE APPROACH: Launching a Business on the Internet: The Life Cycle Approach – The Business Planning and Strategizing Phase – Hardware, Software, Security, and Setup Phase - The Design Phase – The Marketing Phase – The Fulfillment Phase – The Maintenance and Enhancement Phase. Internet Architecture: What Is a Network? – Information Transfer – Network Hardware – Designing a Network – Managing the Network – Management Implications.

Unit III

PAYMENT AND SECURITY: Payment Systems: Getting the Money: From Barter to Money – Requirements for Internet- Based Payments – Electronic Payment Credit Cards, Debit Cards, Smart Cards. ESecurity: Security in Cyberspace – Designing for Security – How Much Risk Can You Afford? – The Virus: Computer Enemy Number One – Security Protection and Recovery – How to Secure Your System.

Unit IV

ENCRYPTION: A Matter of Trust: What Is Encryption? – The Basic Algorithm System – Authentication and Trust – Key Management – Internet Security Protocols and Standards – Other Encryption Issues. Marketing on the Internet: The Pros and Cons of Online Shopping – Internet Marketing Techniques – The E- Cycle of Internet Marketing – Marketing Your Presence – Attracting Customers to Your Site – Tracking Customers – Customer Service –Managing Implication

Unit V

IMPLEMENTATION AND MAINTENANCE: Implementation and Maintenance: Implementation Strategies – Managing Implementation –Maintenance Strategies – Management Implications. Web-Based Business –to-Business ECommerce: What Is B2B E- Commerce? – B2B Models – B2B Tools – EDI – Beyond B2B:A2Z – Management Applications

Text Book:

1. Elias M. Awad, “Electronic Commerce”, Prentice-Hall of India, 2003. ISBN: 81-203-2133-2, ISBN: 978-3-656-03426-1

Reference Books:

1. Kenneth C. Laudon, Carol Guercio Traver, “E-Commerce – Business,Technology, Society”, Addison Wesley, Third Edition.2007,ISBN: 0-13-173516-0.
2. Henry Chan, Raymond Lee, Tharam Dillon, “E-commerce Fundamentals and Applications”, John Wiley & Sons-2001, ISBN 978-81-265-1469-4.

12CA363 BANKING TECHNOLOGY

Credits: 4:0:0

Course Objective:

- To study the technology aspects used in banking applications
- Elaborate discussion about the role of wireless networks in financial services
- To discuss about Internet banking, ATMS, Financial Services and VPNs

Course Outcome:

- Acquire a strong knowledge about the latest technologies in banking industry
- Acquire knowledge to improve efficiency and security in banking industry

Unit I

BANKING: Grab a Ringside Seat for the Best of Banking Technology – Banking Technology in Emerging Markets – Going Global – Systems Issues for Servicing a Global Business – A Brief Case History in Internet Banking – How “Internet Bill Presentment” Changes the Deployment Strategy Home banking on Online Payment.

Unit II

THE SELF-SERVICE REVOLUTION: Harnessing the Power of Kiosks and ATMs – Checking It Twice: Check Imaging Systems Offers Greater Flexibility and Efficiency – Internet Banking: Leveling the Playing Field for Community Banks – Straight Talk on SET: Challenges and Opportunities from a Business Perspective.

Unit III

TECHNOLOGY TRENDS IN FINANCIAL SERVICES: Distributed Integration: An Alternative to Data Warehousing – Distributed Solutions in n-Tier Design in the Financial Services Industry – Windows Distributed internet architecture for Financial Services - Customer Profiling for Financial Services – A History of Knowledge-Based Systems in Financial Services

Unit IV

KEY ISSUES AND CRITICAL NEEDS: The Unfolding of Wireless Technology in the Financial Services Industry – Personal Financial Appliances – VPNs for Financial Services – Designing a High- Availability Network Infrastructure – Organizations: Key Issues and Critical Needs – Voice over ATM – Toward a More Perfect Union: The European Monetary Conversion and Its Impact on Information Technology

Unit V

MULTIMEDIA BASED TRAINING: Multimedia Based Training (MBT) for financial Services – Law (or the Lack of It) on the Web: A Primer for Financial Services Technology for Online Marketing, Sales and Support of Financial Services.

Text Book:

1. Jessica Keyes, “Banking Technology Handbook”, CRC Press, 1999, ISBN: 08493-9992-0.

Reference Books:

1. Firdos T. Shroff, “Modern Banking Technology”, Northern Book Centre, 2007, ISBN: 81-7211-222-X.
2. Vadlamani Ravi , “Advances in Banking Technology and Management: Impacts of ICT and CRM”, Information Science Publishing,2007, ISBN: 978-1-59904-675-4.

12CA364 SECURITY IN COMPUTING**Credits: 4:0:0****Course Objective:**

- To discuss about various computer security threats.
- Elaborate discussion about programs security, database security.
- Study of 'secure' behavior on the operation of computers.

Course Outcome:

At the end of the course students will be able to understand

- the need of security systems.
- planning and exploring the information in a secured manner.
- different security categories.

Unit I

SECURITY PROBLEMS IN COMPUTING: Attacks – Meaning of Computer Security – Computer Criminals – Methods of Defense. Elementary Cryptography: Terminology and background –Substitution ciphers – Transpositions – Encryption algorithms- Data encryption standard -AES Encryption algorithm – Public key encryption – Uses of encryption.

Unit II

PROGRAMS SECURITY: Secure programs – Non malicious program errors – Viruses and othermalicious code – Targeted malicious code – Controls against program threats.

Unit III

DATABASE SECURITY: Introduction to databases – Security requirements – Reliability and integrity – Sensitive data – Inference – Multilevel databases – Proposals for multilevel security.

Unit IV

SECURITY IN NETWORKS: Network concepts – Threats in Network – Network security controls –Firewalls – Intrusion detection systems - Secure E-mail.

Unit V

ADMINISTERING SECURITY: Security in planning – Risk analysis – Organizational security policies – Physical Security.

Text Book:

1. Charles P. Pfleeger, Shari Lawrence Pfleeger, “Security in Computing”, Pearson Education Asia, Third edition, 2003. ISBN: 81-297-0042-5.

Reference Book:

1. Rick Lehtinen, Deborah Russell, G.T. Gangemi Sr, “Computer Security Basics”, Second Edition, O’Reilly ,2007.

12CA365 LINUX ADMINISTRATION

Credits: 4:0:0

Course Objective:

- To learn about Linux operating system that runs on a variety of different platforms.
- Administering a LINUX based client/server
- Discussion about the TCP/IP networking and system configuration basics.

Course Outcome:

Students will have detailed information about

- the efficient use of Linux in productive environment
- Linux Networking
- various Linux distributions

Unit I

INTRODUCTION TO LINUX ADMINISTRATION: Linux’s relationship to Unix-Linux and Unix history-Linux distributors-Notation and typographical conventions-Where to go for information-How to find and install software-Essential tasks of the system administrator-System administration under duress. Booting and Shutting Down: Bootstrapping-Booting PCS-Boot loaders: LILO and GRUB-Booting single user mode-Startup scripts-Rebooting and shutting down. Rootly Powers: Ownership of files and processes-The super user-Choosing a root password-becoming root-other pseudo-users.

Unit II

CONTROLLING PROCESSES AND FILE SYSTEM: Components of a process-The life cycle of a process-signals-process states-Runaway processes. The File System: Pathnames-Mounting and unmounting file systems-the organization of the file tree-File Types-File attributes. Adding New Users: The /etc/passwd file-The /etc/shadow file-The /etc/group file-Adding users-Removing users.

Unit III

SERIAL DEVICES: Serial standards –Alternative connectors-Hard and soft carrier-Hardware flow control-Cable length-Serial device files-setserial-Software configuration for serial devices-Configuration of hardwired terminals-Special characters and the terminal driver-How to unweidge a terminal-Modems-Debugging a serial line-other common I/O ports. Adding a Disk: Disk interfaces-Disk geometry-An overview of the disk installation procedure-The ext2 and ext3

file systems-fsck: check and repair file systems-Adding a disk to Linux. Periodic Processes: cron: schedule commands-The format of crontab files-Crontab management-Some common users for cron.

Unit IV

BACKUPS :Motherhood and apple pie – Backup devices and media – Setting up an increment backup regime with dump – Restoring from dumps with restore – Dumping and restoring for upgrades – Using other archiving programs – Using multiple files on a single tape – Amanda - Commercial backup products. Syslog and log files : Logging policies – Linux log files – logrotate – Syslog – Condensing log files to useful information. Drivers and the Kernel: Kernel adaption – Why configure the kernel? – Configuration methods – Tuning a Linux Kernel – Adding a device driver – Device files – Loadable kernel modules – Building a Linux Kernel

Unit V

NETWORK FILE SYSTEM AND MANAGEMENT: General information about NFS – Server side NFS – Client – side NFS – Automating mounting – automount – amd. Sharing System Files – Copying Files around NIS, NIS+, LDAP. Network Management and Debugging – Trouble shooting a Network – Ping, Trace Route, Net Stat, Packets Sniffers, Network Management Protocol, SNMP, The NET-SMNP, Network Management Applications. Cooperating with windows: File and Print Sharing – Secure terminal emulation with SSH – X windows emulators – PC mail clients – PC backups – Dual booting – Running Windows application under Linux – PC hardware.

Text Book:

1. Evi Nemeth, Garth Snyder and Trent R. Hein, “Linux Administration Handbook”, Prentice Hall of India, 2002.

Reference Book:

1. Christopher, “Red Hat Linux 9 Bible”, Wiley Publishing, 2003.

12CA366 GRID COMPUTING AND APPLICATIONS

Credits: 4:0:0

Course Objective:

- To know about grid and the distributed computing resources available over a local or wide area network that appears to an end user or application as one large virtual computing :system.
- To discuss about grid computing by applying the resources of many computers in a network to a single problem at the same time.
- To learn about the grid computing parameters such as load balancing, cost effectiveness, pervasive computing.

Course Outcome:

At the end of the course students will be able to

- describe how to apply the resources of many computers to solve a single problem
- understand the various grid computer parameters and apply it to grid computing problems

Unit I

INTRODUCTION TO GRID COMPUTING: Basic values of grid computing: Introduction Business values – Risk Analysis – Grid market place. Grid Computing Technology – An Overview: Introduction – History – High performance computing – Cluster computing –Peer-to-Peer Computing – Internet Computing – Grid computing Model – Grid Protocols –Globus Toolkit – Open Grid Services Architecture - Types of Grids.

Unit II

TYPES OF GRID: Introduction – Background – Grid value proposition – Challenges – Suitability – Grid Server– Role of Desktop grids in an enterprise computing infrastructure – Practical uses of desktop grids. Cluster Grids: Introduction – Clusters – Industry Examples – Cluster grids.

Unit III

HPC GRIDS AND DATA GRIDS: Introduction – Five steps to scientific insight – Applications and Architectures – HPC application development environment – Production HPC Reinvented – HPC Grids. Data Grids: Introduction – Data grids – Alternatives to data grids – Avaki data grid – Data grid architecture.

Unit IV

CREATING AND MANAGING GRID SERVICES: The Open Grid Architecture: Introduction – An analogy for OGSA – the evolution of OGSA – OGSA overview – Building on the OGSA Platform – Implementing OGSA based grids. Creating and Managing Grid Services: Introduction – Services and the grid – Converting existing software – Service discovery – Operational requirements – Tools and Toolkits – Support in UDDI – UDDI and OGSA.

Unit V

GRID APPLICATION: Desktop Supercomputing: Native programming for grids – Grid-Enabling Software Applications – Managing Grid Environments – Grid computing adoption in Research and Industry.

Text Book:

1. Ahmar Abbas, “GRID Computing: A Practical guide to technology and applications”, Firewall Media, 2008. ISBN: 81-7008-626-4.

Reference Book:

1. Janakiram D. “Grid Computing -a Research Monograph”, TATA McGraw-Hill Publications, 2005.

12CA367 AJAX PROGRAMMING USING ASP.NET

Credits: 3:1:0

Course Objective:

- To gain experience about a strong comprehension of the new concepts and development techniques that ASP.NET AJAX brings to ASP.NET
- To help students to understand the AJAX features and techniques

Course Outcome:

- Students will be able to use AJAX features and techniques in web development

Unit I

ASP.NET AJAX BASICS: Introducing ASP.NET AJAX: What is Ajax?- ASP.NET AJAX architecture - ASP.NET AJAX in action. First Steps with the Microsoft Ajax library: A quick overview of the library – The Application model – Working with the DOM – Making development with JavaScript easier. JavaScript for Ajax Developers: Working with objects – Working with JSON – Classes in JavaScript – Understanding inheritance – Understanding interfaces and enumerations – Using type reflection – Working with events.

Unit II

EXPLORING THE AJAX SERVER EXTENSIONS: Ajax for ASP.NET developers – Enhancing an existing ASP.NET site – ScriptManager: the brains of an Ajax page – Partial-page updates. Making asynchronous network calls: Working with ASP.NET Web Services – The asynchronous communication layer – Consuming external Web Services – Using ASP.NET application services. Partial-page rendering with UpdatePanels: With great power comes great responsibility – Getting to know the UpdatePanel – Triggers – Advanced techniques – Live GridView filter.

Unit III

ADVANCED TECHNIQUES-Under the hood of the UpdatePanel: The PageRequestManager: The unsung hero – A client-side event viewer – UpdatePanel cookbook – Caveats and limitations. ASP.NET AJAX client components: The client component model – Working with client components – Behaviors – Controls.

Unit IV

BUILDING AJAX-ENABLED CONTROLS: Script descriptors – Introduction to Ajax-enabled controls – Extenders - Script controls. Developing with the Ajax Control Toolkit: A world of extenders – The Ajax Control Toolkit API – Animations.

Unit V

ASP.NET AJAX FUTURES AND XML SCRIPT: XML Script basics – Actions – Bindings
Dragging and dropping: The drag-and-drop engine – A drag-and-drop shopping cart.

Text Book:

1. Alessandro Gallo, David Barkol, Rama Krishna Vavilala, “ASP.NET AJAX IN ACTION”. Dreamtech Press, 2008. ISBN 10: 81-7722-778-5, ISBN 13: 978-81-77-22-778-9.

Reference Book:

1. Christian Wenz, “Programming ASP.Net AJAX”, O’Reilly, First Indian Reprint, 2007. ISBN 10: 81-8404-383-X, ISBN 13: 978-81-8404-383-9.

12CA368 AD HOC NETWORKS

Credits: 4:0:0

Course Objective:

- To gain adequate knowledge about the various protocols in ad hoc networks
- To develop and demonstrate a complete system of ad hoc networking that paves the way to new technologies, and applications for the future benefit of the research community and telecommunications Industry.
- To know the current technology trends for the implementation and deployment of wireless ad-hoc networks.

Course Outcome:

- Gain adequate knowledge about the fundamentals of ad hoc network technologies, protocols and realizations.
- Ability to develop a new routing protocol in ad hoc networks
- Gain adequate knowledge in designing MAC, routing and transport protocols for wireless ad-hoc networks

Unit I

AD HOC NETWORKING: An Introduction- Model of operation- Commercial Applications of Ad Hoc Networking- Technical and market Factors affecting Ad Hoc Networks – A DoD Perspective on Mobile Ad Hoc Networks: The Past- The Present- The Future.

Unit II

ROUTING OVER A MULTIHOP WIRELESS NETWORK OF MOBILE COMPUTERS: Introduction- overview of Routing Methods- Destination-Sequenced Distance Vector Protocol- Examples of DSDV in Operation- properties of DSDV Protocol- Comparison with other Methods- Cluster-Based Networks: Clustering for Transmission Management- Clustering for Backbone Formation- Clustering for Routing Efficiency.

Unit III

THE DYNAMIC SOURCE ROUTING PROTOCOL FOR MULTIHOP WIRELESS AD HOC NETWORKS: DSR Protocol Description- Overview and Important Properties-DSR Evaluation- The Ad Hoc On-Demand Distance-Vector Protocol: AODV Properties-Unicast Route Establishment- Multicast Route Establishment-Broadcast- Simulations-Optimizations and Enhancements.

Unit IV

HYBRID FRAMEWORK FOR ROUTING IN AD HOC NETWORK: The Communication Environment and the RWN Model-The Zone Routing Protocol- ZRP-Formal Description-Evaluation of ZRP-Performance Results. Link Reversal Routing: The Gafni-Bertsekas Algorithm-The lightweight Mobile Routing Algorithm- The Temporally Ordered Routing Algorithm- Comparison of LRR Algorithms.

Unit V

EFFECTS OF BEACONING ON THE BATTERY LIFE OF AD HOC MOBILE COMPUTERS: Ad Hoc Wireless Networks-Associativity Based on Routing-Effects of Beaconing on Battery Life- Experimental Results and Observations-Beaconing with Neighbouring Nodes at Low Bandwidth-Efficient Link-State Routing in Wireless Networks: Updating Routes in Wireless Networks-STAR Description-Performance Evaluation.

Text Book:

1. Charles E.Perkings, “Ad Hoc Networking”, Addison-Wesley, 2008, ISBN: 978-81-317-2096.

Reference Books:

1. C.K Toh, “Ad Hoc Mobile Wireless Networks, 2007”, Pearson Education Inc., ISBN: 81-317-1510-8.
2. C. Siva Ram Murthy and B.S Manoj, “Ad Hoc Wireless Networks Architectures and Protocols”, Pearson Education, 2008, ISBN-978-81-317-0688

12CA369 NETWORK ANALYSIS, ARCHITECTURE, AND DESIGN**Credits: 4:0:0****Course Objective:**

- To provide students with a comprehensive and structured view of network design from a theoretical and a practical perspective.
- Presents basic principles and methods for developing traffic characterization and optimization models for a subset of network design problems.
- It also aims at helping students to understand recent advances and to be exposed to research problems in network design.

Course Outcome:

Upon completing this course, students should be able to:

- Become familiar with gathering, deriving, and defining real network requirements.
- Determine how and where addressing and routing, security, network management, and performance are implemented in the network.
- Evaluate and choose different network technologies.
- Determine where to apply performance mechanisms, including quality of service, service level agreements, and policies in the network.

Unit I

INTRODUCTION TO NETWORK ANALYSIS AND ARCHITECTURE: Overview of Analysis, Architecture, and Design Processes – System Description – Service Description – Service Characteristics – Performance Characteristics Requirement Analysis: Concepts – User Requirements – Application Requirements – Device Requirements – Network Requirements – The Requirement Specifications and Map.

Unit II

REQUIREMENT ANALYSIS: Process – Gathering and Listing Requirements – Developing Service Metrics – Characterizing Behavior – Developing RMA Requirements – Developing Delay Requirements – Developing Capacity Requirements – Developing Supplemental Performance Requirements – Requirements for Predictable and Guaranteed Performance – Requirements Mapping – Developing the Requirements Specification.

Unit III

FLOW ANALYSIS AND ARCHITECTURE: Flows – Identifying and Developing Flows – Data Sources and Sinks – Flow Models – Flow Prioritization – The Flow Specification. Network

Architecture: Component Architecture – Reference Architecture – Architecture Models – Systems and Network Architectures.

Unit IV

NETWORK MANAGEMENT ARCHITECTURE: Defining Network Management – Network Management Mechanisms – Architectural Considerations. Performance Architecture: Developing Goals for Performance – Performance Mechanisms – Architectural Considerations. Security and Privacy Architecture: Developing a Security and Privacy Plan – Security and Privacy Administration – Security and Privacy Mechanisms.

Unit V

NETWORK DESIGN: Design Concepts – Design Process – vendor, Equipment, and Service-Provider Evaluations – Network Layout – Design Traceability – Design Metrics.

Text Book:

1. McCabe James , “Network Analysis, Architecture, and Design”, Morgan Kaufmann Publishers. An imprint of Elsevier Science, San Francisco, Third Edition (2007), CA 94104-3205, USA, ISBN: 978-0-12-370480-1.

Reference Book:

1. William Stallings, “Computer Networking with Internet Protocols and Technology”, Pearson Prentice Hall, 2004, ISBN: 0-13-141098-9.

12CA370 PROGRAMMING IN JavaME

Credits: 4:0:0

Course Objective:

- To program mobile telephones using Java Technology
- To understand Mobile Information Device Profile (MIDP) and advanced concepts
- To acquire knowledge about networking using J2ME

Course Outcome:

- Ability to integrate J2ME client applications with server-side applications.
- Enable to build and deploy J2ME based solutions.
- Enable to do mobile networking using J2ME techniques

Unit I

INTRODUCTION TO J2ME: Understanding J2ME – Configuration – Profiles – Anatomy of MIDP applications – Advantages of MIDP – Building MIDlets – J2ME Development Environment – J2ME Architecture.

Unit II

J2ME USER INTERFACE: Items and Event Processing – Command - High Level Display: Creating a User Interface – Lists and Forms - Low Level Display: The Canvas Class.

Unit III

PERSISTENT STORAGE: MIDP Record Store – File Connection and PIM API.

Unit IV

J2ME NETWORKING: Generic Connection Framework – Connection types –Wireless Messaging API - SMS – WMA API.

Unit V

J2ME NETWORKING AND MULTIMEDIA: Bluetooth and OBEX – Protecting Network Data- Multimedia- sound, voice and Video: MMAPI.

Text Book:

1. Sing Li, Jonathan Knudsen, “Beginning J2ME from Novice to Professional”, Springer (India) Pvt. Ltd., 2006. ISBN 81-8128-292-2

Reference Books:

1. James Koegh, “J2ME – The Complete Reference”, Tata McGraw Hill Edition, 2003. ISBN : 0 -07-053415-2
2. Kim Topley, “J2ME – In a Nutshell”, O’Reilly publications, 2002.ISBN: 81-7366-343-2.

12CA371 NEURAL NETWORKS AND ITS APPLICATIONS

Credits: 3:0:0

Course Objective:

- To introduce the basic concepts of Neural Networks
- To explore in pattern classification and pattern association
- To introduce back propagation architecture, algorithm and applications

Course Outcome:

- Gain adequate knowledge about the algorithms and theories of neural networks and applications
- Understand and use the appropriate Application of Neural Networks (ANN) methods and tools for specifying, designing, implementing neural network systems.
- Have a good knowledge of several types of ANN models.

Unit I

INTRODUCTION TO NEURAL NETWORKS :Neural Net – Applications of Neural Net – Uses of Neural Networks – History of Neural Networks – Architecture, Algorithm and Applications of Neural Net – the McCulloch Pitt Neuron.

Unit II

NEURAL NETWORKS FOR PATTERN CLASSIFICATION:Simple Neural Nets for Pattern Classification: HebbNet – Perception – Adaline. Pattern Association: Training Algorithm

for Pattern Association – Hetroassociative Memory Neural Network – Autoassociative Net – Iterative Autoassociative Net – Bidirectional Associative Memory (BAM).

Unit III

NEURAL NETWORKS BASED ON COMPETITION: Fixed –Weight Competitive Nets – Kohonen Self – Organizing Maps – Learning Vector Quantization – Counter propagation.

Unit IV

ADAPTIVE RESONANCE THEORY: Introduction: Motivation – Basic Architecture – Basic Operation – ART1: Architecture – Algorithm – Applications – Analysis - ART2: Architecture – Algorithm – Applications – Analysis.

Unit V

BACK PROPAGATION NEURAL NET: Standard Back propagation: Architecture – Algorithm – Applications – Variation: Alternative Weight Update Procedures – Alternative Activation Functions – Strictly Local Back Propagation – Number of Hidden Layers. A Sampler of other Neural Nets: Fixed Weight Nets for Constrained Optimization: Boltzmann Machine – Continuous Hopfield – Gaussian Machine – Cauchy Machine.

Text Book:

1. Laurene Fausett, “Fundamentals of Neural Networks Architecture, Algorithms, and Applications”, Pearson Education, 2005

Reference Books:

1. Simon Haykin, “Neural Networks” , Pearson Education,2007.
2. James A Freeman and Davis Skapura, “Neural Networks”, Pearson Education, 2002.

12CA372 NETWORK MANAGEMENT

Credits: 4:0:0

Course Objective:

- To understand the fundamental concepts of network management
- To study network management protocols and Applications
- To familiarize with network management standards, models, tools and systems

Course Outcome:

- Able to manage the operation of modern data communication networks
- Enable to acquire depth knowledge about SNMP protocols, Remote monitoring and web management
- Able to manage network using network management tools and systems

Unit I

INTRODUCTION TO NETWORK MANAGEMENT: Analogy of Telephone Network Management - Data and Telecommunication Network-Distributed Computing Environments-

TCP/IP Based Networks-Communication Protocols and standards-Network Management: Goals, Organization and Functions-Network Management System Platform

Unit II

BASIC STANDARDS AND MODELS: Basic Foundations: Standards, Models and Language: Network Management Standards, Network Management Model, Organization Model, Communication Model. SNMPv1 Network Management Organization and Information Model: History of SNMP Management, SNMP Model, Organization Model, System Overview, The Information Model

Unit III

SNMP ARCHITECTURE :SNMPv1 Network Management: Communication and Functional Models: The SNMP Communication Model, SNMP Architecture, Administrative Model, SNMP Protocol Specifications, SNMP Operations, SNMP MIB Group. SNMP Management: SNMPv2: SNMPv2 System Architecture, SNMPv2 Structure of Management Information, SNMPv2 Management Information Base, SNMPv2 Protocol.

Unit IV

NETWORK MANAGEMENT TOOLS: Bit Error Rate Tester, Basic Software Tools, SNMP MIB Tools, The Protocol Analyzer. Network Statistics Measurement Systems. Network Management Systems: Functional Components, Multiple NMS Configurations, Network Management System Requirements

Unit V

CONFIGURATION MANAGEMENT AND EVENT CORRELATION: Configuration Management, Fault Management, Performance Management, Event Correlation Techniques, Security Management.

Text Book:

1. Mani Subramanian, "Network Management Principles and Practice", Addison Wesley, 2000. ISBN: 81-7808-595-X.

Reference Books:

1. Stephen B. Morris, Network Management, MIBs and MPLS: "Principles Design and Implementation", Pearson, 2003. ISBN-10:0131011138.
2. Sebastian Abeck, Adrian Farrel, "Network Management Know it all", Elsevier Morgan Kaufmann, 2008, ISBN: 978-012374598-9.

12CA373 SATELLITE COMMUNICATIONS

Credits: 3:0:0

Course Objective:

- To understand operation of satellite systems.
- To learn about the basic theory of digital radio transmission.

- To acquire knowledge in satellite applications and services.

Course Outcome:

- Gain knowledge on satellite access, its applications and services.
- Ability to discuss launch methods and technologies depending upon the orbital mechanic and characteristics of common orbits.
- Gains adequate knowledge about satellite access and multiple access techniques.

Unit I

INTRODUCTION: Kepler's Three Laws of Planetary Motion-Orbital Parameters-Orbital Perturbations-Orbit Types (LEO, MEO, GSO) – Regulatory Service.

Unit II

SATELLITE LINK AND POWER MANAGEMENT: Transmission Losses – Link power Budget calculation – Uplink – Downlink – C/N Ratio – Rain Effects

Unit III

EARTH STATION FUNDAMENTALS: Earth Station General Block Diagram – Transmitter and Receiver – Antennas – Tracking system

Unit IV

SATELLITE ACCESS TECHNIQUES: Voice, Data, Video Transmission system – Multiple Access Techniques: FDMA – TDMA – CDMA –SPADE

Unit V

APPLICATION AND SERVICES: Satellite Applications and services: Services: INTELSAT – INSAT-U.S DOMSAT-VSAT-GSM-GPS Applications: E-Mail – Mobile Services – Video Conferencing and Internet – DTH (cable TV) – Navigation – Remote Sensing.

Text Book:

1. Dennis Roddy, "Satellite Communications", Mc Graw-Hill International, IIIrd Edition, 2001.

Reference Books:

1. Frenzel, "Communication Electronics – Principles and Applications", IIIrd Edition, Tata McGraw Hill, 2008 Reprint.
2. Wilbur L. Pritchard and Joseph A Sciulli, "Satellite Communication Systems Engineering", Pearson Education, 2003.
3. Timothy Pratt and Charles W. Bostian, "Satellite Communication", John Wiley and Sons, 2005.

12CA374 VIRTUAL PRIVATE NETWORKS

Credits: 3:0:0

Course Objective:

- To explain the role of a VPN that may perform in a security posture of an organization

- To analyze security requirements of an organization and to recommend an appropriate technical solution for a VPN
- To configure VPNs using diverse equipments such as routers, firewalls, clients and dedicated VPN termination equipment

Course Outcome:

- Enable to configure VPNs using diverse equipment such as routers, firewalls, clients and dedicated VPN termination equipment
- Ability to configure a VPN solution using a Certificate Authority and digital certificates
- Gain adequate knowledge in VPNs installation, implementation and troubleshooting

Unit I

INTRODUCTION TO VPN TECHNOLOGY: History of VPN – Components of VPN – Support and Growth of VPN – Needs for VPN in Organization and Business.

Unit II

VPN ARCHITECTURE: VPN Architecture – Topologies of VPNs – Government restrictions on VPN Technology.

Unit III

VPN IMPLEMENTATION: The Basics – Installing a VPN – Troubleshooting VPN's.

Unit IV

THE SECURITY OF VPN'S: Cryptography – Encryption – Secure communication and Authentication – VPN operating System.

Unit V

THE SECURITY OF VPN'S: VPN Security Attacks – Security toolset – Intrusion Detection and Security Scanning – Emerging Technologies for VPN's.

Text Book:

1. Steven Brown, "Implementing Virtual Private Networks", Tata McGraw-Hill Edition 2000, ISBN 0 – 07 – 463780 -0

Reference Books:

1. William Stallings, "Cryptography and Network Security", Pearson Education, Second Edition, 2002. ISBN – 81-7808-605-0
2. Marcus Goncalves, "Firewalls – A Complete Guide", Tata McGraw-Hill, 2000. ISBN 0-07-4639722

12CA375 WIRELESS LAN

Credits: 3:0:0

Course Objective:

- To know about the network components of WLAN.
- To know about the MAC Layer and frame types of the network.
- To know about the authentication protocols of wireless networks.
- To know about the installation and analysis procedures of the network.

Course Outcome:

- Students learn about the working of 802.11 protocol.
- Students learn about the security issues of WLAN.
- Students learn to deploy and maintain wireless LAN network.

Unit I

OVERVIEW OF 802.11 NETWORKS: IEEE 802 Network Technology Family Tree 802.11 Nomenclatures and Design- 802.11 Network Operations – Mobility Support. 802.11 MAC: – Challenges for the MAC –MAC Address Modes and Timing, Contention Based Access using DCF- Fragmentation and Reassembly - Frame Format - Encapsulation of Higher Layer Protocols - Contention based data Service

Unit II

WIRED EQUIVALENT PRIVACY: Cryptographic Background to WEP-WEP Cryptographic Operations-Problems with WEP – Extensible Authentication Protocol - 802.1x: Network Port Authentication 802.1x on Wireless LANs - Management Operations: Management Architecture- Scanning – Authentication - Association –Power Conservation-Timer Synchronization

Unit III

CONTENTION FREE SERVICE WITH PCF: Contention Free Access using PCF – Detailed PCF Framing Power Management and PCF. Physical Layer Overview: Physical Layer Architecture, The Radio Link, RF and 802.11. Using 802.11 Access Points: General Functions of an Access point-ORiNOCO AP-1000 Access point-Nokia A032 Access Point.

Unit IV

802.11 NETWORK ANALYSIS: Use of Network Analyser-Network Analysers-Commercial Network Analyser, Ethereal, 802.11 Network Analysis Examples- AirSnort.

Unit V

NETWORK DEPLOYMENT: The Topology Archetype-Project Planning-Site Survey-Installation. 802.11 Performance Tuning-Tuning Radio Management, Tuning Power Management, Timing Operations, Physical Operations, Tunable Parameters.

Text Book:

1. Mathew S Gast, “802.11 Wireless Networks, The definitive Guide”, O ’Reilly & Associates, 2002, ISBN 81-7366-442-0

Reference Book:

1. Neil Reid and Ron Seide, “802.1 wi-fi Networking Handbook”, Tata McGraw-Hill,2003 ISBN 0-07-053143-9

12CA376 CLOUD COMPUTING

Credits: 4:0:0

Course Objective:

- To guide the student for building a virtualized -computing infrastructure using open source software.
- To urge the knowledge of the students in the area of cloud-oriented environments such as high-speed access to the internet, secure data storage, and various standardizations.
- To know about various applications of cloud computing

Course Outcome:

- Students will be oriented to innovate the cloud services depends ultimately on acceptance of the application by the user community.
- Students will be intent to provide the transition from fixed devices connected to the internet to the new mobile device-empowered Internet.
- Gains adequate knowledge about the essential techniques in cloud computing

Unit I

INTRODUCTION TO CLOUD COMPUTING: Introduction- The Emergence of Cloud Computing - Cloud-based Service Offerings - Grid Computing or Cloud Computing - Cloud Model Reliability - Benefits of using a Cloud Model - Key Characteristics of Cloud Computing - Challenges for the cloud- The Evolution of Cloud Computing: Hardware Evolution- Internet Software Evolution - server virtualization.

Unit II

WEB SERVICES ON CLOUD: Web Services Delivered from the Cloud: Communication-as-a-Service – Infrastructure-as-a-Service - Monitoring-as-a-Service - Platform-as-a-Service - Software-as-a-Service. Building Cloud Networks- The Evolution from the MSP Model to Cloud Computing and software-as-a service - The Cloud Data Center – Collaboration - service-oriented Architectures as a step toward cloud computing- Basic approach to a Data center-based SOA - The role of Open source software in Data centers- Where Open source software is used.

Unit III

CLOUD IDENTITIES: Federation, Presence, identity, and Privacy in the Cloud: Federation in the cloud-Presence in the cloud- Privacy and its Relation to the Cloud-based Information Systems- Security in the cloud: Cloud Security Challenges-Software-as-a-Service Security

Unit IV

STANDARDS ON CLOUD: Common Standards in cloud computing: The open Cloud Consortium-The distributed management Task force-Standards for Application Developers-Standards for Messaging-standards for security.

Unit V

END-USER ACCESS ON CLOUD: End-user Access to cloud computing: YouTube-YouTube API Overview – Zimbra- facebook-Zoho-DimDim Collaboration- Mobile Internet Devices and the cloud:- Smartphone- Mobile Operating systems for smartphones-Mobile Platform Virtualization-Collaboration Applications for Mobile Platforms.

Text Book:

1. W. Rittinghouse, James F.Ransome , “Cloud Computing – Implementation, Management & Security”, John, CRC Press, 2010, ISBN: 978-1-4398-0680-7.

Reference Books:

1. Judith Hurich, Robin Bloor, Marcia Kaufman, Fern Halper, “Cloud Computing for Dummies”, Wiley Publication inc., 2010.
2. George REESE, “Cloud Application Architectures”, O’REILLY,2009.
3. Tim Mather, Subra Kumarasamy, shahed Latif, “Cloud Security and Privacy”, O’REILLY, 2009.

12CA377 PROGRAMMING IN JavaEE

Credits: 3:1:0

Course Objective:

- To know the need of Enterprise JAVA applications.
- To know about various JEE components such as Servlets, JDBC, JavaBeans and RMI.
- To develop simple applications using JEE components.

Course Outcome:

- Students are able to develop application with JavaEE components.
- Students acquire knowledge about enterprise architecture.
- Students acquire knowledge about Security measures in JavaEE.

Unit I

INTRODUCING J2EE: JEE Advantage – Enterprise architecture types – Architecture of J2EE – J2EE Components – Developing J2EE applications. J2EE Multitier Architecture: Distributive Systems – The Tier – Multi-Tier Architecture – J2EE Best Practices: Enterprise application strategy – The Enterprise application – Clients- Session management – Web-Tier and JavaServer Pages – Enterprise JavaBeans Tier.

Unit II

JAVA SERVLET AND JSP: Java Servlets: A simple Java servlet – Anatomy of java servlets – Reading data from a client – Reading HTTP request headers - Sending data to a client and writing the HTTP response header – Working with Cookies -Tracking sessions. Java Server Pages: JSP- JSP tags - Tomcat – Request string – User sessions - Cookies – Session object.

Unit III

JDBC: JDBC Objects: Overview - Database connection –Associating with the database – Statement objects - ResultSet - Transaction Processing – Metadata – Data types – Exceptions. JDBC and Embedded SQL: Tables - Indexing – Inserting data into tables – Selecting data from a table – Metadata – Updating tables – Deleting data from a table – Joining tables – Calculating data – Grouping and ordering data.

Unit IV

ENTERPRISE JAVA BEANS: Deployment descriptions – Session Java Bean – Entity Java Bean – Message Driven Bean. Java Mail API: Protocols – Exceptions – Send E-mail messages – Retrieving E-mail messages – Deleting E-mail messages – Replying to and forwarding an E-mail message – Forwarding an E-mail message – receiving Attachments.

Unit V

REMOTE METHOD INVOCATION: Concept- Server side – Client side. Java Message Service: JMS fundamentals – Components of JMS – Messages – Message Selector – Sending and Receiving message to and from a queue – Compiling and running queue programs, Concepts – JVM security – Management – Java API security – Browser security – Web Services Security.

Text Book:

1. James Keogh, “J2EE-The Complete Reference”, Tata McGraw Hill, Sixteenth Reprint 2006, Edition 2002, ISBN: 0-07-052912-4

Reference Books:

1. Kogent Solutions Inc, “J2EE 1.4 Projects”, Dream Tech Press, 2007. ISBN: 81-7722-7378.
2. Michael Girdley, Rob Woollen, Sandra Emerson, “J2EE Applications and BEA WebLogic Server”, Prentice Hall, 2001.

12CA378 FINANCIAL AND MANAGEMENT ACCOUNTING

Credits: 3:1:0

Course Objective:

- This course aims to develop the principles and techniques of accounting and focus on application of financial, cost and management accounting.

Course Outcome:

- Student will be clear on understanding and analyzing the financial statement of the companies.
- Students are exposed to prepare cash flow statements and to prepare Budgets for corporate.

Unit I

INTRODUCTION: Basics of Understanding Corporate Financial Statements - Relevant terms - Corporate Balance Sheet and Profit and Loss Account - Notes to the accounts - Schedules - Window Dressing.

Unit II

FINANCIAL STATEMENTS: Introduction - Financial statements - Significance and limitations of financial statements – Analyzing the Balance Sheet using Excel- Work sheet – Formatting – Audit tool bar – Graphics Viewing Formula - Financial statement analysis – Common size and comparative statement - Decision making relationship with FS & FSA - Ratio analysis of software companies – Profitability – Solvency – Activity ratios

Unit III

TYPES OF CASH FLOW: Cash Flows - Preparation and analysis of Cash flow - Funds flow – statement of Changes in Working capital-Fund from operations- Fund flow statements.

Unit IV

COST CONCEPTS AND CLASSIFICATION: Cost Concepts and Classification - Cost Determination in Manufacturing and Service Organizations – Preparation of cost sheet. Marginal costing and break even analysis - its assumptions and limitations.

Unit V

BUSINESS PLAN AND BUDGET: A General view of Business plan – Cash Budget – Flexible Budget – Types and Techniques of Budgeting.

Text Book:

1. Grewal T.X., “Double Entry Book-keeping”, Sultan Chand & Sons, 2003.

Reference Books:

1. Ruzbeh J. Bodhanwala, “Understanding and Analyzing Balance Sheets using Excel Worksheet”, PHI Private Limited, New Delhi, 2004
2. Maheswari S.N., “Management Accounting”, Sultan Chand, New Delhi, 2004

12CA379 ENTERPRISE RESOURCE PLANNING FUNDAMENTALS

Credits: 4:0:0

Course Objective:

- To understand the basics of Enterprise-wide Information Systems.
- To understand the importance of Information Technology’s support for business processes.
- To learn the methods to implement and maintain ERP packages.
- To learn about the common modules of ERP.
- To learn about the technology and managerial aspects involved in ERP implementation and maintenance.

Course Outcome:

- Students will be able to understand the basics of ERP package.
- Will be able to understand the technical and managerial issues involved in ERP
- Planning, Development, Implementation and Maintenance.

Unit I

ERP FUNDAMENTALS: Overview – Benefits of ERP – ERP and Related Technologies – Business Process Reengineering – Data Warehousing – Data Mining – On-line Analytical Processing – Supply Chain Management-Advanced Technology and ERP Security.

Unit II

ERP LIFECYCLE: Pre-evaluation screening, package valuation, project planning phase, Gap Analysis, Reengineering, Configuration, Team training, Testing, Going live, End-user Training, Post Implementations, Role of Vendors, consultants and user's, Cost of ERP Implementation.

Unit III

ERP PACKAGES AND MODULES: Business Modules in an ERP Package – Finance – Manufacturing – Human Resource – Plant Maintenance – Materials Management – Quality Management – Sales and Distribution.

Unit IV

CHALLENGES IN ERP: Turbo Charge the ERP System – EIA – ERP and E-Commerce – ERP and Internet – Future Directions in ERP.

Unit V

ERP TOOLS AND TECHNIQUES:ERP Market Place – SAP – PeopleSoft – Baan Company – JD Edwards World Solutions Company – Oracle Corporation – QAD – System Software Associates - Case studies on popular RP packages viz. SAP, Baan, Ramco Marshal, Movex & Microsoft Dynamics.

Text Book:

1. Alexis Leon, “ERP Demystified”, Tata McGraw Hill, 2008, ISBN (10): 0-07-065664-9 ISBN (13): 978-0-07-065664-2.

Reference Books:

1. Vinod Kumar Garg, N.K .Venkata Krishnan, “Enterprise Resource Planning – concepts and Planning”, Prentice Hall, 1998.
2. Jose Antonio Fernandz, “The SAP R /3 Hand book”, Tata McGraw Hill, 1998.
3. Fu, “SAP BW: A Step by Step Guide”, First Edition, Pearson Education, 2003.

12CA380 WIRELESS SECURITY**Credits: 4:0:0****Course Objective:**

- To explore vast array of wireless technologies, techniques and methodologies
- Provide relevant analysis and understanding of wireless security issues.

Course Outcome:

At the end of the course, students have

- knowledge of wireless technologies, techniques and methodologies
- understanding of wireless security issues.

Unit I

INTRODUCTION: Wireless Information Warfare - Wireless Is Information Warfare (IW) – A Classification scheme based on network architecture Circuit- switched networks and packet-switched networks- Information theory- Decision theory- A model for Cost-effective risk management- performance measures and key design tradeoffs- A taxonomy of attack operations Electromagnetic capture threads.

Unit II

COMMUNICATION TECHNIQUES – PAST PRESENT AND FUTURE: Telephone system vulnerabilities-Interception/Ease of Interception- Unintentional Interrupts Natural hazards - International interruptions – Cell Phone vulnerabilities-Satellite Communications-History-Satellite orbits-communications - Earth sensing - Satellite spectrum issues - Computer crime - Framework for dealing with policy issues - Security of information systems - Balancing information technology, national security - Information vulnerability importance of information.

Unit III

COMMUNICATION SECURITY: Cryptographic security - Speech cryptology – Threads - Writing systems - Two dimensional scramblers.

Unit IV

WLAN FUNDAMENTALS: The Wireless Local Area Network (WLAN)- Wireless transmission Media- WLAN products and standards- Securing WLANs Countermeasures-The Infamous WEP-Physical Security -Wireless Application Protocol(WAP)-Comparison of the TCP/IP,OSI and WAP Models- WAP Security Architecture- Marginal Security.

Unit V

SECURITY IN WIRELESS COMMUNICATION: Wireless Transport Layer Security (WTLS)- Secure Socket Layer-Wireless Transport layer security and WAP-Bluetooth-Voice Over Internet protocol .

Text Book:

1. Randall K. Nichols, Panos C. Lekkas, “Wireless Security”, Tata McGraw-Hill Edition 2006, Second Reprint 2007, ISBN: 0-07-061884-4.

Reference Books:

1. Tara M. Swaminatha, Charles R. Elden , "Wireless Security and Privacy", Addison Wesley,ISBN-0-201-760347.
2. John R. Vacca, "Guide to Wireless Network Security", Springer Science and Business Media LLC, 2006, ISBN: 13:978-0-387-95425-7.

12CA381 CLUSTER COMPUTING

Credits: 4:0:0

Course Objective:

- It focuses on Cluster Computing requirements, Single System image, High Performance and wide- area Computing
- It covers system area networks, light-weight communication protocols
- It discusses techniques and algorithms of process scheduling, migration and load balancing.

Course Outcome:

Students will have

- knowledge about various protocols and techniques of cluster computing

Unit I

INTRODUCTION: Cluster Computing at a Glance: Introduction- Scalable Parallel Computer Architectures- Towards Low Cost Parallel Computing and Motivations- Windows of opportunity- A Cluster Computer and its Architecture- Clusters Classifications-Commodity Components for Clusters- Network Services/Communication SW-Cluster middleware and Single System Image (SSI) -Resource Management and Scheduling (RMS)- Programming Environments and Tools- Cluster Applications-Representative Cluster Systems- Cluster of SMPs (CLUMPS).Cluster Setup and its Administration:-Introduction- Setting up the Cluster Security-System Monitoring- System Tuning. Constructing Scalable Services-Introduction-Environment-Resource Sharing Resource Sharing enhanced Locality- Prototype Implementation and Extension.

Unit II

ADMINISTERING THE CLUSTERING: Dependable Clustered Computing:-Introduction- Two Worlds Converge-Dependability Concepts- Cluster Architectures- Detecting and Masking Faults-Recovering from Faults- The Practice of Dependable Clustered Computing. Deploying a High Throughput Computing Cluster:-Introduction- Condor Overview- Software Development-System administration Performance Models and Simulation:-Introduction- New Performance Issues- A Cost Model for Effective Parallel Computing.

Unit III

HIGH SPEED NETWORKS: Introduction- Design Issues- Fast Ethernet- High Performance Parallel Interface (HiPPI)- Asynchronous Transfer Mode (ATM)-Scalable Coherent Interface (SCI)-ServerNet- Myrinet- Memory Channel-Synfinity. Lightweight Messaging Systems:- Introduction- Latency/Bandwidth Evaluation of Communication Performance- Traditional Communication Mechanisms for Clusters- Lightweight Communication Mechanisms- Kernel-level Lightweight Communications- User- level Lightweight Communications- A Comparison among Message Passing Systems.

Unit IV

RESOURCE MANAGEMENT: Job and Resource Management Systems:-Motivation and Historical Evolution-Components and Architecture of Job and Resource Management Systems-

The State-of-the-Art in RMS.- Challenges for the present and the future. Scheduling Parallel Jobs on Clusters:-Introduction- Background- Rigid Jobs with Process Migration- Malleable Jobs with Dynamic Parallelism- Communication – Based Co scheduling- Batch Scheduling. Load Sharing and Fault Tolerance Manager:-Introduction- Load Sharing in Cluster Computing- Fault Tolerance by Means of Check pointing- Integration of Load Sharing and Fault Tolerance.

Unit V

SCHEDULING AND LOAD BALANCING METHODS: Parallel Program Scheduling Techniques:-Introduction- The Scheduling Problem for Network Computing Environments- Scheduling Tasks to Machines Connected via Fast Networks- Scheduling Tasks to Arbitrary Processors Networks- CASCH: A Parallelization and Scheduling Tool. Customized Dynamic Load Balancing:-Introduction- Dynamic Load Balancing (DLB)- DLB Modeling and Decision Process- Compiler and Runtime Systems- Experimental Results. Mapping and Scheduling on Heterogeneous systems:-Introduction- Mapping and Scheduling- The Issues of Task Granularity and Partitioning- Static Scheduling and Dynamic Scheduling Load Balancing Issues.

Text Book:

1. Rajkumar Buyya, “High performance Cluster Computing”, Volume-1, Pearson education, Second Impression, 2008, ISBN: 978-81-317-1693-9.

Reference Books:

1. Prabhu C.S.R. , “Grid And Cluster Computing”, First Edition 2008, ISBN :978-81-203-3428-1
2. Karl Heinz Hoffmann, Arnd Meyer , “Parallel Algorithms and cluster computing : Implementations ,Algorithms and Applications”, Springer, ISBN: 978-3-540-33539-9

12CA382 RESEARCH METHODOLOGY

Credits: 4:0:0

Course Objective:

- To describe the steps involved in research process
- To learn how to formalize research problems
- To impart knowledge on Plagiarism

Course Outcome:

- Familiarize the research process and data collection techniques
- Enables to formulate the research problem
- Gains thorough knowledge on research proposal writing

Unit I

INTRODUCTION: Research - Application of Research – Definition and characteristic of Research - Types of Research-Paradigm of Research – Research Process: an eight step model

Unit II

LITERATURE REVIEW: Formulating a Research problem – Reviewing the literature – Formulating a research problem – identifying variables – constructing hypothesis - Research Design – selecting a study design

Unit III

PREPROCESSING ISSUES: Data Collection – selecting a method of data collection – collecting data considering ethical issues: research participants – researchers – sponsoring organization - Collection of – preprocessing the data – displaying the data.

Unit IV

DATA PROTECTION METHODS: Definition – Forms of Plagiarism – Consequences of Plagiarism- Unintentional Plagiarism-Copyright - Infringement-Collaborative work.

Unit V

RESEARC PROPOSAL DESIGN: Research proposal – preamble / introduction – problem and objective of the study – hypotheses to be tested – study design – setting – measurement procedures – sampling – analysis of data – structure of the report – problems and limitations – work schedule.

Text Books:

1. Joseph Gibaldi - “MLA Handbook for Writers of Research Papers” – Sixth Edition – The Modern Language Association of America, 2003
2. Ranjit Kumar, “Research Methodology: A Step by step guide for Beginners”, 2008 Second Edition, Pearson Education

Reference Books:

1. Krishnaswamy, K.N., Sivakumar, Appa Iyer and Mathiranjana M, “Management Research Methodology; Integration of Principles, Methods and Techniques”, Pearson Education, New Delhi, 2006
2. Paneer Selvam, “Research Methodology”, Prentice Hall of India Pvt. Ltd / Pearson Education, 2007.
3. Dipak Kumar Bhattacharyya, “Research Methodology” Excel Books 2006

12CA383 ADVANCED DATA MINING

Credits: 4:0:0

Course Objective:

- To give an insight about advanced data mining concepts with research perspective
- Detailed discussion about computational approaches to data modeling (finding patterns), data cleaning, and data reduction of high-dimensional large databases.
- To inculcate the applications of mining

Course Outcome:

Upon successful completion of this course, students will have the skills to apply data mining techniques to real world problems. In particular, students will be able to

- know tasks associated with data mining such as classification and clustering.
- implement data mining tasks.
- choose a suitable data mining task to the problem at hand.
- interpret the results produced by data mining.
- know web mining and in what ways it is different from data mining.

Unit I

INTRODUCTION TO ADVANCED DATA MINING: Data Mining – Functionalities – Classification of data mining systems – Major issues in data mining. Mining frequent patterns, Associations, and Correlations: basic concepts and a Road map, Efficient and Scalable Frequent Itemset Mining Methods- Mining various kinds of Association rules, From Association Mining to Correlation Analysis- Constraint-Based Association Mining.

Unit II

CLASSIFICATION AND PREDICTION: Issues regarding classification and prediction-classification by decision tree induction-Bayesian classification-Rule based classification-Other classification methods-Prediction

Unit III

CLUSTER ANALYSIS: Types of data in cluster analysis-A Categorization of major clustering methods-Partitioning methods, Hierarchical methods, Density-based methods, Grid-Based methods, Outlier analysis

Unit IV

SEQUENCE PATTERNS: Mining Stream, time-series, and Sequence Data: Mining Data Streams- Mining time series data- Mining Sequence Patterns in Transactional Databases- Mining sequence patterns in biological data.

Unit V

MINING DATA AND APPLICATION IN DATA MING: Mining Object, Spatial, Multimedia, text and web data: Multidimensional analysis and descriptive mining of complex data objects, spatial data mining, multimedia data mining, text mining, mining the world wide web. Applications and Trends in Data Mining: Data mining applications, Data Mining System products and research prototypes, Additional themes on data mining- Social impacts of data mining- trends in data mining

Text Book:

1. Jiawei Han, Micheline Kamber, “Data Mining – Concepts and Techniques”, Morgan Kaufmann Publishers, Second Edition, 2006. Indian reprint ISBN-13:978-81-312-0535-8.

Reference Books:

1. David Hand, Heikki Mannila, Padhraic Smyth, “Principles of Data Mining”, A Bradford Book, The MIT Press, Cambridge, Massachusetts London, England, 2001.ISBN: 0-262-08290-X.
2. Michael J A Berry, Gordon S Linoff, “Data Mining Techniques”, Wiley Publishing inc,Second Edition, 2004. ISBN: 81-265-0517-6.

12CA384 COMPUTING TECHNOLOGIES AND CHEMISTRY

Credits: 4:0:0

Course Objective:

- Deals about the introduction to MS-Office package,
- To learn about the fundamentals of Internet
- To discuss about programming fundamentals in C

Course Outcome:

- Gain knowledge about the basics of MS office package
- Gain ideas about the fundamentals of internet
- Able to do simple C programs

Unit I

INTRODUCTION: Getting started - About OS - Types of OS - Introduction to MS-Office Tools and Techniques: Simple exercises using MS-Word, MS-PowerPoint, MS-Excel & MS-Access.

Unit II

INTER ADDRESSING: Understanding the Internet - Overview of the Internet - Connect to the net - Internet addresses - Mail.

Unit III

FUNDAMENTALS OF C PROGRAMMING: Introduction to C Programming - Operators and Expressions – Data Input and Output – Preparing and running a complete C program.

Unit IV

CONTROL STRUCTURES: Control Statements: Branching – Looping – Nested Control Structures – The switch, break, continue, comma statements – The goto Statement – Functions: Defining a Function – Accessing a Function – Function Prototypes – Passing Arguments to a Function

Unit V

WEB SITE ANALYSIS: Web Site Analysis: Analysis and study of some important websites for applications of Chemistry.

Text Books:

1. Nelson, "Office 2007-The Complete Reference", Tata McGraw Hill Publishers, 2007.
2. Harley Hahn, "Teaches the Internet", Hayden Books; 2nd Revised Edition, 2000 ISBN: 978-0789720931.
3. Byron S. Gottfried, "Programming With C", Second Edition, Tata McGraw Hill, 2006, ISBN: 0-07-059369-8.

Reference Books:

1. Yashwant Kanetkar, "Let us C", Sixth Edition, BPB Publication 2005.

2. Herbert Schildt, “Turbo C: The Complete Reference”, Mc Graw-Hill,1998, ISBN: 9780078813467.

12CA385 PROGRAMMING IN JavaEE LAB

Credits: 0:0:2

Course Objective:

- To enable the students implementing the concepts of Servlets and JSP by developing online applications.
- To make students use the data access process (JDBC) and understand the EJB procedure by creating and accessing various online transactions like Bank Management System.

Course Outcome:

- Students are well-versed in implementing the basic J2EE concepts.
- Students can create any online transaction involved applications and online Query answering system.

List of Experiments:

I. Case Study for online Banking system.

1. Designing a Website Application for online Banking system using HTML.
2. Creating current /saving accounts for online transactions using HTML & SERVLETS.
3. Creating various transaction processes for current / saving accounts in online banking using HTML.
4. Designing a loan transaction processes using HTML.JSP, SERVLET & JDBC.
5. Designing an online Calculator using Session Beans.
6. Designing a mediclaim policy features for online banking customers using HTML, JSP & Entity Beans.
7. Designing a File transaction Process in a Bank using RMI.
8. Creating various online banking purchase schemes using Entity Beans.
9. Designing a Query answering process using RMI.
10. Designing a online payment schemes using Session Beans.

II. Case Study for online stationary management system.

1. Designing a Website Application for online stationary management system.
2. Creating a current/new customer accounts through online system using HTML & SERVLET.
3. Creating a stock process procedure using HTML, JSP & JDBC.
4. Designing an online purchase process using HTML, JSP, and SERVLET & JDBC.

5. Designing a online defect recovery process of an Item using HTML, JSP, JDBC.
6. Designing a Query answering Process using RMI.
7. Designing an online payment process using Entity Beans.
8. Designing a Calculator using Session Beans.
9. Creating a online chat Application using RMI.
10. Creating a automatic stock verification process of items using SERVLET & JDBC.

12CA386 C#.NET PROGRAMMING LAB

Credits: 0:0:2

Course Objective:

- To develop an application using object oriented concepts in C#

Course Outcome:

- Student will develop an application using object oriented concepts in C#.

List of Experiments:

1. Classes and Objects
2. Inheritance
3. Exception Handling
4. Delegates
5. Assemblies
6. Interfaces
7. Collections
8. Multithreading
9. Generics
10. Direct Data Access
11. Disconnected Data Access
12. Reports

12CA387 ASP.NET USING C# PROGRAMMING LAB

Credits: 0:0:2

Course Objective:

- To develop web pages using object oriented concepts using C#.
- To develop web pages using all the advanced GUI controls.

Course Outcome:

- Students will be able to create interactive web pages.

List of Experiments:

1. Design an interactive webpage with the basic controls
2. Perform Validations on the above
3. Create a master page to serve as a template for the Web site's pages.
4. Build the various Content Pages
5. Create a Global.asax file with Application variables cont, color1 and gotohp. Create a Session variable called cont1. Initialize cont as 0 and assign any color to color1. For the variable gotohp, give a hyperlink to any Website. Use the variables in a Web Form. Try these with the lock and unlock methods.
6. Write a program to display three images in a line. When any one of the images is clicked, it must be displayed below. On clicking the displayed image it must be cleared.
7. Demonstrate Query String & Cookies
8. Demonstrate Session
9. Database Connectivity
10. Usage of Rich Controls
11. Themes
12. Report Generation

12CA388 ASP.NET USING VB PROGRAMMING LAB

Credits: 0:0:2

Course Objective:

- To know how to create interactive web page
- To use the Controls in ASP.NET
- To Understand about the database connectivity using SQLServer

Course Outcome:

- Students are enabled to create a web site using ASP.NET
- Enable to use the GUI controls in ASP.net

List of Experiments:

1. Designing of Home page
2. Designing of Content Page
3. Validation
4. Multiview
5. Table Design and Normalization
6. Login & Registration – Cookies
7. Database - Direct Data Access
8. Ad rotator & User Control
9. Database- Paramaterized Command
10. Database- Disconnected Data Access
11. Master page
12. Reports

12CA389 JavaME PROGRAMMINGLAB

Credits: 0:0:2

Course Objective:

- To familiar with the basic components and programming issues of JavaME.
- To program mobile telephones, pagers, PDAs, and other small devices using Java

Course Outcome:

- Students will be familiar about basic components and programming of JavaME
- Familiar with programming mobile telephones, pagers, PDAs, and other small devices using Java Technology

List of Experiments:

1. Creating User Interface using Screen Classes
2. Creating User Interface using Canvas Class
3. Reading and Writing records using RMS
4. Sorting Records in RMS
5. Searching Records in RMS
6. Interaction of J2ME application with a Database
7. Creating Address Book using PIM API
8. Sending and Receiving SMS using Wireless Messaging API.
9. Generic Connection Framework using HTTP
10. Generic Connection Framework using FTP
11. Generic Connection Framework using Socket Connection
12. Remote Method Invocation using JavaME MIDlets

12CA390 PROFESSIONAL SKILLS

Credits: 0:0:2

Course Objective:

- To solve numerical aptitude problems
- To solve logical reasoning problems
- To solve verbal reasoning problems
- To develop soft skills

Course Outcome:

The learners will be able to

- solve numerical aptitude problems
- solve logical reasoning problems

- solve verbal reasoning problems
- expertise in soft skills

List of Experiments:

1. Quantitative Aptitude -1
2. Quantitative Aptitude -2
3. Quantitative Aptitude – 3
4. Data Interpretation
5. Logical Reasoning - 1
6. Logical Reasoning – 2
7. Verbal Reasoning
8. Non-verbal Reasoning
9. Analytical Reasoning
10. Comprehension
11. SWOT Analysis
12. Interview Preparation

12CA391 ADVANCED PC SOFTWARE AND INTERNET LAB

Credits: 0:0:2

Course Objective:

- Make the students to get exposed to the important features present in the components of a standard office automation suite.
- To learn a specific concept / domain apart from the technical features present in the package's components.
- To introduce a case based learning with provisions to interrelate the components of the package

Course Outcome:

- Students will be able to implement features of a standard office suite for office automation activities.

List of Experiments:

1. Prepare a document with necessary formatting using MS-Word.
2. Designing a pamphlet using MS-Word.
3. Mail Merge Using MS-Word.
4. Generate a pay bill for the employee using Ms-Excel
5. Prepare a presentation using MS-Power Point.
6. Prepares a presentation for Event Coordinator with hyperlink.
7. Create a spread sheet for the customer using MS-Excel.
8. Import Excel Spread sheet to MS-Access.
9. Database creation using MS-Access.
10. Web page creation with tables and Text Formatting using HTML.

11. Web Page creation with frames and hyperlink using HTML.
12. Web Page creation with forms using HTML.

12CA392 WIRELESS ADHOC AND SENSOR NETWORKS

Credit: 4:0:0

Course Objective:

- To gain depth knowledge about the ad hoc and sensor networking that paves the way to new technologies and applications for the future benefit of the research community and telecommunications industry.
- To explore different kinds of routing protocols in ad hoc networks
- To study about the network management models and design issues in wireless sensor networks

Course Outcome:

- Gain adequate knowledge about the ad hoc networking technologies.
- Ability to develop a new routing protocol in ad hoc networks
- Familiarize with network management design issues, performance and traffic management in the wireless sensor networks

Unit I

ROUTING IN AD HOC NETWORKS : A Hybrid Framework for Routing in Ad hoc Networks: The Communication Environment and the RWN Model-The Zone Routing Protocol-ZRP- Formal Description - Evaluation of ZRP-Performance Results. Link Reversal Routing: The Gafni-Bertsekas Algorithm-The lightweight Mobile Routing Algorithm-The Temporally Ordered Routing Algorithm- Comparison of LRR Algorithms.

Unit II

AD HOC WIRELESS NETWORKS: The Effects of Beacons on the Battery Life of Ad Hoc Mobile Computers: Ad Hoc Wireless Networks - Associativity Based on Routing-Effects of Beacons on Battery Life- Experimental Results and Observation- Beacons with Neighbouring Nodes at Low Bandwidth- Efficient Link- State Routing in Wireless Networks: Updating Routes in Wireless Networks- STAR Description-Performance Evaluation.

Unit III

WIRELESS SENSING AND TRANSMISSION TECHNOLOGY: Basic Wireless Sensor Technology: Introduction- Sensor Node Technology- Sensor Taxonomy- WN Operating Environment - WN Trends- Wireless Transmission Technology and Systems: Radio Technology Primer- Propagation and Propagation Impairments- Available Wireless Technologies- Campus Applications- MAN/WAN Applications.

Unit IV

ROUTING PROTOCOLS FOR WIRELESS SENSOR NETWORKS: Data Dissemination and Gathering- Routing Challenges and Design issues in Wireless Sensor Networks- Routing Strategies in Wireless Sensor Networks- Transport Control Protocol for Wireless Sensor Networks: Traditional Transport Control Protocols- Transport Protocol Design Issues- Examples of Existing Transport Control Protocols- Performance of Transport Control Protocols- Middleware for Wireless Sensor Networks: WSN Middleware Principles- Middleware Architecture- Existing Middleware.

Unit V

NETWORK MANAGEMENT FOR WIRELESS SENSOR NETWORKS:Traditional Network Management Models - Network Management Design Issues - Example of Management Architecture: MANNA- Naming- Localization Operating System for Wireless Sensor Networks- Design Issues- Examples of Operating System Performance and Traffic Management – WSN Design issues- Performance Modelling of WSNs- Case Study Simple Computation of the System Life Span.

Text Books:

3. Charles E. Perkins, “Ad Hoc Networking”, Addison- Wesley, 2008, ISBN: 978-81-317-2096.
4. Kazem Sohraby, Daniel Minoli and Taieb Znati, “Wireless Sensor Networks: Technology, Protocols, And Applications”, John Wiley & Sons, 2007, 978-0471743002.

Reference Books:

5. C. K. Toh, “Ad Hoc Mobile Wireless Networks”, Pearson Education, Inc. , 2007,ISBN: 81-317-1510-8.
6. C. Siva Ram Murthy and B. S. Manoj,”Ad Hoc Wireless Networks Architectures and Protocols”, Pearson Education, 2008. ISBN- 978-81-317-0688.
7. Mohammad Ilyas and Imad MahGoub (Editors), “HandBook of Sensor Network: Compact Wireless and Wire Sensing System”, CRC Press, 2005, ISBN 0- 8493-1968-4.
8. Holger Karl and Andreas Willig, “Protocols and Architectures for Wireless Sensor Networks”, John Wiley & Sons, 2007, 978-04717178161.

12CA201 WEB DEVELOPMENT

Credits: 3:0:0

Course Objective:

- To discover the basic components of how Web development like HTML and Cascading Style sheets.
- To design web pages that are consistent with good style and interactive multimedia elements in web pages.
- To discover elements of JavaScript to enhance web page interactivity
- To discover the elements of server side programming using PHP

Course Outcome:

After the completion of the course, students will be able to

- successfully code a basic web page
- include tables, frames, and interactive multimedia elements in web pages
- include elements of JavaScript to enhance web page interactivity
- use PHP to build dynamic web pages

Unit I

HTML BASIC: HTML,XML and World Wide Web. HTML: Basic HTML, Document Body,Texts, Hyper Links,Adding Formatting, Lists,Tables,Using Color and images,Images

Unit II

HTML ADVANCED CONCEPTS AND CSS: Mutimedia objects, Frames, Forms, The HTML document head,XHTML. Cascading Stylesheets: Using styles, Defining your own style,Properties and values in styles,Stylesheets-example, Formatting block of information, Layers

Unit III

JAVA SCRIPT: Dynamic HTML, Java Script-Basics, Variables, String Manipulation, Mathematical Functions, Statements, Operators, Arrays, Functions. Objects in Java Script: Data and objects in java script, Regular expressions, Exception Handling, Built-in objects

Unit IV

DYNAMIC HTML WITH JAVA SCRIPT: Dynamic HTML with Java Script: Data Validation, Opening a new window, Message and confirmations, The status bar, Writing to a different frame,Rollover Buttons, Moving Images, Multiple Pages in single Download, Text-only Menu System, Floating Logos

Unit V

PHP AND MYSQL: Introduction to PHP: PHP, Using PHP, Variable, Program Control, Built in Functions. Using PHP with SQL Databases (MySQL): Working with MySQL, Connecting to a Database, Creating a Database in MySQL, Selecting a Database, Creating a Table in a Database, Inserting Records in a Table, Retrieving Information from a Table, Updating Information in a Table.

Text Books:

3. Chris Bates, “Web Programming:Building Internet Applications”, Wiley Dreamtech India (p)Ltd., Second Edition,2002.
4. Ashish Wilfred, Meeta Gupta, and Kartik Bhatnagar with NIT, “PHP Professional Projects”, Prentice- Hall of India,2002.

Reference Books:

3. Jason Gilmore, “Beginning PHP and MySQL 5, From Novice to Professional”, Apress, First Indian Reprint, 2007. ISBN 978-81-8128-673-4
4. Thomas A powell, “Web Design: The complete Reference”, Second Edition, Tata Mc Graw Hill 2003 ISBN:9780070582521

12CA202 BASICS OF COMPUTER & PROGRAMMING

Credits: 3:1:0

Course Objective:

- To know the basic concepts and technologies in computers.
- To know the fundamentals of Programming concepts in C.

Course Outcome:

- To gain knowledge on the basic concepts of computers.
- To make the non computer science people understand the computer technologies.

Unit I

BASICS OF COMPUTERS: Introduction – characteristics of computers – the evolution of computers–the computer generation – classification of computers – basic computer organization – number systems

Unit II

COMPUTING ARITHMETICS: Computer codes – computer arithmetic – binary arithmetic – addition –subtraction - multiplication – division – computer software – types of software – logical system architecture – software development steps

Unit III

PLANNING THE COMPUTER PROGRAM: Planning the computer program – purpose – algorithm – flowcharts – pseudocode – application software packages – word processing – spreadsheet – graphics – personal assistance.

Unit IV

PROGRAMMING LANGUAGE ELEMENTS: Overview of C – constants, variables and data types – operators and expression – managing input and output operators – decision making and branching – decision making and looping.

Unit V

FUNCTION AND STRUCTURES IN PROGRAMMING: User-defined functions -Arrays – handling of character strings – structures and unions - files

Text Books:

1. Pradeep K.Sinha and Priti Sinha, “Computer fundamentals: concepts, systems and applications”,Third edition, Bpb publications, 2003.
2. Yashwant Kanetkar, “Let us C”, Fifth edition BPB Publications, 2004

Reference Books:

1. Allen b.tucker et.al, “Fundamentals of computing”, Third edition, New Delhi, 1998.
2. V.rajaraman, “Fundamentals of Computers”, Third edition, Prentice – Hall of India, 2002.
3. Herbert Schidt. “C made easy”, Second edition McGraw Hill.

12CA203 FUNDAMENTALS OF JAVA

Credits: 3:1:0

Course Objective:

- Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.
- Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, exception handling etc.
- Understand java features for Developing graphical user interfaces

Course Outcome:

At the end of the course the students will

- implement Object Oriented Programming Concepts
- use Java features like packages ,interfaces, exception handling, Multithreading etc. in a Java program
- implement graphical user interface in Java
- use Input/Output Streams

Unit I

INTRODUCTION TO OBJECT ORIENTED PROGRAMMING: Introduction to Java- Variable Declarations and arrays: Data type, java tokens, Variable declaration, Type casting and Conversion- Operators in Java: Introduction, operator precedence-Control Statements

Unit II

OBJECT ORIENTED FEATURES: Classes: Introduction, Instance variables, Class Variables, Instance methods, Constructors, Class Methods, Declaring Objects, Garbage Collection. Classes and Methods : Method overloading, Constructor overloading, the this reference, Using objects in methods , Recursion, Access Modifiers, Inner classes, Command Line arguments. Inheritance: Basics, Super class variable and subclass Object, The super reference, Constructor Chaining, Method Overriding, The final keyword.

Unit III

INTERFACES AND MULTITHREAD PROGRAMMING: Abstract classes and Interfaces: The abstract classes, abstract Methods, Defining interface, Implementing interfaces, Extending interfaces, Interface reference. Exception Handling: Fundamentals, Hierarchy of Exception classes, Types of Exception, Exception classes, Uncaught exceptions, Handling Exceptions. Multithreaded Programming: Java thread model, Concept of thread, The Runnable interface, The thread Class, Thread creation, life cycle, scheduling, Synchronization and deadlock, Interthread Communication, Joining threads, Suspending, Resuming and Stopping threads

Unit IV

PACKAGE AND FILE HANDLING: Packages and Access modifiers: Introduction, Package naming conventions, package declaration, The CLASSPATH variable, import statement, Illustration Packages, The java packages, Access protection. Handling Strings: Creation, Operations, Methods of String class, String Buffer class, Methods of string buffer class, Input Output Classes: Input/output operations, Hierarchy of classes, File class, InputStream and

OutputStream Class, FilterInputStream and FilterOutputStream Class, Reader and Writer Class, RandomAccessFile Class, StreamTokenizer

Unit V

APPLET AND AWT COMPONENTS: Applets: Basics, Life Cycle, Running Applets, Methods of applet classes, Graphic class, Color Class, Font Class, Font Metric Class, Limitations of applets. AWT: AWT classes, Hierarchy of classes in java.awt package, Control Fundamentals, Component class, Basic Component classes, Container class, Various container classes, Frame window in applet. Layout Management and event handling, Swing Basic Concepts

Text Book:

1. Instructional Software Research and Development Group, "Introduction to Object Oriented Programming Through Java", Tata McGraw Hill Education Pvt. Ltd,2007, ISBN: 0070616841

Reference Books:

1. Deitel H.M, Deital P.J, "Java How to program", Sixth Edition, Prentice Hall India,2005. ISBN: 0131483986
2. C.Thomas Wu, "An Introduction To Object Oriented Programming With Java", Fifth Edition,Mc Graw Hill,2009, ISBN: 0073523305
3. Herbert Schildt, "Java - The Complete Reference, J2SE Fifth Edition", Tata McGrawHill, 2005,ISBN-0-07-059878-9.

12CA204 FUNDAMENTALS OF JAVA LAB

Credits: 0:0:2

Course Objective:

- To solve problems using object-oriented paradigm
- To develop applications and applet programming.

Course Outcome:

- To implement Java classes from specifications.
- To effectively create and use objects from predefined class libraries.
- To use interfaces, inheritance, and polymorphism as programming techniques.
- To use exceptions and multithreading.
- To use applets and GUI based controls.

List of Experiments:

1. To determine the sum of the following harmonic series for a given value of 'n' $1 + \frac{1}{2} + \frac{1}{3} + \dots + \frac{1}{n}$
2. Classes and Objects

3. Exception called “Out of Bounds” to be thrown if mark greater than 100.
4. To shuffle the list elements using all the possible permutations
5. Package called “Arithmetic” for methods to deal with all arithmetic operations.
6. Program to design a simple calculator.
7. Read a text and count all the occurrences of a word and display their positions
8. Event Handling
9. Method Overriding
10. Applet program to insert a text in a specified position
11. Threading in Java
12. Graphical objects in awt

Karunya University

LIST OF SUBJECT

Code	Subject Name	Credits
12CA393	Basics of Bioinformatics	4:0:0

12CA393 BASICS OF BIOINFORMATICS

Credits: 4:0:0

Objective:

- This course provides the necessary basic information about bioinformatics.
- It consists of the methods and applications for Genomics, Proteomics and Drug Discovery.

Outcome:

- Know the basics of bioinformatics methods and applications.
- Familiar with the Genomics, Proteomics and Drug Discovery.
- Serves as input to do the research in bioinformatics.

Unit I

INTRODUCTION: Bioinformatics: An Introduction- Information Search and Data Retrieval-Genome Analysis and Gene Mapping.

Unit II

SEQUENCES: Alignment of Pairs of Sequences- Alignment of Multiple Sequences and Phylogenetic Analysis- Tools for Similarity Search and Sequence Alignment- Profiles and Hidden Markov Models.

Unit III

GENE: Gene Identification and Prediction- Gene Expression and Microarrays- Protein Classification and Structure Visualization.

Unit IV

PROTEOMICS: Protein Structure Prediction- Proteomics- Computational Methods for Pathways and System Biology.

Unit V

DRUG DISCOVERY: Introduction to Drug Discovery, Drug Discover-Technology and Strategies-aided Drug Design.

Text Book

1. S.C. Rastogi., N. Mendiratta and P. Rastogi, "Bioinformatics Methods and Applications, Genomics, Proteomics and Drug Discovery", Prentice Hall of India Pvt Ltd, First edition, 2004.

Reference Books

1. Dan Gusfield, "Algorithms on Strings Trees and Sequences", Cambridge University Press, Cambridge, First Edition, 2005.
2. David Mount W., "Bioinformatics Sequence and Genome Analysis", CBS Publishers, New Delhi, Second Edition, 2005.