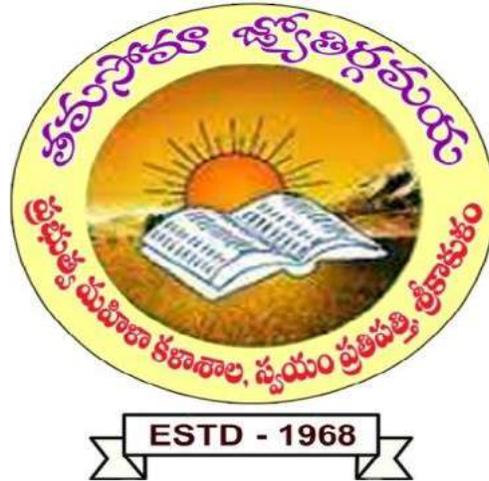


**GOVERNMENT COLLEGE FOR WOMEN (AUTONOMOUS)  
SRIKAKULAM**

**DEPARTMENT OF  
COMPUTER SCIENCE & APPLICATIONS**



**BOARD OF STUDIES  
COMPUTER SCIENCE SYLLABUS  
2022-23**

# Government College for Women(Autonomous)Srikakulam

Reaccredited by NAAC with 'A' Grade during 3<sup>rd</sup> Cycle (CGPA 3.09)

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From  
Dr.K.Sreeramulu,M.Com.,Ph.D.  
Principal  
Govt. College for Women (A)  
Srikakulam

## **BOARD OF STUDIES MEETING AGENDA FOR 2021- 22 & 2022 – 23**

- 1) Adoption of Choice Based Credit System (CBCS) for I, II , III ,IV,V end Semesters.
- 2) Approve and introduce the newly formed syllabi for I,II,III,IV,V,VI Course or subjects.
- 3) Ratification and introduction of semester mode pattern of Examination, for all semesters.
- 4) Approve and ratify value added certificate courses.
- 5) Approval and ratification of Skill Based Programmes
- 6) Approval and ratification of Life Skill courses and skill development Courses for 1<sup>st</sup> and 2<sup>nd</sup> Year Students.
- 7) Approve and ratify community Service Projects and Internships at end of II, IV,V, VI Semesters.
- 8) Approve and ratify Model Question Paper, Blue Print etc.in which 25 marks Internal Assessment and 75 marks External Assessment
- 9) Approve and ratify model question paper, for LSC and SDC for 50 marks external pattern
- 10) Approval of List of Examiners
- 11) Approval of innovative teaching , learning and evaluation Techniques
- 12) Approval of Student Seminars, Workshops, Field Trips – student centric activities.
- 13) Approval of Students Projects and Students Research.
- 14) Approval of ICT mode of teaching.
- 15) Approval of encouragement to join students in JKC
- 16) Approval of encouragement for students to join in NSS and different extension activities.
- 17) Any other matter

Signature of Principal

**Department of Computer Science & Applications**  
**Government College for Women(Autonomous)Srikakulam**

Reaccredited by NAAC with 'A' Grade during 3<sup>rd</sup> Cycle (CGPA 3.09)

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**BOS Meeting 20.10.2022**

The Board of Studies meeting is held on 20.10.2022 Time: 10.00 am in the Department of Computer Science & Applications, Government College for Women (Autonomous), Srikakulam for the Autonomous students i.e., 2020 – 21 under the Chairmanship of Smt.I.Srilakshmi, Head of the Department of Computer Science of this college as per the UGC Letter No.F22-1/2017 (AC) Date: 28.11.2018 and Dr.B.R.Ambekar University, Srikakulam letter, RC.No.BRAU/F J :Autonomous Status 2019 -20 dated 15.03.2019. The following members attended and discussed the various academic matters of the Computer Science Syllabus and its evaluation.

S.No	BOS Committee	Name & Designation
1.	Chair Person	Name : Smt. I.Srilakshmi Designation :Lecturer in Computer Science Address :GCW(A),Srikakulam
2.	Subject Expert (University Nominee)	Name : Dr.A.Mary Sowjanya Designation: Asst.Professor, Dept.of CS&SE Address: Andhra University College of Engineering(A),Vishakhapatnam
3.	Subject Expert (Nominated By Academic Council )	Name : Dr. A. Siva Prasad Designation :Lecturer in Computer Science Address : Govrnment Degree College, Tekkali
4.	Subject Expert (Nominated By Academic Council )	Name : Sri. V. Raghava Swamy Dora Designation :Lecturer in Computer Science Address: Dr.V.S.Krishna College(A),Vishakhapatnam
5.	Member of Industrial	Name : Kum P.VijayaDurga Designation :License Manager Software Asset Management Team Address : Wipro,Hyderabad
6.	Member of Alumni	Name: Kum. M. Gayatri Varshitha Pursuing M.Sc Computer Science Dr.BR. Ambedkar University, Etcherla
7.	Members of Department	1)Smt. G. Suma Latha, Lecturer in Computer Science Government College For Women(A),SKLM  2)Smt. S. Vani Kumari, Lecturer in Computer Applications Government College For Women(A),SKLM  3)Smt. S. Madhavi Latha, Lecturer in Computer Applications Government College For Women(A),SKLM

**GOVT. COLLEGE FOR WOMEN (AUTONOMOUS): SRIKAKULAM**  
**B.Sc. Computer Science Structure of Syllabus**  
**Under CBCS w.e.f. 2020-21**

Semester		Subject	Hrs	Credits	IA	ES	Total	
<b>FIRST YEAR</b>								
I	I	Problem Solving in C	4	3	25	75	100	
		Problem Solving in C Lab	2	2	0	50	50	
II	II	Data Structures using C	4	3	25	75	100	
		Data Structures using C Lab	2	2	0	50	50	
<b>SECOND YEAR</b>								
III	III	Object Oriented Programming using Java	4	3	25	75	100	
		Object Oriented Programming using Java Lab	2	2	0	50	50	
IV	IV	Database Management System	4	3	25	75	100	
		Database Management System Lab	2	2	0	50	50	
	V	Operating Systems	4	3	25	75	100	
		Operating Systems Lab	2	2	0	50	50	
<b>THIRD YEAR</b>								
V	6A	Web Interface Designing Technologies	3	3	25	75	100	
		Web Interface Designing Technologies Lab	3	2	0	50	50	
	7A	Web Applications Development using PHP& MYSQL	3	3	25	75	100	
		Web Applications Development using PHP& MYSQL Lab	3	2	0	50	50	
	<b>OR</b>							
	6B	Internet of Things	3	3	25	75	100	
		Internet of Things Lab	3	2	0	50	50	
	7B	Application Development using Python	3	3	25	75	100	

		Application Development using Python Lab	3	2	0	50	50
	<b>OR</b>						
6C		Data science	3	3	25	75	100
		Data science Lab	3	2	0	50	50
7C		Python for Data science	3	3	25	75	100
		Python for Data science Lab	3	2	0	50	50

## PROBLEM SOLVING IN C

Semester	Course Title	Hours	Credits
I	Problem Solving in C	60	3

### Objectives:

This course aims to provide exposure to problem-solving through programming. It introduces the concepts of the C Programming language.

### Course Learning Outcomes:

Upon successful completion of the course, a student will be able to:

1. Understand the evolution and functionality of a Digital Computer.
2. Apply logical skills to analyze a given problem
3. Develop an algorithm for solving a given problem.
4. Understand 'C' language constructs like Iterative statements, Array processing, Pointers, etc.
5. Apply 'C' language constructs to the algorithms to write a 'C' language program.

### UNIT I

**General Fundamentals:** Introduction to computers, Block diagram of a computer, characteristics and limitations of computers, applications of computers, types of computers, computer generations.

**Introduction to Algorithms and Programming Languages:** Algorithm – Key features of Algorithms, Flow Charts, Programming Languages – Generations of Programming Languages – Structured Programming Language- Design and Implementation of Correct, Efficient and Maintainable Programs.

### UNIT II

**Introduction to C:** Introduction – Structure of C Program – Writing the first C Program –File used in C Program – Compiling and Executing C Programs – Using Comments –Keywords – Identifiers – Basic Data Types in C – Variables – Constants – I/O Statements in C- Operators in C- Programming Examples.

**Decision Control and Looping Statements:** Introduction to Decision Control Statements– Conditional Branching Statements – Iterative Statements – Nested Loops – Break and Continue Statement – Goto Statement

### UNIT III

**Arrays:** Introduction – Declaration of Arrays – Accessing elements of the Array – Storing Values in Array– Operations on Arrays – one dimensional, two dimensional and multi-dimensional arrays, character handling and strings.

## UNIT IV

**Functions:** Introduction – using functions – Function declaration/ prototype – Function definition – function call – return statement – Passing parameters – Scope of variables – Storage Classes – Recursive functions.

**Structure, Union, and Enumerated Data Types:** Introduction – Nested Structures – Arrays of Structures – Structures and Functions– Union – Arrays of Unions Variables – Unions inside Structures – Enumerated Data Types.

## UNIT V

**Pointers:** Understanding Computer Memory – Introduction to Pointers – declaring Pointer Variables – Pointer Expressions and Pointer Arithmetic – Null Pointers - Passing Arguments to Functions using Pointer – Pointer and Arrays – Memory Allocation in C Programs – Memory Usage – Dynamic Memory Allocation – Drawbacks of Pointers

**Files:** Introduction to Files – Using Files in C – Reading Data from Files – Writing Data to Files – Detecting the End-of-file – Error Handling during File Operations – Accepting Command Line Arguments.

## BOOKS

1. E Balagurusamy – Programming in ANSIC – Tata McGraw-Hill publications.
2. Brain W Kernighan and Dennis M Ritchie - The ‘C’ Programming language” -Pearson publications.
3. Ashok N Kamthane: Programming with ANSI and Turbo C, Pearson Edition Publications.
4. Yashavant Kanetkar - Let Us ‘C’ – BPB Publications.

## PROBLEM SOLVING IN C Lab

Semester	Course Title	Hours	Credits
I	Problem Solving in C Lab	30	2

1. Write a program to check whether the given number is Armstrong or not.
2. Write a program to find the sum of individual digits of a positive integer.
3. Write a program to generate the first n terms of the Fibonacci sequence.
4. Write a program to find both the largest and smallest number in a list of integer values
5. Write a program to demonstrate refaction of parameters in swapping of two integer values using **Call by Value&Call by Address**
6. Write a program that uses functions to add two matrices.
7. Write a program to calculate factorial of given integer value using recursive functions
8. Write a program for multiplication of twoN X N matrices.

9. Write a program to perform various string operations.
10. Write a program to search an element in a given list of values.
11. Write a program to sort a given list of integers in ascending order.
12. Write a program to calculate the salaries of all employees using ***Employee (ID, Name, Designation, Basic Pay, DA, HRA, Gross Salary, Deduction, Net Salary)*** structure.
  - a. DA is 30 % of Basic Pay
  - b. HRA is 15% of Basic Pay
  - c. Deduction is 10% of (Basic Pay + DA)
  - d. Gross Salary = Basic Pay + DA+ HRA
  - e. Net Salary = Gross Salary - Deduction
13. Write a program to illustrate pointer arithmetic.
14. Write a program to read the data character by character from a file.
15. Write a program to create ***Book (ISBN, Title, Author, Price, Pages, Publisher)*** structure and store book details in a file and perform the following operations
  - a. Add book details
  - b. Search a book details for a given ISBN and display book details, if available
  - c. Update a book details using ISBN
  - d. Delete book details for a given ISBN and display list of remaining Books

## Data Structures Using C

Semester	Course Title	Hours	Credits
II	Data Structures Using C	60	3

### Objectives:

To introduce the fundamental concept of data structures and to emphasize the importance of various data structures in developing and implementing efficient algorithms.

### Course Learning Outcomes:

Upon successful completion of the course, a student will be able to:

1. Comprehend Data Structure and their real-time applications - Stack, Queue, Linked List, Trees and Graph
2. Choose a suitable Data Structures for an application
3. Develop ability to implement different Sorting and Search methods
4. Have knowledge on Data Structures basic operations like insert, delete, search, update and traversal
5. Design and develop programs using various data structures
6. Implement the applications of algorithms for sorting, pattern matching etc

### UNIT I

**Introduction to Data Structures:** Introduction to Data Structure, Types of Data Structures-Primitive, Non-Primitive, Linear, Non-Linear Data Structures, Abstract Data Type. Algorithm, Analysis of Algorithm-Time and Space Complexity, Asymptotic Notations-Big O, Big Omega, Big Theta

**Arrays and Linked List:** Recap of arrays, Operations on Arrays, Problem with Arrays, Introduction to Linked Lists, Dynamic Memory Allocation, Basic Linked List Operations, Doubly Linked List, Circular Linked List

### UNIT II

**Stacks:** Introduction to Stacks, Stack as an Abstract Data Type, Representation of Stacks through Arrays, Representation of Stacks through Linked Lists, Applications of Stacks-Recursion. Infix to Post Fix, Postfix Evaluation

**Queues:** Introduction, Queue as an Abstract data Type, Representation of Queues, Circular Queues, Double Ended Queues- Dequeues, Priority Queues, Application of Queues

### UNIT III

**Trees:** Binary Tree, Definition, Properties, ADT, Array and Linked representations, Implementations and Applications. Binary Search Trees (BST) – Definition, ADT, Operations and Implementations, BST Applications.

## UNIT IV

**Graphs** – Graph and its Representation, Types of Graphs, Applications of Graphs, Graph Traversals- Breadth First Search, Depth First Search, Minimal Spanning Trees-Prim's and Kruskal's Algorithms

## UNIT- V

**Sorting Techniques:** Selection, Insertion, Bubble, Merge, Quick, Heap sort- algorithms and analysis

**Searching Techniques:** Linear and Binary Searching.

## BOOKS

1. "Data Structures using C", ISRD group Second Edition, TMH
2. "Data Structures through C", Yashavant Kanetkar, BPB Publications
3. "Data Structures Using C" Balagurusamy E. TMH

### Data Structures Using C Lab

Semester	Course Title	Hours	Credits
II	Data Structures Using C Lab	30	2

1. Write a program to read 'N' numbers of elements into an array and also perform the following operation on an array
  - a. Add an element at the beginning of an array
  - b. Insert an element at given index of array
  - c. Update an element using a value and index
  - d. Delete an existing element
2. Write a program using stacks to convert a given
  - a. postfix expression to prefix
  - b. prefix expression to postfix
  - c. infix expression to postfix
3. Write Programs to implement the Stack operations using an array
4. Write Programs to implement the Stack operations using Linked List.
5. Write Programs to implement the Queue operations using an array.
6. Write Programs to implement the Queue operations using Linked List.
7. Write a program for arithmetic expression evaluation.
8. Write a program for Binary Search Tree Traversals
9. Write a program to implement dequeue using a doubly linked list.
10. Write a program to search an item in a given list using the following Searching Algorithms

- a. Linear Search
- b. Binary Search.

11. Write a program for implementation of the following Sorting Algorithms

- a. Bubble Sort
- b. Insertion Sort
- c. Quick Sort
- d. Merge Sort

12. Write a program to implement Depth First Search graph traversals algorithm

15. Write a program to implement Breadth First Search graph traversals algorithm

## OBJECT ORIENTATED PROGRAMMING THROUGH JAVA

Semester	Course Title	Hours	Credits
III	OBJECT ORIENTATED PROGRAMMING THROUGH JAVA	60	3

### Objectives:

To introduce the fundamental concepts of Object-Oriented programming and to design & implement object oriented programming concepts in Java.

### Course Learning Outcomes:

At the end of this course student will:

1. Understand the benefits of a well-structured program
2. Understand different computer programming paradigms
3. Understand underlying principles of Object-Oriented Programming in Java
4. Develop problem-solving and programming skills using OOP concepts
5. Develop the ability to solve real-world problems through software development in high-level programming language like Java

### UNIT – I

**Introduction to Java:** Features of Java, The Java virtual Machine, Parts of Java

**Naming Conventions and Data Types:** Naming Conventions in Java, Data Types in Java, Literals

**Operators in Java:** Operators, Priority of Operators

**Control Statements in Java:** if... else Statement, do... while Statement, while Loop, for Loop, switch Statement, break Statement, continue Statement, return Statement

**Input and Output:** Accepting Input from the Keyboard, Reading Input with Java.util.Scanner Class, Displaying Output with System.out.printf(), Displaying Formatted Output with String.format()

**Arrays:** Types of Arrays, Three Dimensional Arrays (3D array), arrayname.length, Command Line Arguments

### UNIT – II

**Strings:** Creating Strings, String Class Methods, String Comparison, Immutability of Strings

**Introduction to OOPs:** Problems in Procedure Oriented Approach, Features of Object-Oriented Programming System (OOPS)

**Classes and Objects:** Object Creation, Initializing the Instance Variables, Access Specifiers, Constructors

**Methods in Java:** Method Header or Method Prototype, Method Body, Understanding Methods, Static Methods, Static Block, The keyword 'this', Instance Methods, Passing Primitive Data Types to Methods, Passing Objects to Methods, Passing Arrays to Methods, Recursion, Factory Methods  
**Inheritance:** Inheritance, The keyword 'super', The Protected Specifier, Types of Inheritance

### UNIT – III

**Polymorphism:** Polymorphism with Variables, Polymorphism using Methods, Polymorphism with Static Methods, Polymorphism with Private Methods, Polymorphism with Final Methods, final Class  
**Type Casting:** Types of Data Types, Casting Primitive Data Types, Casting Referenced Data Types, The Object Class

**Abstract Classes:** Abstract Method and Abstract Class

**Interfaces:** Interface, Multiple Inheritance using Interfaces

**Packages:** Package, Different Types of Packages, The JAR Files, Interfaces in a Package, Creating Sub Package in a Package, Access Specifiers in Java, Creating API Document

**Exception Handling:** Errors in Java Program, Exceptions, throws Clause, throw Clause, Types of Exceptions, Re – throwing an Exception

### UNIT – IV

**Streams:** Stream, Creating a File using FileOutputStream, Reading Data from a File using FileInputStream, Creating a File using FileWriter, Reading a File using FileReader, Zipping and Unzipping Files, Serialization of Objects, Counting Number of Characters in a File, File Copy, File Class

**Threads:** Single Tasking, Multi Tasking, Uses of Threads, Creating a Thread and Running it, Terminating the Thread, Single Tasking Using a Thread, Multi Tasking Using Threads, Multiple Threads Acting on Single Object, Thread Class Methods, Deadlock of Threads, Thread Communication, Thread Priorities, thread Group, Daemon Threads, Applications of Threads, Thread Life Cycle

### UNIT – V

**Applets:** Creating an Applet, Uses of Applets, <APPLET> tag, A Simple Applet, An Applet with Swing Components, Animation in Applets, A Simple Game with an Applet, Applet Parameters

**Java Database Connectivity:** Database Servers, Database Clients, JDBC (Java Database Connectivity), Working with Oracle Database, Working with MySQL Database, Stages in a JDBC Program, Registering the Driver, Connecting to a Database, Preparing SQL Statements, Using jdbc-odbc Bridge Driver to Connect to Oracle Database, Retrieving Data from MySQL Database, Retrieving Data from MS Access Database, Stored Procedures and CallableStatements, Types of Result Sets

### BOOKS:

1. Core Java: An Integrated Approach, Authored by Dr. R. Nageswara Rao & Kogent Learning Solutions Inc.
2. E. Balaguruswamy, Programming with JAVA, A primer, 3e, TATA McGraw- Hill Company.
3. John R. Hubbard, Programming with Java, Second Edition, Schaum's outline Series, TMH.
4. Deitel & Deitel. Java TM: How to Program, PHI (2007)

## OBJECT ORIENTATED PROGRAMMING THROUGH JAVA Lab

Semester	Course Title	Hours	Credits
III	OBJECT ORIENTATED PROGRAMMING THROUGH JAVA Lab	30	2

1. Write a program to read *Student Name, Reg.No, Marks[5]* and calculate *Total, Percentage, Result*. Display all the details of students
2. Write a program to perform the following String Operations
  - a. Read a string
  - b. Find out whether there is a given substring or not
  - c. Compare existing string by another string and display status
  - d. Replace existing string character with another character
  - e. Count number of works in a string
3. Java program to implements Addition and Multiplication of two N X N matrices.
4. Java program to demonstrate the use of Constructor.
5. Calculate area of the following shapes using method overloading.
  - a. Triangle
  - b. Rectangle
  - c. Circle
  - d. Square
6. Implement inheritance between *Person (Aadhar, Surname, Name, DOB, and Age)* and *Student (Admission Number, College, Course, Year)* classes where ReadData(), DisplayData() are overriding methods.
7. Java program for implementing Interfaces
8. Java program on Multiple Inheritance.
9. Java program for to display *Serial Number from 1 to N* by creating two Threads
10. Java program to demonstrate the following exception handlings
  - a. Divided by Zero
  - b. Array Index Out of Bound
  - c. File Not Found
  - d. Arithmetic Exception
  - e. User Defined Exception

11. Create an Applet to display different shapes such as Circle, Oval, Rectangle, Square and Triangle.

12. Write a program to create **Book (ISBN, Title, Author, Price, Pages, Publisher)** structure and store book details in a file and perform the following operations

- a. Add book details
- b. Search a book details for a given ISBN and display book details, if available
- c. Update a book details using ISBN
- d. Delete book details for a given ISBN and display list of remaining Books

## Database Management Systems

Semester	Course Title	Hours	Credits
IV	Database Management Systems	60	3

### Course Objective:

The objective of the course is to introduce the design and development of databases with special emphasis on relational databases.

### Course Learning Outcomes:

On completing the subject, students will be able to:

1. Gain knowledge of Database and DBMS.
2. Understand the fundamental concepts of DBMS with special emphasis on relational data model.
3. Demonstrate an understanding of normalization theory and apply such knowledge to the normalization of a database
4. Model database using ER Diagrams and design database schemas based on the model.
5. Create a small database using SQL.
6. Store, Retrieve data in database.

### UNIT I

**Overview of Database Management System:** Introduction to data, information, database, database management systems, file-based system, Drawbacks of file-Based System, database approach, Classification of Database Management Systems, advantages of database approach, Various Data Models, Components of Database Management System, three schema architecture of data base, costs and risks of database approach.

### UNIT II

**Entity-Relationship Model:** Introduction, the building blocks of an entity relationship diagram, classification of entity sets, attribute classification, relationship degree, relationship classification, reducing ER diagram to tables, enhanced entity-relationship model (EER model), generalization and specialization, IS A relationship and attribute inheritance, multiple inheritance, constraints on specialization and generalization, advantages of ER modelling.

### UNIT III

**Relational Model:** Introduction, CODD Rules, relational data model, concept of key, relational integrity, relational algebra, relational algebra operations, advantages of relational algebra, limitations of relational algebra, relational calculus, tuple relational calculus, domain relational Calculus (DRC), Functional dependencies and normal forms upto 3rd normal form.

### UNIT IV

**Structured Query Language:** Introduction, History of SQL Standard, Commands in SQL, Data Types in SQL, Data Definition Language, Selection Operation, Projection Operation, Aggregate

functions, Data Manipulation Language, Table Modification Commands, Join Operation, Set Operations, View, Sub Query.

## UNIT V

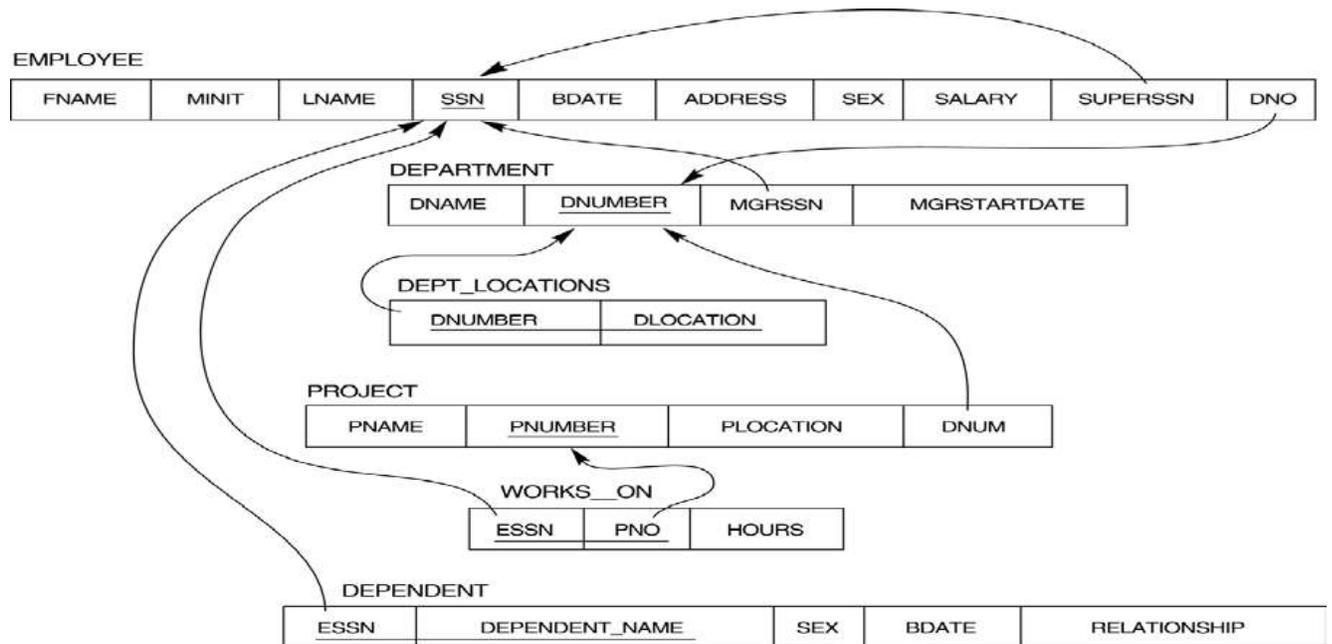
**PL/SQL:** Introduction, Shortcomings of SQL, Structure of PL/SQL, PL/SQL Language Elements, Data Types, Operators Precedence, Control Structure, Steps to Create a PL/SQL, Program, Iterative Control, Procedure, Function, Database Triggers, Types of Triggers.

### Database Management Systems Lab

Semester	Course Title	Hours	Credits
IV	Database Management Systems Lab	30	2

1. Draw ER diagram for hospital administration
2. Creation of college database and establish relationships between tables
3. Relational database schema of a company is given in the following figure.

### Relational Database Schema - COMPANY



### Questions to be performed on above schema

1. Create above tables with relevant **Primary Key**, **Foreign Key** and other constraints
2. Populate the tables with data
3. Display all the details of all employees working in the company.
4. Display *ssn, lname, fname, address* of employees who work in department no 7.

5. Retrieve the *Birthdate and Address* of the employee whose name is 'Franklin T. Wong'
6. Retrieve the name and salary of every employee
7. Retrieve all distinct salary values
8. Retrieve all employee names whose address is in 'Bellaire'
9. Retrieve all employees who were born during the 1950s
10. Retrieve all employees in department 5 whose salary is between 50,000 and 60,000(inclusive)
11. Retrieve the names of all employees who do not have supervisors
12. Retrieve SSN and department name for all employees
13. Retrieve the name and address of all employees who work for the 'Research' department
14. For every project located in 'Stafford', list the project number, the controlling department number, and the department manager's last name, address, and birth date.
15. For each employee, retrieve the employee's name, and the name of his or her immediate supervisor.
16. Retrieve all combinations of Employee Name and Department Name
17. Make a list of all project numbers for projects that involve an employee whose last name is 'Narayan' either as a worker or as a manager of the department that controls the project.
18. Increase the salary of all employees working on the 'ProductX' project by 15%. Retrieve employee name and increased salary of these employees.
19. Retrieve a list of employees and the project name each works in, ordered by the employee's department, and within each department ordered alphabetically by employee first name.
20. Select the names of employees whose salary does not match with salary of any employee in department 10.
21. Retrieve the employee numbers of all employees who work on project located in Bellaire, Houston, or Stafford.
22. Find the sum of the salaries of all employees, the maximum salary, the minimum salary, and the average salary. Display with proper headings.
23. Find the sum of the salaries and number of employees of all employees of the 'Marketing' department, as well as the maximum salary, the minimum salary, and the average salary in this department.

24. Select the names of employees whose salary is greater than the average salary of all employees in department 10.
25. Delete all dependents of employee whose *ssn is '123456789'*.
26. Perform a query using alter command to drop/add field and a constraint in Employee table.

## Operating Systems

Semester	Course Title	Hours	Credits
IV	Operating Systems	60	3

### Course Objectives

1. To understand the services provided by and the design of an operating system.
2. To understand the structure and organization of the file system.
3. To understand what a process is and how processes are synchronized and scheduled.
4. To understand different approaches to memory management.
5. Students should be able to use system calls for managing processes, memory and the file system.

### Course Outcomes

1. Analyze the concepts of processes in operating system and illustration of the scheduling of processor for a given problem instance.
2. Identify the dead lock situation and provide appropriate solution so that protection and security of the operating system is also maintained.
3. Analyze memory management techniques, concepts of virtual memory and disk scheduling.
4. Understand the implementation of file systems and directories along with the interfacing of IO devices with the operating system.

### UNIT - I

**Operating System Introduction:** Operating Systems Objectives and functions, Computer System Architecture, OS Structure, OS Operations, Evolution of Operating Systems - Simple Batch, Multi programmed, time shared, Parallel, Distributed Systems, Real-Time Systems, Operating System services.

### UNIT - II

Process and CPU Scheduling - Process concepts - The Process, Process State, Process Control Block, Threads, Process Scheduling - Scheduling Queues, Schedulers, Context Switch, Preemptive Scheduling, Dispatcher, Scheduling Criteria, Scheduling algorithms, Case studies: Linux, Windows.

Process Coordination - Process Synchronization, The Critical section Problem, Synchronization Hardware, Semaphores, and Classic Problems of Synchronization, Monitors, Case Studies: Linux, Windows.

### UNIT - III

Memory Management and Virtual Memory - Logical & physical Address Space, Swapping, Contiguous Allocation, Paging, Structure of Page Table. Segmentation, Segmentation with Paging,

Virtual Memory, Demand Paging, Performance of Demanding Paging, Page Replacement Page Replacement Algorithms, Allocation of Frames.

#### **UNIT - IV**

File System Interface - The Concept of a File, Access methods, Directory Structure, File System Mounting, File Sharing, Protection, File System Structure,  
Mass Storage Structure - Overview of Mass Storage Structure, Disk Structure, Disk Attachment, Disk Scheduling.

#### **UNIT - V**

Deadlocks - System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection and Recovery from Deadlock.

#### **REFERENCES BOOKS:**

1. Operating System Principles, Abraham Silberchatz, Peter B. Galvin, Greg Gagne 8th Edition, Wiley Student Edition.
2. Principles of Operating Systems by Naresh Chauhan, OXFORD University Press
3. Operating systems - Internals and Design Principles, W. Stallings, 6th Edition, Pearson.
4. Modern Operating Systems, Andrew S Tanenbaum 3rd Edition PHI.
5. Operating Systems A concept - based Approach, 2nd Edition, D. M. Dhamdhare, TMH.
6. Principles of Operating Systems, B. L. Stuart, Cengage learning, India Edition.
7. Operating Systems, A. S. Godbole, 2nd Edition, TMH

#### **Operating Systems Lab**

<b>Semester</b>	<b>Course Title</b>	<b>Hours</b>	<b>Credits</b>
<b>IV</b>	<b>Operating Systems Lab</b>	<b>30</b>	<b>2</b>

1. Write a program to implement Round Robin CPU Scheduling algorithm
2. Simulate SJF CPU Scheduling algorithm
3. Write a program the FCFS CPU Scheduling algorithm
4. Write a program to Priority CPU Scheduling algorithm
5. Simulate Sequential file allocation strategies
6. Simulate Indexed file allocation strategies
7. Simulate Linked file allocation strategies
8. Simulate MVT and MFT memory management techniques
9. Simulate Single level directory File organization techniques

10. Simulate Two level File organization techniques
11. Simulate Hierarchical File organization techniques
12. Write a program for Bankers Algorithm for Dead Lock Avoidance
13. Implement Bankers Algorithm Dead Lock Prevention.
14. Simulate all Page replacement algorithms.
  - a) FIFO
  - b) LRU
  - c) LFU
15. Simulate Paging Techniques of memory management

## Course 6A: Web Interface Designing Technologies

Semester	Course Title	Hours	Credits
V	Web Interface Designing Technologies	60	3

### Course Outcomes

1. Understand and appreciate the web architecture and services.
2. Gain knowledge about various components of a website.
3. Demonstrate skills regarding creation of a static website and an interface to dynamic website.
4. Learn how to install word press and gain the knowledge of installing various plugins to use in their websites.

### UNIT - I

**HTML:** Introduction to web designing, difference between web applications and desktop applications, introduction to HTML, HTML structure, elements, attributes, headings, paragraphs, styles, colours, HTML formatting, Quotations, Comments, images, tables, lists, blocks and classes, HTML CSS, HTML frames, file paths, layout, symbols, HTML responsive.

### UNIT - II

**HTML forms:** HTML form elements, input types, input attributes, HTML5, HTML graphics, HTML media – video, audio, plug INS, you tube.

**HTML API'S:** Geo location, Drag/drop, local storage, HTML SSE.

**CSS:** CSS home, introduction, syntax, colours, back ground, borders, margins, padding, height/width, text, fonts, icons, tables, lists, position, over flow, float, CSS combinators, pseudo class, pseudo elements, opacity, tool tips, image gallery, CSS forms, CSS counters, CSS responsive

### UNIT - III

**Client side Validation:** Introduction to JavaScript - What is DHTML, JavaScript, basics, variables, string manipulations, mathematical functions, statements, operators, arrays, functions. Objects in JavaScript - Data and objects in JavaScript, regular expressions, exception handling. DHTML with JavaScript - Data validation, opening a new window, messages and confirmations, the status bar, different frames, rollover buttons, moving images.

### UNIT - IV

**Word press:** Introduction to word press, servers like wamp, bitnami e.tc, installing and configuring word press, understanding admin panel, working with posts and pages, using editor, text formatting with shortcuts, working with media-Adding, editing, deleting media elements, working with widgets, menus

## UNIT – V

Working with themes-parent and child themes, using featured images, configuring settings, user and user roles and profiles, adding external links, extending word press with plug-ins. Customizing the site, changing the appearance of site using css , protecting word press website from hackers

### REFERENCES BOOKS:

1. Chris Bates, Web Programming Building Internet Applications, Second Edition, Wiley (2007)
2. Paul S.WangSanda S. Katila, an Introduction to Web Design plus Programming, Thomson (2007).
3. Head First HTML and CSS, Elisabeth Robson, Eric Freeman, O'Reilly Media Inc.
4. An Introduction to HTML and JavaScript: for Scientists and Engineers, David R. Brooks. Springer, 2007
5. Schaum's Easy Outline HTML, David Mercer, Mcgraw Hill Professional.
6. Word press for Beginners, Dr.Andy Williams.
7. Professional word press, Brad Williams, David damstra, Hanstern.

### Co-Curricular Activities

#### a) Mandatory: (Training of students by teacher in field related skills: (lab: 10 + field: 05) :

1. For Teacher: Field related training of students by the teacher in laboratory/field for not less than 15 hours on identifying the case study to build a website, designing the format, structure, menus, submenus etc for a website and finally to build a website.
2. For Student: Students shall (individually) search online and visit any of the agencies like hotels, hospitals, super bazaars, organizations, etc. where there is a need for a website and identify any one case study and submit a hand-written Fieldwork/Project work/Project work/Project work/Project work Report not exceeding 10 pages. Example: Choosing a firm or business to develop a website, identifying various business entities to be included in the website, identifying menu bar and content to be placed in their websites.
3. Max marks for Fieldwork/Project work/Project work/Project work/Project work/Project work Report: 05.
4. Suggested Format for Fieldwork/Project work/Project work/Project work/Project work:  
Title page, student details, index page, details of place visited, observations, findings and acknowledgements.
5. Unit Tests

## b) Suggested Co-Curricular Activities

1. Build a website with 10 pages for the case study identified.
2. Training of students by related industrial experts.
3. Assignments
4. Seminars, Group discussions, Quiz, Debates etc. (on related topics).
5. Presentation by students on best websites.

### Course 6A: Web Interface Designing Technologies Lab

Semester	Course Title	Hours	Credits
V	Web Interface Designing Technologies Lab	30	2

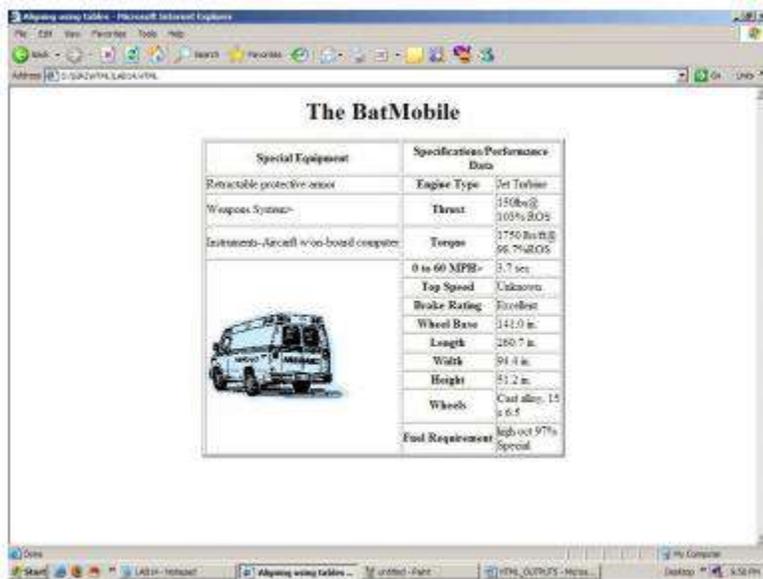
### HTML and CSS:

1. Create an HTML document with the following formatting options: (a) Bold, (b) Italics, (c) Underline, (d) Headings (Using H1 to H6 heading styles), (e) Font (Type, Size and Color), (f) Background (Colored background/Image in background), (g) Paragraph, (h) Line Break, (i) Horizontal Rule, (j) Pre tag
2. Create an HTML document which consists of: (a) Ordered List (b) Unordered List (c) Nested List (d) Image
3. Create a Table with four rows and five columns. Place an image in one column.
4. Using “table” tag, align the images as follows:



5. Create a menu form using html.
6. Style the menu buttons using css.

7. Create a form using HTML which has the following types of controls: (a) Text Box (b) Option/radio buttons (c) Check boxes (d) Reset and Submit buttons
8. Embed a calendar object in your web page. 5
9. Create an applet that accepts two numbers and perform all the arithmetic operations on them.
10. Create nested table to store your curriculum.
11. Create a form that accepts the information from the subscriber of a mailing system.
12. Design the page as follows:



13. Create a help file as follows:



14. Create a webpage containing your bio data (assume the form and fields).

15. Write a html program including style sheets.
16. Write a html program to layers of information in web page.
17. Create a static webpage.

**Word press:**

18. Installation and configuration of word press.
19. Create a site and add a theme to it.
- 20 Create a child theme
21. Create five pages on COVID – 19 and link them to the home page. .
22. Create a simple post with featured image.
23. Add an external video link with size 640 X 360.
24. Create a user and assign a role to him.
25. Create a login page to word press using custom links
26. Create a website for your college.

## Course 7A: Web Applications Development using PHP & MYSQL

Semester	Course Title	Hours	Credits
V	Web Applications Development using PHP & MYSQL	60	3

### Course Outcomes

1. Write simple programs in PHP.
2. Understand how to use regular expressions, handle exceptions, and validate data using PHP.
3. Apply In-Built functions and Create User defined functions in PHP programming.
4. Write PHP scripts to handle HTML forms
5. Write programs to create dynamic and interactive web based applications using PHP and MYSQL.
6. Know how to use PHP with a MySQL database and can write database driven web pages.

### UNIT - I

The Building blocks of PHP: Variables, Data Types, Operators and Expressions, Constants. Flow Control Functions in PHP: Switching Flow, Loops, Code Blocks and Browser Output. Working with Functions: What is function?, Calling functions, Defining Functions, Returning the values from User-Defined Functions, Variable Scope, Saving state between Function calls with the static statement, more about arguments.

### UNIT - II

Working with Arrays: What are Arrays? Creating Arrays, Some Array-Related Functions. Working with Objects: Creating Objects, Object Instance Working with Strings, Dates and Time: Formatting strings with PHP, Investigating Strings with PHP, Manipulating Strings with PHP, Using Date and Time Functions in PHP.

### UNIT - III

Working with Forms: Creating Forms, Accessing Form Input with User defined Arrays, Combining HTML and PHP code on a single Page, Using Hidden Fields to save state, Redirecting the user, Sending Mail on Form Submission, and Working with File Uploads. Working with Cookies and User Sessions: Introducing Cookies, Setting a Cookie with PHP, Session Function Overview, Starting a Session, Working with session variables, passing session IDs in the Query String, Destroying Sessions and Unsetting Variables, Using Sessions in an Environment with Registered Users.

### UNIT - IV

Working with Files and Directories: Including Files with include(), Validating Files, Creating and Deleting Files, Opening a File for Writing, Reading or Appending, Reading from Files, Writing or Appending to a File, Working with Directories, Open Pipes to and from Process Using popen(), Running Commands with exec(), Running Commands with system() or passthru(). Working with

Images: Understanding the Image-Creation Process, Necessary Modifications to PHP, Drawing a New Image, Getting Fancy with Pie Charts, Modifying Existing Images, Image Creation from User Input.

## UNIT – V

Interacting with MySQL using PHP: MySQL Versus MySQLi Functions, Connecting to MySQL with PHP, Working with MySQL Data. Creating an Online Address Book: Planning and Creating Database Tables, Creating Menu, Creating Record Addition Mechanism, Viewing Records, Creating the Record Deletion Mechanism, Adding Sub-entities to a Record.

## REFERENCES BOOKS:

1. Julie C. Meloni, SAMS Teach yourself PHP MySQL and Apache, Pearson Education (2007).
2. Steven Holzner , PHP: The Complete Reference, McGraw-Hill
3. Robin Nixon, Learning PHP, MySQL, JavaScript, CSS & HTML5, Third Edition O'reilly, 2014
4. Xue Bai Michael Ekedahl, The web warrior guide to Web Programming, Thomson (2006).
5. Web resources:  
<http://www.codecademy.com/tracks/php>  
<http://www.w3schools.com/PHP>  
<http://www.tutorialpoint.com>
6. Other web sources suggested by the teacher concerned and the college librarian including reading material

## Co-Curricular Activities

### a) Mandatory: (Training of students by teacher in field related skills: (lab: 10 + field: 05) :

1. For Teacher: Field related training of students by the teacher in laboratory/field for not less than 15 hours on demonstrating various interactive and dynamic websites available online, addressing the students on identifying the case study to build an interactive and database driven website, forms to be used in website, database to be maintained, reports to be produced, etc.
2. For Student: Students shall (individually) search online and visit any of the agencies like malls, hotels, super bazaars, etc. where there is a need for an interactive and database driven website and submit a hand-written Fieldwork/Project work/Project work/Project work/Project work Report not exceeding 10 pages. Example: Choosing a firm or business to develop a website, identifying forms to be placed in the websites, back end databases to be maintained and reports to be generated and placed in the websites.
3. Max marks for Fieldwork/Project work/Project work/Project work/Project work/Project work Report: 05. 4. Suggested Format for Fieldwork/Project work/Project work/Project work/Project work: Title page, student details, index page, details of place or websites visited, structure of the website and acknowledgements.
4. Unit tests (IE).

## b) Suggested Co-Curricular Activities

1. Arrange expert lectures by IT experts working professionally in the area of web content development
2. Assignments (in writing or implementing contents related to syllabus or outside the syllabus. Shall be individual and challenging)
3. Seminars, Group discussions, Quiz, Debates etc. (on related topics).
4. Preparation by students on best websites.
5. Arrange a webpage development competition among small groups of students.

### Course 7A: Web Applications Development using PHP & MYSQL

Semester	Course Title	Hours	Credits
V	Web Applications Development using PHP & MYSQL Lab	60	3

1. Write a PHP program to Display “Hello”
2. Write a PHP Program to display the today’s date.
3. Write a PHP program to display Fibonacci series.
4. Write a PHP Program to read the employee details.
5. Write a PHP program to prepare the student marks list.
6. Write a PHP program to generate the multiplication of two matrices.
7. Create student registration form using text box, check box, radio button, select, submit button. And display user inserted value in new PHP page.
8. Create Website Registration Form using text box, check box, radio button, select, submit button. And display user inserted value in new PHP page.
9. Write PHP script to demonstrate passing variables with cookies.
10. Write a program to keep track of how many times a visitor has loaded the page.
11. Write a PHP application to add new Rows in a Table.
12. Write a PHP application to modify the Rows in a Table.
13. Write a PHP application to delete the Rows from a Table.
14. Write a PHP application to fetch the Rows in a Table.
15. Develop an PHP application to implement the following Operations
  - i. Registration of Users.
  - ii. Insert the details of the Users.
  - iii. Modify the Details.
  - iv. Transaction Maintenance.
    - a) No of times Logged in
    - b) Time Spent on each login.
    - c) Restrict the user for three trials only.
    - d) Delete the user if he spent more than 100 Hrs of transaction.
16. Write a PHP script to connect MySQL server from your website.

17. Write a program to read customer information like cust-no, cust-name, item purchased, and mob-no, from customer table and display all these information in table format on output screen.
  18. Write a program to edit name of customer to “Kiran” with cust-no =1, and to delete record with cust-no=3.
9. Write a program to read employee information like emp-no, emp-name, designation and salary from EMP table and display all this information using table format in your website.
  20. Create a dynamic web site using PHP and MySQL.

### **Course 6B: Internet of Things**

<b>Semester</b>	<b>Course Title</b>	<b>Hours</b>	<b>Credits</b>
<b>V</b>	<b>Internet of Things</b>	<b>60</b>	<b>3</b>

### **Course Outcomes**

1. Appreciate the technology for IoT
2. Understand various concepts, terminologies and architecture of IoT systems.
3. Understand various applications of IoT
4. Learn how to use various sensors and actuators for design of IoT.
5. Learn how to connect various things to Internet.
6. Learn the skills to develop simple IOT Devices.

#### **UNIT - I**

Fundamentals of IoT: Introduction, Definitions & Characteristics of IoT, IoT Architectures, Physical & Logical Design of IoT, Enabling Technologies in IoT, History of IoT, About Things in IoT, The Identifiers in IoT, About the Internet in IoT, IoT frameworks, IoT and M2M. Applications of IoT: Home Automation, Smart Cities, Energy, Retail Management, Logistics, Agriculture, Health and Lifestyle, Industrial IoT, Legal challenges, IoT design Ethics, IoT in Environmental Protection.

#### **UNIT - II**

Sensors Networks : Definition, Types of Sensors, Types of Actuators, Examples and Working, IoT Development Boards: Arduino IDE and Board Types, RaspberriPi Development Kit, RFID Principles and components, Wireless Sensor Networks: History and Context, The node, Connecting nodes, Networking Nodes, WSN and IoT.

#### **UNIT - III**

Wireless Technologies for IoT: WPAN Technologies for IoT: IEEE 802.15.4, Zigbee, HART, NFC, Z-Wave, BLE, Bacnet And Modbus. IP Based Protocols for IoT IPv6, 6LowPAN, LoRA, RPL, REST, AMPQ, CoAP, MQTT. Edge connectivity and protocols.

## UNIT - IV

Arduino Simulation Environment: Arduino Uno Architecture, Setting up the IDE, Writing Arduino Software, Arduino Libraries, Basics of Embedded C programming for Arduino, Interfacing LED, push button and buzzer with Arduino, Interfacing Arduino with LCD. Sensor & Actuators with Arduino: Overview of Sensors working, Analog and Digital Sensors, Interfacing of Temperature, Humidity, Motion, Light and Gas Sensors with Arduino, Interfacing of Actuators with Arduino, Interfacing of Relay Switch and Servo Motor with Arduino

## UNIT – V

Developing IOT's: Implementation of IoT with Arduino, Connecting and using various IoT Cloud Based Platforms such as Blynk, Thingspeak, AWS IoT, Google Cloud IoT Core etc. Cloud Computing, Fog Computing, Privacy and Security Issues in IoT.

## REFERENCES BOOKS:

1. Internet of Things - A Hands-on Approach, ArshdeepBahga and Vijay Madiseti, Universities Press, 2015, ISBN: 9788173719547
2. Vijay Madiseti and ArshdeepBahga, "Internet of Things (A Hands-onApproach)", 1st Edition, VPT, 2014
3. Daniel Minoli, — "Building the Internet of Things with IPv6 and MIPv6: The Evolving World of M2M Communications", ISBN: 978-1-118-47347-4, Willy Publications
4. Pethuru Raj and Anupama C. Raman, "The Internet of Things: Enabling Technologies, Platforms, and Use Cases", CRC Press
5. Open source software / learning websites
  - a. <https://github.com/connectIOT/iottoolkit>
  - b. <https://www.arduino.cc/>
  - c. [https://onlinecourses.nptel.ac.in/noc17\\_cs22/course](https://onlinecourses.nptel.ac.in/noc17_cs22/course)
  - d. [http://www.cse.wustl.edu/~jain/cse570-15/ftp/iot\\_prot/index.html](http://www.cse.wustl.edu/~jain/cse570-15/ftp/iot_prot/index.html)
  - e. Contiki (Open source IoT operating system)
  - f. Ardudroid (open source IoT project)
  - g. <https://blynk.io> (Mobile app)
  - h. IoT Toolkit (smart object API gateway service reference implementation)
6. Other web sources suggested by the teacher concerned and the college librarian including reading material.

## Co-Curricular Activities

### a) Mandatory: (Training of students by teacher in field related skills: (lab: 10 + field: 05) :

1. For Teacher: Field related training of students by the teacher in laboratory/field for not less than 15 hours on demonstrating various interactive and dynamic websites available online, addressing the students on identifying the case study to build an interactive and database driven website, forms to be used in website, database to be maintained, reports to be produced, etc.

2. For Student: Students shall (individually) search online and visit any of the agencies like malls, hotels, super bazaars, etc. where there is a need for an interactive and database driven website and submit a hand-written Fieldwork/Project work/Project work/Project work/Project work Report not exceeding 10 pages. Example: Choosing a firm or business to develop a website, identifying forms to be placed in the websites, back end databases to be maintained and reports to be generated and placed in the websites.
3. Max marks for Fieldwork/Project work/Project work/Project work/Project work/Project work Report: 05. 4. Suggested Format for Fieldwork/Project work/Project work/Project work/Project work: Title page, student details, index page, details of place or websites visited, structure of the website and acknowledgements.
4. Unit tests (IE).

#### **b) Suggested Co-Curricular Activities**

1. Training of students by related industrial experts.
2. Assignments
3. Preparation and presentation of power-point slides, which include videos, animations,
4. pictures, graphics, etc by the students.
5. Seminars, Group discussions, Quiz, Debates etc. (on related topics).
6. Field visits to identify the problems for IoT solutions..

### **Course 6B: Internet of Things Lab**

<b>Semester</b>	<b>Course Title</b>	<b>Hours</b>	<b>Credits</b>
<b>V</b>	<b>Internet of Things Lab</b>	<b>60</b>	<b>3</b>

1. Understanding Arduino UNO Board and Components
2. Installing and work with Arduino IDE
3. Blinking LED sketch with Arduino
4. Simulation of 4-Way Traffic Light with Arduino
5. Using Pulse Width Modulation
6. LED Fade Sketch and Button Sketch
7. Analog Input Sketch (Bar Graph with LEDs and Potentiometre)
8. Digital Read Serial Sketch (Working with DHT/IR/Gas or Any other Sensor)
9. Working with Adafruit Libraries in Arduino
10. Spinning a DC Motor and Motor Speed Control Sketch
11. Working with Shields
12. Design APP using Blink App or Things peak API and connect it LED bulb.
13. Design APP Using Blynk App and Connect to Temperature, magnetic Sensors.

## Course 7B: APPLICATION DEVELOPMENT USING PYTHON

Semester	Course Title	Hours	Credits
V	APPLICATION DEVELOPMENT USING PYTHON	60	3

### Course Outcomes

1. Understand and appreciate the web architecture and services.  
Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
2. Demonstrate proficiency in handling Strings and File Systems.
3. Create, run and manipulate Python Programs using core data structures like Lists,
4. Dictionaries and use Regular Expressions.
5. Interpret the concepts of Object-Oriented Programming as used in Python.
6. Apply concepts of Python programming in various fields related to IOT, Web Services and Databases in Python.

### UNIT - I

Python basics, Objects- Python Objects, Standard Types, Other Built-in Types, Internal Types, Standard Type Operators, Standard Type Built-in Functions, Categorizing the Standard Types, Unsupported Types Numbers - Introduction to Numbers, Integers, Floating Point Real Numbers, Complex Numbers, Operators, Built-in Functions, Related Modules Sequences - Strings, Lists, and Tuples, Mapping and Set Types

### UNIT - II

Files: File Objects, File Built-in Function [ open() ], File Built-in Methods, File Built-in Attributes, Standard Files, Command-line Arguments, File System, File Execution, Persistent Storage Modules, Related Modules Exceptions: Exceptions in Python, Detecting and Handling Exceptions, Context Management, Exceptions as Strings, Raising Exceptions, Assertions, Standard Exceptions, Creating Exceptions, Why Exceptions (Now)?, Why Exceptions at All?, Exceptions and the sys Module, Related Modules Modules: Modules and Files, Namespaces, Importing Modules, Importing Module Attributes, Module Built-in Functions, Packages, Other Features of Modules

### UNIT - III

Regular Expressions: Introduction, Special Symbols and Characters, Res and Python Multithreaded Programming: Introduction, Threads and Processes, Python, Threads, and the Global Interpreter Lock, Thread Module, Threading Module, Related Modules

## **UNIT - IV**

GUI Programming: Introduction, Tkinter and Python Programming, Brief Tour of Other GUIs, Related Modules and Other GUIs Web Programming: Introduction, Web Surfing with Python, Creating Simple Web Clients, Advanced Web Clients, CGI-Helping Servers Process Client Data, Building CGI Application, Advanced CGI, Web (HTTP) Servers

## **UNIT – V**

Database Programming: Introduction, Python Database Application Programmer's Interface (DBAPI), Object Relational Managers (ORMs), Related Modules

## **REFERENCES BOOKS:**

1. Core Python Programming, Wesley J. Chun, Second Edition, Pearson.
2. Think Python, Allen Downey, Green Tea Press.
3. Introduction to Python, Kenneth A. Lambert, Cengage.
4. Python Programming: A Modern Approach, Vamsi Kurama, Pearson.
5. Learning Python, Mark Lutz, O' Really.
6. Web sources suggested by the teacher concerned and the college librarian including reading material.

## **Co-Curricular Activities**

### **a) Mandatory: (Training of students by teacher in field related skills: (lab: 10 + field: 05) :**

1. For Teacher: Training of students by the teacher in laboratory/field for not less than 15 hours on field related skills like building an IOT device with the help of Python.
2. For Student: Students shall (individually) identify the method to link their IOT project done in Paper 7A with Python and submit a hand-written Fieldwork/Project work/Project work/Project work/Project work Report not exceeding 10 pages. It should include a brief report on the selected case study of IOT device, algorithm and Python program to operate the IOT device.
3. Max marks for Fieldwork/Project work/Project work/Project work/Project work/Project work Report: 05.
4. Suggested Format for Fieldwork/Project work/Project work/Project work/Project work:  
Title page, student details, index page, design of the IOT device, implementation of Python

program to connect the IOT device, findings and acknowledgements.

5. Unit tests (IE).

### b) Suggested Co-Curricular Activities

1. Training of students by related industrial experts.
2. Assignments
3. Seminars, Group discussions, Quiz, Debates etc. (on related topics).
4. Presentation by students on best websites.

### Course 7B: APPLICATION DEVELOPMENT USING PYTHON Lab

Semester	Course Title	Hours	Credits
V	APPLICATION DEVELOPMENT USING PYTHON Lab	60	3

- 1 Write a menu driven program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's choice.
2. Write a python program to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria :  
Grade A: Percentage  $\geq 80$   
Grade B: Percentage  $\geq 70$  and  $< 80$   
Grade C: Percentage  $\geq 60$  and  $< 70$   
Grade D: Percentage  $\geq 40$  and  $< 60$   
Grade E: Percentage  $< 40$
3. Write a python program to display the first n terms of Fibonacci series.
4. Write a python program to calculate the sum and product of two compatible matrices.
5. Write a function that takes a character and returns True if it is a vowel and False otherwise.
6. Write a menu-driven program to create mathematical 3D objects
  - I. curve
  - II. sphere
  - III. cone
  - IV. arrow
  - V. ring
  - VI. Cylinder.
7. Write a python program to read n integers and display them as a histogram.
8. Write a python program to display sine, cosine, polynomial and exponential curves.
9. Write a python program to plot a graph of people with pulse rate p vs. height h. The values of P and H are to be entered by the user.

10. Write a python program to calculate the mass  $m$  in a chemical reaction. The mass  $m$  (in gms) disintegrates according to the formula  $m=60/(t+2)$ , where  $t$  is the time in hours. Sketch a graph for  $t$  vs.  $m$ , where  $t \geq 0$ .
11. A population of 1000 bacteria is introduced into a nutrient medium. The population  $p$  grows as follows:  
$$P(t) = (15000(1+t))/(15 + e)$$
12. Where the time  $t$  is measured in hours. WAP to determine the size of the population at given time  $t$  and plot a graph for  $P$  vs  $t$  for the specified time interval.
13. Input initial velocity and acceleration, and plot the following graphs depicting equations of motion:
  - I. velocity wrt time ( $v=u+at$ )
  - II. distance wrt time ( $s=u*t+0.5*a*t*t$ )
  - 17
  - III. distance wrt velocity ( $s=(v*v-u*u)/2*a$ )
14. Write a program that takes two lists and returns True if they have at least one common member.
15. Write a Python program to print a specified list after removing the 0th, 2nd, 4th and 5th elements.
16. Write a program to implement exception handling.
17. Try to configure the widget with various options like: `bg="green"`, `family="times"`, `size=20`.
18. Write a Python program to read last 5 lines of a file.
19. Design a simple database application that stores the records and retrieve the same
20. Design a database application to search the specified record from the database.
21. Design a database application to that allows the user to add, delete and modify the records.

## Course 6C: DATA SCIENCE

Semester	Course Title	Hours	Credits
V	DATA SCIENCE	60	3

### Course Outcomes

1. Develop relevant programming abilities.
2. Demonstrate proficiency with statistical analysis of data.
3. Develop the ability to build and assess data-based models.
4. Demonstrate skill in data management
5. Apply data science concepts and methods to solve problems in real-world contexts
6. and will communicate these solutions effectively

### UNIT - I

**Introduction:** The Ascendance of Data, What is Data Science? , Finding key Connectors, Data Scientists You May Know, Salaries and Experience, Paid Accounts, Topics of Interest, Onward.

**Python:** Getting Python, The Zen of Python, Whitespace Formatting, Modules, Arithmetic, Functions, Strings, Exceptions, Lists, Tuples, Dictionaries, Sets, Control Flow, Truthiness, Sorting, List Comprehensions, Generators and Iterators, Randomness, Object – Orienting Programming, Functional Tools, enumerate, zip and Argument Unpacking, args and kwargs, Welcome to Data Science!

**Visualizing Data:** matplotlib, Bar charts, Line charts, Scatterplots.

**Linear Algebra:** Vectors, Matrices

### UNIT - II

**Statistics:** Describing a Single Set of Data, Correlation, Simpson’s Paradox, some Other Correlation Caveats, Correlation and Causation.

**Probability:** Dependence and Independence, Conditional Probability, Bayes’s Theorem, Random Variables, Continuous Distributions, The Normal Distribution, The Central Limit Theorem.

**Hypothesis and Inference:** Statistical Hypothesis Testing, Example: Flipping a Coin, Confidence Intervals, P-hacking, Example: Running an A/B Test, Bayesian Inference.

**Gradient Descent:** The Idea behind Gradient Descent, Estimating the Gradient, Using the Gradient, Choosing the Right Step Size, Putting It All Together, Stochastic Gradient Descent.

### UNIT - III

**Getting Data:** stdin and stdout, Reading Files – The Basics of Text Files, Delimited Files, Scraping the Web - HTML and the parsing Thereof, Example: O’Reilly Books About Data, Using APIs – JSON ( and XML), Using an Unauthenticated API, Finding APIs.

**Working with Data:** Exploring Your Data, Exploring One-Dimensional Data, Two Dimensions Many Dimensions, Cleaning and Munging, Manipulating Data, Rescaling, Dimensionality Reduction.  
**Machine Learning:** Modeling, What Is Machine Learning? Over fitting and under fitting, Correctness, The Bias-Variance Trade-off, Feature Extraction and Selection

#### **UNIT - IV**

**K-Nearest Neighbors:** The Model, Example: Favorite Languages, The Curse of Dimensionality.

**Naive Bayes:** A Really Dumb Spam Filter, A More Sophisticated Spam Filter, Implementation, Testing Our Model.

**Simple Linear Regression:** The Model, Using Gradient Descent, Maximum Likelihood Estimation.

**Multiple Regression:** The Model, Further Assumptions of the Least Squares Model, Fitting the Model, Interpreting the Model, Goodness of Fit.

#### **UNIT – V**

**Logistic Regression:** The Problem, The Logistic Function, Applying the Model, Goodness of Fit Support Vector Machines.

**Decision Trees:** What Is a Decision Tree? Entropy, The Entropy of a Partition, Creating a Decision Tree, Putting It All Together, Random Forests.

**Neural Networks:** Perceptron, Feed-Forward Neural Networks And Back propagation, Example: Defeating a CAPTCHA. Clustering: The Idea, The Model,

**Example:** Meetups , Choosing k, Example: Clustering Colors, Bottom-up Hierarchical Clustering.

#### **REFERENCES BOOKS:**

1. Data Science from Scratch by Joel Grus O'Reilly Media
2. Wes McKinney, "Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython", O'Reilly, 2nd Edition, 2018.
3. Jake VanderPlas, "Python Data Science Handbook: Essential Tools for Working with Data", O'Reilly, 2017.
4. Web resources:
  - a. <https://www.edx.org/course/analyzing-data-with-python>
  - b. [http://math.ecnu.edu.cn/~lfzhou/seminar/\[Joel\\_Grus\]\\_Data\\_Science\\_from\\_Scratch\\_First\\_Princ.pdf](http://math.ecnu.edu.cn/~lfzhou/seminar/[Joel_Grus]_Data_Science_from_Scratch_First_Princ.pdf)
5. Other web sources suggested by the teacher concerned and the college librarian including reading material.

#### **Co-Curricular Activities**

##### **a) Mandatory: (Training of students by teacher in field related skills: (lab: 10 + field: 05) :**

1. For Teacher: Field related training of students by the teacher in laboratory/field for not less than 15 hours on identifying, analyzing and presenting the data and then to predict the future instances.
2. For Student: Students shall (individually) search online and visit any of the agencies like Statistical cell, weather forecasting centers, pollution control boards, manufacturing industries, agriculture departments, etc. to observe the manual process going on to collect the

data, maintain the data, present the data and to predict the data for future instances and submit a hand-written Fieldwork/Project work/Project work/Project work/Project work Report not exceeding 10 pages.

20

3. Max marks for Fieldwork/Project work/Project work/Project work/Project work/Project work Report: 05.

4. Suggested Format for Fieldwork/Project work/Project work/Project work/Project work: Title page, student details, index page, details of place visited, observations, findings and acknowledgements.

5. Unit tests (IE).

### b) Suggested Co-Curricular Activities

1 Training of students by related industrial experts.

2. Assignments

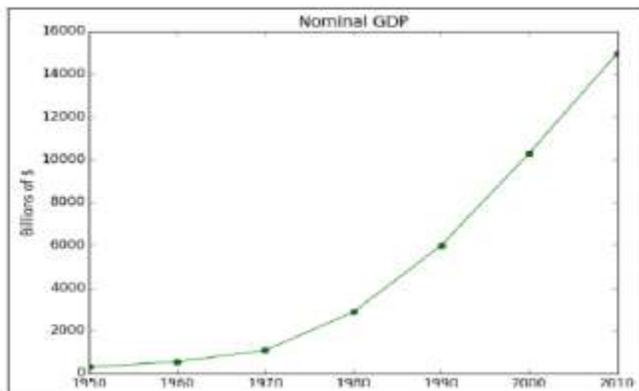
3. Seminars, Group discussions, Quiz, Debates etc. (on related topics).

4. Presentation by students in related topics

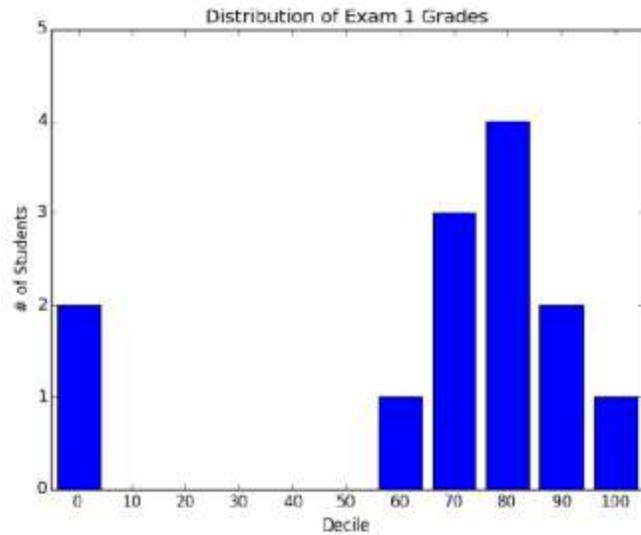
### Course 7B: Data Science Lab

Semester	Course Title	Hours	Credits
V	Data Science Lab	60	3

1. Write a Python program to create a line chart for values of year and GDP as given Below



2. Write a Python program to create a bar chart to display number of students secured different grading as given below



3. Write a Python program to create a time series chart by taking one year month wise stock data in a CSV file
4. Write a Python program to plot distribution curve
5. Import a CSV file and perform various Statistical and Comparison operations on rows/columns. Write a python program to plot a graph of people with pulse rate  $p$  vs. height  $h$ . The values of  $P$  and  $H$  are to be entered by the user.
6. Import rainfall data of some location with the help of packages available in R Studio and plot a chart of your choice

## Course 7C: Python For Data Science

Semester	Course Title	Hours	Credits
V	Python For Data Science	60	3

### Course Outcomes:

1. Identify the need for data science and solve basic problems using Python built-in data types and their methods.
2. Design an application with user-defined modules and packages using OOP concept
3. Employ efficient storage and data operations using NumPy arrays.
4. Apply powerful data manipulations using Pandas.
5. Do data pre-processing and visualization using Pandas

### Unit - I

Introduction to Data Science - Why Python? - Essential Python libraries - Python Introduction- Features, Identifiers, Reserved words, Indentation, Comments, Built-in Data types and their Methods: Strings, List, Tuples, Dictionary, Set - Type Conversion- Operators. Decision Making- Looping- Loop Control statement- Math and Random number functions. User defined functions - function arguments & its types.

### UNIT –II

User defined Modules and Packages in Python- Files: File manipulations, File and Directory related methods - Python Exception Handling.  
OOps Concepts -Class and Objects, Constructors – Data hiding- Data AbstractionInheritance.

### UNIT –III

NumPy Basics: Arrays and Vectorized Computation- The NumPy ndarray- Creating ndarrays- Data Types for ndarrays- Arithmetic with NumPy Arrays- Basic Indexing and Slicing - Boolean Indexing-Transposing Arrays and Swapping Axes.  
Universal Functions: Fast Element-Wise Array Functions- Mathematical and Statistical Methods-Sorting- Unique and Other Set Logic.

### UNIT –IV

Introduction to pandas Data Structures: Series, Data Frame and Essential Functionality: Dropping Entries- Indexing, Selection, and Filtering- Function Application and MappingSorting and Ranking.  
Summarizing and Computing Descriptive Statistics- Unique Values, Value Counts, and Membership. Reading and Writing Data in Text Format

## UNIT –V

Data Cleaning and Preparation: Handling Missing Data - Data Transformation: Removing Duplicates, Transforming Data Using a Function or Mapping, Replacing Values, Detecting and Filtering Outliers- String Manipulation: Vectorized String Functions in pandas. Plotting with pandas: Line Plots, Bar Plots, Histograms and Density Plots, Scatter or Point Plots.

### REFERENCES BOOKS:

1. Y. Daniel Liang, “Introduction to Programming using Python”, Pearson, 2012.
2. Wes McKinney, “Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython”, O’Reilly, 2nd Edition, 2018.
3. Jake VanderPlas, “Python Data Science Handbook: Essential Tools for Working with Data”, O’Reilly, 2017.
4. Wesley J. Chun, “Core Python Programming”, Prentice Hall, 2006.
5. Mark Lutz, “Learning Python”, O’Reilly, 4th Edition, 2009.
6. Web resources:
  - a. <https://www.edx.org/course/python-basics-for-data-science>
  - b. <https://www.edx.org/course/analyzing-data-with-python>
  - c. <https://www.coursera.org/learn/python-plotting?specialization=data-sciencepython>
  - d. <https://www.programmer-books.com/introducing-data-science-pdf/>
  - e. <https://www.cs.uky.edu/~keen/115/Haltermanpythonbook.pdf>
7. Other web sources suggested by the teacher concerned and the college librarian including reading material.

### Co-Curricular Activities:

#### **a) Mandatory: (Training of students by teacher in field related skills: (lab:10 + field: 05):**

1. For Teacher: Field related training of students by the teacher in laboratory/field for not less than 15 hours on collecting the data, analyzing the data and presenting the data using Python language with some real time data.
2. For Student: Students shall (individually) visit any of the agencies like Agriculture dept, statistical cell, irrigation department, Ground water department, CPO office, Rural Water Supply and Sanitation department etc or search online to get real time data like Aids database, weather forecasting database, social networking data, etc and identify any one database, implement and present the necessary charts in Python language and submit a handwritten Fieldwork/Project work/Project work/Project work/Project work Report not exceeding 10 pages. Example: Identifying a database, get the data, present the data in required charts and to predict the future instances if possible.
3. Max marks for Fieldwork/Project work/Project work/Project work/Project work Report: 05.
4. Suggested Format for Fieldwork/Project work/Project work/Project work/Project work: Title page, student details, index page, and details of place visited, observations, method of data collection, database identified, and implementation in Python language, other findings and acknowledgements.

5. Unit tests (IE).

**b) Suggested Co-Curricular Activities**

1. Training of students by related industrial experts.
2. Assignments
3. Seminars, Group discussions, Quiz, Debates etc. (on related topics).
4. Presentation by students on the topics within and outside the syllabus.

**Course 7C: Python For Data Science Lab**

Semester	Course Title	Hours	Credits
V	Python For Data Science Lab	60	3

1. Perform Creation, indexing, slicing, concatenation and repetition operations on Python built-in data types: Strings, List, Tuples, Dictionary, Set
2. Apply Python built-in data types: Strings, List, Tuples, Dictionary, Set and their methods to solve any given problem.
3. Handle numerical operations using math and random number functions
4. Create user-defined functions with different types of function arguments.
5. Create packages and import modules from packages.
6. Perform File manipulations- open, close, read, write, append and copy from one file to another.
7. Write a program for Handle Exceptions using Python Built-in Exceptions
8. Write a program to implement OOP concepts like Data hiding and Data Abstraction.
9. Create NumPy arrays from Python Data Structures, Intrinsic NumPy objects and Random Functions.
10. Manipulation of NumPy arrays- Indexing, Slicing, Reshaping, Joining and Splitting.
11. Computation on NumPy arrays using Universal Functions and Mathematical methods.
12. Load an image file and do crop and flip operation using NumPy Indexing.
13. Create Pandas Series and Data Frame from various inputs.
14. Import any CSV file to Pandas Data Frame and perform the following:
  - (a) Visualize the first and last 10 records
  - (b) Get the shape, index and column details
  - (c) Select/Delete the records (rows)/columns based on conditions.
  - (d) Perform ranking and sorting operations.
  - (e) Do required statistical operations on the given columns.
- 25
- (f) Find the count and uniqueness of the given categorical values.
- (g) Rename single/multiple columns
15. Import any CSV file to Pandas Data Frame and perform the following:
  - (a) Handle missing data by detecting and dropping/ filling missing values.

- (b) Transform data using apply () and map() method.
- (c) Detect and filter outliers.
- (d) Perform Vectorized String operations on Pandas Series.
- (e) Visualize data using Line Plots, Bar Plots, Histograms, Density Plots and Scatter Plots

**Govt. College for Women(Autonomous),Srikakulam**

**I B.Sc., Computer Science**

**Semester-I Blue Print**

**<<Paper Title>>**

**Subject: <<Paper Title>>**

**Paper: <<No>>**

**Time: 3 hrs**

**Marks:75M**

**Model Blue print for the question paper setter**

<b>Chapter name</b>	<b>Essay Questions 10 Marks</b>	<b>Short Questions 5 Marks</b>	<b>Marks allotted to the chapter</b>
<b>UNIT-I</b>	<b>2</b>	<b>2</b>	<b>30</b>
<b>UNIT-II</b>	<b>2</b>	<b>2</b>	<b>30</b>
<b>UNIT-III</b>	<b>2</b>	<b>2</b>	<b>30</b>
<b>UNIT-IV</b>	<b>2</b>	<b>2</b>	<b>30</b>
<b>UNIT-V</b>	<b>2</b>	<b>2</b>	<b>30</b>
<b>Total no. of questions</b>	<b>10</b>	<b>10</b>	<b>20</b>
<b>Total Marks Including Choice</b>	<b>100</b>	<b>50</b>	<b>150</b>

**Govt. College for Women(Autonomous),Srikakulam**  
**I B.Sc., Computer Science**  
**Semester-I Paper-I Model Paper**  
**Problem Solving in C**

**Subject: Problem Solving in C**  
**Time: 3 hrs**

**Paper: I**  
**Marks:75M**

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Section – A

I. Answer the following questions (5x10=50)

1. (a) Illustrate different Symbols of Flow Chart? Draw Flow Chart for finding Factorial of a Number.  
(OR)  
(b) Describe functions of each component of Computer with block diagram.
2. (a) Describe Tokens in C.  
(OR)  
(b) Differentiate while and do-while loop with an example.
3. (a) Write a C program to find largest and smallest elements using arrays.  
(OR)  
(b) Explain String handling functions.
4. (a) Explain arrays of structures with an example.  
(OR)  
(b) How to passing the parameters in functions.
5. (a) Explain dynamic memory allocation functions in C.  
(OR)  
(i) Explain the following file handling functions:  
a. fseek() b. ftell() c. rewind() d. feof()  
(ii) Write a C program to copy the contents from one file to another file.

Section – B

II. Answer any FIVE questions (5x5=25)

1. List out applications of Computer.
2. Illustrate characteristics of Algorithm.
3. What is the structure of C Program?
4. Explain switch statement with its syntax and example.
5. How to declare and initialize 1-D, 2-D array with an example.
6. Write a program to print the array elements in reverse order.
7. Describe Life and Scope of a variable
8. Explain Recursion with an example
9. What is pointer arithmetic?
10. Write the syntax for opening a file with various modes and closing a file.

**Govt. College for Women(Autonomous),Srikakulam**

**I B.Sc., Computer Science**

**Semester-II Paper-II Model Paper**

**Data Structures Using C**

**Subject: Data Structures Using C**

**Time: 3 hrs**

**Paper: II**

**Marks:75M**

Section – A

I. Answer the following questions

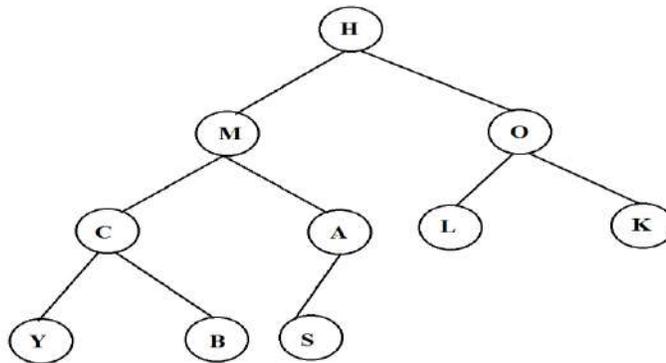
(5x10=50)

- (a) What is an ADT? Explain Array ADT with examples.  
(OR)

(b) Write the Algorithm for inserting an element in a single linked  
(i) At the Beginning of the list (ii) After a Specific Position (iii) at the end of the list
- (a) Describe Stack ADT. Illustrate recursion implementation using STACK.  
(OR)

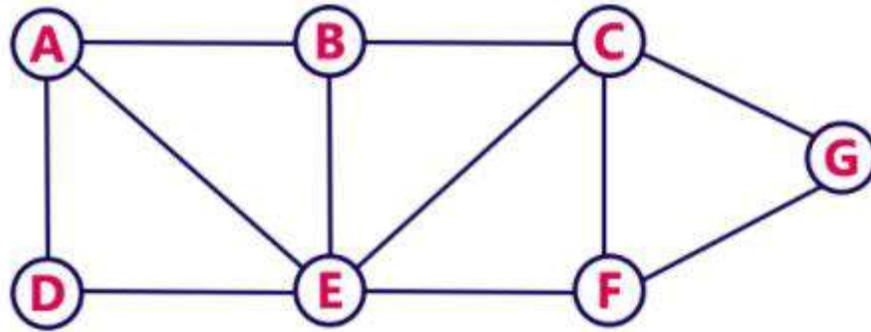
(b) Describe Circular Queue ADT. Describe different operations performed on circular queue.
- (a)Write Procedures of insert and delete operations on Binary Search Tree(BST).  
(OR)

(b)Explain different traversals of Binary Tree.  
For the following binary tree



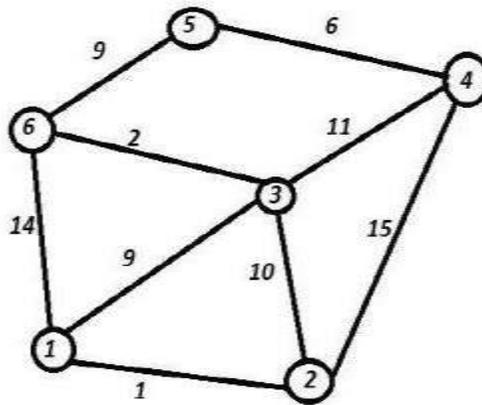
Obtain In order, Pre Order and Post Order Traversals.

- (a) Write the step by step procedure of DFS algorithm. Find the Depth First Traversal of the given graph  
(Assume A as starting Vertex).



(OR)

(b) Write the step by step procedure of Krushkal's minimal spanning tree algorithm. Obtain minimum spanning tree for the following graph



5. (a) List out the steps in Heap Sort algorithm. Perform Heap sort over 13, 102, 405, 136, 15, 105, 390, 432, 28,444

(OR)

(b) Write Binary Search Algorithm. Analyse the time complexity of Binary Search.

### Section – B

II. Answer any FIVE questions

(5x5=25)

1. Differentiate Linear and Non-Linear Data Structures.
2. Explain asymptotic notations.
3. Explain infix to prefix conversion of an arithmetic expression  $((A-(B+C)*D)/(E+F))$ .
4. Explain applications of Queues.
5. Define Binary Tree. Explain different ways of representing a binary tree.
6. Describe different types of Binary Trees.
7. List out applications of Graphs.
8. Describe the adjacency matrix and adjacency list representations of graphs.
9. Explain Linear Search algorithm with an Example.
10. Write Bubble Sort Algorithm.

**Govt. College for Women(Autonomous),Srikakulam**

**I B.Sc., Computer Science**

**Semester-III Paper-III Model Paper**

**Object Oriented Programming Through Java**

**Subject:** Objecte Oriented Programming through Java

**Paper: III**

**Time: 3 hrs**

**Marks:75M**

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**Section – A**

I. Answer any FIVE questions (5x10=50)

1. (a) Explain about different data types in Java.  
(OR)  
(b) Explain about Java operators.
2. (a) Explain the different ways of creating, initializing and accessing arrays in Java  
(OR)  
(b) Define String. Discuss the way of creating Strings. Explain different String Class Methods
3. (a) Define Constructor. Explain different types of constructors in java.  
(OR)  
(b) Explain with examples different types of Inheritance in java
4. (a) Explain how to create package and access a package.  
(OR)  
(b) Explain how to read data from a file using File Input Stream.
5. (a) What is an Exception? Explain how to create a user defined exception.  
(OR)  
(b) Explain creation ,running and terminating of a Thread

**Section – B**

II. Answer any FIVE questions

**(5x5=25)**

6. Explain about features of Java.
7. Explain different ways of reading input in a Java Program
8. Distinguish break and continue
9. Explain any one loop statement available in Java with an example
10. Define Class and Object. Explain how to create objects in java.
11. Explain Method overloading with an example.
12. Define Package. What are different types of Packages.
13. Explain how to read a file using File Reader
14. Explain different types of Exceptions
15. Explain Thread Life Cycle

**Govt. College for Women(Autonomous),Srikakulam**

**II B.Sc., Computer Science**

**Semester-IV Paper-IV MODEL PAPER**

**Subject: Database Management Systems**

**Paper: C4**

**Time: 3 hrs.**

**Marks: 75M**

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**Section – A**

**I. Answer the following questions**

**(5x10=50)**

1. Differentiate File system Vs DBMS

OR

Explain architecture of DBMS.

2. What are the symbols used in ER-diagram? Explain with examples.

OR

Illustrate classification of relationships with examples.

3. What is Normalization? Explain about various Normal Forms.

OR

Explain COOD's rules in detail.

4. Explain various SQL commands with examples.

OR

Illustrate various set operations with examples.

5. What are iterative statements in PL/SQL? Explain in detail.

OR

What is Trigger? Explain various types of triggers.

**Section – B**

**II. Answer any FIVE questions**

**(5x5=25)**

1. Define the terms Data, information, and Database management system. Give example for each of them

2. Write about hierarchical and network data models

3. What is data Independence?

4. Write about relational data model

5. Classify the relationships based on degree? Give an example for each of the types

6. What are the data types supported by SQL?

7. What are aggregate functions? Specify the aggregate functions supported by SQL

8. Explain the structure of PL/SQL program

9. What is a Procedure? Write about the parameters supported by the procedures in PL/SQL.

10. What is the need for data dictionary?

**Govt. College for Women(Autonomous),Srikakulam**  
**II B.Sc., Computer Science**  
**Semester-IV Paper-V MODEL PAPER**

**Subject: Operating Systems**  
**Time: 3 hrs.**

**Paper: C5**  
**Marks: 75M**

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**Section – A**

I. Answer the following questions (5x10=50)

1. Explain the operating system structure  
OR  
Explain the evolution of operating system.

2. Explain various CPU scheduling algorithms.  
OR

What is monitor? State the solution for Dining Philosophers problem using monitors.

3. Explain the structure of a page table.  
OR  
Explain the need of page replacement.

4. Explain various file access methods.  
OR  
Explain various disk scheduling algorithms.

5. Explain the deadlock prevention techniques.  
OR  
Define safe state? Explain safety algorithm for deadlock avoidance.

**Section – B**

II. Answer any FIVE questions (5x5=25)

6. What is Operating system? List some of its functions.
7. Explain various types of multiprocessor systems?
8. Explain the state diagram of a process?
9. What is semaphore? Explain its types.
10. Logical address space verses physical address space.
11. What is demand paging?
12. Explain various file attributes.
13. Explain the mass storage structure..
14. What are the necessary condition for deadlock?
15. How to detect deadlocks?

**Government College for Women(Autonomous)Srikakulam**  
**Reaccredited by NAAC with 'A' Grade during 3<sup>rd</sup> Cycle (CGPA 3.09)**

**RESOLUTIONS/MINUTES OF BOARD OF STUDIES MEETING HELD**  
**ON 10<sup>TH</sup> OCTOBER,2022**

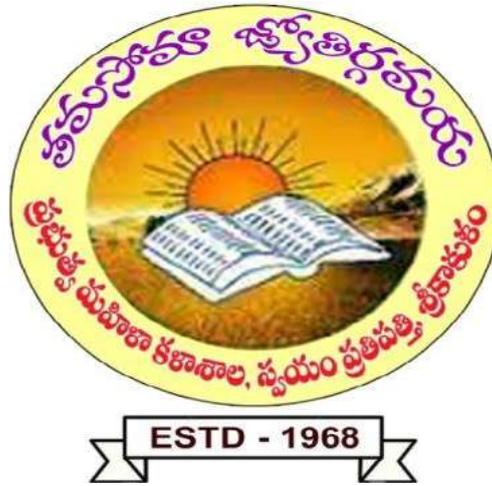
1. It is resolved to adapt CBCS system for all 6 Semesters.
2. It is resolved to adapt the syllabus framed by APSCHE.
3. It is resolved to approve and ratify the first ,second and third year syllabus of the Computer Science Degree for 2022-23 admitted batch .
4. It is resolved to introduce Community Service Project and Internship of total 10 months duration from 2020-21 admitted batch.
5. It is resolved to approve and ratify the model question papers submitted by the concerned faculty members for all the semesters. The evaluation of internal will be done for 25 Marks(Continuous Assessment) and External assessment is for 75 Marks.
6. It is resolved to encourage students to register for certificate courses offered by Microsoft, NetAcad, Spoken Tutorials etc.
7. Conduct Seminars, Workshops, Symposia, Industry visits etc...
8. Adapt quality based curriculum as per the norms of the NAAC.
9. Encourage the students to join JKC ,APSSDC to improve Technical and communication skills
10. Encourage students to participate in community centric activities like health programs and tie –up with reputed organizations.

## Member Present

S.No	BOS Committee	Name & Designation	Signature
1.	Chair Person	Name : Smt. I. Srilakshmi Designation :Lecturer in Computer Science Address :GCW(A),Srikakulam	
2.	Subject Expert (University Nominee)	Name : Dr. A. Mary Sowjanya Designation: Asst. Professor, Dept. of CS&SE Address: Andhra University College of Engineering(A),Vishakhapatnam	
3.	Subject Expert (Nominated By Academic Council )	Name : Dr. A. Siva Prasad Designation :Lecturer in Computer Science Address : Government Degree College, Tekkali	
4.	Subject Expert (Nominated By Academic Council )	Name : Sri. V. RaghavaSwamy Dora Designation :Lecturer in Computer Science Address: Dr. V. S. Krishna College(A),Vishakhapatnam	
5.	Member of Industrial	Name : Kum. P. Vijaya Durga Designation :License Manager Software Asset Management Team Address : Wipro, Hyderabad	
6.	Member of Alumni	Name: Kum. M. Gayatri Varshitha Pursuing M.Sc Computer Science Dr. BR. Ambedakar University, Etcherla	
7.	Members of Department	1)Smt. G. Suma Latha, Lecturer in Computer Science Government College For Women(A),SKLM  2)Smt. S. Vani Kumari, Lecturer in Computer Applications Government College For Women(A),SKLM  3)Smt. S. Madhavi Latha, Lecturer in Computer Applications Government College For Women(A),SKLM	

**GOVERNMENT COLLEGE FOR WOMEN (AUTONOMOUS)  
SRIKAKULAM**

**DEPARTMENT OF  
COMPUTER SCIENCE & APPLICATIONS**



**BOARD OF STUDIES  
LIFE SKILL & SKILL DEVELOPMENT COURSES  
SYLLABUS  
2022-23**

# Government College for Women(Autonomous)Srikakulam

Reaccredited by NAAC with 'A' Grade during 3<sup>rd</sup> Cycle (CGPA 3.09)

\* \* \* \*

From  
Dr.K.Sreeramulu,M.Com.,Ph.D.  
Principal  
Govt. College for Women (A)  
Srikakulam

## **BOARD OF STUDIES MEETING AGENDA FOR 2021- 22 & 2022 – 23**

- 1) Adoption of Choice Based Credit System (CBCS) for I, II , III ,IV,V end Semesters.
- 2) Approve and introduce the newly formed syllabi for I,II,III,IV,V,VI Course or subjects.
- 3) Ratification and introduction of semester mode pattern of Examination, for all semesters.
- 4) Approve and ratify value added certificate courses.
- 5) Approval and ratification of Skill Based Programmes
- 6) Approval and ratification of Life Skill courses and skill development Courses for 1<sup>st</sup> and 2<sup>nd</sup> Year Students.
- 7) Approve and ratify community Service Projects and Internships at end of II, IV,V, VI Semesters.
- 8) Approve and ratify Model Question Paper, Blue Print etc.in which 25 marks Internal Assessment and 75 marks External Assessment
- 9) Approve and ratify model question paper, for LSC and SDC for 50 marks external pattern
- 10) Approval of List of Examiners
- 11) Approval of innovative teaching , learning and evaluation Techniques
- 12) Approval of Student Seminars, Workshops, Field Trips – student centric activities.
- 13) Approval of Students Projects and Students Research.
- 14) Approval of ICT mode of teaching.
- 15) Approval of encouragement to join students in JKC
- 16) Approval of encouragement for students to join in NSS and different extension activities.
- 17) Any other matter

Signature of Principal

**Department of Computer Science & Applications**  
**Government College for Women(Autonomous)Srikakulam**

Reaccredited by NAAC with 'A' Grade during 3<sup>rd</sup> Cycle (CGPA 3.09)

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**BOS Meeting 20.10.2022**

The Board of Studies meeting is held on 20.10.2022 Time: 10.00 am in the Department of Computer Science & Applications, Government College for Women (Autonomous) , Srikakulam for the Autonomous students i.e., 2020 – 21 under the Chairmanship of Smt. S. Vani Kumari , Head of the Department of Computer Applications of this college as per the UGC Letter No.F22-1/2017 (AC) Date: 28.11.2018 and Dr.B.R.Ambekar University , Srikakulam letter, RC.No.BRAU/F J :Autonomous Status 2019 -20 dated 15.03.2019. The following members attended and discussed the various academic matters of the Life Skill and Skill Development courses Syllabus and its evaluation.

S.No	BOS Committee	Name & Designation
1.	Chair Person	Name : Smt. S. Vani Kumari Designation :Lecturer in Computer Applications Address :GCW(A),Srikakulam
2.	Subject Expert (University Nominee)	Name : Dr. A. Mary Sowjanya Designation: Asst. Professor, Dept. of CS&SE Address: Andhra University College of Engineering(A),Vishakhapatnam
3.	Subject Expert (Nominated By Academic Council )	Name : Dr. A. Siva Prasad Designation :Lecturer in Computer Science Address : Government Degree College, Tekkali
4.	Subject Expert (Nominated By Academic Council )	Name : Sri. V. Raghava Swamy Dora Designation :Lecturer in Computer Science Address: Dr. V. S. Krishna College(A),Vishakhapatnam
5.	Member of Industrial	Name : Kum P. VijayaDurga Designation :License Manager Software Asset Management Team Address : Wipro, Hyderabad
6.	Member of Alumni	Name: Kum. M. Gayatri Varshitha Pursuing M.Sc Computer Science Dr.BR. Ambedkar University, Etcherla
7.	Members of Department	1)Smt. S. Madhavi Latha , Lecturer in Computer Applications, Government College For Women(A),SKLM  2)Smt. I. Sri Lakshmi, Lecturer in Computer Science Government College For Women(A),SKLM  3)Smt. G. Suma Latha, Lecturer in Computer Science Government College For Women(A),SKLM

**GOVT. COLLEGE FOR WOMEN (AUTONOMOUS): SRIKAKULAM**  
**B.Sc./B.Com/B.A Foundation Courses Structure of Syllabus**  
**Under CBCS w.e.f. 2020-21**

<b>Year</b>	<b>Semester</b>	<b>Paper</b>	<b>Title of the Paper</b>
I	I	LSC	Basic Computer Applications
II	II	LSC	Information and Communication Technology
II	III	SDC	Online Business

# GOVT. COLLEGE FOR WOMEN (AUTONOMOUS): SRIKAKULAM

## B.Sc./B.Com/B.A Foundation Courses Syllabus

### Under CBCS w.e.f. 2019-20

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#### INFORMATION & COMMUNICATION TECHNOLOGY –1 (ICT-1)

##### Computer Fundamentals and Office Tools B.Sc/B.Com/B.A - I YEAR – Semester-II

#### Unit-I:

Basics of Computers: Definition of a Computer - Characteristics and Applications of Computers – Block Diagram of Computer – Classification of Computers - Types of computers based on Size and Functionally – Central Processing Unit – I/O Devices - Input Devices: Keyboard, Mouse and Optical Inputs, Output Devices: Monitor and Printer.

#### Unit-II:

Memory devices – Primary Memory, Secondary Memory and Cache Memory. Software, Hardware, – Definition and Types of Operating System, Functions of an Operating System – MS-DOS - Internal Command and External Commands, MS Windows – Desktop, Documents, Recycle Bin, Task Bar - Control Pane.

#### Unit-III:

MS-Word: Features of MS-Word – MS-Word Window Components – Creating, Editing, Formatting and Printing of Documents, Formatting Text, Cut, Copy and Paste options – Headers and Footers – Insert/Draw Tables, Table Auto format – Page Borders and Shading, Page Numbers – Inserting Clip Arts, Shapes, Word Art ,– Mail Merge.

#### Unit-IV:

MS-PowerPoint -Features of PowerPoint – Creating a Presentation- Inserting and Deleting Slides in a Presentation, Views in power point– Adding Clip Art/Shapes/Pictures - Resizing and Reposition of an Object – Custom Animation.

#### Unit-V:

MS-Excel - Overview of Excel features and parts – Creating a new worksheet, Selecting cells, Entering and editing Text, Numbers, Formulae, Referencing cells – Inserting Rows/Columns –Changing column widths and row heights, Auto fill features , Font options, Excel functions and Excel charts.

#### Reference Books:

1. Fundamentals of Computers by ReemaThareja, Publishers: Oxford University Press, India
2. Fundamentals of Computers by V.Raja Raman, Publishers: PHI
3. Microsoft Office 2010 Bible by John Walkenbach, Herb Tyson, Michael R.Groh and Faithe Wempen, Publishers: Wiley

## **INFORMATION & COMMUNICATION TECHNOLOGY –1 (ICT-1)**

### **Internet Fundamentals and Web Tools**

#### **B.Sc/B.Com/B.A - II YEAR – Semester-III**

### **SYLLABUS**

#### **Unit-I:**

Fundamentals of Internet: Networking Concepts, Data Communication – Types of Networking, Network topologies, Internet and its Services, – Computer Virus and its types – Types of Browsers.

#### **Unit-II:**

Internet applications: Internet Applications - Using Internet Explorer, Standard Internet Explorer Buttons, Entering a Web Site Address, Searching the Internet – Introduction to Social Networking: Twitter, Face book, Yahoo, Google, YouTube, WhatsApp, etc.

#### **Unit-III:**

E-mail: Definition of E-mail - Advantages and Disadvantages – UserIds, Passwords, Email Addresses, Mailers, Message Components, Message Composition, Mail Management, Email Inner Workings.

#### **Unit-IV:**

WWW- Web Applications, Web Terminologies, Web Browsers, URL – Components of URL, Searching WWW – Search Engines and Examples

#### **Unit-V:**

Basic HTML: Basic HTML – Structure of a HTML Document – HTML, Head and Body tags – Semantic and Syntactic Tags – HR, Heading, Font, Image, color and background Tags – Different types of Lists using tags – Table Tags, Image formats – Creation of simple HTML Documents.

#### **Reference Books:**

1. In-line/On-line: Fundamentals of the Internet and the World Wide Web, 2/e - by Raymond Greenlaw and Ellen Hepp, Publishers: TMH

# GOVT. COLLEGE FOR WOMEN (AUTONOMOUS): SRIKAKULAM

## B.Com Skill Development Course Syllabus

### Under CBCS w.e.f. 2019-20

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#### Online Business B.Com - II YEAR – Semester-III

#### SYLLABUS

#### Learning Outcomes:

After successful completion of the course, students will be able to;

1. Understand the online business and its advantages and disadvantages
2. Recognize new channels of marketing, their scope and steps involved
3. Analyze the procurement, payment process, security and shipping in online business
4. Create new marketing tools for online business
5. Define search engine, payment gateways and SEO techniques.

#### SYLLABUS:

##### Section-I: 06 Hrs

Introduction to Online-business-Definition-Characteristics-Advantages of Online BusinessChallenges- Differences between off-line business, e-commerce and Online Business.

##### Section-II: 10 Hrs

Online-business Strategies-Strategic Planning Process- Procurement -Logistics & Supply Chain Management- Customer Relationship management.

##### Section-III: 10 Hrs

Designing Online Business Website – Policies - Security & Legal Issues - Online Advertisements - Payment Gateways - Case Study

Co-curricular Activities Suggested: (4 hrs)

1. Assignments, Group discussion, Quiz etc.
2. Short practical training in computer lab
3. Identifying online business firms through internet
4. Invited Lectures by e-commerce operators
5. Working with Google and HTML advertisements.
6. Visit to a local online business firm.

Reference books:

1. David Whiteley, "E-Commerce", Tata McGraw Hill, 2000.
2. E Business by Jonathan Reynolds from Oxford University Press.
3. Soka, From EDI to Electronic Commerce, McGraw Hill.
4. Websites on Online business

**Govt. College for Women(Autonomous),Srikakulam**

**B.Sc/B.Com/BA**

**LIFE SKILL COURSE**

**<<Paper Title>>**

**Subject: <<Paper Title>>**

**Paper: <<No>>**

**Time: 1.5 hrs**

**Marks: 50 M**

**Model Blue print for the question paper setter**

<b>Chapter name</b>	<b>Short Questions 5 Marks</b>	<b>Essay Questions 10 Marks</b>	<b>Marks allotted to the chapter</b>
<b>UNIT-I</b>	<b>3</b>	<b>2</b>	<b>35</b>
<b>UNIT-II</b>	<b>3</b>	<b>2</b>	<b>35</b>
<b>UNIT-III</b>	<b>2</b>	<b>1</b>	<b>20</b>
<b>Total no. of questions</b>	<b>8</b>	<b>5</b>	
<b>Total Marks Including Choice</b>			<b>90</b>

**Govt. College for Women(Autonomous),Srikakulam**

**B.Com**

**SKILL DEVLOPMENT COURSE**

**<<Paper Title>>**

**Subject: <<Paper Title>>**

**Paper: <<No>>**

**Time: 1.5 hrs**

**Marks: 50 M**

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**Model Blue print for the question paper setter**

<b>Chapter name</b>	<b>Short Questions 5 Marks</b>	<b>Essay Questions 10 Marks</b>	<b>Marks allotted to the chapter</b>
<b>UNIT-I</b>	<b>3</b>	<b>2</b>	<b>35</b>
<b>UNIT-II</b>	<b>3</b>	<b>2</b>	<b>35</b>
<b>UNIT-III</b>	<b>2</b>	<b>1</b>	<b>20</b>
<b>Total no. of questions</b>	<b>8</b>	<b>5</b>	
<b>Total Marks Including Choice</b>			<b>90</b>

**Govt. College for Women(Autonomous)**

**Srikakulam**

**B.Sc. / B.Com / B.A**

**LIFE SKILL COURSE**

**Subject: INFORMATION & COMMUNICATION TECHNOLOGY**

**Paper: I**

**Time: 1 1/2 hrs**

**Marks:50M**

**Model Question Paper Format**

Max. Marks: 50

Time: 1 1/2 hrs (90 Minutes)

**Section -A**

**(Answer any four questions. Each answer carries 5 marks) (Total: 4x5=20 Marks)**

1. What is a Browser? Explain about different types of browsers?  
బ్రౌజర్ అంటే ఏమిటి? వివిధ రకాల బ్రౌజర్ల గురించి వివరించండి?
2. Explain in detail the different ways of searching the world wide web.  
వరల్డ్ వైడ్ వెబ్ లో శోధించే వివిధ మార్గాలను వివరించండి.
3. Explain about Whats App and Facebook  
వాట్సాప్ మరియు ఫేసుబుక్ గూర్చి వివరించండి
4. Write the advantages and disadvantages of an email.  
ఇమెయిల్ ప్రయోజనాలు మరియు అప్రయోజనాలు గురించి వివరించండి.
5. Write about email address and Domain names  
ఇమెయిల్ అడ్రెస్సు మరియు డొమైన్ నేమ్స్ గూర్చి వివరించండి
6. Explain about Google Drive and Google Documents  
గూగుల్ డ్రైవ్ మరియు గూగుల్ డాక్యుమెంట్స్ గూర్చి వివరించండి.
7. What is a Computer Virus? Explain about types of viruses and anti-virus softwares.

కంప్యూటర్ వైరస్ అనగా నేమి ? వివిధ రకాల వైరస్ లు మరియు వాటి ప్రభావాలు వివరించండి.

8. Discuss about Digital signatures and Copyright issues.

డిజిటల్ సిగ్నచేర్స్ మరియు కాపీ రైట్స్ ఇష్యూస్ గూర్చి చర్చించండి.

### **Section- B**

Answer any **three questions**. Each answer carries **10 marks** (Total: 3x10 = 30 Marks)

1. Explain various applications of internet.

ఇంటర్నెట్ యొక్క వివిధ అప్లికేషన్స్ వివరించండి.

2. What is Social Networking? Explain about its advantages and disadvantages.

సోషల్ నెట్వర్కింగ్ ని నిర్వచించుము. దాని ప్రయోజనాలు మరియు అప్రయోజనాలు గురించి వివరించండి.

3. Explain the Procedure for composing an E-mail

ఇ-మెయిల్ కంపోజ్ చేసే విధానాన్ని వివరించండి

4. Explain the purpose of Google Forms. Write the steps for creation of a simple Google form .

గూగుల్ ఫార్మ్స్ ప్రయోజనాన్ని వివరించండి . గూగుల్ ఫారం తయారు చేసే విధానాన్ని వివరించండి

5. List and explain any five GOI digital initiatives in higher education?

ఉన్నత విద్య లో ఏవైనా అయిదు GOI డిజిటల్ కార్యక్రమాలను గూర్చి విశిదీకరించండి

**Government College for Women(Autonomous)Srikakulam**  
Reaccredited by NAAC with 'A' Grade during 3<sup>rd</sup> Cycle (CGPA 3.09)

**RESOLUTIONS/MINUTES OF BOARD OF STUDIES MEETING HELD**  
**ON 10<sup>TH</sup> OCTOBER,2022**

1. It is resolved to adapt the syllabus framed by APSCHE
2. It is resolved to approve and ratify syllabus of the Life Skill Courses for batch admitted 2022-23.
3. It is resolved to approve and ratify the model question papers with external assessment for 50 Marks.
4. Conduct Seminars, Workshops, Symposia, Industry visits etc...
5. Adapt quality based curriculum as per the norms of the NAAC.
6. Encourage the students to join JKC,APSSDC to equip with communication skills and improve their personality development.
7. Encourage students to participate in community centric activities like health programmes and tie –up with reputed organizations.

## Member Present

S.No	BOS Committee	Name & Designation	Signature
1.	Chair Person	Name : Smt. I. Srilakshmi Designation :Lecturer in Computer Science Address :GCW(A),Srikakulam	
2.	Subject Expert (University Nominee)	Name : Dr. A. Mary Sowjanya Designation: Asst. Professor, Dept. of CS&SE Address: Andhra University College of Engineering(A),Vishakhapatnam	
3.	Subject Expert (Nominated By Academic Council )	Name : Dr. A. Siva Prasad Designation :Lecturer in Computer Science Address : Government Degree College, Tekkali	
4.	Subject Expert (Nominated By Academic Council )	Name : Sri. V. RaghavaSwamy Dora Designation :Lecturer in Computer Science Address: Dr. V. S. Krishna College(A),Vishakhapatnam	
5.	Member of Industrial	Name : Kum. P. Vijaya Durga Designation :License Manager Software Asset Management Team Address : Wipro, Hyderabad	
6.	Member of Alumni	Name: Kum. M. Gayatri Varshitha Pursuing M.Sc Computer Science Dr. BR. Ambedakar University, Etcherla	
7.	Members of Department	1)Smt. G. Suma Latha, Lecturer in Computer Science Government College For Women(A),SKLM  2)Smt. S. Vani Kumari, Lecturer in Computer Applications Government College For Women(A),SKLM  3)Smt. S. Madhavi Latha, Lecturer in Computer Applications Government College For Women(A),SKLM	