

**SYLLABUS**

**18CSA101    COMPUTATIONAL THINKING AND PROBLEM SOLVING    3 0 0 3**

**Unit 1**

Basics

Introduction, Information and data, Number Systems-Binary, Hexadecimal, Octal, Conversion, BCD, Data encoding. Boolean Algebra, Simplification of Boolean expression.

**Unit 2**

Problem Solving

Problem definition, Problem decomposition, Abstraction, Greedy Method, Divide and Conquer.

**Unit-3**

Algorithmic Thinking

Algorithm and Flowcharting, Name binding, Selection, Repetition.

**Unit 4**

Data organization: List and Arrays, Modularization, Problem Solving: Factoring and Recursion Techniques,

**Unit-5**

Searching and Sorting Techniques, Text processing and Pattern matching.

**TEXT BOOKS:**

1. David Riley and Kenny Hunt , Computational thinking for modern solver, Chapman & Hall/CRC, 2014
2. R.G. Dromey , “How to solve it by Computer”, PHI, 2008

**18CSA103**

**COMPUTER ESSENTIALS**

**3 0 2 4**

**Unit-1**

Introduction to computers: Characteristics of computers, Classification of Digital Computer Systems: Microcomputers, Minicomputers, Mainframes, Supercomputers. Anatomy of Computer: Introduction, Functions & Components of a Computer, Central Processing Unit, Microprocessor, Storage units, Input and output Devices. How CPU and memory works. Program execution with illustrative examples. Introduction to microcontrollers.

Lab Component- PC Assembly,

**Unit-2**

Operating System Fundamentals

Operating Systems: Introduction, Functions of an operating System, Classification of Operating Systems, System programs, Application programs, Utilities, The Unix Operating System, Basic Unix commands, Microkernel Based Operating System, Booting,

Lab Component- OS installation, Basic unix commands

### **Unit-3**

Introduction to Database Management Systems

Database, DBMS, Why Database -File system vs DBMS, Database applications, Database users, Introduction to SQL, Data types, Classification of SQL-DDL with constraints, DML, DCL, TCL

Lab Component

Create: Table and column level constraints- Primary key, Foreign key, Null/ Not null, Unique, Default. Check, Alter, Drop, Insert, Update, Delete, Truncate, Select: using WHERE, AND, OR, IN , NOT IN

### **Unit-4**

Internet Basics

Introduction, Features of Internet, Internet application, Services of Internet, Logical and physical addresses, Internet Service Providers, Domain Name System.

Lab Component: Web Browsing, Emails, Searching

### **Unit-5**

Web Basics

Introduction to web,web browsers, http/https, URL, HTML5,CSS

Lab Component -HTML5 & CSS

### **TextBook**

J. Glenn Brookshear,"Computer Science: An Overview", Addison-Wesley, Twelfth Edition, 2014

**18CSA111**

**COMPUTER ORGANIZATION**

**3 1 0 4**

#### **Unit1**

SOP and POS Expressions, Karnaugh Map Simplification - Universal gates, Sequential circuits and combinational circuits, Flip Flops, Registers, Counters, Decoder, Encoder, Multiplexer, De-multiplexer, Arithmetic circuits,

#### **Unit 2**

Computer Organization and Design - Instruction Codes- Computer Registers- Computer Instructions - Instruction Cycle - Memory Reference Instructions - Input Output configuration

#### **Unit 3**

Central Processing Unit: Introduction- General Register Organization - Stack Organization - Instruction Formats - Addressing Modes - Data Transfer and Manipulation - Conditional Branch Instructions - Program Interrupts

#### **Unit 4**

Pipeline and Vector Processing

Parallel Processing - Pipelining - Arithmetic Pipeline - Instruction Pipeline - Vector Processing - Array Processors

#### **Unit 5**

Memory Organization

Memory Hierarchy - Types of Memory - Main Memory - Auxiliary Memory - Associative Memory - Cache Memory

**TEXTBOOKS:**

1. M Morris Mano - Computer System Architecture - PHI - Third Edition
2. Gideon Langholz, Abraha& Joe L Mott - Digital Logic Design - World Scientific Publishing Co Ltd

**REFERENCES:**

1. P Pal Chaudhuri - Computer Organization and Design - PHI - Second Edition
2. Thomas C Bartee - Digital Computer Fundamentals - Tata Mc Graw Hill - Sixth Edition
3. Carl V Hamcher - Computer Organization 5<sup>th</sup> Edition – Mc Graw Hill

**18CSA113**

**PROGRAMMING IN C**

**3 1 0 4**

**Unit1**

Introduction to C language - structure of 'C' program, Programming elements(tokens) – Classes of data types –Declaration of variables, assigning values to variables, defining symbolic constants, escape sequences (backslash character constants), Operators–operator precedence and associativity, Expressions – Evaluation of expressions, type conversions(type casting).

**Unit 2**

Input and Output operations – formatted and unformatted input and output–Conversion specifiers- Conditional and Control structures

**Unit 3**

Arrays – single dimensional arrays - declaration –memory representation– initialization and access. 2D arrays and multidimensional arrays.

Strings – defining strings, initializing, accessing, character handling functions, arithmetic operations on characters, character by character input and output, string handling functions, array of strings and its features.

Pointers –Introduction, declaring and initializing pointer variables, pointer expressions, pointers and arrays, pointers and strings, array of pointers.

**Unit 4**

Functions – definition-declaration-prototypes and function call- actual and formal arguments- types of functions- call by value-call by reference-nesting of functions-recursive functions- pointers to functions-storage class specifiers.

Enumerated data types- Preprocessor directives – Macros - File inclusion, Command line arguments.

**Unit 5**

Structures – definition-declaration-initialization-accessing structures- array of structures, array within structures, structures within structures, self-referential structures, pointers to structures, uses of structures.

Union- definition- union of structures.

Files – Reading and writing files - file handling functions – file opening modes – file operations

**TEXTBOOKS:**

1. “Let us C”, YashavantKanetkar, 13<sup>th</sup> Edition, BPB Publications.
2. “Programming in ANSI C”, E. Balagurusamy, Sixth Edition, Tata McGraw-Hill Publishing Company Limited.

**REFERENCES:**

1. “Test your C skills”, YashavantKanetkar,
2. “Exploring C”, YashavantKanetkar,

**UNIT 1**

Introduction - Data Independence - The Three Levels Of Architecture - The External Level - Conceptual Level - Internal Level - Client/Server Architecture- System Structure , Instance and schema, Data Models, Types of DBMS

**UNIT 2**

Keys - CODD's Rules, Design Issues -ER – Model –Attribute types- Weak Entity Sets - Extended ER Features –ER to Relational Mapping, Structure Of Relational Databases

**UNIT 3**

Normalization –Anomalies- Functional Dependency: Armstrong's axioms- closure of a relation and closure of attribute– Lossless decomposition-1NF, 2NF, 3NF, Boyce - Codd Normal Form

**UNIT 4**

The Relational Algebra -- Query Processing and Optimization: Evaluation of Relational algebra expressions-Query Equivalence-Transaction Processing: ACID properties, states of a transaction-Introduction to concurrency control-Deadlock-Recovery.

**UNIT 5**

Built in SQL functions- Set operations, Sub Queries-Joins-DCL – TCL- Views – Sequences – Index – Locks

PL/SQL Basics – Exceptions – Cursors - Stored Functions – Triggers

**TEXTBOOKS:**

1. Silberschatz. Korth. Sudarshan: Database System Concepts - 6thEdition McGraw-Hill International Edition
2. Ivan Bayross: Sql- PL/SQL The Programming Language Of Oracle- 4rd Edition- Bpb Publications

**REFERENCE:**

1. C.J. Date: An Introduction To Database Systems - Eighth Edition - Pearson Education Asia
2. Kevin Loney - George Koch: Oracle 9i The Complete Reference McGraw-Hill International Edition
3. "Fundamentals of Database Systems" by Elmasri and Navathe

**18CSA182 COMPUTATIONAL THINKING AND PROBLEM SOLVING LAB 0 0 2 1**

Unit-1 Excel

Unit-2 Excel

Unit3-Flowgarithm



Deadlocks: System Model-Deadlock Characterization-Methods for handling Deadlocks-Deadlock Prevention-Deadlock Avoidance-Deadlock detection-Recovery from deadlock.

#### **UNIT 4**

Memory Management: Background-Swapping-Contiguous Memory allocation-Paging-Segmentation-Segmentation with Paging. Virtual Memory: Background-Demand paging-Process creation-Page replacement-Allocation of Frames-Thrashing.

#### **UNIT 5**

I/O Systems: Overview, I/O Hardware

Mass storage structure- Disk structure, disk scheduling, disk management.

Case Study:- Unix System

#### **TEXT BOOK:**

Abraham SilberSchartz- peter B Galvin-Greg Gagne, Operating system Concepts. Eighth Edition, Addison-Wesley(2003)

#### **REFERENCES:**

1. S.Godbole - Operating Systems - Tata McGraw Hill Publications
2. H.M Deitel - Operating Systems - Second Edition - Pearson Edition Asia

### **18CSA206                    OBJECT ORIENTED PROGRAMMING USING C++    3 1 0 4**

#### **UNIT 1**

Introduction to C++, Object Oriented Concepts, Basics of C++ environment, Classes & Object, Data members, Access specifiers, Defining member functions, inline member functions, nesting of member functions, Array within a class, Static data members, Constant members , Arrays of objects, Objects as arguments, Returning objects, Constructors, Default Constructors, Parameterized constructors, Copy constructors, Destructors, friend functions, friend classes.

#### **UNIT 2**

Compile time polymorphism, function overloading, Overloading operators, Overloading unary, Overloading binary, Overloading using friends, Overloading constructor Manipulation of strings using operators, overloading constructors, Inheritance, Base classes and derived classes, Protected members, Types, constructors in base derived classes,

#### **UNIT 3**

Run time Polymorphism, function overriding, virtual base class, Virtual functions, pure virtual function, Abstract classes, class containership. Exception handling- basics of exception handling, exception handling mechanism, throw , catch, rethrow exceptions.

#### **UNIT 4**

Fundamentals of pointers, New, Delete operators, pointer declarations, operations on pointers, passing pointers to function, passing an entire array to a function, pointers and two-dimensional arrays, array of pointers, passing functions to other functions, pointers to structures, this pointer.

#### **UNIT 5**

class templates, class templates with multiple parameters, function templates, function templates with multiple parameters, Data files -C++ stream classes, unformatted and

formatted I/O operations, Opening and closing of files, File modes, File pointers and manipulation, Sequential input and output operations , Updating a file, Error handling during file operations.

#### **TEXT / REFERENCES:**

1. E. Balagurusamy “Object-Oriented Programming With C++”, Fifth Edition, Tata Mcgraw-Hill Publishing Company Ltd
2. H.M. Deitel and P.E. Deital,”C++ How to Program”, Eighth Edition Prentice Hall of India,1998.

### **18CSA207 PRINCIPLES OF MANAGEMENT AND ACCOUNTING 3 0 0 3**

**OBJECTIVES:** *The objective of this course to enable the students to have a basic knowledge of principles of management and to provide theoretical and practical aspects of various systems of accounting.*

#### **Unit 1**

Management: meaning and definition, importance of management, administration and management, functional management, functions of management, levels of management

#### **Unit 2**

Financial Accounting: Meaning and important terms, accounting concepts, double entry book keeping, types of accounts, journal, ledger, trial balance.

#### **Unit 3**

Final Accounts: Preparation of Trading and Profit and Loss Accounts and Balance Sheet, adjustments relating to outstanding expenses, prepaid expenses, accrued income unearned income, depreciation and bad and doubtful debts.

#### **Unit 4**

Financial Statement Analysis, Trend Analysis

#### **Unit 5**

Cost Accounting: Meaning and Definition, difference between cost accounting and financial accounting, elements of cost, Cost sheet, Expenses excluded from cost.

#### **Reference Books:**

1. DinkarPagare – Principles of Management, Sultan Chand and Sons
2. Vineeth, Shabu – Principles of Management and Accounting, Kalyani Publishers
3. S.P. Jain, K.L. Narang – Financial Accounting, Kalyani Publishers
4. S.P. Jain, K.L. Narang – Cost Accounting, Kalyani Publishers

### **18MAT208 STATISTICAL AND NUMERICAL METHODS 3 1 0 4**

#### **Unit 1**

Statistics-Introduction -Measures of average-AM-Median-Mode, Measures of dispersion and its coefficients – Range – QD – SD-MD

#### **Unit 2**

Correlation- Karl Pearson’s and Spearman’s rank correlation, Regression- regression equations, regression coefficients

### **Unit 3**

Permutations – combinations – Probability-addition theorem, multiplication theorem, independent events, conditional probability, Baye's theorem, Probability distribution- Binomial, Poisson, Normal.

### **Unit 4**

Interpolation- Newton's forward & backward method- Lagrange's Method, Curve fitting-fitting a straight line

### **Unit 5**

Solutions of Numerical, Algebraic and transcendental methods- bisection method, Newton Raphson method, Simultaneous linear equations -Gauss elimination

### ***TEXT BOOKS:***

P.R.Vittal-Business Mathematics and Statistics, Margham Publications, Chennai,

### ***REFERENCE:***

1. H.S.Hall and S.R.Knight: Higher Algebra –AITBS Publishers India.
2. M.K.Venkataraman: Numerical methods in Science and Engineering-National Publishing Company, Chennai

**18CSA209**

**DATA STRUCTURES AND ALGORITHMS**

**3 1 0 4**

**OBJECTIVES:** This course is intended to introduce abstract concepts and shows how those concepts are useful in problem solving, and then shows how the abstractions can be made concrete by using a programming language. Equal emphasis is placed on both the abstract and the concrete versions of a concept. The only prerequisite for students is an understanding in programming.

#### **Unit 1. Algorithm Analysis**

Basic mathematical review, RAM model of computation, Pseudocode conventions, Worst case, Average case and Best case analysis, Asymptotic Analysis, Back Substitution Method, masters method, Euclid's algorithm, Exponentiation.

#### **Unit 2: Searching and Sorting**

Linear Search, Binary Search – Analysis, Bubble Sort, Insertion Sort, Merge sort, Quick Sort

#### **Unit 3. Linear Data Structures**

Abstract Data Type, List ADT: Singly linked lists, Doubly linked lists, Circular Linked Lists, Stack ADT implementation and applications, Queue ADT: Implementation and Application. Circular Queue, Priority Queue

#### **Unit 4. Non-Linear Data Structures.**



Basic concepts of trees, Implementation of trees, Traversal, Binary tree, Expression tree, Binary search tree, AVL tree, Heap

### Unit 5. Graphs

Adjacency matrix, Adjacency list, bfs, dfs, MST Prims and Kruskals, Dijkstras algorithm

**Text Book:** Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Second Edition, Pearson Education

**References:** 1. Samanta, Debasis. Classic data structures. PHI Learning Pvt. Ltd., 2004.  
2. Cormen, Thomas H. Introduction to algorithms. MIT press, 2009.

**18CSA211**

**SOFTWARE ENGINEERING**

**3 0 2 4**

**Objectives:** Software Engineering presents a broad perspective on software systems engineering, concentrating on widely used techniques for developing large-scale software systems. This course covers a wide spectrum of software processes from initial requirements elicitation through design and development to system evolution.

#### Unit 1

Introduction – Software - Software Crisis - Software Myths – Process and Product - Software characteristics- SDLC Introduction

#### Unit 2

Software requirements specification – Approaches – Paradigms – Build and Fix - Waterfall – Prototyping – Spiral – Concurrent – RAD – Incremental – Agile Introduction.

#### Unit 3

Analysis Modelling - Elements of Analysis Model - Data Modelling - ERD – DFD - Data Dictionary. Introduction to Design concepts - Design Architecture, Design characteristics, Description, Principles. Object oriented diagrams - Class diagrams - Use Case Diagrams – State-transition diagrams – Object diagrams – Interaction diagrams – UML Modelling .

#### Unit 4

Software Testing Fundamentals - Objectives of Testing - Testing Principles – Testability - Testing Process and Methods – Introduction to Testing Strategies.

#### Unit 5

Software Maintenance - Reverse Engineering and Reengineering

#### **TEXTBOOK:**

Roger S. Pressman, “Software Engineering”, Tata McGraw-Hill Publishing Company Pvt. Ltd, Sixth Edition.

#### **REFERENCE:**

Shooman, “Software Engineering”, Tata McGraw-Hill Publishing Company, Pvt. Ltd, 1987

**18CSA214**

**COMPUTER NETWORKS**

**3 1 0 4**

**Objectives:** This course presents an in-depth discussion of the most important networking protocols comprising the TCP/IP protocol suite. Students will be able to understand state of the art in network protocols, architectures, and applications.

#### Unit 1

Evolution of Computer Networking-Types of Network- networks topologies-Protocols & standards-Network Devices-The OSI reference model- TCP/IP Reference Model. Physical Layer: transmission media- Analog Transmission- Digital transmission

#### Unit 2

Data Link Layer Design Issues-Services provided to the Network Layer-Framing-Error Control-Flow Control- Error Detection and Correction- Elementary Data Link Protocols-Sliding Window Protocols- Multiple Access Protocols-An overview of IEEE Standard for LANs, MAC Address.

### **Unit 3**

Introduction to Network Layer – Services - Circuit Switching Vs Packet Switching-Packet Switched Networks-Types of Routing-routing algorithms- congestion control algorithms-Network Protocols-IP- IPV4, IPV6, Subnets, Gateways- Congestion Avoidance in Network Layer.

### **Unit 4**

The Transport Services – Services provided to the upper layers –Elements of transport Protocols –Internet Transport Protocols- Congestion Controls in Transport Layer

### **Unit 5**

Principles of Network Applications-Web and HTTP-Electronic mail-DNS

### **TEXTBOOK**

Computer Networks (Fifth Edition) – Andrew S. Tanenbaum (Prentice Hall of India)

### **REFERENCES:**

1. Computer Networking A Top-Down Approach(Fifth Edition)-James F. Kurose-Keith W. Ross (Pearson)
2. Computer Networks - Protocols, Standards and Interfaces (Second Edition) – UylessBlack(Prentice Hall of India Pvt. Ltd.)
3. Data communication and Networking(Fourth Edition)- Behrouz A Forouzan(Tata Mcgraw Hill)

**18CSA215**

**JAVA PROGRAMMING**

**3 1 0 4**

***Objectives:** The main objective of this course is to understand the basic concepts and techniques which form the object oriented programming paradigm using Java Language.*

### **Unit 1**

Introduction and Features of Java - Byte Code, Program Translation, JVM.

### **Unit 2**

Program Structure, Data types, Java Statements, Type casting in Java programs - Types of Operators.

### **Unit 3**

Decision Making statements, Looping statements-Arrays, Strings, Vectors, Wrapper classes - Class, methods, Inheritance, Visibility control, Final Classes, methods and Variables.

### **Unit 4**

Interfaces - Interfaces in Java Library - Packages - System Packages, User defined packages – Multithreading - Threads, Runnable Interface, Thread Priorities - Exception Handling - try, catch, throw, throws, finally.

### **Unit 5**

File handling and I/O in java - Stream Classes, Random access Files. Event handling - GUI Programming - AWT, Windows Fundamentals - Applets - Life cycle of an applet.

### **TEXTBOOK:**

*E Balagurusamy, Programming with Java – A Primer, Fourth Edition, Tata McGraw Hill Education Private Limited.*

### **REFERENCE:**

*Java 2 - The Complete Reference – McGraw Hill publication.*

**Unit -1**

HTML5 and CSS3

HTML5- Basic Tags, Tables,Forms.HTML5 Tags,HTML Graphics, HTML media, HTML Graphics,HTML APIs.

CSS - Background, Borders,margin, Box model. Styling text, fonts,list,links,tables. CSS overflow,float,inline blocks, pseudoclasses,pseudoelements.CSS border images,rounded corners

**Unit-2**

Java Script

Client side scripting using java script, Introduction to java script, internal and external Java script files, variables, control statements, loops, Arrays , string handling , How to write functions in JavaScript, inputting and outputting from form elements to JavaScript. DOM concept, creating html elements using java script. Drawing 2D shapes, handling events. Introduction to AJAX

**Unit-3**

Building Single page applications with Angular JS

Single page application – introduction , two way data binding, MVC in angular JS, controllers, getting user inputs , loops , Client side routing – accessing URL data , various ways to provide data in angular JS.

**Unit -4**

Server Side Programming

Server side scripting, Difference between client side and server side scripting languages. Introduction to PHP, variables, control statements, loops, Arrays, string handling, PHP forms, Global variables in PHP, Regular expression and pattern matching, Database programming: inputting and outputting data from MySQL using PHP, insertion , deletion and updating data.

State management in web applications, cookies, Application and session state.

**Unit-5**

Introduction to Xml, usage of XML, XML tags, elements and attributes, attribute type, XML validation: DTD and XSD, XML DOM

Case study:-Application Development using Laravel framework

**Textbook/Reference:**

The Complete Reference, HTML and CSS by Thomas A Powell latest edition

XML Bible by Horold, Ellotte Rusty

Web Reference:- W3Schools.com

**Topic 1:        *Sorting – Searching***

1. Write a program to implement Bubble Sort.
2. Write a program to implement selection sort.
3. Write a program to implement Quick Sort.
4. Write a program to implement Insertion Sort.
5. Write a program to implement Merge Sort.
6. Write a program to implement Binary Search.

**Topic 2:        *Arrays –Stacks-Recursion***

7. Write and test a function that transposes a square matrix.
8. Write and test a recursive function that prints all the permutations of the first n characters of a string.
9. Write and test a recursive function that returns the power  $x^n$
10. Write a program to implement a stack of strings (illustrate the operations push (), pop(), size(), empty() and top()).
11. Write a program to show the linked implementation of the **Stack** class.
12. Write a program to covert infix to postfix.
13. Write a program to implement Towers of Hanoi using Stack.

***Queues-Linked-Lists***

14. Write a program to implement a linear list and perform the operation such as insert(), search() and delete().
15. Write a program to implement a queue by adding the functions such as
  - (i) Determine the size
  - (ii) input queue
  - (iii) output a queue
  - (iv) split a queue into two queues
16. Write a program to search a circular linked list with a header node.

**Topic 3:        *Binary Trees - Binary Tree Traversal***

17. Write a program to implement Binary Search Tree.
18. Priority queue implementation.
19. Write a program to create a binary tree and find the height of a binary tree.
20. Write a program to perform the binary tree traversals.
21. Write a program to perform a deletion from a Binary Tree (using a delete () function).

**Topic 4:        *Graphs***

20. Matrix representation of graphs
21. DFS traversal
22. BFS traversal

**18CSA284        OBJECT ORIENTED PROGRAMMING USING C++ LAB 0 0 2 1**

Class and objects- creating class, objects, private, public data members, member functions, object as array, arguments, returning objects

Constructors & destructors- Default Constructors, Parameterized constructors, Copy constructors, friend functions, friend classes.

Polymorphism- function overloading, operator overloading, overloading unary and binary

Pointers -operations on pointers, passing pointers to function, passing an entire array to a function, pointers and two-dimensional arrays, array of pointers, pointers to objects.

Inheritance, Single, multiple, hierarchical, multi-level, hybrid

Function overriding, virtual base class, Creation of pure virtual function

Using new and delete operator, pointer arithmetic

Data files - unformatted and formatted I/O operations, Opening and closing of files, File modes, File pointers and manipulation, Sequential input and output operations, Updating a file, Error handling

Templates - class templates, class templates with multiple parameters, function templates, function templates with multiple parameters

Exception handling- basics of exception handling, throw, catch, rethrow exceptions.

**18CSA285**

**JAVA PROGRAMMING LAB**

**0 0 2 1**

#### Unit 1 Java Fundamentals

1. Write a program to print the following triangle of numbers

```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

2. Write a simple java application, to print the message , “Welcome to java”
3. Write a program to display the month of a year. Months of the year should be held in an array.
4. Write a program to assign two integer values to X and Y. Using the ‘if’ statement the output of the program should display a message whether X is greater than Y.
5. Write a program to find the area of rectangle.
6. Write a program to list the factorial of the numbers 1 to 10. To calculate the factorial value, use while loop. (Hint Fact of 4 = 4\*3\*2\*1)

#### Unit 2 OOPs in Java

7. Write a java program to add two integers and two float numbers. When no arguments are supplied, give a default value to calculate the sum. Use function overloading.
8. Write a program to perform mathematical operations. Create a class called AddSub with methods to add and subtract. Create another class called MulDiv that extends from AddSub class to use the member data of the super class. MulDiv should have methods to multiply and divide A main function should access the methods and perform the mathematical operations.
9. Write a program with class variable that is available for all instances of a class .Use static variable declaration. Observe the changes that occur in the object’s member variable values.
10. Write a java program
  - a. To find the area and circumference of the circle by accepting the radius from the user.
  - b. To accept a number and find whether the number is Prime or not
11. Write a java program to create a Student class with following attributes  
Enrollment No:, Name, Mark of sub1, Mark of sub2, mark of sub3, Total Marks.  
Total of the three marks must be calculated only when the student passes in all three subjects. The pass mark for each subject is 50. If a candidate fails in any one of the subjects his total mark must be declared as zero. Using this condition write a constructor for this class. Write separate functions for accepting and displaying student details. In the main method create an array of three student objects and display the details.

12. In a college first year class are having the following attributes  
 Name of the class (BCA, BCom, MHA), Name of the staff  
 No of the students in the class, Array of students in the class  
 Define a class called first year with above attributes and define a suitable constructor. Also write a method called best Student() which process a first year object and return the student with the highest total mark. In the main method define a first year object and find the best student of this class
13. Write a Java program to define a class called employee with the name and date of appointment. Create ten employee objects as an array and sort them as per their date of appointment. ie, print them as per their seniority.
14. Create a package 'student.fulltime .BCA' in your current working directory
  - a. Create a default class student in the above package with the following attributes: Name, age, sex.
  - b. Have methods for storing as well as displaying

### Unit 3 Exception Handling

15. Write a program to demonstrate a division by zero exception
16. Write a program to create an user defined exception say Pay Out Of Bounds.
17. Write a small program to catch Negative Array Size Exception. This exception is caused when the array is initialized to negative values.
18. Write a program to handle Null Pointer Exception and use the "finally" method to display a message to the user.

### Units 4 and 5 GUI Programming I and II

19. Write a program which create and displays a message on the window
20. Write a program to draw several shapes in the created window
21. Write a program to create an applet and draw grid lines
22. Write a Java program which creates a frame with two buttons father and mother. When we click the father button the name of the father, his age and designation must appear. When we click mother similar details of mother also appear.
23. Create a frame which displays your personal details with respect to a button click
24. Create a simple applet which reveals the personal information of yours.
25. Write a program to move different shapes according to the arrow key pressed.
26. Write a java Program to create a window when we press
  - M or m the window displays Good Morning
  - A or a the window displays Good After Noon
  - E or e the window displays Good Evening
  - N or n the window displays Good Night
27. Demonstrate the various mouse handling events using suitable example.
28. Write a program to create menu bar and pull down menus.
29. Write a program to explain the multithreading with the use of multiplication table. Three threads must be defined. Each one must create one multiplication table.
30. Write a program to illustrate thread priority.
31. Create a GUI program in java with the following components.
  - a. A frame with flow layout.
  - b. Add the following components on to the frame.
    - i. Two Text Field
    - ii. A button with the label display
  - c. Allow the user to enter data into the textfield
  - d. When the button is clicked paint the frame by displaying the data entered in the textfield
  - e. Allow the user to properly close the frame

1. Create a web page with advanced layouts and positioning with CSS and HTML.
2. Design a website with different methods of embedding CSS in a web page.

3. Create a static web page which displays your personal details. (Hint: CSS3 and HTML5)
4. Create a web page through which the user can enter his / her details to become an authenticated user of that page.
5. Create a web site for a Computer Hardware shop. (Hint: CSS3 and HTML5)
6. Create a web site for Amrita School of Arts and Sciences. (Hint: CSS3 and HTML5)
7. Create a web page that shows different methods of embedding JavaScript.
8. Create a web page with rollover menus. Rollover menus should be created using JavaScript.
9. Create a simple calculator, which can perform the basic arithmetic operations.
10. Validate the registration for with the following criteria:
  - a. Name and Age should be Mandatory Fields.
  - b. Password and Re-enter Password fields should contain same value.
  - c. Name field should accept only character values.
11. Write a PHP program to store current date-time in a COOKIE and display the 'Last visited on' date-time on the web page upon reopening of the same page.
12. Write a PHP program to store page views count in SESSION, to increment the count on each refresh, and to show the count on web page.
13. Using PHP and MySQL, develop a program to accept book information viz. Accession number, title, authors, edition and publisher from a web page and store the information in a database and to search for a book with the title specified by the user and to display the search results with proper headings.
14. Create a registration form using Angular JS.
15. Create a simple **AngularJS** calculator application using Angular Services.
16. Create an application Searching for a character and displaying its position using AngularJS.
17. Create an application using angular JS filters.
18. Create single page web applications using the MVC pattern of *AngularJS*.
19. Design an XML document to store information about a student in an engineering college affiliated to Amrita. The information must include USN, Name, Name of the College, Branch, Year of Joining, and e-mail id. Make up sample data for 3 students. Create a CSS style sheet and use it to display the document.
20. Create an XML document with the following sample real estate data
  - Root element real-estate will contain a sequence of sub-elements agencies, owners, properties and flats, all with an empty content
  - Ensure well-formedness
21. Create an internal DTD for the previous XML document
  - Ensure its validity
  - Then try to break it
22. Move the previous DTD to an external file and validate the XML document again
23. Create an application that loads a text string into an XML DOM object, and extracts the info from it with JavaScript.
24. Create an application which reads data from an XML file into XMLDOM object and retrieves the text value of the first element in the xml file.

**18CSA306**

**ADVANCED JAVA AND J2EE**

**3 0 0 3**

**Objectives:** *The main Objective of the course is to enable students to understand the concepts underlying technologies in JAVA Enterprise edition with Swings and multithreading, configuring Apache tomcat server, Java beans and Enterprise Java Beans.*

### **Unit 1**

Networking: Classes to be covered Socket, ServerSocket, IPAddress, URL connections – Swing controls – JDBC - Writing JDBC applications using select, insert, delete, update.

### **Unit 2**

SERVLETS: Introduction to Servlets (Life cycle of servlets, Java Servlets Development Kit, creating, Compiling and running servlet). The servlet API: javax. servlet package. Reading the servlet Parameters, Reading Initialization parameter. The javax.servlet.http.

### **Unit 3**

JAVA SERVER PAGES: Configuring Tomcat JSP/Servlet server. Brief Introduction to J2EE Architecture. Advantage of JSP technology. JSP Architecture, JSP Access Model. JSP Syntax Basic (Directions, Declarations, Expression, Scriptlets, Comments) JSP Implicit Object (Out, HttpServlet Request, Http Servlet Respose, Exception Handling, Session Management.

### **Unit 4**

Package Handling HTTP Request and Response (GET/ POST Request), Using Cookies, Session Tracking. Exception Handling.

### **Unit 5**

Introduction to EJB – Understanding MVC – Building Controllers, models and views – Integrating hibernate with spring.

### **TEXTBOOKS:**

1. Deitel&Deitel, "Java How to program", Prentice Hall, 4 th Edition, 2000.
2. Gary Cornell and Cay S. Horstmann, "Core Java Vol 1 and Vol 2", Sun Microsystems Press, 1999.
3. Stephen Asbury, Scott R. Weiner, Wiley, "Developing Java Enterprise Applications", 1998.

## **18CSA307**

## **C# AND .NET FRAMEWORK**

**2 0 2 3**

### **Unit 1**

.Net Framework Overview- Architecture-.Net Framework class Libraries-CLR-Metadata-Interoperability-Assemblies-the .net Packaging system-CLR-MSIL , Introduction to Visual Studio.Net-C# Programming Concepts-Predefined Types- Value types and reference type, Classes and Objects, Constructors and methods , Conditional statements, loops, arrays , Collection classes: ArrayList , HashTable, Stack ,Queue, indexers and properties.

### **Unit 2**

String class: methods and properties of string class, enumerations, boxing and unboxing, OOPS concepts: Encapsulation, data hiding, inheritance, interfaces, polymorphism, operator overloading, overriding Methods, Static Class members, Delegates and events. Exception Handling, garbage collector, generics and collection

### **Unit 3**

Basics of Windows Programming- Event Driven Programming, Windows Forms, Using common controls-Labels, textboxes, buttons, check boxes, radio button, progress bar, combo box, list box. Components-timer, imagelist, Menus, Modal and Modeless Dialog Boxes, MDI, Mouse and keyboard event handling.

### **Unit 4**

Introduction to ADO.Net-Object Model- System. Data Namespace- Data Bound controls-Connected Mechanism-Disconnected mechanism-.Net Data Providers.

### **Unit 5:**

Files: System.IO, directory and file types, Stream readers and stream writers, working with binary data.

### **Textbook/Reference:**



1. C# 4.0 the Complete Reference by Herbert Schildt
2. Latest version of Andrew Trolsens C# text from Apress(Pro C# 5.0 and the .NET Framework 4.5)
3. Robert Powel, Richard Weeks, C# and the .NET Framework, Techmedia

**18CSA317**

**COMPUTER GRAPHICS**

**3 0 0 3**

***Objectives:** The primary objective of this course is to give the basic principles of 2D and 3D computer graphics, to study the elementary mathematical techniques that allow us to position objects in three dimensional spaces and techniques necessary to produce basic 2D/3D dimensional illustrations.*

**Unit 1**

Applications of Graphics: CAD, Presentation Graphics, Computer Art, Entertainment, Education and Training, Visualization, Image Processing,

**Unit 2**

Graphical User Interfaces - Overview of Graphics Systems: CRT, Flat Panel Displays, Three Dimensional Viewing Devices, Virtual Reality systems, Raster-Scan Systems, Random-Scan Systems.

**Unit 3**

Input Devices: Keyboards, Mouse, Data Glove, Digitizers, Touch Panels; Hard Copy Devices: Printers, Plotters. Output Primitives: Bresenham's Line Algorithm, Midpoint Circle Algorithm; Filled Area Primitives: Boundary-Fill Algorithm, Flood-Fill Algorithm; Character Generation; Homogeneous Coordinates.

**Unit 4**

Two Dimensional Geometric Transformations; Translation, Rotation, Scaling, Reflection, Shear; Two Dimensional Viewing: Cohen Sutherland Line Clipping Three Dimensional Geometric Transformations; Translation, Rotation, Scaling, Reflection, Shear; Three Dimensional Viewing: Projections, Parallel Projections, Perspective Projections, View Volumes and General Projection Transformations.

**Unit 5**

Graphics Programming: OpenGL Introduction: Command Syntax, Drawing and filling images, patterns, Filling regular and irregular shapes, Outputting Text, Justifying Text, Animation. Drawing with mouse, Building mouse cursors, freehand drawing using mouse, menus using mouse.

**TEXTBOOKS:**

1. Computer Graphics, C Version, D. Hearn, M.P. Baker, 2nd Edition, Pearson Education
2. OpenGL Programming Guide, M. Woo, J. Neider, T. Davis, D. Shreiner, 3rd edition, Pearson Education

**18CSA318**

**CRYPTOGRAPHY AND CYBER SECURITY**

**4 0 0 4**

***Objectives:** The main objective of this course is to introduce the working of various cryptographic methods and how to apply this knowledge to real-world applications. This course will also present an overview of Cyber Security.*

**Unit 1**

Introduction to Cyber Security - Types of Attacks, Goals for Security, Security threat and vulnerability, Cyber security models (the CIA triad, the star model).

Classical encryption techniques substitution ciphers and transposition ciphers, cryptanalysis, steganography, Stream and block ciphers - Modern Block Ciphers: Block ciphers principles,

Shannon's theory of confusion and diffusion. Data encryption standard (DES), Strength of DES, Idea of differential cryptanalysis, block cipher modes of operations.

## **Unit 2**

Principals of public key crypto systems, RSA algorithm, security of RSA. Key Management and distribution: Symmetric key distribution, Diffie-Hellman Key Exchange, Public key distribution, Introduction to SSL.

## **Unit 3**

Message Authentication Codes: Authentication requirements, authentication functions, message authentication code, hash functions, birthday attacks, security of hash functions,

## **Unit 4**

Digital Signatures: Digital Signatures, Elgamal Digital Signature Techniques, Digital signature standards (DSS), proof of digital signature algorithm.

## **Unit 5**

Introduction to Cyber Crime and security: Cyber Crimes, types of Cyber Crime, hacking, attack vectors, Cross Site Scripting (XSS), XSS Consequences. Cyber Space and criminal behaviour, traditional problems associated with Cyber Crime, Introduction to Incident Response, Digital Forensics - Phishing.

### ***TEXTBOOK:***

*William Stallings, "Cryptography and Network Security: Principals and Practice", Pearson Education, Sixth Edition.*

### ***REFERENCE:***

*Nina Godbole and SunitBelpure, Cyber Security: Understanding Cyber crimes, ComputerForeinsics and Legal Perspectives, Willey India Pvt.Ltd.*

*Dr T R Padmanabhan N Harini, "Cryptography and Security Paperback", Wiley India*

**18CSA319**

**PYTHON PROGRAMMING**

**2 0 2 3**

## **Unit 1**

Introduction to Python: Python variables, Python basic Operators, Understanding python blocks. Python Data Types, Declaring and using Numeric data types: int, float etc.

## **Unit 2**

Python Program Flow Control Conditional blocks: if, else and else if, Simple for loops in python, For loop using ranges, string, list and dictionaries. Use of while loops in python, Loop manipulation using pass, continue, break and else. Programming using Python conditional and loop blocks.

## **Unit 3**

Python Complex data types: Using string data type and string operations, Defining list and list slicing, Use of Tuple data type. String, List and Dictionary, Manipulations Building blocks of python programs, string manipulation methods, List manipulation. Dictionary manipulation, Programming using string, list and dictionary in-built functions. Python Functions, Organizing python codes using functions.

#### **Unit 4**

Python File Operations: Reading files, Writing files in python, Understanding read functions, read(), readline(), readlines(). Understanding write functions, write() and writelines() Manipulating file pointer using seek Programming, using file operations.

Database Programming: Connecting to a database, Creating Tables,INSERT, UPDATE, DELETE and READ operations, Transaction Control,Disconnecting from a database, Exception Handling in Databases.

#### **Unit 5**

Python packages: Simple programs using the built-in functions of packages matplotlib, numpy, pandas etc.

GUI Programming: Tkinter introduction, Tkinter and PythonProgramming, Tk Widgets, Tkinter examples.

Python programming with IDE.

#### **Text Book/References**

1. Wesley J. Chun, “Core Python Applications Programming”, 3rd Edition , Pearson Education, 2016
2. Charles Dierbach, “Introduction to Computer Science using Python”, Wiley, 2015
3. Jeeva Jose &P.SojanLal, “Introduction to Computing and Problem Solving with PYTHON”, Khanna Publishers, New Delhi, 2016
4. Downey, A. et al., "How to think like a Computer Scientist: Learning with Python", John Wiley, 2015
5. Mark Lutz, “Learning Python”, 5th edition, Orelly Publication, 2013, ISBN 978-1449355739
6. John Zelle, “Python Programming: An Introduction to Computer Science”, Second edition, Course Technology Cengage Learning Publications, 2013, ISBN 978-1590282410
7. Michel Dawson, “Python Programming for Absolute Beginners” , Third Edition, Course Technology Cengage Learning Publications, 2013, ISBN 978-1435455009
8. David Beazley, Brian Jones., “Python Cookbook”, Third Edition, Orelly Publication, 2013, ISBN 978-1449340377

**18CSA331**

**ARTIFICIAL INTELLIGENCE**

**3 0 0 3**

#### **Unit 1**

What is Artificial Intelligence? – The AI Problems – The Underlying Assumption – What is an AI technique – Criteria for Success.

Problems, Problem Spaces and Search – Defining Problem as a State Space Search – Production Systems – Problem Characteristics – Production System Characteristics – Issues in the design of Search Programs.

#### **Unit 2**

Heuristic Search Techniques - Generate – and – Test – Hill Climbing – Best-First Search – Problem Reduction – Constraint Satisfaction - Means - Ends Analysis. Knowledge Representation issues – Representations and Mapping - Approaches to knowledge Representation – Issues in knowledge Representation – The Frame Problem. Using Predicate Logic – Representing simple facts in Logic – Representing Instance and Isa Relationship – Computable Functions and Predicates – Resolution – Natural Deduction.

#### **Unit 3**

Representing Knowledge Using Rules – Procedural versus Declarative knowledge – Logic Programming – Forward versus Backward Reasoning – Matching – Control Knowledge.

Symbolic Reasoning under Uncertainty – Introduction to Non-monotonic Reasoning – Augmenting a Problem Solver – Implementation: Depth - First Search.

Statistical Reasoning – Probability and Baye’s Theorem – Bayesian Networks – Fuzzy Logic.

## **Unit 4**

Game Playing - The Minimax Search Procedure – Adding Alpha-Beta Cutoffs.

Understanding – What is Understanding? What makes Understanding hard?

## **Unit 5**

Common Sense – Qualitative Physics – Commonsense ontology – Memory Organization - Expert Systems – Representing and Using Domain knowledge – Expert System Shells – knowledge Acquisition - Components of an AI program.

### **TEXTBOOKS:**

1. *Artificial Intelligence (Second Edition) – Elaine Rich, Kevin knight (Tata McGraw-Hill)*
2. *A Guide to Expert Systems – Donald A. Waterman (Addison-Wesley)*

### **REFERENCES:**

1. *Principles of Artificial Intelligence – Nils J. Nilsson (Narosa Publishing House)*
2. *Introduction to Artificial Intelligence – Eugene Charnaik, Drew McDermott (Pearson Education Asia)*

## **18CSA332 ARCHITECTURE AND DEPLOYMENT OF SECURE AND SCALABLE WAN 3 0 0 3**

### **Unit 1**

Introduction to Scaling Networks, Implementing a Network Design, LAN Redundancy, Spanning Tree Concepts and protocols.

### **Unit 2**

Link Aggregation Concepts and Configuration, Wireless LAN Concepts, operations and Security, Wireless LAN Configuration, Troubleshoot Single-Area OSPF, Multiarea OSPF

### **Unit 3**

Operation and configuration. Hierarchical Network Design, WAN Technologies, Spanning Tree Configuration, First-Hop Redundancy Protocols, Point-to-Point Connections.

### **Unit 4**

PPP Operation and Configuration, HDLC protocol, Troubleshoot WAN Connectivity, Frame Relay concepts and Configurations, NAT Operation & Configuration, Troubleshooting NAT

### **Unit 5**

Tele working, Broadband Solutions, Configuring xDSL Connectivity, Securing Site-to-Site Connectivity, VPNs, Site-to-Site GRE Tunnels, IPsec, Monitoring the Network – Syslog, SNMP, Netflow, Network Troubleshooting with a Systematic Approach.

### **TEXTBOOKS:**

1. *Youlu Zheng and ShakilAkhtar, "Networks for Computer Scientists and Engineers".*
2. *Peterson & Davie, "Computer Networks, A Systems Approach", 5th Edition, Morgan Kaufmann, 2011.*

### **REFERENCES:**

1. *"Scaling Networks - Course Booklet ", Cisco Press.*
2. *"Switched Networks - Course Booklet", Cisco Press.*

**Objectives:** *Client Server Computing Model defines the way successful organizations will use technology during the next decade. As a result knowledge of client server architecture has become an essential part of computer science. The main objective is to provide the basic concepts of client server computing and the new technologies involved in it.*

**Unit 1**

Client Server System Concepts – Introduction – Concepts - Client Server Architecture - Two-Tier Architecture – Three-Tier Architecture - N-Tier Architecture - N-Tier vs 2-Tier Architecture - Case Study of N-Tier Architecture - Client Server Models - Gartner Classification – Middleware - Characteristics and types of Server - File Server - Database Server - Communication Server - Object Server - Groupware Server - Transaction Server - Characteristics and types of Clients - Thin Client - Fat Client.

**Unit 2**

Components of Client Server Computing – Client - Role of the Client - Client Services - Request for Service - Components of Client Server Computing – Server - Role of the Server - Server Functionality in detail - Components of Client Server Applications – Connectivity – OSI - Communications Interface Technology.

**Unit 3**

Client Server System Architecture - Client Server Building Blocks – Hardware - Client Hardware - Server Hardware - Client Server Building Blocks – Software - Client Server Systems Development Methodology - Project Management - Architecture Definition - Systems Development Environment – Middleware - Types of Middleware - DCE, MOM, TP – Monitors – ODBC - Design Overview of ODBC - ODBC Architecture – Components – Applications - Driver Managers - Database Drivers - ODBC Data Sources - Network Operating System - Base Services - External Services.

**Unit 4**

SQL Database Servers - Server Architecture - Multithread Architecture - Hybrid Architecture - Stored Procedures – Triggers - Client Server Transaction Processing - Rules of Client Server Transaction Processing - Transaction Models - Chained and Nested Transactions - Transaction Management Standards - Data Warehousing - Warehousing Techniques - Data Mining.

**Unit 5**

Client Server Protocols – RPC – IPC - Recent Trends – Intranet – Extranet – Internet - CORBA.

**TEXTBOOK:**

*Robert Orfali, Dan Harkey and Jerri Edwards: Essential Client/Server Survival Guide, John Wiley & Sons Inc 1996*

**REFERENCES:**

1. Alex Berson: *Client Server Architecture*
2. Patrick Smith, Steve Guengerich: *Client Server Computing, Second Edition, Prentice Hall of India Pvt Ltd.*

**Unit 1**

An Overview of Embedded System - What is an Embedded System? – Categories of Embedded Systems – Requirements of Embedded Systems - Challenges and issues in Embedded Software Development – Trends in Embedded Software Development - Applications of Embedded Systems.

**Unit 2**

Hardware Fundamentals for the Software Engineer - Gates – Timing Diagrams – memory – Microprocessors – Buses – DMA – Interrupts - Other Common Parts – Built-ins on the microprocessor – Interrupts - Microprocessor Architecture – Interrupt Basics – The Shared Data Problem – Interrupt Latency.

**Unit 3**

Survey of Software Architectures - Round Robin – Round Robin with Interrupts – Function Queue Scheduling Architecture – Use of real time operating system. RTOS, Tasks, Scheduler, Shared data reentrancy - priority inversion, mutex binary semaphore and counting semaphore – Selecting an Architecture - Introduction to Real Time Operating Systems - Tasks and Task states – Tasks and Data – Semaphores and Shared Data – Message Queues mailboxes and pipes – Timer functions – Events – Memory management – interrupt routines in an RTOS environment.

**Unit 4**

Basic Design Using a Real Time Operating System - Overview – Principles – Encapsulating Semaphores and Queues – Hard Real - Time Scheduling Considerations – Saving memory space – saving power - Embedded Software Development Tools - Host and Target Machines – linker/Locators for Embedded Software – Getting Embedded software into the target systems.

**Unit 5**

Debugging Techniques - Testing on Host Machine – Instruction Set simulators – The assert Macro – Using Library Tools - Future Trends in Embedded Systems - System on a chip (SOC) – Smart Cards and the cashless society – Security in Embedded System.

**TEXTBOOKS:**

1. *Dr.K.V.K.K. Prasad & Vikas Gupta – Programming for Embedded Systems – Wiley 1<sup>st</sup> edition 2002*
2. *David E. Simon – An Embedded Software Primer- Pearson Education Asia – 1999*

**REFERENCES:**

1. *Caroline Yao & Quing Li – Real Time Concepts for Embedded Systems*
2. *Kirk Zureli - C Programming for Embedded Systems*

**18CSA335 ENTERPRISE RESOURCE PLANNING MANAGEMENT 3 0 0 3****Unit 1****Introduction to ERP**

Accommodating Variety – Integrated Management Information – Seamless Integration – Supply Chain Management – Resource Management – Integrated Data Model – Scope – Technology – Benefits of ERP.

**Business Engineering and ERP**

What is BE? – Significance and Principles of BE – BPR, ERP and IT – BE with IT – ERP and Management Concerns.

## **Unit 2**

### **Business Modelling for ERP**

Building the Business Model.

### **ERP Implementation**

Role of Consultants, Vendors and Users – Customization – Precautions – ERP: Post-implementation Options – ERP Implementation Methodology – Guidelines for ERP Implementation.

## **Unit 3**

### **ERP and the Competitive Advantage**

ERP and the Competitive Strategy.

### **The ERP Domain**

MFG/PRO, IFS/Avalon - Industrial and Financial systems – Baan IV – SAP – SAP R/3 Applications – Example of an Indian ERP Package – The Arrival of ERP III.

## **Unit 4**

### **Marketing of ERP**

Market Dynamics and Competitive Strategy.

### **Sample Case Studies**

## **Unit 5**

### **Client Server and ERP Architecture**

Introduction to Client Server – Advantages and Disadvantages – N tier Architecture – ERP Architecture.

[http://ebuild.imtindia.com/erp\\_software\\_architecture.html](http://ebuild.imtindia.com/erp_software_architecture.html)

### **Open Technology**

Background of Open Technology – Introduction – Proprietary v/s Open source – Need for Open Source Solutions – Open Source ERP.

<http://elearning.nic.in/mdp/2-open-technology/opentechnology-mdp.pdf>

### **Commercial ERP**

Commercial ERP – Open Source ERP v/s Commercial ERP.

<http://www.erpwire.com/erp-articles/commercial-and-open-source-erp.htm>

### **TEXTBOOK:**

*“Enterprise Resource Planning – Concepts and Practice”, Vinod Kumar Garg, N.K. Venkitakrishnan, Second Edition, Eastern Economy Edition, Prentice-Hall of India Pvt., Ltd., 2008.*

**Unit 1**

Introduction – Applied Knowledge Management – Web Warehousing and Knowledge Management – Value Chains and Killer Applications.

**Unit 2**

Web Warehousing in Action – Traditional Warehousing – Web Based Graphical Geographic Information System.

**Unit 3**

An Introduction to Text Information Management System – Architecture of Text Information Management System – Text Mining Systems.

**Unit 4**

Knowledge Management Principles – Knowledge Management at work in Organization.

**Unit 5**

Technology Foundations – The Internet and Internet Services – Web Components and Communications.

**TEXTBOOKS:**

*Web Warehousing and Knowledge Management: Mattison 1999, Tata McGraw-Hill*

*Measuring and Managing Knowledge: Tom Housel and Arthur Bell 2001, International Edition, Tata McGraw-Hill*

**REFERENCE:**

*Knowledge Management: Ganesh Natarajan, President & CEO Aptech*

**Unit 1**

IPv4 & IPv6 Network Addresses, IPv6 Network Addresses, Subnetting IP Networks, Network Design & trouble shooting for IPv4 & IPv6. Introduction to Switched Networks, LAN Design.

**Unit 2**

Basic Switching Concepts and Configuration, Switch Security: Management and Implementation, VLANs.

**Unit 3**

Routing Concepts & operations, Configuration of a Router, Media Access Control, Inter-VLAN Routing, Layer 3 Switching, Static Routing Implementation, Configure Static and Default Routes, CIDR and VLSM.

**Unit 4**

Network security, Dynamic Routing Protocols, Distance Vector Routing Protocols, RIP(IPv4) and RIPng(IPv6) Routing, Link-State Dynamic Routing, The Routing Table, Single-Area OSPF, Configuring Single-Area OSPFv2 (IPv4) & v3(IPv6).



## **Unit 5**

Access Control Lists and operations, Configuring and Troubleshooting Standard & extended IPv4 ACLs, IPv6 ACLs, DHCPv4 (IPv4) DHCPv6(IPv6).

### **TEXTBOOKS:**

1. James F. Kurose and Keith W. Ross “Computer Networking: A Top-Down Approach”, 4<sup>th</sup> Edition, Addison-Wesley, 2008.
2. Andrew S.Tanenbaum, “Computer Networks”, 3<sup>rd</sup> Edition, PHI, 2004.

### **REFERENCES:**

1. Introduction to Networks-Course Booklet “,Cisco Press
2. Routing and Switching Essentials – Course Booklet”, Cisco Press

**18CSA338**

**MICROPROCESSOR SYSTEM**

**3 0 0 3**

## **Unit 1**

Combinational circuit implementations – Introduction – NAND & NOR implementations – Arithmetic circuits – Flip-flops - counters – Ripple counters – Synchronous counters.

## **Unit 2**

Introduction to Microprocessor and microcomputers – General architecture of a micro computer system – 8086/88 microprocessor - Architecture – software model of 8086/88 – Memory address space – Data organization – Data types – Registers in 8086/88 – Addressing modes – instruction formats – I/O Address space.

## **Unit 3**

8086/88 Microprocessor programming – Instruction set – Data transfer instructions – arithmetic – Logic – shift – rotate – Flag control – compare – jump – subroutines – loops – string handling instructions.

## **Unit 4**

8086/88 microprocessor and their memory interfaces – Introduction – system clock – bus cycle – Hardware organization of the memory address space – read/write bus cycles – memory interface circuits.

## **Unit 5**

I/O interfacing with 8086/88 microprocessor – Types of I/O – I/O data transfer – I/OP instructions – bus cycles – 8255 PPI – 8237A DMA controller Interrupt handling – types – Interrupt address pointer table – Interrupt instructions – enabling and disabling interrupts – 8259A Programmable Interrupt Controller.

### **TEXTBOOK:**

*The 8086 and 8088 microprocessors – Programming, Interfacing, Software, Hardware and Applications – Walter A tribbel, AvtarShing – PHI*

### **REFERENCE BOOKS:**

1. Digital Logic Design – Langholz, Kandel, Mott - 1988 Wm C. Brown publishers
2. Microcomputer systems: 8086/88 family architecture, programming and design – Yuching Liu, Glenn A Gibson – PHI
3. The 8086/88 family – John Uffenbeck – PHI

**Unit 1**

Introduction: What is Multimedia? – Introduction to making Multimedia - Media Skills – Macintosh and Windows Platforms – Basic software tools.

**Unit 2**

Making instant Multimedia – Multimedia Authoring tools.

**Unit 3**

Multimedia Building Blocks: Text – Sound – Images.

**Unit 4**

Multimedia Building Blocks: Animation – Video.

**Unit 5**

Multimedia and the Internet: The Internet and how it works – Tools for World Wide Web – Designing for the World Wide Web.

**TEXTBOOK:**

*Tay Vaughan – Multimedia (Making it work) - Tata McGraw Hill – ISBN-0-07-047276-9*

**REFERENCES:**

*Nigel Chapman – Digital Multimedia – Wiley – ISBN – 81-265-0489-7*

*John F. Koegel Buford – Multimedia Systems – PEARSON – ISBN – 81-78-08-162-8*

**Unit 1**

Social Context: Introduction to the social implications of computing, Social implications of networked communication, Growth of, Control of, and access to the Internet, Gender – Related issues, Cultural issues, International Issues, Accessibility Issues (e.g. underrepresentation of minorities, Women and disabled in the computing profession), Public policy issues (e.g. electronic voting).

**Unit 2**

Analytical Tools: Making and evaluating ethical arguments, Identifying and evaluating ethical choices, Understanding the social context of design, Identifying assumptions and values.

Professional Ethics: Community values and the laws by which we live, The nature of professionalism (Including care, attention and discipline, fiduciary responsibility, and mentoring).

Keeping up-to-date as a professional (in terms of knowledge, tools, skills, legal and professional framework as well as the ability to self-assess and computer fluency), Various forms of professional credentialing and the advantages and disadvantages, The role of the

professional in public policy, Maintaining awareness of consequences, Ethical dissent and whistle-blowing.

Codes of ethics, conduct, and practice(IEEE, ACM, SE, AITP, and so forth), Dealing with harassment and discrimination, “Acceptable use” policies for computing in the work place.

Healthy Computing environment (ergonomics)

### **Unit 3**

Risks: Historical examples of software risks (such as the Therac-25 case), Implications of software complexity, Risk assessment and Risk Management; Risk removal, risk reduction and risk control.

Security Operations: Physical security, Physical access controls, Personnel access controls, Operational security, Security polices for systems/networks, Recovery and Response, Dealing with problems (both technical and human)

### **Unit 4**

Intellectual Property: Foundations of Intellectual Property, Copyrights, patents, and trade secrets, Software Piracy, Software Patents, Transactional issues concerning Intellectual Property.

Privacy and Civil Liberties: Ethical and legal basis for privacy protection, Ethical and legal framework for freedom of information, Privacy implications of database systems (e.g. Data gathering, storage and sharing, massive data collecting, computer surveillance systems)

Technological strategies for privacy protection, Freedom of expression in cyberspace, International and intercultural implications.

### **Unit 5**

Computer Crime: History and examples of computer crime, “Cracking” (“Hacking”) and its effects, Viruses, Worms, and Trojan Horses, Identity Theft, Crime Prevention strategies.

### ***TEXTBOOK:***

*Ethics for Information Age, 3<sup>rd</sup> Edition, Michael J. Quinn, Pearson/Addison Wesley, 2009*

**18CSA341**

**SOFT COMPUTING**

**3 0 0 3**

### **Unit 1**

Basic Concepts - Single Layer Perception - Multilayer Perception - Supervised and Unsupervised Learning - Back Propagation networks - Kohnen’s self-organizing networks - Hop field networks - Distance measures.

### **Unit 2**

FUZZY sets, properties, Membership functions Fuzzy operations, Applications.

### **Unit 3**

Classification and Regression Trees - Data Clustering Algorithms - Rule based Structure identification.

### **Unit 4**

### **Unit 5**

Evolutionary Computation - Survival of the Fittest - Fitness Computation – Crossover – Mutation – Reproduction - Rank space Method. Case Studies: Applications of soft computing.

#### **TEXTBOOK/ REFERENCES:**

1. Laurence Fausett, "Fundamentals of Neural Networks", Seventh Edition, Dorling Kindersley (India) P. Ltd 2006.
2. Satish Kumar - "Neural Networks – A Classroom Approach", Tata McGraw-Hill, 2004.
3. Timothy J. Rose, "Fuzzy Logic with Engineering Applications", Third Edition, John Wiley, 2010.
4. J.S.R Jang, C.T Sun and E. Mizutani, "Neuro-Fuzzy and Soft Computing", Second Edition, Prentice Hall of India, 2002.
5. D.E. Goldberg "Genetic Algorithms in search, optimization and Machine learning", Second Edition, Addison Wesley, 2007.

**18CSA342**

**SYSTEMS AND NETWORK ADMINISTRATION**

**3 0 0 3**

### **Unit 1**

Understanding System Administration – Network Operating System - Network File System – Admin User - Administration Tools – Commands - Configuration Files – Log Files - Backup and Restore Files.

### **Unit 2**

User Management - Issues - Registration – Account Policy – Login environment – Setting up and Supporting Users – Disk Quotas.

### **Unit 3**

Network Administration – Topologies – Network Devices - Understanding TCP/IP – Administering TCP/IP - Network Configuration – Static and Dynamic.

### **Unit 4**

Introduction to File Server – Setting Up a File Server – Network File Systems - SAMBA – Web Server.

### **Unit 5**

Understanding Directory Services – Active Directory – Network Security – Importance of Port Number – Tracking Services – Monitoring your System – Network Security Tools.

#### **TEXTBOOKS:**

1. Red Hat Linux - System Administration
2. Introducing Microsoft Windows Server 2003 – Jerry Homeycutt – PHI

#### **REFERENCE:**

**18CSA383 COMPUTER GRAPHICS LAB**

**0 0 2 1**

1. Write a program for 2D line drawing as Raster Graphics Display.
2. Write a program for display basic 2D geometric primitives.
3. Write a program to display a filled square.
4. Write a program to display a series of concentric circles of varying radius.
5. Write a program for line drawing as Raster Graphics Display.
6. Write a program for circle drawing as Raster Graphics Display.
7. Write a program to draw a line using Bresenham line drawing algorithm
8. Write a program to draw a circle using Midpoint algorithm. Modify the same for drawing an arc and sector.
9. Write a program to rotate a point about origin.
10. Write a program to rotate a triangle about origin.
11. Write a program to scale the triangle using 2D transformation.
12. Write a program to translate a triangle using 2D transformation.
13. Write a program to reflect a triangle 2D transformation.
14. Write a program for polygon filling as Raster Graphics Display
15. Write a program for line clipping.
16. Write a program for polygon clipping.
17. Write a program for displaying 3D objects as 2D display using perspective transformation.
18. Write a program for rotation of a 3D object about arbitrary axis.
19. Write a program in openGL for building mouse cursors.
20. Write a program in openGL for freehand drawing using mouse.

**18CSA388**

**ADVANCED JAVA AND J2EE LAB**

**0 0 2 1**

1. Program to demonstrate Swing components.
2. Program to implement Address Book using Swing components.
3. Program to demonstrate loading of file in an Swing Component.
4. Multithreading program, one of the threads print a...z and other thread print 1...26.
5. Example: 1a2b3c.... 26z.
6. Multithreading program to schedule two jobs.
7. Client Server Socket Programming.
8. Server Socket which receives data from a java client program using JSON
9. Program to fetch a particular Website tags when an URL is specified.
10. Implement stack, queue, hashmap, hashtable, enumeration, ArrayList.
11. Create a table from a java program.
12. Update a table from a java program.
13. Load a table data in Swing components.
14. Delete a record from a table, drop table from a java file.
15. Program which shows use of Statement, Prepared Statement and Callable Statement.
16. Configure Apache Tomcat and write a hello world jsp page.
17. Configure Apache Tomcat server to deploy Servlets.
18. Exceptional handling in a JSP page.
19. Create a login page and authenticate a user in a JSP page using database.
20. Write a program to implement a simple servlet which writes a Welcome HTML page in the web browser.
21. A servlet should receive a parameter from JSP page and process it.
22. Servlet program to implement parameter handling.
23. Servlet program to handle GET and POST request.

24. A website hit counter data which has to be saved in a cookie.
25. Implement a Java Beans to set and get values.
26. Program to illustrate the procedure of handling session and print a Hello world using Java Bean.
27. Enterprise Session Beans, deploy, and run a simple Java EE application which does add, subtract, multiply and division using stateless session bean.
28. An application named account using stateful session bean. The purpose of account is to perform transaction operations (deposit and withdraw) for the customer.
29. The account application consists of an enterprise bean, which performs the transactions, and two types of clients: an application client and a web client.

**18CSA389**

**MOBILE APPLICATION DEVELOPMENT LAB**

**0 1 2 2**

Introduction: About Android, Pre-requisites to learn Android, Dalvik Virtual Machine & .apk file extension, Android API levels (versions & version names)

Android Java Basics: Getting started with Android development, project folder structure, simple programming, running project, generating build/APK of the app from Android Studio

First application: Creating Android Project, Android Virtual Device Creation, Set up debugging environment, Workspace set up for development, Launching emulator, debugging on mobile devices.

Basic UI design: Basics about Views, Layouts, Drawable Resources, Input controls, Input Events, Toasts.

More UI Components: Layouts - GridView and ListView, Action bar, Adapters, Menus: Option menu, context menu, sub menu, Pickers - Date and Time, Spinners.

Activity and Fragment: Activity, Fragment, Activity Lifecycle and Fragment Lifecycle.

Intents: Implicit Intents, Explicit intents, communicating data among Activities.

Navigation Drawer: Panel that displays the app's main navigation screens on the left edge of the screen

Android Notifications – Toast, Dialogs (TimePicker, DatePicker, Progress, Alert), Notification Manager and Push Notification

Introducing SQLite - SQLiteOpenHelper and creating a database - Opening and closing a database, Working with cursors Inserts, updates, and deletes

As a term project students should implement a mobile app with the following:

- Understand the app idea and design user interface/wireframes of mobile app
- Set up the mobile app development environment

**TEXTBOOKS/ REFERENCES:**

Head first Android Development.

Android Programming: Pushing the Limits, Wiley By Erik Hellman

Android Application Development Black Book, Dreamtech Press, Pradeep Kothari, KLSI

**18CSA391**

**COMPREHENSIVE TECHNICAL VIVA-VOCE**

**2 cr**

The viva may be done based on every course covered till the sixth semester. The objective of this is to enable the students to attend placements and be better performers in their future.

**18CSA392**

**MINOR PROJECT (OPTIONAL – leading to Paper Publication)3cr**

To expose the student to the industry-standard project practices, under time and deliverable constraints, applying the knowledge acquired through various courses done in the programme.

To allow students to develop their own ideas and get experienced in industrial and research projects. It provides an opportunity in solving a real life problem by applying the knowledge gained through various courses of study and an exposure on different phases of software /system development life cycle.

**18MAT102****MATHEMATICAL FOUNDATION****3 1 0 4****Unit 1**

Basic concepts of set theory - Mathematical logic-introduction-statements-connectives-negation, conjunction, disjunction- statement formulas and truth tables- conditional and bi-conditional statements- tautology-contradiction-equivalence of formulas-duality law- Predicates and Quantifiers, Arguments.

**Unit 2**

Operations on sets - power set- venn diagram Cartesian product-relations -functions- types of functions -composition of functions.

**Unit 3**

Matrix algebra-Introduction-Types of matrices-matrix operations- transpose of a matrix - determinant of matrix - inverse of a matrix- Cramer's rule

**Unit 4**

Matrix: finding rank of a matrix - normal form-echelon form-Cayley Hamilton theorem- Eigen values

**Unit 5**

Differential calculus - Functions and limits - Simple Differentiation of Algebraic Functions – – Evaluation of First and Second Order Derivatives – Maxima and Minima

**TEXT BOOKS:**

P.R.Vittal-Business Mathematics and Statistics,MarghamPublications,Chennai,

**REFERENCE:**

B.S.Vatsa-Discrete Mathematics –New Age International Limited Publishers,New Delhi

**18MAT112DISCRETE MATHEMATICS****3 1 0 4****Unit 1**

Binary operations, group, semi group,monoid, abelian group, subgroup(simple theorems without proof) Boolean algebra-definition-principle of duality-theorems.

**Unit 2**



Basic Counting Principles, Generating Functions, Euler's phi-function and its Application to Cryptography.

### **Unit 3**

Relations and their properties - relation matrix, graph of a relation - types of relations - equivalence relation - n-ary relations

### **Unit 4**

Advanced Counting Techniques: Recurrence Relations, Solving Linear Recurrence relations, Divide and Conquer Algorithms and Recurrence relations, Generating Functions, Inclusion Exclusion principles and their Applications.

### **Unit 5**

Introduction to Graph Theory: Graphs, Bipartite Graphs, Eulerian and Hamiltonian Graphs, Graph Connectivity.

### **TEXTBOOK:**

*Kenneth H. Rosen, Discrete Mathematics and its Applications, McGraw Hill.*

### **REFERENCES**

1. R. P. Grimaldi, "Discrete and Combinatorial Mathematics", Pearson Education, Fifth Edition, 2007.

2. Thomas Koshy, "Discrete Mathematics with Applications", Academic Press, 2005.

**18MAT208**

**STATISTICAL AND NUMERICAL METHODS**

**3 1 0 4**

### **Unit 1**

Statistics-Introduction -Measures of average-AM-Median-Mode, Measures of dispersion and its coefficients – Range – QD – SD-MD

### **Unit 2**

Correlation- Karl Pearson's and Spearman's rank correlation, Regression- regression equations, regression coefficients

### **Unit 3**

Permutations – combinations – Probability-addition theorem, multiplication theorem, independent events, conditional probability, Baye's theorem, Probability distribution- Binomial, Poisson, Normal.

### **Unit 4**

Interpolation- Newton's forward & backward method- Lagrange's Method, Curve fitting- fitting a straight line

### **Unit 5**

Solutions of Numerical, Algebraic and transcendental methods- bisection method, Newton Raphson method, Simultaneous linear equations -Gauss elimination

***TEXT BOOKS:***

P.R.Vittal-Business Mathematics and Statistics, Margham Publications, Chennai,

***REFERENCE:***

1. H.S.Hall and S.R.Knight: Higher Algebra –AITBS Publishers India.
2. M.K.Venkataraman: Numerical methods in Science and Engineering-National Publishing Company, Chennai