

Curriculum 2019						
Sem	Subject Code	Subject Name	C	L	P	T
I		Language	3	4	-	4
		English	3	4	-	4
	Major 1	C Programming	5	5	-	5
	Major 2	C Programming Lab	5	-	5	5
	Allied 1	Allied Mathematics I	5	6	-	6
		General Course –Introduction to Computers and Information Technology	2	3	1	4
		Value Education	1	2	-	2
II		Language	3	4	-	4
		English	3	4	-	4
	Major 3	Data Structures Using C++	5	5	-	5
	Major 4	Data Structures Using C++ Lab	5	-	5	5
	Allied 2	Allied Mathematics II	5	6	-	6
		General Course –Introduction to Computers and Information Technology	2	3	1	4
		Value Education	1	2	-	2
III		Language	3	4	-	4
		English	3	4	-	4
	Major 5	Relational Database Management Systems	5	5	-	5
	Major 6	PHP and MYSQL Lab	5	-	5	5
	Allied 3	Allied – Computer Integrated Statistical Methods and Optimization Technique–I / System Management –I	5	6	-	6
		Inter-Disciplinary Elective – Multimedia Systems	3	4	-	4
		Environmental Studies	-	4	-	4
	Personality Development	-	2	-	2	
IV		Language	3	4	-	4
		English	3	4	-	4
	Major 7	Java Programming	5	5	-	5
	Major 8	Java Programming Lab	5	-	5	5
	Allied 4	Allied – Computer Integrated Statistical Methods and Optimization Technique–II / System Management –II	5	6	-	6
		Inter-Disciplinary Elective – Multimedia Systems	-	4	-	4
		Environmental Studies	2	4	-	4
	Personality Development	3	2	-	2	
V	Major 9	ASP.NET using C#	4	5	-	5
	Major 10	ASP.NET using C# Lab	4	-	5	5
	Major 11	Computer Architecture & Networking	4	4	-	4
	Major 12	Operating Systems	4	5	-	5
	Elective 1	Data Mining through R Programming (or) UI Development(or) Information Security	4	3 5 5	2 - -	5
		General Elective – Web Designing	3	2	2	4
		Skilled Based Training–System and Network Administration	3	-	2	2
VI	Major 13	Python Programming	4	5	-	5
	Major 14	Python Programming Lab	4	-	5	5
	Major 15	Cloud Computing	4	4	-	4
	Major 16	Software Engineering and Testing	4	5	-	5
	Elective 2	Android and its Applications (or) Big Data Analytics (or) Natural Language Processing	4	3 5 5	2 - -	5
	Project	Project	5	-	6	6
		Extension Activities *	1	-	-	-
	TOTAL CREDITS	150				
·C-Credit, L–Lecture, P–Practical, T–Total hours						
*NCC/NSS/Sports/SFA						

SEMESTER I

SEM : I	C PROGRAMMING	C	L	P	T
M1		5	5	-	5

Unit I

Overview of C: Importance of C, sample C program, C program structure, executing C program.

Constants, Variables, and Data Types: Character set, C tokens, keywords and identifiers, constants, variables, data types, declaration of variables, Assigning values to variables---Assignment statement, declaring a variable as constant, as volatile. Operators and Expression: Arithmetic, Relational, logical, assignment, increment, decrement, conditional, bitwise and special operators, arithmetic expressions, operator precedence, type conversions, mathematical functions. Managing Input and Output Operators: Reading and writing a character, formatted input, formatted output.

Unit II

Decision Making and Branching: Decision making with If, simple IF, IF ELSE, nested IF ELSE, ELSE IF ladder, switch, and GOTO statement.

Decision Making and Looping: While, Do-While, For, Jumps in loops.

Unit III

Arrays: Declaration and accessing of one & two-dimensional arrays, initializing two-dimensional arrays, multidimensional arrays.

Functions: The form of C functions, Return values and types, calling a function, categories of functions, Nested functions, Recursion, functions with arrays, call by value, call by reference , storage classes, String Functions.

Unit IV

Structures and Unions: Defining, giving values to members, initialization and comparison of structure variables, arrays of structure, arrays within structures, structures within structures, structures and functions, unions.

Preprocessors: Macro substitution, file inclusion.

Unit V

Pointers: definition, declaring and initializing pointers, accessing a variable through address and through pointer, pointer expressions, pointer increments and scale factor, pointers and arrays, pointers and functions, pointers and structures.

File Management in C: Opening, closing and I/O operations on files, random access to files, command line arguments.

Text Book

1. E. Balagurusamy, Programming in ANSI C, Fifth Edition, Tata McGraw-Hill, 2011.

Reference Books

1. Byron Gottfried, Schaum's Outline Programming with C, Third Edition, Tata McGraw-Hill, 2007.
2. Kernighan and Ritchie, The C Programming Language, Second Edition, Prentice Hall, 1998.

SEM : I	C PROGRAMMING LAB	C	L	P	T
M2		5	-	5	5

LIST OF PROGRAMS

1. Variables , data types , Constants and operators

1. Evaluation of expression ex : $((x+y)^2 * (x+z))/w$
2. Temperature conversion problem (Fahrenheit to Celsius)
3. Program to convert days to months and days (Ex: 364 days = 12 months and 4 days)
4. Solution of quadratic equation
5. Salesman salary (Given : Basic Salary, Bonus for every item sold, commission on the total monthly sales)

2. Decision making Statements

6. Maximum of three numbers
7. Find the Grade of the students
8. Calculate Square root of five numbers (using goto statement)
9. Pay-Bill Calculation for different levels of employee (Switch statement)
10. Date validation (Switch statement)

3. Looping Statements

11. Fibonacci series
12. Factorial
13. Square Root table
14. Floyds Triangle
15. Pascal's Triangle
16. Evaluation of Series (Sin x, cos x, e^x ...)
17. Program to Draw Histogram
18. Mean and Mode

4. Arrays

19. Prime numbers in an array
20. Sorting data (Ascending and Descending)
21. Matrix Addition and Subtraction
22. Matrix Multiplication
23. Evaluate a multiple choice test

5. Strings

24. Finding String Length
25. Read a Line of text from Terminals
26. String Copy
27. Printing Sequence of characters
28. Concatenation of strings
29. Comparison of Two strings

6. Functions (use call by reference and call by value)

- 30. Function with no arguments and no return values
- 31. Function to calculate x^y
- 32. Function that convert lower case letters to upper case

7. Macros

- 33. Write a macro that calculates the max and min of two numbers
- 34. Nested macro to calculate Cube of a number.

8. Structures

- 35. Book Shop inventory
- 36. Structure that describe a Hotel (name, address, grade, avg room rent, number of rooms)
Perform some operations (list of hotels of a given grade etc.)
- 37. Structure for Cricket team

9. Pointers

- 38. Evaluation of Pointer expressions
- 39. Function to exchange two pointer values
- 40. A function that receives a character string and a character as argument and deletes all occurrences of this character in the string. The function should return corrected string with no holes.
- 41. Creation, insertion and deletion in a linked list
- 42. Polynomial expression evaluation

10. Files

- 43. Program to read a file and print the data.
- 44. Program to receive a file name and a line of text as command line arguments and write the text to the file
- 45. Program to copy the content of one file to another file.

CA/GM/A1

ALLIED –I

MATHEMATICS - I

C	L	P	T
5	6	-	6

Unit I

Determinants and Matrices: Elementary properties of determinants and matrices. Matrix inversion, elementary transformations, determination of rank of a matrix. Eigen values and Eigen vectors of a matrix (Stressing on symmetric matrices). Cayley-Hamilton theorem - Cramer's rule. Consistency of a system of linear non-homogenous equations. (Statement only). Simple problems.

Unit II

Theory of Equations: Roots of polynomial equation, Irrational roots, complex roots, Relation between the roots and the coefficients, simple problems related to cubic equations only. Reciprocal equations.

Unit III

Differential Calculus: Derivative of a continuous function, rules of differentiation, Derivative of implicit function, hyperbolic and inverse functions, Successive differentiation. Leibnitz rule.

Unit IV

Integral Calculus: Introduction, Integration of a rational functions, algebraic expressions involving only one irrational quantity, rational functions of $\sin x$ and $\cos x$, Trigonometric substitutions, Bernoulli's formula for integration by parts.

Unit V

Differential equations: Definition, solutions of differential equations. Formation of differential equations, equations of the first order and of the first degree (first three types).

Reference books :

1. Narayanan S. and Manickavachagam , Allied Mathematics Vol.1 & Vol.2.
2. M.K. Venkataraman, NPC, Engineering Mathematics Vol.1 & Vol.2.

G E N E R A L C O U R S E

C	L	P	T
2	3	1	4

INTRODUCTION TO COMPUTERS AND INFORMATION TECHNOLOGY

Unit I

Computer Hardware Input Hardware- Processing and memory (primary storage) hardware- Output hardware secondary storage hardware.

Computer software- System software - Application software. The processor, main memory and registers: The processor-specialized processor chips CISC.R ISC, AND M PP - Main Memory- registers. ROM chips.

Unit It

Input hardware: keyboard input- pointing devices-scanning devices- voice recognition-audio input devices- video and photographic input.

Output Hardware: Impact printers- Non impact printers- Plotters-Monitors.
Storage hardware : Tape storage- Diskette Storage - Hard disks Optical disks.

Unit III

System software components : Common operating system platforms DOS- and windows windows NT /windows 2000 - UNIX LINUX.

Productivity Software Tools: Word processing software spread sheet software - database management system software.

Unit IV

Communications Technology: Using computers to communicate technological basics THE MODIN ISDN, cable modems, ADS]. and dishes.

Communication Channels: Twisted pair coaxial cable fiber optic cable- satellite system - other wireless communication. Communication Networks - Types of Networks - topology.

Unit V

Uses of communications Technology: the Internet - Connecting to the Internet Internet address

The World Wide Web - Popular uses of the web - browsing the web searching the web experiencing multimedia on the web designing web pages

Reference Books

1. Sarah E Hutchinson, Stacey C Sawyer , Computers, Communications and Information. Tata McGraw Hill Publications, 2001 .
2. Peter Norton, Introduction to Computers, Seventh Edition, Tata McGraw I lilt Publications, 2010

SEMESTER II

SEM : II	DATA STRUCTURES USING C++	C	L	P	T
M3		5	5	-	5

Unit I

Principles of Object oriented programming: object oriented programming paradigm, basic concepts of object oriented programming, benefits of OOP, object oriented languages.

Beginning with C++: Applications of C++, a simple C++ program, structure of C++ program, compiling and linking. Tokens, Expressions and Control structures: Tokens, keywords, identifiers and constants, basic data types, operators in C++, scope resolution operator, member dereferencing operator, memory management operators, manipulators, operator precedence, control structures.

Unit II

Functions in C++: the main function, function prototyping, call by reference, return by reference, inline functions, default arguments, const arguments, recursion, function overloading, friend and virtual functions. Classes and objects: specifying a class, defining member functions, a C++ program with class, private member functions, arrays within a class, static data members, static member functions, array of objects, friendly functions, pointers to members.

Unit III

Constructors and destructors: Constructors, parameterized constructors, multiple constructors in a class, constructors with default arguments, dynamic initialization of objects, copy constructors, dynamic constructors, destructors. Operator overloading and type conversions: defining operator overloading, overloading unary and binary operators.

Unit IV

Inheritance: Extending classes, defining derived classes, single, multilevel, multiple, hierarchical and hybrid inheritance. Pointers, Virtual Functions and Polymorphism: Introduction, Pointers to objects, this pointer, pointers to derived classes, virtual functions, pure virtual functions

Unit V

Stacks and Queues: the stack abstract data type, the queue abstract datatype, evaluation of expression – expressions postfix notation, infix to postfix. Linked list: Single linked lists and chains, representing chains in C++ - defining a node in C++, designing a chain class in C++, pointer manipulation in C++, chain manipulation operations. Doubly linked list. Trees: terminology, representation of trees, Binary tree traversal and tree iterators – inorder, preorder, postorder, iterative inorder and level order traversal.

Text Books:

1. E Balagurusamy, Object Oriented programming with C++, Sixth Edition, Tata McGraw Hill, 2013.
2. E.Horowitz, S.Sahni and Mehta, Fundamentals of Data Structures in C++, second edition, Galgotia, 2013.

Reference Books:

1. P. Sudharsan, J. John Manoj kumar, C and Data structures, third edition, RBA Publications, 2008.
2. Tenebaum, Yedidyah, Moshe, Data Structures using C, Sixth Edition, Pearson Education, 2008.

SEM : II	DATA STRUCTURES USING C++ LAB	C	L	P	T
M4		5	-	5	5

LIST OF PROGRAMS

C++ Programs

1. Implementation of function overloading.
2. Implementation of default arguments.
3. Implementation of pass by value, pass by reference and return by reference.
4. Implementation of classes and objects.
5. Implementation of default constructors.
6. Implementation of constructor overloading.
7. Implementation of copy constructor.
8. Implementation of friend functions.
9. Implementation of Unary operator overloading.
10. Implementation of Binary operator overloading.
11. Using constructors and destructors.
12. Implementation of simple and multi-level inheritance.
13. Implementation of multiple inheritance and hybrid inheritance.
14. Implementation of virtual functions.

Data Structures using C++

15. Stack using array
16. Queue using array
17. Binary tree traversal
18. Linear and binary search
19. Bubble sort and quick sort
20. Operations of singly linked list

C	L	P	T
5	6	-	6

CA/DM/A2

ALLIED

MATHEMATICS II

Unit I

Set theory: set theory, set operations, computer representation of sets, mathematical induction, matrices, logic normal forms.

Unit II

Combinatorics and recurrence relations: permutations, combinations, partitions, binomial coefficients, discrete numeric functions, recurrence relations.

Unit III

Isomorphism, homomorphism, representation of posets.

Unit IV

Graphs: Basic concepts, special graphs, paths, reachability and connectedness, euler and hamilton paths, fleury's algorithm, computer representation of graphs, linked representation of graphs

Unit V

Trees and automata: trees, computer representation of positional array, representation of algebraic expressions, tree searching.

Reference books

1. Tremblay, J.P, Manohar, R. Discrete Mathematical Structures with Applications to Computer Science, 2nd print 1988, McGraw Hill.
2. Kolman, Bernard, Robert C. Busby and Sharon Ross, Discrete Mathematical Structures, 3rd Edition, PHI.

SEMESTER III

SEM : III	RELATIONAL DATABASE MANAGEMENT SYSTEM	C	L	P	T
M5		5	5	-	5

Unit I

Introduction: Database - System Applications, Purpose of Database Systems, View of Data, Database languages, Relational Databases, Database design, Data storage and Querying, Transaction Management, Database Architecture.

Unit II

Introduction to Relational Model: Structure of Relational Databases, Database Schema, keys, Schema diagrams, Relational Query Language
 Introduction to SQL: Overview of the SQL Query language, SQL Data definition, Basic Structure of SQL Queries, Additional Basic operations, Set operations, null values, Aggregate function, Nested Sub queries, Modification of the database.

Unit III

Intermediate SQL: views, Transactions, Integrity constraints, SQL data types and schemas, Authorization. Advanced SQL: Functions and Procedures, Triggers

Unit IV

Formal Relational Query Languages: The Relational Algebra, The Tuple Relational Calculus, The Domain Relational Calculus
 Database Design and the E-R model: Overview of the design process, The Entity- Relationship model, Constraints, Entity-Relationships diagrams, Entity -Relationship Design Issues.

Unit V

Relational Database Design: Features of Good Relational Designs, Atomic Domains and first normal form, Decomposition using Functional dependencies - keys and functional dependencies, Boyce codd normal form, BCNF and dependency preservation, Third normal form, Higher normal forms

Text Books:

1. Abraham Silberchatz, Hank F. Korth, S. Sudarshan, Database System Concepts, Sixth edition, McGraw-Hill, 2011.

Reference Books:

1. RamezElmasri and Shamkant B. Navathe, "Fundamentals of Database Systems", FifthEdition, Pearson Education, 2008.
2. Nilesh Shah, Database Systems using oracle – A Simplified guide to SQL and PL/SQL, second edition, PHI learning, 2013

SEM : III	PHP and MYSQL Lab	C	L	P	T
M6		5	-	5	5

LIST OF PROGRAMS

PHP Basic

1. PHP "Hello World!" application
2. PHP single line and multi-line comments
3. PHP Echo and print

PHP Data Types

4. PHP integers, strings, floating point numbers or doubles, Booleans, null

PHP Operators & Control Structures

5. PHP arithmetic, logical, string operators
6. PHP while loop, do...while loop
7. PHP for loop, foreach loop

PHP Array

8. Sorting ascending and descending array
9. Finding largest and smallest value in array

PHP Function

10. Creating a function, PHP functions with parameters
11. PHP functions with optional parameters and default values
12. PHP functions returning values

PHP Date and Time

13. Get current date, Formatting the dates
14. Formatting the times, Get current time as timestamp

Integrating PHP & MYSQL

15. Creating Tables inside MySQL Database Using PHP
16. PHP Form Handling , PHP - An application of

CA/SM/A3

C	L	P	T
5	6	-	6

ALLIED

**COMPUTER INTEGRATED STATISTICAL METHODS
AND OPTIMIZATION TECHNIQUE - I**

UNIT I

Diagrammatic and Graphical Presentation Of Data: Significance of diagrams and graphs; types of diagrams – types of bar diagrams – simple bar diagrams, multiple bar diagrams, sub-divided bar diagrams; graphs of frequency distributions -histogram, frequency polygon, cumulative frequency curves or ogives.

UNIT II

Measures of Central Value: Objectives of averaging, requisites of good average, types of averages – Arithmetic mean, Median, Mode.

Measure of Dispersion: Methods of studying variation – Inter-quartile range or the quartile deviation, mean deviation, standard deviation.

UNIT III

Correlation Analysis: types of correlation; Karl Pearson's coefficient; properties of coefficient of correlation; rank correlation coefficient.

Regression Analysis: Regression lines, regression equations.

UNIT IV

Interpolation: Introduction; Newton's Interpolation formulae; Lagrange's Interpolation formula; divided differences; Newton's divided difference formula

UNIT V

Numerical Differentiation and Integration: Numerical integration – Trapezoidal rule, Simpson's one third rule; Simpson's three eight rule.

Reference books

1. S. P.Gupta, Statistical methods, Sultan Chand & Sons. Thirty fourth edition, 2005
2. S. Arumugam, A.Thangapandi Isaac, A. Somasundaram, Numerical methods SCITECH publications Pvt ltd, Second edition 2005.

CA/SD/A3

Allied – I

C	L	P	T
5	6	-	6

SYSTEMS MANAGEMENT- I

UNIT I

Introduction to Information System development: Overview of SAD, Systems analysts work, Categories of information system, System development strategy, System development life cycle, Structured analysis, Development method, Tools for system development.

UNIT II

Managing application development portfolio: Preliminary investigation, Selecting the project development strategy, Requirement determination, Fact-finding techniques, Tools for documenting procedures and decisions.

UNIT III

Structured Analysis and development strategy: Structured analysis; data flow analysis; Features of dataflow strategy; Development dataflow diagrams, Development process; General rules for drawing logical flow data diagrams; Features of Data Dictionary,

UNIT IV

Analysis to design transition: Specifying application requirements, objective in designing an information system, Design features.

UNIT V

Output Design: Identifying output needs, Format of presentation, Designing printed output, Designing visual display output.

Input and Control Design: Objectives, Capturing data for input, Input validation.

File Design: Basic file terminology, Data structure diagram, Type of files, file Organization.

Reference Books

1. James.A.Senn, Analysis & Design of information system, Second Edition, McGraw-Hill International edition
2. Elias. M. Awad ,System Analysis and Design, McGraw-Hill International edition

CA/MM/IE1

INTERDISCIPLINARY ELECTIVE

C	L	P	T
3	4	-	4

MULTIMEDIA SYSTEMS

Unit I

Multimedia: Dawn of the new communications medium, definition, multiple facets of multimedia, various classifications.

Multimedia Hardware: typical multimedia system configuration,

Multimedia Software: drivers, players tools and applications

Introducing the digital medium: Meeting the analog signals, secrets of digital recording – sampling rate and sampling size.

Unit II

Digital audio technology: computers and sounds, digital audio, definition,

Digital Audio Playback & Recording: Digital audio recording techniques, Digital audio editing techniques.

MIDI fundamentals: concept of MIDI, MIDI Vs digital audio, general MIDI standards, base level and extended level MIDI

Unit III

Text in Multimedia: Designing text for multimedia Hypermedia, Hypertexts.

World of colors: Basic concepts of color display, color monitors

Digital Imaging Fundamentals: Graphics in multimedia projects, raster and vector graphics.

Digital Image Development and Editing: Scanning techniques, graphics editing manipulation terminology.

Unit IV

Computer Animation Fundamentals: Animation in multimedia projects, object and cell animation, **Video in multimedia projects-**digital video fundamentals, full motion and full screen videos, digital video file sizes.

Unit V

Flash Basics & tools: Flash editor, panels, timelines, tools. Basic drawing tools brush tool, free hand painting tool, paint bucket tool, fills enclosed areas with colors or gradients, arrow tool and sub selection tool, oval and rectangle tool and pen tool.

Animation with flash: shape tween, motion tween, guides and masks, working with mask.

Text books:

1. S. Gokul, Multimedia Magic, Revised and Updated edition BPB Publications, (Chapters 1, 2, 6)-2nd Edition, 2008.
2. Underdahl Brain, “Macromedia Flash MX-A Beginners Guide”, Dream Tech Press.

Reference books:

1. Vaughan Tay, Multimedia: Making it Work, Tata McGraw-Hill, Fourth edition, 1999
2. Reinhardt Robert, Dowd Snow, 2006, “Macromedia Flash 8 Bible”, John Wiley & Sons

SEMESTER IV

SEM : IV	JAVA PROGRAMMING	C	L	P	T
M7		5	5	-	5

Unit I

Java Language: Creation of JAVA, Java Buzzwords, Java magic code; Object-oriented programming. Data types, Variables & Arrays: The primitive types; Floating-point types; Characters; Booleans; Variables; Type conversion and casting; Arrays. Operators: Arithmetic operators; Bitwise operators; Relational operators; Boolean logical operators; Assignment operator; Conditional operator; Control Statements: Selection statements; Iteration statements; Jump statements.

Unit II

Classes: Class fundamentals; Declaring Objects; Constructors; this keyword; Garbage Collection; finalize () method. Methods: Overloading methods; Returning objects; Recursion; introducing access control; understanding static; introducing final; introducing nested and inner classes; Strings: String operations; Character Extraction; Comparing, Searching & Modifying the strings; Data conversion using value Of(); String Buffer.

Unit III

Inheritance: Inheritance Basics; using super; creating a multilevel hierarchy; method overriding; dynamic method dispatch; using abstract classes; using final with inheritance. Packages and interfaces: Packages; access protection; importing packages; interfaces;

Unit IV

Multithread programming: The JAVA thread model; creating a thread; creating a multiple thread; Using isAlive() and join (), Thread Priorities, Synchronization, Interthread communication; suspending, resuming and stopping threads; Exception handling: Exception handling fundamentals; Exception types; Uncaught exceptions; Using try and catch; Multiple catch clauses; Nested try statements; throw; throws; finally; Java's built-in exceptions;

Unit V

Input/output: Java I/O classes and interfaces; file; The stream classes; The byte streams; character streams; Applet class: Applet basics; Applet Architecture; Applet skeleton; applet displaying methods; Event handling: Two event handling mechanisms; delegation event model; event classes; source of events; event listener **interface**

Text Book

1. Herbert Schildt, "The Complete Reference", 7th Edition, Tata McGraw Hill, 2007.

Reference Books

1. Bruce, Eckel, Thinking in Java, 3rd edition, Pearson education, 2005.
2. M.P. Bhawe, S.A. Patekar, Programming with Java, Pearson, 2012.

SEM : IV	JAVA PROGRAMMING LAB	C	L	P	T
M8		5	-	5	5

LIST OF PROGRAMS

ARRAYS

1. Java program to remove duplicate elements from an array.
2. Java program to sort a numeric array and a string array.
3. Java program to find the number of even and odd integers in a given array.

DATE & TIME

4. Program to compute the difference between two dates (year, months, days).
5. Program to get and display information (year, month, day, hour, minute) of a default calendar.

PACKAGES

6. Program to find all twin prime numbers less than 100.

(3, 5) (5, 7) (11, 13) (17, 19) (29, 31) (41, 43) (59, 61) (71, 73)

7. Program to generate and show all Kaprekar numbers less than 1000.

[In number theory, a Kaprekar number for a given base is a non-negative integer, the representation of whose square in that base can be split into two parts that add up to the original number again. For instance, 45 is a Kaprekar number, because $45^2 = 2025$ and $20 + 25 = 45$.

The first few Kaprekar numbers in base 10 are:

1, 9, 45, 55, 99, 297, 703, 999, 2223, 2728, 4879, 4950, 5050, 5292, ...]

STRING

8. Program to count all vowels and words in a string.
9. Program to check whether a string is a valid password.

[Password rules:

A password must have at least ten characters.

A password consists of only letters and digits.

A password must contain at least two digits.]

INHERITANCE

10. Write a Java program to find and print the first 10 happy numbers.

[Happy number: Starting with any positive integer, replace the number by the sum of the squares of its digits, and repeat the process until the number equals 1, or it loops endlessly in a cycle which does not include 1.

Example: 19 is a happy number

$$1^2 + 9^2 = 82$$

$$8^2 + 2^2 = 68$$

$$6^2 + 8^2 = 100$$

$$1^2 + 0^2 + 0^2 = 1]$$

MULTITHREADING

11. Program to implement banking transaction

CONSTRUCTOR

12. Program to implement Area of Geometric Shapes

13. Program to implement Payroll using this keyword

APPLET

14. Applet program that allows the user to draw lines, rectangles, ovals and text.

15. Applet program to insert the image in an Applet.

EVENT HANDLING

16. Program to implement Action Listener

17. Program to implement Key Listener

(Use Exceptions wherever applicable in the above list)

C	L	P	T
5	6	-	6

CA/OR/A4

ALLIED

**COMPUTER INTEGRATED STATISTICAL METHODS
AND OPTIMIZATION TECHNIQUE - II**

UNIT I:

Introduction to Operations Research: Operations research defined; characteristics of OR; scope of OR; models and modeling in OR – advantages and drawbacks of OR models.

Linear Programming – I : Linear programming defined; requirements of linear programming problem; general model of linear programming problem; formulating a problem as an linear programming model; graphic method of solution; some special cases in linear programming.

UNIT II:

Linear Programming – II: Principle of simplex method – basic terms involved in simplex procedure; computational aspect of simplex method; special situations encountered during the application of simplex method – unbounded solutions; two-phase simplex method.

UNIT III:

Transportation Problem: General structure of transportation problem; linear programming formulation of the transportation problem; solution procedure for transportation problem; methods for finding initial solution – North West Corner method, Least Cost method, Vogel's Approximation method; test for optimality – stepping stone method.

UNIT IV:

Assignment Problem: Approach of the assignment model; maximization in an assignment problem; unbalanced assignment problem.

Sequencing Problems: Basic terminology and notations; general assumptions; processing n-jobs through two machines, processing n-jobs through three machines.

UNIT V:

Project Management: Basic concepts of network analysis, time estimates in critical path analysis; critical path method (CPM); programme evaluation and review technique (PERT); distinction between PERT and CPM.

Reference books

1. V. K. Kapoor, Operations Research Techniques for management, Sultan Chand & Sons, Seventh revised edition, 2001.
2. Prem Kumar Gupta, D. S. Hira, Operations Research, S. Chand and co Ltd., First Edition, 1976
3. KantiSwarup, P.K Gupta, Man Mohan, Operations Research, Sultan Chand & Sons, Twelfth edition, 2004.

CA/FA/A4

**ALLIED
SYSTEM MANAGEMENT –II
(E-Commerce)**

C	L	P	T
5	6	-	6

UNIT-I: What is e-commerce? – E-Commerce is not E-Business – the drivers – Myths You should know – Advantages and Issues in E-Commerce – Benefits and Limitations of the Internet – Role of E-Strategy – Integrating E-commerce – E-Commerce Business Models – Management Implications.

UNIT-II: Mobile-Commerce-The Business of Time: What is M-Commerce? – Why wireless? – How wireless Technology is employed? – Wireless LAN – Wireless application Protocol - Implications for Management.

UNIT-III: Business-to-Business E-Commerce: What is B2B E-Commerce? – Supply chain Management and B2B – B2B Models – B2B Tools-EDI.

UNIT-IV: E-Security: Security in Cyberspace – Designing for Security – How much risk you afford? – The VIRUS – Security Protection and Recovery – Role of Biometrics - How to secure your system? – Security and Terrorism.

UNIT-V: Getting the money: Real World Cash – Electronic Money – Requirements for Internet-Based Payments – How would you like to pay? – B2B and E-Payment – M-Commerce and M-Payment – General Guide to E-Payment.

TEXTBOOK:

1. **ELECTRONIC COMMERCE from Vision to Fulfillment** – Elias M. Awad, 3rd edition, PHI.2004 (Chapters: 1, 6, 11, 13 &15)

REFERENCE BOOKS:

1. **E-COMMERCE Strategy, Technologies and Applications** – David Whiteley, 2001, TMH.
2. **INTRODUCTION TO E-COMMERCE** – Jeffrey F. Rayport, Bernard J. Jaworski,

SEMESTER V

SEM : V	ASP.NET USING C#	C	L	P	T
M9		4	5	-	5

UNIT 1

Introduction: The main development area, Informational windows.

Customizing IDE : Rearranging windows, Modifying the tool box, Customizing the document window, Customizing toolbars, Customizing Keyboard shortcuts.

UNIT 2

Creating and opening a new website-Working with files in website: File types of ASP.NET website, Adding existing files, organizing website. Working with web Forms. Introduction to css-working with css in Visual Studio.

ASP.Net Server Controls-Types of Controls: Standard controls, Html controls, Data Controls.
ASP.Net State Engine

UNIT 3

Introduction to Programming: Data types and Variables, Statements, Organizing Code, Object Orientation basics

UNIT 4

Navigation: Understanding absolute and relative URLs- Using the Navigation Controls-Programmatic redirection.

Validating User Input: Gathering data from the user, processing data at the server.

UNIT 5

Introduction to Database: Retrieving and manipulating data with sql, creating tables.

Displaying and updating data: data controls-data source and bound controls-Customizing the appearance of data control –Updating and inserting data.

Text Book:

1. Beginning ASP.NET 4.5 in C# and VB, Imar Spaanjaars, Wiley-India Edition.

Reference Books:

1. Professional ASP.NET 4 IN C# and VB,Bill Evjen, Scott Hamelman, Devin Rader,Willey India, 2013 edition.
2. ASP.NET 4.5 Black Book, DT Editorial Series, Dreamtech, 2016 Edition.

SEM : V	ASP.NET USING C# Lab	C	L	P	T
M10		4	-	5	5

LIST OF PROGRAMS

Create web pages for the following

1. Using database connection and displaying the data using SQL
2. Creating application using web server controls.
3. Create a program to populate the drop down list
4. Demonstration of web services using web application
5. Creating Web service to perform calculations
6. Create a complete web page using ASP.NET.

SEM : V	COMPUTER ARCHITECTURE AND NETWORKING	C	L	P	T
M11		4	4	-	4

Unit I

Binary systems: number base conversion-logic gates-simplification of Boolean function: k-map 3 variable. Combinational logic: Adders - Subtractors. Sequential logic: - Basic Flip flops – registers: shift registers.

Computer Arithmetic: ALU – Integer Representation and Arithmetic – Floating Point Representation and Arithmetic. Instruction Set: Characteristics – Operand Types – Operation Types – Addressing Modes.

Unit II

Memory: Characteristics – Hierarchy. Main Memory: Static RAM – Dynamic RAM – Types of ROM. External Memory: Magnetic Disk – Basics of RAID – Optical Memory – Magnetic Tapes.

Control Unit: Micro-Operations – Control of Processors – Hardwired Implementation - Micro Programmed Control Concepts – Microinstruction Sequencing – General Microinstruction Execution.

Unit III

Introduction: Data communication – components; networks – network criteria, applications; protocols and standards – protocols, standards.

Basic Concepts: Line configuration – point to point, multipoint; Topology – mesh, star, tree, bus, ring, hybrid technologies; transmission mode – simplex, half-duplex and full-duplex; categories of networks – LAN, MAN, WAN.

The OSI Model: Model – Layered architecture; functions of the layers – physical layer, data link layer, network layer, transport layer, session layer, presentation layer, application layer.

Unit IV

Signals: Analog and digital – Analog and digital data, analog and digital signals; periodic and aperiodic signals; Transmission Media: Guided media – twisted pair cable, coaxial cable, optical fiber; unguided media – radio frequency allocation, propagation of radio waves, satellite communication and cellular telephony.

Unit V

Networking and Internetworking devices: repeaters; bridges; routers; gateways; routing algorithms. – Distance vector routing; link state routing.

Text Books:

1. M. Morris Mano, Computer System Architecture, 3rd Edition, Prentice Hall, 2007.
2. W. Stallings , Computer Organization and Architecture, 6th Edition- PHI, New Delhi, 2003.
3. Behrouz, A. Forouzan, Data Communications and Networking, Second Edition, Tata McGraw-Hill publishing company Ltd 2003.

Reference Books

1. C. Hamacher, Z. Vranesic, S.Zaky, Computer Organization,5th Edition, Mc Graw Hill, 2002.
2. Andrew. S. Tannenbaum, Computer Networks, Third edition, Prentice Hall of India Private Ltd, 2005.
3. Achyut S. Godbole, Data Communication & networks, fourth edition, Tata McGraw-Hill, 2005.

SEM : V	OPERATING SYSTEMS	C	L	P	T
M12		4	5	-	5

Unit I

Introduction: operating system, history (1990s to 2000 and beyond), Process concepts: definition of process, process states-Life cycle of a process, process management- process state transitions, process control block(PCB), process operations , suspend and resume, context switching, Interrupts -Interrupt processing, interrupt classes, Inter process communication-signals, message passing.

Unit II

Asynchronous concurrent processes: mutual exclusion- critical section, mutual exclusion primitives, implementing mutual exclusion primitives , software solutions to the mutual Exclusion Problem-, Dekkers algorithm, Peterson’s algorithm, n-thread mutual exclusion- Lamports Bakery Algorithm, hardware solution to the mutual exclusion- testandset instruction. Semaphores – Mutual exclusion with Semaphores, thread synchronization with semaphores, counting semaphores, implementing semaphores. Concurrent programming: monitors-condition variables, simple resource allocation with monitors, monitor example readers and writers .

Unit III

Deadlock and indefinite postponement: Resource concepts, four necessary conditions for deadlock, deadlock prevention, deadlock avoidance and Dijkstra’s Banker’s algorithm, deadlock detection, deadlock recovery.

Unit IV

Processor scheduling: scheduling levels, preemptive vs non-preemptive scheduling, scheduling objectives , scheduling criteria, scheduling algorithms -FIFO scheduling, RR scheduling, SPF scheduling , HRRN scheduling, SRT scheduling, multilevel feedback queues, Fair share scheduling.

Unit V

Real memory organization and management : Memory organization, Memory management, Memory hierarchy, Memory management strategies, contiguous vs non-contiguous memory allocation, single user contiguous memory allocation, fixed partition multiprogramming, variable partition multiprogramming, multi programming with memory swapping.

Virtual memory organization: virtual memory basic concepts, block mapping, paging Paging address translation by direct mapping, associative mapping and with direct/associative mapping. Segmentation- segmentation address translation by direct mapping, Segmentation/paging systems: Dynamic address translation in a segmentation/paging system..

Virtual memory management: page replacement strategies.

Text Book:

1.H.M. Deitel, Paul J. Dietel, David R Choffnes Operating Systems, Third Edition, Pearson Education Asia, 2012.

Reference Books

1. William Stallings, Operating System: Internals and Design Principles, Fifth Edition, Prentice-Hall of India, 2005.
2. A. Silberschatz, and P.B. Galvin., Operating Systems Concepts, Fifth Edition, John Wiley & Sons (ASIA) Pvt Ltd, 2012.

SEM : V	ELECTIVE	C	L	P	T
ELECTIVE	DATA MINING THROUGH R PROGRAMMING	4	3	2	5

Unit I

Introduction - Data mining: Motivation -On what kind of data - Data Mining Functionalities - Classification of Data Mining systems - Major Issues in Data Mining systems. Data Preprocessing-Data cleaning- Data Integration and Transformation - Data Reduction - Discretization and concept Hierarchy Generation.

Unit II

Mining Association Rules in Large Databases - Association Rule Mining - Mining Single-Dimensional Boolean Association rules from Transactional Databases - Mining Multilevel Association Rules - Mining Multidimensional Association Rules - From Association Mining to Correlation Analysis - Constraint- Based Association Mining.

Unit III

Classification and Prediction - What is Classification and Prediction - Issues regarding Classification and Prediction - Classification by Decision Tree Induction - Bayesian Classification - Classification by Back propagation - Other Classification Methods - Prediction - Classifier Accuracy.

Unit IV

Introduction: What is R? –Installing R-Choosing an IDE
 Basics: Mathematical Operations and Vectors-Assigning Variables-Special Numbers-Logical vectors.
 Inspecting Variables: Classes-Different type of numbers-other common classes-checking and changing classes-Examining variables.

Unit V

Vectors: Vectors-Sequences-lengths-Names-Indexing Vectors-Vector Recycling and Repetition.
 Matrices and Arrays: Creating array and Matrices-Rows, Columns and Dimensions-Indexing arrays-Combining Matrices.
 List: Creating list-Atomic and Recursive Variables-List Dimension and Arithmetic-Indexing Lists- Converting between vector and List-Combining Lists.
 Data Frames: Creating Data Frames-Indexing Data Frames-Basic Data Frames Manipulation.
 Functions: Creating and Calling Functions-Passing Function to and from other Functions.

Text Books:

1. Han Jiawei Han and Kamber Micheline, Data Mining Concepts and Techniques, Second Edition, Morgan Kaufmann Publishers, 2006.
2. Sam Anahory, Dennis Murray Data Warehousing in real world, First Edition ,Addison Wesley Longman Publishing,1997.
3. Learning R: A Step-by-Step Function Guide to Data Analysis, Richard Cotton, O'Reilly,2013.

Reference Books:

1. M Barry and G.Linoff, Mastering Data Mining, Second Edition, John Wiley, 2000.
2. Paulraj Ponniah, Data Warehousing: Fundamentals for IT Professionals, Second Edition, Wiley India Pvt Ltd, 2012..

SEM : V	ELECTIVE	C	L	P	T
ELECTIVE	UI DEVELOPMENT	4	3	2	5

Unit 1

Introduction: Why HTML5? Setting up a document structure- Formatting Text-List-Creating hyperlinks and anchors-creating tables.

Unit 2

Introduction to style sheets-types of style sheet-formatting text using css-Forms-displaying graphics using css-Box model in css-Incorporating sound and video.

Unit 3

Introduction to Java Script: Displaying a line of text in a web page-data types.

Control statements-functions-Arrays.

Unit 4

Objects in Java Scripts-Document Object model-Events and event handlers in Java Script.

Unit 5

Introduction to jQuery- obtaining jQuery-selecting element using jQuery.

Text Books:

1. Step by step HTML5, Faithe Wempen, PHI ,2011
2. JavaScript for programmers, Paul J. Deitel and Harvey and Deitel, Pearson Publications, 2012.

Reference Books:

1. JavaScript in easy steps, Mike Mcgrath, TMG, 4th Edition.

SEM : V	ELECTIVE	C	L	P	T
ELECTIVE	INFORMATION SECURITY	4	5	-	5

Unit I

Introduction : Basics of Information Security, changing nature and global information systems. Threats: New Technologies Open Door Threats - information Level Threats Vs Network Level- Threats - Information system security - Computer Viruses - Classifications of Threats and assessing damages, protecting information system security.

Unit II

Information Security Management in organization, Security policy, standards, guidelines and information security management system: Basic Principles, Security related Terms, Three Pillars of Information Security. Information Classification: classification of data.

Unit III

Physical Security: Need, Meaning, Natural Disasters and control, basic tenets of physical security of information systems resources, physical entry controls. Biometrics Controls for Security: Introduction, Access Control, User Identification & Authentication. Meaning, Nature of Biometric identification/Authentication techniques, Biometric techniques. Key Success factors and benefits.

Unit IV

Network Security: Need, Basic concepts, network security dimensions, establishing security perimeter for network protection, Network types, Firewall: Introduction, need, topologies for different type of firewalls. Cryptography: basic elements of cryptography, Digital Signature, Cryptography algorithms – IES, AES and public key cryptography (RSA)

Unit V

Database Security: Introduction, Need, federated databases, securing the contents of mobile databases, data integrity as a parameter for database security, database security policy.

Text Books:

1. Nina Godbole , Information Systems Security , Wiley Publications 2003.
2. Atul Kahate , Cryptography & Network Security, Tata Mcgraw , 2003.

Reference Books:

1. Mark Merkow , Information Security, 1/e: Principles and Practices” Pearson Education, 2006.
2. Bragg, Roberta , Network Security: The Complete Reference”, Tata Mc Graw Hill, 2004.

CA/WD/GE1

C	L	P	T
3	2	2	4

GENERAL ELECTIVE WEB DESIGNING

Unit I

Introduction to the Internet:Networking, Internet, E-mail, resource sharing, gopher, www, Usenet, telnet, BBS.

Internet technologies: Modem, internet addressing, physical connection, telephone lines.

Unit II

Internet browsers:Internet explorer, Netscape navigator.

Introduction to HTML:History to HTML, HTML generations, HTML documents, anchor tag, hyper links.

Unit III

Head & Body section:Header section, title, links, colorful web pages, comment lines.

Designing the body section:heading printing, aligning the heading, horizontal rule, paragraph, tab settings, images & pictures.

Unit IV

Order & unordered list:Lists, Unordered list, headings in a list, ordered list, nested list.

Table Handling: Tables, Table creation in HTML, width of the tables& cells, Cell spanning multiple rows/columns, coloring cells, column specification.

DHTML & style sheets:Defining styles, elements of styles, linking the style sheet, in-line style, External style sheets, internal style sheets, and multiple styles.

Unit V

Frames: Frameset definition, Frame definition, Nested framesets, A web page design project:

Forms:Action attribute, Method attribute, Enctype attribute, drop down list, sample forms.

References Books

1. C.Xavier,World wide web design with HTML,Tata McGraw Hill,2000.
2. Musciano, Chuck and Bill Kennedy, HTML the definitive guide, Third Edition, O'Reilly, Shroff Publications and Distributors Pvt. Ltd.

C	L	P	T
3	-	2	2

CA/SNA/SEI

SYSTEM AND NETWORK ADMINISTRATION

Unit I

Hardware : PC-Memory - Rom BIOS, Types of RAM- SDRAM, DDRAM - Cache Memory - Hard disk Drive-Jumper setting-Intel Series Mother Boards, Computer-server-client, cables, connectors, NIC-Network Interface Card, and Networking Devices.

BIOS Setup, SMPS- AT & ATX Power supply- Keyboard, Mouse, Monitor, Printers, Ethernet Cards - PC Assembling and Disassembling.

Unit II

Installation:Install and Unstall MS Office, Microsoft visual studio 2012, Flash, SQL Server, UBUNTU OS, Windows 8 operating System,Windows server 2008.

Unit-III

System Maintenance : Creating Partitions,System Tools - Disk cleanup, System information, Disk defragmented and System Restore IP Addressing.

Unit-IV

Installation of Ubuntu as a server:Configuring Network, setting up user accounts ,setting rights and polices,tools for setting Linux- SCP(Secure Copy),SSH (Secure Shell).

Unit -V

Domain creation and Networking: Active Directory, Creating User Accounts, Network file sharing.

Reference Books

1. Ubuntu unleashed, 2012 edition , Publisher: SAMS Publishing
- 2..“Microsoft Windows Server 2008: The Complete Reference is a one-stop-shop for learning all The essential steps for setting up Window Server 2008.
- 3.IBM PC and Clones Hardware, Troubleshooting and maintenance-Second Edition

SEMESTER VI

SEM : VI	PYTHON PROGRAMMING	C	L	P	T
M13		4	5	-	5

Unit I

Variables, expressions and statements: Values and types, Variables, Statements, Evaluating expressions, Order of operations. **Functions:** Function calls, Type conversion, Type coercion, Definitions and use, Flow of execution, Parameters and arguments, Functions with results

Unit II

Conditionals and recursion: Logical expressions, Logical operators, Conditional execution, Alternative execution, Chained conditionals, Nested conditionals, the return statement, Recursion. **Fruitful functions:** Return values, Program development, Composition, Boolean functions, checking types.

Unit III

Iteration: Multiple assignment, the while statement, Tables, Two-dimensional tables, Encapsulation and generalization, Local variables. **Strings:** A compound data type, Length, Traversal and the for loop, String slices, String comparison, Immutability of strings, Looping and counting, the string module.

Unit IV

Lists: List values, Accessing elements, List length, List membership, Lists and for loops, List operations, List slices, Mutability, List deletion, Objects and values, Aliasing, Cloning lists, List parameters, Nested lists, Matrixes. **Tuples:** Mutability and tuples, Tuple assignment, Tuples as return values. **Dictionaries:** Dictionary operations, Dictionary methods, Aliasing and copying, sparse matrices

Unit V

Files and exceptions: Text files, Writing variables, Exceptions. **Classes and objects:** User-defined compound types, Attributes, Instances as parameters, Sameness, Instances as return values, Objects are mutable, Copying; Classes and functions - Pure functions, Modifiers; Classes and methods --- Object-oriented features, Optional arguments, Polymorphism.

GUI: GUI in Python, The Root Window, Fonts and Colors, Working with Containers, Canvas, Frame, Widgets, Button Widget, Arranging Widgets in the Frame, Label Widget, Message Widget, Text Widget, Scrollbar Widget, Checkbutton Widget, Radiobutton Widget, Entry Widget, Spinbox Widget, Listbox Widget, Menu Widget, Creating Tables.

Text Books:

1. Allen Downey, Jeffrey Elkner, Chris Meyers, How to Think Like a Computer Scientist - Learning with Python, Dreamtech Press
2. R.Nageswara Rao, Core Python Programming, Dreamtech Press, 2018

Reference Book:

1. Chun, Python Programming, LPE.
2. <http://www.python.org>

SEM : VI	PYTHON PROGRAMMING LAB	C	L	P	T
M14		4	-	5	5

Objectives:

1. To implement the concepts using python
2. To implement colours and buttons
3. To implement the files

Program List

1. Add Two Numbers
2. Print the Fibonacci sequence
3. Count the Number of Each Vowel
4. Check Leap Year
5. Make a Simple Calculator
6. Prime Numbers in an Interval
7. Find LCM - The least common multiple (L.C.M.)
8. Multiply Two Matrices & Matrix Multiplication using Nested Loop
9. Find HCF or GCD - The highest common factor (H.C.F) or greatest common divisor (G.C.D)
10. Find the Size (Resolution) of Image
11. Find Hash of File
12. User Lister
13. Find GIF files
14. Polynomial Evaluator
15. A Colourful, Useless Button

SEM : VI	CLOUD COMPUTING	C	L	P	T
M15		4	4	-	4

Unit I

Introduction: Cloud Computing Basics-Cloud Computing Overview, Disambiguation, Cloud Components, Infrastructure, Services.Application-Storage,Database Services. Intranets and the cloud-Components, Hypervisor Applications. Your Organization and Cloud Computing-When you can Use Cloud Computing, Benefits, Limitations, services

Unit II

The Business Case for Going to the Cloud: Cloud Computing Services, How those applications Help your Business, Deleting your Datacenter.

Unit III

Cloud Computing Technology: Hardware and Infrastructure- Client, Security and Network, services, Accessing the Cloud-Platforms, Web Applications, Web APIs, Web Browsers. Cloud Storage-Overview, Cloud storage providers.

Unit IV

Cloud computing at work: Software as a service-Overview, Driving Forces, Company Offerings. Developing Applications-Google, Microsoft, Intuit Quick Base.

Unit V

Local Clouds and Thin Clients: Virtualization in your Organization, Server Solutions, Thin Clients Migrating to the cloud-Cloud Services for Individuals, Migration.

Text Books:

1. Cloud Computing A practical Approach—AnthonyT.Velte Toby J.Velte RobertElsenpeter-1st editon 2010
2. David S. Linthicum, Cloud Computing and SOA Convergence in Your Enterprise, Addison Wesley,2009.

Reference Books:

1. Charles Babcock, Management Strategies for the Cloud Revolution, 1st Ed., McGraw/Hill,2010.

SEM : VI	SOFTWARE ENGINEERING & TESTING	C	L	P	T
M16		4	5	-	5

Unit I

Software and software Engineering: The nature of software. Engineering software process-software engineering practice software myths-Process Models: Generic process models-prescriptive process models-specialized process models-unified process.

Unit II

Agile Development: Agile process –Extreme programming –Agile process models –Principles that guide practice: core Principles-framework activity-Understanding requirements: requirements Engineering –Eliciting requirements.

Unit III

Requirement modeling: Requirement Analysis-Scenario based modeling Data modeling concepts-Class based modeling-Flow oriented modeling patterns for requirement modelling –requirements modeling for Web Apps.

Unit IV

Black box testing techniques: Boundary Value Analysis, Equivalence class testing, state table based testing, decision table based testing, and cause-effect graphing based testing.

Unit V

White box testing techniques: need, logic coverage criteria, basis path testing, applications of path testing, graph matrices. Validation activities: Integration testing, function testing, System testing and acceptance testing.

Text Books:

1. S. Pressman, Software Engineering: A Practitioners approach, seventh edition, Tata McGraw-Hill. 2009.
2. Naresh Chauhan , Software testing principles and practices, Oxford university Press.

Reference Books:

1. R. Fairley, Software Engineering Concepts, Tata McGraw-Hill. 2001
2. Srinivasan Desikan, Gopaldaswamy Ramesh, Software Testing – Principles and practices, fourteenth edition, Pearson, 2012.

SEM : VI	ELECTIVE	C	L	P	T
ELECTIVE	ANDROID AND ITS APPLICATIONS	4	3	2	5

Unit I

Android: An open platform for mobile development-Android SDK features, introducing the the development framework, understanding Android software stack, Android Application architecture, Creating Android virtual devices. Types of Android Applications, Developing for Android, Android Activity Life Cycle, Role of the Android manifest file.

Unit II

Creating the user interface, Commonly used Layouts and controls, Event handling, displaying message through toast, creating and starting a activity. Using the Edit Text control, Checkbox, Radio buttons,

Unit III

Laying out Controls in containers: Linear Layout, Relative Layout, Absolute Layout, Frame Layout, Table Layout, Grid Layout.

Unit IV

Adapting to screen orientation, Utilizing resources: types, values, dimension and color, applying styles and themes, Arrays, playing audio and video, displaying progress with progress bar.

Unit V

Displaying and fetching information using dialogs and fragments: What are dialogs?-selecting the date and time in one application. Fragments: The structure of a fragment, the life cycle of a fragment.

Text Books:

1. B.M. Harwani, Android Programming Unleashed, First Edition, Pearson publications, 2013.
2. Reto Meier, Professional Android 4 Application Development, Wiley India Pvt. Ltd., 2015.

Reference Book:

1. Pradeep Kothar, Android application developments, Dreamtech Press, 2014.

SEM : VI	ELECTIVE	C	L	P	T
ELECTIVE	BIG DATA ANALYTICS	4	5	-	5

Unit I

Overview of Big Data: What is Big Data? History of Data Management – Evolution of Big Data, Structuring Big Data, Types of Data, Elements of Big Data, Big Data Analytics and Advantages of Big Data Analytics, Careers in Big Data, Skills Required and Future of Big Data.

Unit II

Exploring the Use of Big Data in Business Context: Use of Big Data in Social Networking, Use of Big Data in Preventing Fraudulent Activities, Preventing Fraud Using Big Data Analytics, Fraud Detection Methods.

Unit III

Introducing Technologies for Handling Big Data: Distributed and Parallel Computing for Big Data, How data models and computing models are different.

Unit IV

Introducing Hadoop, HDFS and MapReduce, How does Hadoop Function? Understanding Hadoop Ecosystem: Hadoop Ecosystem, Hadoop Distributed File System, concepts of blocks in HDFS Architecture, Features of HDFS, MapReduce.

Unit V

Understanding Big Data Technology Foundations: Exploring the Big Data Stack, Data Sources Layer, Ingestion Layer, Storage Layer, Physical Infrastructure Layer, Platform Management Layer, Security Layer, Monitoring Layer, Analytics Engine, Visualization Layer, Big Data Applications, Virtualization and Big Data, Virtualization Approaches.

Text Book:

1. DT Editorial services, Big data black book, Dreamtech press, 2016.

Reference Books:

1. Judith Hurwitz, Alan Nugent, Fern Halper, Marcia Kaufman Big data for dummies, A Wiley brand, 2013.
2. The Wiley and SAS Business series , Taming the big data tidal wave, 2016.

SEM : VI	ELECTIVE	C	L	P	T
ELECTIVE	NATURAL LANGUAGE PROCESSING	4	5	-	5

Unit I

Introduction – Knowledge in Speech and Language Processing, Ambiguity, Models and Algorithms, Some Brief History. Regular Expressions and Automata – Regular Expressions – Finite State Automata – Regular Languages and FSAs.

Unit II

Words and Transducers, Finite-State Morphological Parsing, Construction of a Finite-State Lexicon, Finite-State Transducers, FSTs for Morphological Parsing, Transducers and Orthographic Rules, The Combination of an FST Lexicon and Rules, Lexicon-Free FSTs, Word and Sentence Tokenization, Detection and Correction of Spelling Errors, Minimum Edit Distance, Part-of-Speech Tagging

Unit III

Context Free Grammars for English Syntax- Context-Free Rules and Trees – Sentence - Level Constructions –Agreement – Sub Categorization – Syntactic Parsing – Top-down Parsing – Early Parsing - Probabilistic Context-Free Grammars – Feature Structures

Unit IV

Computational Semantics – Syntax – Driven Semantic Analysis, Semantic Augmentations, Quantifier Scope Ambiguity and Under specification, Unification-Based Approaches to Semantic Analysis, Integration of Semantics into the Earley Parser, Idioms and Compositionality

Unit V

Information Extraction – Named Entity Recognition – Advanced: Biomedical Information Extraction – Machine Translation – Why Machine Translation is hard – Classical MT and the Vauquois Triangle – Statistical MT – The Phrase – Based Translation Model

Text Book:

1. D. Jurafsky and J. Martin “Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition”, Second Edition, Pearson, 2013

Reference Books:

1. James Allen. “Natural Language Understanding”, second edition, Pearson, 1995.
2. Robert Dale, Hermann Moisl, Harold Somess, Handbook of Natural Language Programming, Marcel Dekker Inc, 2006

PROJECT

The Final Year Project (FYP) provides an important opportunity for students to plan, design and develop an application using any programming language or package tools.

The FYP is a substantial piece of work that will require creative activity and original thinking. A good FYP starts with the formulation of a problem, suggests alternative solutions, and then implements one of them. The Project should be scheduled over a period of 3 months (normally 6 hours per week) to potentially reach a working solution.

In general, the objectives of a final year project are to:

Allow students to demonstrate a wide range of the skills learned during their course of study by asking them to develop an application that has passed through the design, analysis, testing, and evaluation stages.

Allow students to develop problem solving, analysis, synthesis and evaluation skills.

The FYP reports should demonstrate an appropriate level of professional competence in the practical development of a suitable application.