Computer Section
FACULTY OF SCIENCE

SYLLABUS

BACHELOR OF COMPUTER APPLICATIONS

(B.C.A.)

B.C.A. (First and Second Semester) 2023-2024

B.C.A. (Third and Fourth Semester) 2024-2025

B.C.A. (Fifth and Sixth Semester) 2025-2026

JAI NARAIN VYAS UNIVERSITY

JODHPUR

BACHELOR OF COMPUTER PPLICATIONS
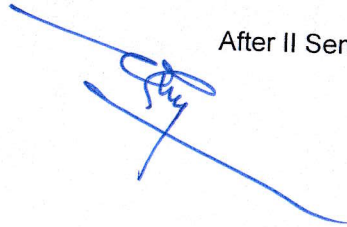# TEACHING AND EXAMINATION SCHEME 2024
First semester

Course Type	Course Code	Course Title	L	P	H/W	Credits	Sessional Marks	EoSE Marks	M.M
DCC	CSA5001T	Fundamentals Of Computers	3		3	3	30	70	100
DCC	CSA5002T	Mathematics For Computing	4		4	4	30	70	100
DCC	CSA5003T	Programming With 'C'	4		4	4	30	70	100
DCC	CSA5004T	Digital Logic	3		3	3	30	70	100
DCC	CSA5001P	'C' Programming Laboratory		2	4	2	30	70	100
DCC	CSA5002P	Office Tools Laboratory		2	4	2	30	70	100
AECC	CSA5005T	Communication Skills	2		2	2	30	70	100
		Total				20	210	490	700

BACHELOR OF COMPUTER APPLICATIONS
TEACHING AND EXAMINATION SCHEME 2024
Second semester

Course Type	Course Code	Course Title	L	P	H/W	Credits	Sessional Marks	EoSE Marks	M.M
DCC	CSA5006T	Multimedia Tools	3		3	3	30	70	100
DCC	CSA5007T	Object Oriented programming with C++	4		4	4	30	70	100
DCC	CSA5008T	Data Structure And Algorithms	4		4	4	30	70	100
DCC	CSA5009T	System Analysis and Design	3		3	3	30	70	100
DCC	CSA5003P	Object Oriented programming with C++ laboratory		2	4	2	30	70	100
DCC	CSA5004P	Data Structure And Algorithms Laboratory		2	4	2	30	70	100
AECC	CSA5010T	Environmental Science	2		2	2	30	70	100
		Total				20	210	490	700

After II Semester - Exit option with Certificate in Computer Applications (with a minimum of 40 credits)

BACHELOR OF COMPUTER APPLICATIONS
TEACHING AND EXAMINATION SCHEME 2025
Third Semester

Course Type	Course Code	Course Title	L	P	H/W	Credits	Sessional Marks	EoSE Marks	M.M
DCC	CSA6001T	Database Management System	4		4	4	30	70	100
DCC	CSA6002T	Computer Networks	4		4	4	30	70	100
DCC	CSA6003T	Introduction to JAVA programming	4		4	4	30	70	100
DCC	CSA6004T	Computer Oriented statistical Techniques	4		4	4	30	70	100
DCC	CSA6001P	Database Management System Laboratory		2	4	2	30	70	100
SEC	CSA6002P	Java Laboratory		2	4	2	30	70	100
		Total				20	180	420	600

BACHELOR OF COMPUTER APPLICATIONS
TEACHING AND EXAMINATION SCHEME 2025
Fourth Semester

Course Type	Course Code	Course Title	L	P	H/W	Credits	Sessional Marks	EoSE Marks	M.M
DCC	CSA6005T	Introduction to Internet Technology	4		4	4	30	70	100
DCC	CSA6006T	Operating System	4		4	4	30	70	100
DCC	CSA6007T	Introduction to Python Programming	4		4	4	30	70	100
DCC	CSA6008T	Client Server Computing	4		4	4	30	70	100
DCC	CSA6003P	Python Programming Laboratory		2	4	2	30	70	100
SEC	CSA6004P	Internet Technology Laboratory		2	4	2	30	70	100
		Total				20	180	420	600

After IV Semester - Exit option with Diploma in Computer Applications (with a minimum of 80 credits)

BACHELOR OF COMPUTER APPLICATIONS
TEACHING AND EXAMINATION SCHEME 2026
Fifth semester

Course Type	Course Code	Course Title	L	P	H/W	Credits	Sessional Marks	EoSE Marks	M.M
DSE	CSA 7101T	Introduction to Artificial Intelligence and Machine Learning	4		4	4	30	70	100
	CSA 7102 T	Design and Analysis of Algorithms							
DSE	CSA 7103T	Computer System Architecture	4		4	4	30	70	100
	CSA 7104T	Compiler Design							
DSE	CSA 7105T	Software Engineering	4		4	4	30	70	100
	CSA7106T	Introduction to Linux operating system							
DSE	CSA 7107T	Mobile Application Development	4		4	4	30	70	100
	CSA7108T	R Programming							
DSE	CSA 7101P	Mobile Application Development Laboratory		2	4	2	30	70	100
	CSA 7102P	R Programming Laboratory							
SEC	CSA 7103P	Seminar		2	4	2	30	70	100
		Total				20	180	420	600

Note : Laboratory subject will be offered based on the corresponding theory subject selected as elective

BACHELOR OF COMPUTER APPLICATIONS
TEACHING AND EXAMINATION SCHEME 2026
Sixth semester

Course Type	Course Code	Course Title	L	P	H/W	Credits	Sessional Marks	EoSE Marks	M.M
DSE	CSA 7109T	Data Science	4		4	4	30	70	100
	CSA7110T	Computer Graphics							
DSE	CSA 7111T	Web Programming Using C#	4		4	4	30	70	100
	CSA7112T	VB.NET							
DSE	CSA 7113T	Cyber Security	4		4	4	30	70	100
	CSA7114T	Principles of Management							
DSE	CSA 7115T	Cloud Computing	4		4	4	30	70	100
	CSA7116T	Introduction to IOT							
DSE	CSA 7104P	Web Programming Using C# Laboratory		2	4	2	30	70	100
	CSA 7105P	VB.NET Laboratory							
SEC	CSA 7106P	Minor Project		2	4	2	30	70	100
		Total				20	180	420	600

Note : Laboratory subject will be offered based on the corresponding theory subject selected as elective

After VI Semester - Exit Option with Bachelor of Computer Applications Degree, BCA Degree (with a minimum of 120 credits)

BCA- FIRST YEAR FIRST SEMESTER

CSA 5001T FUNDAMENTALS OF COMPUTERS

Brief history of development of computers, Computer system concepts, Computer system characteristics, Capabilities and limitations, Types of computers-Analog, Digital, Hybrid, General, Special Purpose, Micro, Mini, Mainframe, Super, Generations of computers, Personal Computer (PCs) - configurations, Pentium and Newer PCs specifications and main characteristics. Types of PCs- Desktop, Laptop, Notebook, Palmtop, Workstations etc. their characteristics. Basic components of a computer system - Control unit, ALU, Input/Output functions and characteristics, memory - RAM, ROM, EPROM, PROM and other types of memory.

Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, Scanners, Digital Camera, MICR, OCR, OMR, Bar-code Reader, Voice Recognition, Light pen, Touch Screen, Monitors - characteristics and types of monitor -Digital, Analog, Size, Resolution, Refresh Rate, Interlaced / Non Interlaced, Dot Pitch, Video Standard - VGA, SVGA, XGA etc, Printers - Daisy wheel, Dot Matrix, Inkjet, Laser, Line Printer, Plotter, Sound Card and Speakers, Storage fundamentals - Primary Vs Secondary Data Storage and Retrieval methods - Sequential, Direct and Index Sequential, Various Storage Devices - Magnetic Tape, Magnetic Disks, Cartridge Tape, Hard Disk Drives, Floppy Disks (Winchester Disk), Optical Disks, CD, VCD, CD-R, CD-RW, Zip Drive.

Types of Software - System software, Application software, System Software - Operating System, Utility Program, Programming languages, Assemblers, Compilers and Interpreter, Operating Systems - Functions, Types- Batch, Single, Multiprogramming, Multiprocessing, Programming languages- Machine, Assembly, High Level, 4GL, their merits and demerits, Application Software - Word-processing, Spreadsheet, Presentation Graphics, Data Base Management Software, characteristics, Uses and examples and area of applications of each of them, Virus working principles, Types of viruses, virus detection and prevention, viruses on network.
Physical structure of disk, drive name,

Filesystems-FAT, NTFS, File & directory structure and naming rules, booting process, Basic commands such as DIR, MD, CD, RD, COPY, DEL, REN, VOL, DATE, TIME, CLS, PATH, TYPE , Introduction to Linux, Linux directory structure, Linux basic commands

CSA 5002T MATHEMATICS FOR COMPUTING

Set, Relation and Functions: Sets, type of sets, Cartesian product of sets, Relations, type of relation, Domain and Range of a relation, Functions, Domain, co-domain and Range of a function, types of a function, composite of a function, Binary operations, type of binary operations

Trigonometry: Concept of Angles, measurement of angles in Degree and radian and their conversions, trigonometrical ratios of angles, trigonometrical ratios of sum of two angles, trigonometrical ratio of an angle 2A in term of angle A.

Cartesian system of rectangular coordinates: The number plane, distance formula area of a triangle, section formulae, slopes of a line, locus and equation.

Straight line: To find equation of a straight line parallel to an axis: the point slope form, two-point form, intercept form, slope-intercept form, normal form, condition of concurrency for three straight lines, analytical proof of geometric theorems.

Circle and family of circles: Standard form of equation of a circle, its general form, condition of tangentancy.

Polynomial: standard form of polynomial, notation, degree of polynomial, type of polynomial (monomial, binomial, trinomial only), polynomial operations (Addition, subtraction, multiplication), solving polynomial (linear and Quadratic).

Quadratic equation: Solution of quadratic equations, symmetric functions of roots.

Matrix: Definition and type of matrices, operation on matrices i.e. addition, subtraction and multiplication of a matrix, Properties and applications, elementary transformation of a matrix, inverse of a matrix, normal form of a matrix, orthogonal matrices.
Determinants: Definition and expansion of determinants, determinant of a square matrix od order 2 and 3, minors and Cofactors, singular and non-singular matrix, Adjoint of matrix, Inverse of a matrix.

Permutation and Combinations: Factorial notations, Value of n_{P_r} and n_{C_r}

CSA 5003T PROGRAMMING WITH C

Program Concept, Programming aids: Algorithms, Flow Charts - Symbols, Rules for making Flow chart, Pseudocodes,

Introduction & features of C, Structure of C program, Variables, Expressions, Identifiers, Keywords, Data Types, Constants, Operator and expression Operator: Arithmetic, Logical, Relational, Conditional and Bit wise Operators, Precedence and Associativity of Operators, Type conversion in expression, Basic input/output and library functions Single character input/output i.e. getch(), getchar(). getche(), putchar(),Formatted input/output i.e. printf() and scanf(), Library functions

If statement, If.....Else statement, Nesting of If....Else Statement, else if ladder, The ?: operator, Switch statement, Compound statement, Loop controls, for, while, do-while loops, break, continue,
ARRAYS Single and Multi Dimensional arrays, Array declaration and initialization of arrays,
Strings : declaration, initialization, functions.
The need and form of C functions, User defined and library functions, Function arguments, Return values and nesting of function, Recursion, Calling of functions, Scope and life of variables - local and global variable, Storage class specified - auto, extern, static, register.

Defining structure, Declaration of structure variable, accessing structure members, Union,
working with text files reading a text file and writing to a file.
Understanding pointers, Declaration and initializing pointers, pointer expressions

CSA 5004T DIGITAL LOGIC

Data types and Number systems, Binary number system, Octal & Hexa-decimal number system,1's&2's complement, Binary Fixed-Point Representation,
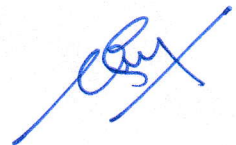Arithmetic operation on Binary numbers, Overflow & underflow, Floating Point Representation, Codes, ASCII, EBCDIC codes, Gray code, Excess-3&BCD

Logic Gates, AND, OR, NOT GATES and their Truth tables, NOR, NAND & XOR gates, Boolean Algebra, Basic Boolean Law's, Demorgan's theorem, MAP Simplification, Minimization techniques, K–Map- 2,3 variable, Sum of Product & Product of Sum
Combinational circuits: Half Adder & Full Adder, Half sub tractor, Full sub tractor, Multiplexer, Demultiplexer, Encoder, Decoder,
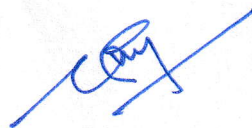
Idea about Arithmetic Circuits, Program Control, Instruction Sequencing, Auxiliary memory, Associative Memory, Virtual Memory,

Sequential circuits: Flip Flops: RS, D using NAND and NOR Gates, Gated Flip Flops (latches), J-K Flip Flop, T- Flip Flop, J – K Master Salve Flip Flop Registers: Sift Register, Buffer Register.

CSA 5001P C PROGRAMMING LABORATORY

1. Program to read radius of a circle and to find area and circumference

2. Program to read three numbers and find the biggest of three

3. Program to demonstrate user defined and built in library functions

4. Program to check for prime number

5. Program to print prime numbers

6. Program to read a number, find the sum of the digits, reverse the number and check it for palindrome

7. Program to read numbers from keyboard continuously till the user presses 999 and to find the sum of only positive numbers

8. Program to read percentage of marks and to display appropriate message (Demonstration of else-if ladder)

9. Program to find the roots of quadratic equation (demonstration of switch Case statement)

10. Program to read marks scored by n students and find the average of marks

11 Program to find the length of a string without using built in function

12. Program to demonstrate string functions.

13. Program to demonstrate pointers in C
14. Program to read a file and write to a file

CSA5002P OFFICE TOOLS LABORATORY

1. Write a paragraph in MS-Word and show the use of various tools.
2. Write an application & copy it to another document and differentiate between paste and paste special.
3. How to Insert a picture or chart in a document and reference it to another document?
4. Write a paragraph in MS-Word of 12 lines and Explain these Formatting tools:-
   - Columns.
   - Drop cap.
   - Paragraph.
   - Alignment.
   - Bullet and Numbering.
   - Tab Setting.
5. What is mail merge? How to use this facility? Describe it Step by Step.
6. Create a Student Table(Rno, Name, Fname, Class, Address, Phone)and insert 5 records in it and delete one record.
7. To study various charts and their implementations using a marksheet of 10 students.
8. Create a salary statement of an organization of 10 employees using if condition (S.no. , Name, Designation, Basic, Da, Hra, total, net salary)
9. Create a
10. Create a power point presentation to present your institution detail, create at least 7 slides with different animation effect.
11. Create a power point presentation on "destination India" using images from clipart.
12. Create a power point presentation on "youth icon of India" and show the following
13. Custom Animation.
14. Compare and Merge Presentations.
15. Slide Design.

CSA 5005T COMMUNICATION SKILLS

Theory of Communication: What are Communication, Types of Communication, Process of Communication, and Feedback, Barriers of communication, importance and Purpose of communication, Verbal and non-Verbal communication, Formal and Informal communication.
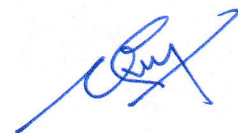
Non-Verbal Communication: Personal Appearance, Gestures, Postures, Face Expression, Eye Contact ,Body Language, Tips for improving Non-Verbal Communication.

Motivation: Concept of Motivation, Types of Motivation, People Skills, General Awareness

Reading and Listening skills, Writing and speaking skills: Note making, Letter writing, writing formal letters, Memo, circulars Agenda , E-mail, Fluency Enhancement, Group Discussion, Role Play, Anchoring , Effective writing

PRESENTATION SKILLS : Techniques of Presentation, Planning a Presentation, Preparing a Presentation, Methods of preparing Presentation, Delivering the Presentation, Removal of stage fear, Tools of Presentation (Transparencies, Slides & Audio-Visual Tools) ,

Oral presentation skills - Preparation of Formal Speech, Meetings, Interviews, Group Discussion, Debate, Elocution, Extempore, Public speaking

BCA- FIRST YEAR SECOND SEMESTER

CSA 5006T MULTIMEDIA TOOLS

Identifying Multimedia elements – Text, Images, Sound, Animation and Video, Making simple multimedia with PowerPoint. Text – Concepts of plain & formatted text, RTF & HTML texts, using common text preparation tools, Conversion to and from of various text formats, using standard software, Object Linking and Embedding concept, Basics of font design, overview of some fonts editing and designing tools, Understanding & using various text effects.

Images – importance of graphics in multimedia, Vector and Raster graphics, image capturing methods – scanner, digital camera etc. various attributes of Images – size, color, depth etc, Various Image file format – BMP, PIC, JPG, PNG and TIF format – their features and limitations, processing images with common software tools such as Photoshop, Paint Shop pro, Corel draw etc..

Sound: Sound and it Attributes, Mono V/s Stereo sound, Sound Depth, Channels, Capturing and Editing sound on PC, Overview and using some sound recording, editing software. Overview of various sound file formats on PC – WAV, MP3, MP4

Animation: Basics of animation, Principle and use of animation in multimedia, Effect of resolutions, pixel depth, Images size on quality and storage. Overview of 2-D and 3-D animation techniques and software Animation on the Web, creating simple animations for the Web using GIF Animator and Flash.

Video: Basics of Video –Introduction to graphics accelerator cards, DirectX, Interlacing and non-interlacing, Brief note on various video standards – NTSC, HDTV, Introduction to video capturing Media & instrument – Videodisk, DVCAM, Camcorder,
Introduction to digital video compression techniques and various file formats – AVI, MPEG,
Multimedia on the Web: Text in the web, Audio on the Web – Real Audio and MP3/MP4, Video on the Web – Streaming video,

CSA5007T OBJECT ORIENTED PROGRAMMING WITH C++

Basic concept of Object Oriented Programming, concept of class, object, inheritance, encapsulation, polymorphism.

Structure of C++ program, token and identifier, data types, operator, type conversion and type cast operators. Console I/O cin and cout. Control statements, if, loops, break, continue, goto.

Functions- Declaration, definition, parameter passing, reference variable, overloaded functions, inline functions, default arguments, return by reference.

Classes and objects, class definition, object declaration, constructors and destructors, dynamic initilization of objects, copy constructors.

Operator overloading, unary, binary operator, data and type conversions, conversion among objects, basic types and different classes.

Derived classes and base classes, protected access specifier, derived class constructors, abstract base class, inheritance – public and private inheritance, multiple inheritance, member function, constructor, ambiguity in inheritance.

Pointers, addresses, pointers and strings, memory management using new and delete operator.

Virtual functions, friend function, static function, dynamic binding.

File handling, File Operation functions and attributes.

Introduction to streams, templates and exception handling.

CSA 5008T DATA STRUCTURES AND ALGORITHMS

Elementary data Structures: Arrays, STACKS: Definition, implementation, operations on stack, application of stacks, evaluation of arithmetic expression and recursion, Prefix fix and post fix notations, evaluation of post fix expression using stacks, parenthesis matching using stck

Queues: Queue data structure, implementation, operations on queues- insertion, deletion, Circular queue, applications

Linked lists: Singly linked list, Inserting and deleting element, searching in a list, Circularly linked list, Doubly linked list Application of linked list:

Trees: Concepts and terminology, tree representation using linked list, Binary tree, Linear and linked representation of binary tree, Tree traversal, In order, Preorder and post order traversal.

Graphs: Representation, Adjacency matrix, Graph traversal, Breadth first search and Depth first search traversal.

Searching and Sorting: Sequential searching, binary searching, Bubble, Selection and Insertion sort, quick sort and merge sort, Hashing

CSA 5009T System Analysis and Design

System Development Life Cycle: Various phases of system development, Considerations for system planning and control for system success.

Initial Investigation: Determining users requirements and analysis, fact finding process and techniques.
Feasibility study: Determination of feasibility study, Technical, Operational & Economic Feasibilities, System performance constraints, and identification of system objectives, feasibility report.

Cost/Benefit Analysis: Data analysis, cost and benefit analysis of a new system. Categories determination and system proposal.

Tools of structured Analysis: Logical and Physical models, context, diagram, data dictionary, data diagram, form driven methodology, IPO and HIPO charts, Gantt charts, system model, pseudo codes, Flow charts- system flow chart, run flow charts etc., decision tree, decision tables, data validation,
Input/ Output and Form Design: Input and output form design methodologies, menu, screen design, layout consideration.

Management standards, Documentation standards – User Manual, system development manual, programming manual, programming specifications, operator manual.
System testing & quality: System testing and quality assurance, steps in system implementation and software maintenance.
System security: Data Security, Disaster/ recovery and ethics in system development, threat and risk analysis.

CSA 5003P OBJECT ORIENTED PROGRAMMING WITH C++ LABORATORY

1. Write a program to read your name and display the name and its length
2. Write a program to implement a point class having p(x,y). Perform following
   * Swap the value of two point objects
   * Pass a point object to a function and modify the value and return the object.

3. Write a program to create a time class. Perform the addition of time in hour and minute format.

4. Write a program to add two complex numbers using operator overloading.

5. Write a program for string addition and string comparison using operator overloading (use + & == operators).

6. Write a program that reads a text file and create a file that is identical to it except that every consecutive sequence of blank spaces is replaced by a single space.

7. Create a data file that will store the marks obtained by students in three subjects. Read the created file , find total of each student and create a new file with marks obtained in three subjects and total.

8. Write a program containing an exception. Use try and catch to handle the exception.

9. Write a program to implement Inheritance of various types

CSA 5004P DATA STRUCTURE AND ALGORITHMS LABORATORY

1. Design and implement Stack and its operations using arrays
2. Design and implement Queue and its operations using arrays
3. Design and implement linked list and its operations
4. Write a program to create a tree using linked list
5. Write a program to represent a graph using adjacency matrix
6. Write a program to implement linear search
7. Write a program to implement binary search
8. Write a program to implement Selection sort
9. Write a program to implement Insertion sort

CSA 5010T ENVIRONMENTAL SCIENCE

The multidisciplinary nature of environmental studies, Definition, scope and importance, Need for public awareness.

Natural Resources: Renewal and non-renewable resources, Natural Resources and associated problems.
Forest Resources: Use and over – exploration, deforestation, mining and their effects on forest and tribal people.
Water Resources: Use and over-utilization of surface and groundwater, floods and drought.
Food Resources: World food problem, effects of modern agriculture, fertilizer & pesticide problems.
Land Resources: Land degradation, soil erosion and desertification.

Ecosystem: Structure and function of an ecosystem. Energy flow in the ecosystem, food chains, food webs and ecological pyramids.

Structure and function of following ecosystem - Desert ecosystem and Aquatic ecosystem

Biodiversity and its conservation: Introduction, Definition, Value of Biodiversity, Threats to biodiversity, Important endangered and endemic species of India.

Environmental Pollution: Definition, causes, effects and control measures of : Air pollution, water pollution and soil pollution.

BCA- SECOND YEAR THIRD SEMESTER

CSA6001T DATABASE MANAGEMENT SYSTEM

Purpose of the data base system, data abstraction, data model, data independence, data definition language, data manipulation language, data base manager, data base administrator, data base users

ER Models, entities, mapping constrains, keys, E-R diagram, reduction E-R diagrams to tables, generalization and aggregation, design of an E-R data base scheme.

Normalization : First, Second, Third, BCNF, Fourth and Fifth Normal Forms

Oracle RDBMS, architecture, kernel, system global area (SGA), data base writer, log writer, process monitor, database files, control files,

SQL: commands and data types, data definition language commands, data manipulation commands, data query language commands, transaction language control commands, data control language commands.

Joins, equi-joins, non-equi-joins, self joins, other joins, aggregate functions, math functions, string functions, group by clause,

PL/SQL, basics of pl/sql, data types, control structures, database access with PL/SQL, data base connections, transaction management, data base locking, cursor management.

CSA 6002T COMPUTER NETWOKS

Introduction to Data Communication and computer Networks:- Transmission media, twisted pair, coaxial cable, optical fiber,

Network Devices-Hubs, Bridge, Switches, Router.

Principle of Layering Concept: - ISO-OSI Model, functions of each layer, TCP/IP Model. Concepts of circuit switching, packet switching and network switching.

Elements of LAN, WAN, MAN.
LAN topologies: STAR, BUS and RING network ,LAN access techniques: ALOHA, CSMA/CD, CSMA/CA, token ring and token bus. Issues related with network reliability and security.

Ethernet:-Ethernet Standards ZigBee, Wifi etc.

Error detection and correcting codes: Hamming codes, parity generation and detection, single error detection and correction, double correction codes, CRC.

IP Addressing:- Internet Protocol and IPv4 Packet format, logical Addresses, Physical addresses, Network Part, Host part, Network Masks. Introduction to IPv6.

CSA 6003T Introduction to JAVA Programming

Principles of OOP, data hiding, encapsulation, inheritance, polymorphism, overloading,

JAVA program structure, JAVA virtual machine, Constant & Variables, Data Types, Declaration of Variables, Scope of Variables, Symbolic Constants, Type Casting.

Operators : Arithmetic, Relational, Logical Assignments, Increment and Decrement, Conditional, Bitwise
If statement, if...else... statement, Nesting of if...else... statements, else...if Ladder, Switch, ? operators, Loops – While, Do, For, Jumps in Loops, Labelled Loops.

Defining a Class, Creating Objects, Accessing Class Members, Constructors, Methods Overloading, Static Members,

Inheritance: Derived classes and Base class, public, private and protected access specifiers,
Extending a Class, Overriding Methods, Final Variables and Methods, Final Classes, Finalize Methods, Abstract methods and Classes,

Arrays: One Dimensional & two Dimensional, strings,

Defining Interface Extending Interface, Implementing Interface, Accessing Interface Variable,

System Packages, Using System Package, Adding a Class to a Package, Hiding Classes.
Creating Threads, Extending the Threads Class, Exceptions, , Implementing the Runnable Interface.

Local and Remote Applets Writing Applets, Applets Life Cycle, Creating an Executable Applet

CSA 6004T Computer Oriented Statistical Techniques

Introduction: Raw material of statistics, ungrouped & grouped frequency distribution. Diagrammatic presentation: Bar diagram, Pie-diagram. Graphical presentation: Histogram, Frequency polygon, Frequency curve, Cumulative frequency curve.

Measures of Central Tendency and Dispersion: Arithmetic Mean, Mode, Median, Geometric Mean, Harmonic Mean, Range, Mean Deviation, Standard Deviation, Skewness and Kurtosis.

 Correlation and Regression Analysis: Linear Correlation, Measures of Correlation, The Least-Squares Regression Lines, Standard Error of Estimate, Explained and Unexplained Variation, Coefficient of Correlation,, Scatter diagram, Karl Pearson, Concurrent deviation methods, Regression Lines, Method of least square.,

Probability & Probability Distribution: , Independent and Dependent Events, Mutually Exclusive Events, Classical approach to probability, Addition and multiplicative law of probability, Conditional probability, Bayes Theorem, Probability Distributions

 Sampling Theory, Random Samples and Random Numbers, Sampling With and Without Replacement, Sampling Distributions, Sampling Distribution of Means, Sampling Distribution of Proportions, Sampling Distributions of Differences and Sums, Standard Errors,
Small Samples, Student's t Distribution, Confidence Intervals, Tests of Hypotheses and Significance, The Chi- Square Distribution, Confidence Intervals for Sigma , Degrees of Freedom, The F Distribution.

CSA 6001P DATABASE MANAGEMENT SYSTEM LABORATORY

Q1 Draw E-R diagram of banking system
Q2 Convert the ER diagram of question 1 of banking system into relation table.
Q3 Create a database of an organization with appropriate tables and perform the following

- Display all the employees' details that belong to department SALES
- Display employees name along with their Salary who are MANAGER.
- Display the employees who are getting Salary between 25000 and 50000.
- Display employees that are not managers.
- Display employees whose name begins with Character 'R'.
- Display employees that are analyst but getting salary greater than 30000.
- Display all the employees having 'A' in their names.
- Display all the employees having T and 'R' in their names.
- List the average salary for each department. Then find out the employees who are getting more than that average salary.

Q4 Perform following operations on the tables.
- ALTER
- DROP
- UPDATE

Q5 Perform following on a table of a database
- INSERT into
- SELECT
- DELETE
- Min max count
- like and between

CSA 6002P JAVA LABORATORY

1. Write a program that prints all integer between 0 and 36.

2. Create an array of 4 random numbers.

3. Create a rectangle class that contains width and height fields also give it a getarea() method again. Make a few test cases.

4. Write a Java program to create a class called "Rectangle" with width and height attributes. Calculate the area and perimeter of the rectangle

5. Write a Java program to create a class called "Employee" with a name, salary, and hire date attributes, and a method to calculate years of service

6. Create a class with three different methods to calculate minimum, maximum and addition of integers

7. Create a class Fruit which has data members- color and taste. Create constructor to set the values of data members and a method Details() which prints the values of color and taste. Create a new class Apple which inherits from Fruit class and has data members- size and condition.

8 Write and execute java program which create a shape class and derive circle and rectangle classes from shape class. All the classes in this program should have proper constructors and methods to display details of different shapes. Also use appropriate access specifiers in your program

9. Create an interface Account having methods- deposit(), withdraw() and aboutBank() (aboutBank() is a static method). Create two classes Saving and Current which implement the Account interface. Call the methods of Saving and Current classes in main method

10. Write an Applet program to display the "Hello World " in the browser.

11. Write an Applet program that automatically display the text with Font Style, Font type.

12. Write a program to illustrate usage of try/catch with finally clause.

13. Write a program to describe usage of throws clause.

14. Write a program for creation of user defined exception.

BCA- SECOND YEAR FOURTH SEMESTER

CSA 6005T INTRODUCTION TO INTERNET TECHNOLOGY

WORLD WIDE WEB (WWW) - Working, Web Browsers, Its functions, URLs, web sites, Domain names, Portals. Concept of Search Engines, Search engines types, searching the Web, Web Servers, TCP/IP and others main protocols used on the Web. E-Mail: Concepts, POP and WEB Based E-mail, merits, address, Basics of Sending & Receiving, E-mail Protocols, Mailing List, Free E-mail services, e-mail servers and e-mail clients programs.

Concepts of Hypertext, HTML introduction, features, uses & versions Using various HTML tags, Elements of HTML syntax, Head & Body Sections, , Inserting texts, Text alignment, Using images in pages, Hyperlinks – text and images, bookmarks, Backgrounds and Color controls, creating and using Tables in HTML, and presentation, Use of font size & Attributes, List types and its tags. Cascading Style sheets – defining and using CSS.

Design tools for HTML, popular HTML editors, designing web sites, Use of Frames and Forms in web pages, Image editors, static and dynamic Websites, Issues in Web site creations & Maintenance,

E - Commerce An introductions, Concepts, Advantages and disadvantages, Technology in E- Commerce, Internet & E-business, Applications, Feasibility & various constraints. E-transition challenges for Indian corporate, the Information Technology Act 2000 and its highlights related to e-commerce.

Electronic Payment Systems: Introduction, Types of Electronic Payment Systems, Digital Token-Based Electronic Payment Systems, Smart Cards and Electronic Payment Systems, Credit Card-Based Electronic Payment System.

CSA 6006T OPERATING SYSTEM

Operating Systems Definitions, Types of operating system, Functionalities and Characteristics of OS, Hardware Concepts related to OS, Operating system Services, and System Calls, System programs, System structure.

Process Concepts, process state & process control block, Process Scheduling FCFS, SJF, Priority Scheduling, Round robin, Algorithms, multiple level queue scheduling Threads concepts, Critical Section Problem and Mutual Exclusion, Semaphores, Classical Problem of Synchronization, Deadlock, prevention, Avoidance, detection and Recovery

Memory Management, Logical versus physical address space, Swapping, Contiguousand Non Contiguous Allocating, Paging, Segmentation, Demand Paging, Page Replacement Algorithm, FIFO, LRU, LIFO, Hit ratio Virtual Memory Concepts.

Disk Scheduling algorithms, Swap Space Management, Disk reliability, Stable Storage Implementation.

Types of Mobile OS, Overview of Android OS, Application of Mobile OS, Overview of Linux OS.

CSA 6007T INTRODUCTION TO PYTHON PROGRAMMING

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

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.

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, List Slicing, List comprehension, string manipulation methods, List manipulation. Dictionary manipulation, Programming using string, list and dictionary in-built functions. Python Functions, Organizing python codes using functions.
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. Exception handling in Python,Python packages: Simple programs using the built-in functions of packages matplotlib, numpy, Pandas.

CSA 6008T CLIENT SERVER COMPUTING

Introduction to Client/Server computing - Basic Client/Server Computing Model, Server for Every Client- File Server, Print Server, Application Server, Mail Server, Directory Services Server, Web Server, Database Server, Transaction Servers. Client/Server-Fat or Thin, Stateless or Stateful, Servers

Client/Server Types-Single Client/Single Server, Multiple Clients/Single Server, Multiple Clients/Multiple Servers, Integration With Distributed Computing, Alternatives To Client/Server Systems. Classification of Client/Server Systems-Two-Tier Computing, Middleware, Three-Tier Computing- Model View Controller (MVC), Principles behind Client/Server Systems. Client/Server Topologies. Existing Client/Server Architecture.

Client- Services, Request for services, RPC, Windows services, Print services, Remote boot services, other remote services, Utility Services. Server- Detailed server functionality, Network Client/Server Technology and Databases - Storing Data, Database System Architectures.

Client/Server In Respect Of Databases- Client/Server Databases, Client/Server Database Computing, Database Computing Vs. Mainframe, PC/File Server Computing. Client/Server Database Architecture - Process-Per-Client Architecture, Multi-Threaded Architecture, Hybrid Architecture.

CSA 6003P PYTHON PROGRAMMING LABORATORY

1. Read a list of numbers and write a program to check whether a particular element is present or not using membership operators.

2. Read your name and age and write a program to display the year in which you will turn 100 years old.

3. Read width and length of a cone and write a program to find the area of a rectangle cone.

4. Write a program to compute distance between two points taking input from the user (Hint: use Pythagorean theorem)

5. Write a program to read a string and print the vowels present in the string

6. Write a Python function that takes two lists and returns True if they have at least one common member.

7. Write a Python program to get the largest number from a list

8. Write a Python program to sum all the items in a list.

9. Write a Python program to append a list to the second list.

10. Use list to store [1,2,3,...,12] and [Jan, Feb, Mar,..., Dec]. Create a dictionary using these lists where key values are 1,2,3... and value are Jan,feb,Mar,.... Print the key and value elements of the created dictionary.

11. Write a program to read and print all the lines of a text file.
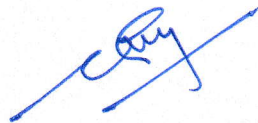12. Write a program for handling exceptions

CSA 6004P INTERNET TECHNOLOGY LABORATORY

1.Design a HTML document using basic elements like:
    <HTML>, <body>, <head>, <title>, <br>, <hr>.

2.Design a HTML document which show the use of following Text formatting tag:
    center, sup, em, ins, sub, font, h1 to h6.
3.Design a HTML document to demonstrate all computer output tag:
    code, kbd, samp, tt, var, pre, listing, xmp.
4.Design a HTML document which demonstrate the use of following tag:
    abbr, acronym, address, bdo, blockquote, .
  Also apply these character entities in your HTML document:
    Non-breaking space
    <
    >
    "
    &
    ,

5. Demonstrate how to create a link in an HTML document.
6. Demonstrate how to use an image as a link in HTML document.
7. Demonstrate how to link to another page by opening a new window
8. Demonstrate how to use a link to jump to another part of same document.
9. Demonstrate how to make a vertical and horizontal frameset with three different documents.
10. Design a HTML document which does not allow a user to resize frame.
11. Demonstrate how to make a navigation frame. This navigation frame contains a list of links with the second frame as the target.
12. Design a HTML document having
       Colored background table.
       Table having image in background.
       Colored background cell.
       Table having image in only one cell.
13. Demonstrate how to use the "frame" attribute (with values like: box, void, above, below, hside, vside, lhs, rhs) and border

BCA- THIRD YEAR FIFTH SEMESTER

CSA 7101T Introduction to Artificial Intelligence and Machine Learning

Introduction, AI problems, Examples, Applications., Challenges

Intelligent behavior. The Turing test, Agent, Environment,. Rational versus non-rational reasoning. Nature of environments - Fully versus partially observable, Single versus multi-agent, Deterministic versus stochastic, Static versus dynamic, Discrete versus continuous.

Nature of agents: Autonomous versus semi-autonomous, Reflexive, goal-based, and utility-based. The importance of perception and environmental interactions

Basic Search: Strategies Problem spaces, problem solving by search, Uninformed search -breadth-first, depth-first, depth-first with Iterative deepening.

Perceptron & Neural Network Learning – Feed Forward & Back Propagation

Basic Machine Learning Applications, Machine Learning algorithms,
Supervised Learning - Regression and Classification, Decision Trees, Measuring classifier accuracy, SVM, Measuring accuracy, Confusion matrix
Unsupervised Learning: Clustering, K-means, Reinforcement learning

CSA 7102 T DESIGN AND ANALYSIS OF ALGORITHM

Introduction: Algorithm Specification-Simple example of design and analysis of time complexity-Performance Analysis: Space Complexity and Time complexity, Asymptotic Notation -(Big-O,θ,Ω, and little-o & Ω).

Divide and Conquer algorithm: Introduction to Divide and Conquer Algorithms - Master Theorem – Sorting - Insertion Sort, Merge Sort using links, Quick Sort- Analysis of linear and binary search algorithm. Horner's method of evaluation a polynomial at a given point, Strassen's Matrix Multiplication.

Dynamic programming: Design and analysis, Computing a Binomial Coefficient, Multistage graphs, Traveling salesman problem. Greedy approach: General method, Dijkstra's Algorithm, Knapsack problem, Minimum cost Spanning trees, Single source shortest path problem.

Back tracking: General method - Sum of subsets - 4-Queen Problem using backtracking. Branch and Bound method,,Traveling Salesman problem using Branch and Bound method.

CSA 7103T COMPUTER SYSTEM ARCHITECTURE

Microprocessor systems with bus organization, Microprocessor Architecture & Operations, Memory, I/O Device, Memory and I/O Operations

CPU Organization: Data, Address & control bus, ALU, Instruction formats, Stack organization, Subroutines, Addressing modes-Direct, indirect, Immediate, Indexed and relative. Addressing formats one, two and three addresses.

Microprocessor: Architecture of 8085 microprocessor, Registers, Pins of 8085 microprocessor.
Instruction set of 8085, Mnemonics and operation codes of data transfer group, Arithmetic group, Logic group, Branches group and stack, I/O and Machine control group, Assembly language, Assembler,

Architecture of 8086 microprocessor: register organization, bus interface unit, execution unit, memory addressing, memory segmentation.

Simple programs in assembly language, Writing, Assembling & Executing A Program.

CSA 7104T Compiler Design

Introduction to translators , compilers, interpreters, compilation process.

Lexical analyzer, input buffering, specification and recognition of tokens, regular expressions to NFA, minimization of DFA, keywords, LEX - the lexical analyzer generator. Syntax analyzer, context free grammars, top down parsing, Brute force parser, recursive descent parser, LL (1) parser. Bottom up parsing, operator precedence parsing, LR parser, LALR parser,

Syntax directed translation schemes, implementation of syntax directed translators, construction of syntax trees, bottom up evaluation of S- attributed definitions, L- attributed definitions, top down translation of L - attributed definitions. Errors, lexical phase errors, syntactic phase errors.

Intermediate languages, postfix notation, syntax trees, parse trees, three address code- quadruples, triples and indirect triples. Translation of assignment statements, boolean expressions, statements that alter flow of control, array references, procedure calls, declarations, case statement, record structures.

Symbol tables, operation on symbol tables

Code optimization, sources of optimization, loop optimization,. Code generation, a machine model, ,

CSA 7105 T SOFTWARE ENGINEERING

Introduction: The Evolving Role of Software, Software characteristics, Software Engineering as a Layered Technology, Software Process Framework and Umbrella Activities, Process Models. Software Development Life Cycle. Models – Waterfall, Spiral, Prototype, Agile, TSP, Extreme Programming

Requirement Analysis: Software Requirement Analysis, Initiating Requirement Engineering Process, Requirement Analysis and Modelling Techniques, Flow Oriented Modelling, Need for SRS, Characteristics and Components of SRS.

Software Project Management: Estimation in Project Planning Process, Project Scheduling. Risk Management: Software Risks, Risk Identification, Risk Projection and Risk Refinement, Software Design: Identifying Actors, Use cases and Actions. Identify Objects & Classes. Generalization, Specialization, Aggregation & Relationships. Class Diagrams. Modelling interactions using Sequence Diagrams

Software Engineering Principles &Tools: Tools of Design (Data Flow Diagrams, Data Dictionary, Decision Tree, Decision Tables), Modularization (Coupling)

Testing Strategies & Tactics : Software Testing Fundamentals, Test Strategies for Conventional Software, Validation Testing, System testing, Black-Box Testing, White-Box Testing and their type, Basis Path Testing.

CSA 7106 T Introduction to Linux operating system

LINUX architecture, features of LINUX, Directory structure, booting, login, Root login, superuser, configuration files, ,introduction to vi editor. Linux commands, file handling utilities, security by file permissions, process utilities, disk utilities, networking commands
Introduction to Shells: Linux Session, Standard Streams, Redirection, Pipes, Tee Command, Command Execution, Command-Line Editing,
UNIX FILE STRUCTURE: Introduction to UNIX file system, inode (Index Node), file descriptors, system calls and device drivers. File Management :File Structures, System Calls for File Management – create, open, close, read, write, lseek, link, symlink, unlink, stat, fstat, lstat, chmod, chown, Directory API – opendir, readdir, closedir, mkdir, rmdir, umask.

PROCESS AND SIGNALS: Process, process identifiers, process structure: process table, viewing processes, system processes, process scheduling, starting new processes: waiting for a process, zombie processes, orphan process, fork, vfork, exit, wait, waitpid, exec, signals functions, unreliable signals, interrupted system calls, kill, raise, alarm, pause, abort, system, sleep functions, signal sets.

INTER PROCESS COMMUNICATION: Pipe, process pipes, the pipe call, parent and child processes, and named pipes: fifos, semaphores: semget, semop, semctl, message queues: msgget, msgsnd, msgrcv, msgctl, shared memory: shmget, shmat, shmdt, shmctl, ipc status commands.

INTRODUCTION TO SOCKETS: Socket, socket connections - socket attributes, socket addresses, socket, connect, bind, listen, accept, socket communications.

CSA 7107T MOBILE APPLICATION DEVELOPMENT

Installing and configuring Android SDK and Android Studio. Design Considerations for mobile devices. Android Virtual Device, Emulators

Basics of Android Application Development - Launch Configurations, Execution and Debugging. Architecture of Android-based devices, Android Application Life Cycle

Application User Interface – Views and Layouts. Optimizing Layouts. Drawable Views. Android UI Controls. Event Listeners & Event Handlers in Android. Adapters, ListView and Spinner. Menus and Menu Hierarchies, Context Menus and Popup Menus. Dialog - Alert Dialog Class, Activities as Dialogs, Toasts and Notifications.

Testing Android applications, Publishing Android application,
Application Data - Application Preferences, Shared Preferences, File Handling, Files as Resources.

Using Common Android APIs: Using Android Data and Storage APIs, managing data using Sqlite, Sharing Data between Applications with Content Providers, Using Android Networking APIs, Using Android Web APIs,

Accessing Web Content and RESTful data sources, Introduction to Google Play Services. Submitting an application to Google Playstore.

CSA 7108T R PROGRAMMING

Introduction - How to run R, R Sessions and Functions ,Basic Math and statistics, Variables, Data Types, Vectors — Advanced Data Structures - Data Frames, Lists, Matrices, Arrays, Classes.

R Programming Structures - Control Statements, Loops, Looping Over Non-vector Sets, If Else - Arithmetic and Boolean Operators and values, Default Values for Argument, Return Values - Deciding Whether to explicitly call return Returning Complex Objects - Functions are Objective - No Pointers in R – Recursion, A Quicksort Implementation Extended, Example: A Binary Search Tree.

Doing Math,statistics and Simulation in R - Math Function - Extended Example Calculating Probability Cumulative Sums and Products Minima and Maxima Calculus - Functions Fir Statistical Distribution – Sorting - Linear Algebra Operation on Vectors and Matrices - Extended Example: Vector cross Product Extended Example: Finding Stationary Distribution of Markov Chains - Set Operation - Input /Output - Accessing the Keyboard and Monitor - Reading and writer Files.

Creating Graphs - The Workhorse of R Base Graphics - the plot() Function – Customizing Graphs - Saving Graphs to Files.

Probability Distributions - Normal Distribution Binomial Distribution Poisson Distributions other Distribution - Basic Statistics - Correlation and Covariance – Ttests – ANOVA - Linear Models - Simple Linear Regression - Multiple Regression Generalized Linear Models - Logistic Regression – Poisson Regression other Generalized Linear Models Survival Analysis, Nonlinear Models, Splines Decision Random Forests,

CSA 7101P MOBILE APPLICATION DEVELOPMENT LABORATORY

Q1 Installation of Android studio.

Q2 Development of Hello World Application

Q3 Create an application that takes the name from a text box and shows hello message along with the name entered in text box, when the user clicks the OK button

Q4 Create a screen that has input boxes for User Name, Password, Address, Gender(radio buttons for male and female), Age (numeric), and a Submit button. On clicking the submit button, print all the data below the Submit Button (use any layout)

Q5 Design an android application to create page using Intent and one Button and pass the Values from one Activity to second Activity

Q 6 Design an android application Using Radio buttons

Q7 Design a Registration form in Android

Q 8 Design an android application for menu

Q9 Design a calculator to perform addition, subtraction, multiplication and division.

Q 10 Write a program in Android to display the multiplication table of a number

CSA 7102P R PROGRAMMING LABORATORY

1. R Program to print "Hello World".

2. R Program to Add Two Vectors.

3. Find Sum, Mean and Product of Vector in R Programming.

4. R Program to Take Input from User.

5. R Program to Generate Random Number from Standard Distributions.

6. R Program to Sample from a Population.

7. R Program to Find Minimum and Maximum.

8. R Program to Sort a Vector.

9. R Program to Find the Factorial of a Number.

10. R Multiplication Table.

11. R Program to Check Prime Number.

12. R Program to Check Armstrong Number.

13. R Program to Print the Fibonacci sequence.

14. R Program to Check for Leap Year.

15. Check if a Number is Odd or Even in R Programming.

BCA- THIRD YEAR SIXTH SEMESTER

CSA 7109T DATA SCIENCE

Introduction to Data Science: Overview and need of Big Data, The role of Big Data, Big Data Driven Business Models, Challenges,

Descriptive Statistics- measures of central tendency, measures of dispersion,. Inferential Statistics: Inferential Statistics through hypothesis tests, Null hypothesis, alternate hypothesis, level of significance, Random variables, and Probability Distributions.

Pattern Recognition Basics: Problem Definition, Representation of Input, Feature Engineering, Training and Test datasets, validation dataset,
Distance Metrics & Similarity Measures – Euclidean Distance, Manhattan Distance and Hamming distance. Correlation & Higher Order Measures.

Supervised Learning - Regression and Classification, Decision Trees, Support Vector Machines, Random Forest, Unsupervised Learning and Challenges: Clustering, K-means, Associative Rule Mining

Data Visualization, Graph Visualization, Data Summaries, Visualization of one, two and multidimensional data, Tools of Data Science

CSA 7110T COMPUTER GRAPHICS

Introduction: Basic elements of Computer graphics, Applications of Computer Graphics. Graphics Hardware, Video Display Devices, Architecture of Raster and Random scan display devices, Input devices, Hard-copy devices, Graphics software.

Fundamental Techniques in Graphics: Line Drawing Algorithms: DDA Algorithm, Bresenham's Line algorithm, Circle Generating Algorithms: Midpoint Circle Algorithm. Filled-Area Primitives: Scan-line polygon fill algorithm, Inside-Outside Tests, boundary Fill Algorithm, Flood- Fill algorithm.

Two- Dimensional Geometric Transformations: Basic Transformations- Translation, Rotation, Scaling. Matrix representations and Homogeneous Coordinates, Composite Transformations. Other Transformations: Reflection, Shearing.

Two-Dimensional Viewing: The Viewing Pipeline, clipping operations: Point clipping, Line Clipping: Cohen Sutherland line clipping, Polygon Clipping: Sutherland-Hedgeman Polygon Clipping, Weiler-Atherton Polygon Clipping, text clipping.

Three-Dimensional Concepts and 3-D Transformations: Basic Transformations- Translation, Rotation, Scaling,3-D display methods: Parallel projection, Perspective projection.

CSA 7111T WEB Programming using C#

Overview of C#, C# and .NET,, Structure of C# program. Language features: Type system, boxing and unboxing, flow controls, Classes, Constructors, interfaces, Serialization, Delegates, Reflection

Overview of ASP.NET framework, Understanding ASP.NET Controls, Applications Web servers, installation of Web Server.Web forms, web form controls -server controls, client controls, web forms& HTML, Adding controls to a web form ,Buttons, Text Box, Labels,Checkbox, Radio Buttons, List Box, etc. Running a web Application, creating a multiform web project.

Form Validation: Client side validation, server Side validation, Validation Controls: Required Field Comparison Range. Calendar control, Ad rotator Control, Internet Explorer Control.State management- View state, Session state, Application state.

Architecture of ADO.NET, , Create Connection using ADO.NET Object Model, Connection Class, Command Class, Data Adapter Class, Dataset Class. Display data on data bound Controls and Data Grid. Database Accessing on web applications: Data Binding concept with web, creating data grid, standard web server controls. Display data on web form using Data bound controls.

CSA 7112T VB.NET

Introduction to .NET, .NET Framework features & architecture, CLR, Common Type System, MSIL, Assemblies and class libraries. Introduction to visual studio, Project basics, types of project in .Net, IDE of VB.NET- Menu bar, Toolbar, Solution Explorer, Toolbox, Properties Window, Form Designer, Output Window, Object Browser. Event drive Programming - Methods and events.

The VB.NET Language- Variables -Declaring variables, Data Type of variables, Forcing variables declarations, Scope & lifetime of a variable, Constants, Arrays, types of array, control array, Collections, Subroutines, Functions, Passing variable Number of Argument Optional Argument, Returning value from function, Control flow statements: conditional statement, loop statement. Msgbox & Inputbox.

Working with Forms : Loading, showing and hiding forms, controlling One form within another.
GUI Programming with Windows Form: Textbox, Label, Button, Listbox, Combobox, Checkbox, PictureBox, RadioButton, There Properties, Methods and events. OpenFileDilog, SaveFileDialog, FontDialog, ColorDialog, PrintDialog.
Designing menues : ContextMenu,

Database programming with ADO.NET – Overview of ADO, from ADO to ADO.NET, Accessing Data using Server Explorer. Creating Connection, Command, Data Adapter and Data Set with OLEDB and SQLDB. Display Data on data bound controls, display data on data grid.

CSA 7113T CYBER SECURITY

Defining Cyberspace, Architecture of cyberspace, Communication and web technology, Internet, World wide web, Advent of internet, Internet infrastructure for data transfer and governance, Internet society, Regulation of cyberspace, Concept of cyber security, Issues and challenges of cyber security

Classification of cyber crimes, Common cyber crimes- cyber crime targeting computers and mobiles, cyber crime against women and children, financial frauds, social engineering attacks, malware and ransomware attacks, zero day and zero click attacks, IT Act 2000 and its amendments, Cyber crime and offences, Organisations dealing with Cyber crime and Cyber security in India,

Introduction to Social networks. Types of Social media, Social media platforms, Social media monitoring, Hashtag, Viral content, Social media marketing, Social media privacy, Challenges, opportunities and pitfalls in online social network, Security issues related to social media, Flagging and reporting of inappropriate content, Laws regarding posting of inappropriate content, Best practices for the use of Social media, Case studies.
Definition of E- Commerce, Main components of E-Commerce, Elements of E-Commerce security, E-Commerce threats, E-Commerce security best practices, Introduction to digital payments, Components of digital payment and stake holders, Modes of digital payments- Banking Cards, Unified Payment Interface (UPI), e-Wallets, Unstructured Supplementary Service Data (USSD), Aadhar enabled payments, Digital payments related common frauds and preventive measures.
,
End Point device and Mobile phone security, Password policy, Security patch management, Data backup, Downloading and management of third party software, Device security policy, Cyber Security best practices, Significance of host firewall and Ant-virus, Management of host firewall and Anti-virus, Wi-Fi security

CSA 7114T Principles of Management

Introduction to Management- Meaning & Definition, Nature, Scope and Functions of Management, Roles and Responsibilities of a Manager, System and Contingency Approach for understanding organizations, Management principles, Managerial levels, roles and skills

Planning – Concept, Meaning, purpose, Nature, Importance, Advantages & Limitations, Essentials of Planning, Types of planning. Objectives- Definition, Characteristics, Essentials of Objectives, Management by Objectives (MBO).

Fundamentals of Organizing- Meaning and definition -Nature and purpose, Types of Organizations: line, staff and matrix. Delegation of Authority- Centralization & Decentralization, Span of Management.

Decision Making- Concept, Process, Types, Direction & Co-ordination- definition and Meaning - Importance, Management by Exception.

Controlling: Concept and Process, Control Techniques, Control as a Feedback System and Feed Forward Control. Span of control. Managing People - Meaning, Need of understanding human behavior in organization, Models of OB, Major concepts in OB (elementary)- Personality, Learning, Perception & Attitude Building.

CSA 7115T CLOUD COMPUTING

Introduction: Cloud-definition, benefits, usage scenarios, History of Cloud Computing, Cloud Architecture, Types of Clouds, Players in Cloud Computing, issues in Clouds.

Cloud Computing Architecture: Cloud computing stack, Comparison with traditional computing architecture (client/server), Services provided at various levels, Role of Networks in Cloud computing, protocols used, Role of Web services, Service Models (XaaS), Deployment Models & types of cloud.

Cloud Services: Types of Cloud services, Software as a Service, Platform as a Service, Infrastructure as a Service, Database as a Service, Monitoring as a Service, Communication as services.

Service Providers- Google, Amazon, Microsoft Azure, IBM, Sales force.

Collaborating Using Cloud Services Email Communication over the Cloud, CRM Management, Project Management, Event Management, Task Management, Calendar, Schedules, Word Processing, Presentation, Spreadsheet, Databases, Desktop, Social Networks and Groupware.

Virtualization for Cloud Need for Virtualization, Pros and cons of Virtualization, Types of Virtualization, System VM, Process VM, Virtual Machine monitor, Virtual machine properties, HLL VM, Hypervisors, Xen, KVM, VMWare, Virtual Box, Hyper-V.

Cloud Security: Infrastructure Security- Network level security, Host level security, Application level security, Data security, Authentication in cloud computing, Cloud security challenges.

CSA 7116T Introduction to IOT

The Internet of Things Today, Advantages and disadvantages of IOT, Various applications of IOT,- Smart parking, smart home, smart health and smart city, Internet of Things Vision, , Future Internet Technologies, Infrastructure, Networks and Communication, Processes, Data Management, Device Level ,Energy Issues, IoT Related Standardization, IOT sensors, sensing and actuation

M2M to IoT –, M2M Value Chains, IoT Value Chains, An emerging industrial structure for IoT, The international driven global value chain and global information monopolies. Iot Architectural Overview– Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations.

IoT Architecture -State of the Art – Introduction, State of the art, Architecture. Reference Model- Introduction, Reference Model and architecture, IoT reference Model, IoT Reference Architecture- Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views.

IoT Applications for Value Creations Introduction, IoT applications for industry: Future Factory Concepts, Brownfield IoT, Smart Objects, Smart Applications, Four Aspects in your Business to Master IoT, Value Creation from Big Data and

Serialization, IoT for Retailing Industry, IoT For Oil and GasIndustry, Opinions on IoT Application and Value for Industry, Home Management, eHealth.

Internet of Things Privacy and Security issues, Governance, Security, Privacy and Trust in IoT-Data-Platforms for Smart Cities

CSA 7104P WEB Programming using C# LAB

1. Design a form to create account in website using following fields
   - First name
   - Last name
   - Username
   - Password
   - Confirm Password
   - Gender

2 Validate the account form using validation control
   - Required field Validation
   - Range Validation
   - Compare Validation
   - Regular Expression Validation
   - Summary Validation

3 Write a simple ASP.NET program to display the following Web Controls:
   - A button with text "click me". The button control must be in the center of the form.
   - A label with a text hello
   - A checkbox. The form name must be Web Controls

4..Create a database college and create following tables(consider appropriate fields):
   login
   Department
   Staff
   Student
6. design a web form to input values in the above tables
5.Write a program to connect the web form to Database College and display following
   - display all usernames in the login table
   - display names of departments
   - display names of students beginning with 'A'

CSA 7105P VB.NET LABORATORY

1.Design a form in vb.net using the following controls

   - 3 TextBoxes
   - 4 Buttons
Perform the following :
   - Change the text of the buttons as
   - Button1   "+"
   - Button2   "-"
   - Button3   "*"
   - Button4   "/"

- input values on textbox1 and textbox2 and display the result on textbox3 according to the type of the button clicked.

2. Using the above form Display the result on textbox3 when any changes made on Textbox1 and Textbox2.
3. Design a simple Text Editor in vb.net to implement find and replace operation.

4. Design 2 ListBoxes on a Form and perform following
   - Add at least 5 Items on Listbox1
   - Display the selected item on the Textbox
   - Remove selected item from the ListBox1
   - Move selected item of ListBox1 into ListBox2

5. Design a form using 1 ListBox and 1 textBox and perform following
   - Add 5 items on ListBox
   - Highlight the item of the ListBox , if typed character/s on TextBox1 is matched with the character/s of the ListBox.

6. Design MDI (Multiple Document Interface) Form in vb.net that consists of MenuBar and ToolBar.
7. Create a basic text editor that enables user to open the selected text file on TextBox. (**Hint.** Use OpenFileDialog control)
8. Design a form using checkboxes and radiobuttons and display the text of selected checked boxes and RadioButton
9.. Create a database **"employee.mdb"** in Ms-access.
   Create a table emp whose fieilds are as follows
   - EmpId
   - EmpName
   - Emp_Dept
   - Emp_salary

On the above tables perform following
- Establish the connection to employee.mdb
- Insert/Update/Delete data in the above tables using form
- Display the first record of emp on TextBoxes used on form.
- Display all the records on DataGridView control