



**Sophia Girls' College (Autonomous),
Ajmer**



Department of Computer Science

Course Plan

Mr. Gautam Chaturvedi



Course Plan

Session 2021-22

(Even Semester)

S.No.	Class	Semester	Paper
1.	BCA / IMSC	II	BCA / IMSC 203 Object Oriented Programming with C++
2.	BCA / IMSC	IV	BCA / IMSC 403 Python Programming
3.	BCA / IMSC	VI	BCA/IMSC – 606 Project
4.	M.Sc. CS	II	MSC-203 - Programming in Python



SOPHIA GIRL'S COLLEGE, AJMER (AUTONOMOUS)
BCA / IMSC (SEMESTER II) 2021-22

BCA / IMSC– 203 Object Oriented Programming with C++

Max. Marks :75 (50Ext; 25 Int)

Min. Marks: 30(20 Ext;10 Int) Credits: 4

COURSE PLAN

SEM II Month	UNIT / TOPIC	Concepts / Facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
JANURARY	Introduction: to OOP's, Evolution of OOP, Advantages of OOP, Features of OOPS- Objects, Classes, Data Abstraction & Encapsulation, Inheritance, Polymorphism. Comparison between Functional Programming and OOPS (Difference between structure and Class)	Know Features of OOPS Understand basic characterises of C++ like character set, operators etc.	PPT, Practical Implementation, Practice questions, worksheet, MCQ'S	Understand and apply OOP's features and C++ concepts	<u>Knowledge Based</u> What is OOPS? Define Data Types of C++ <u>Understanding Based</u>	Knowledge—50 Understanding-35 Higher Order-15
FEBURARY	C++: Character set, Keywords, Constant, Variables, Data types (Built- in, User Defined), Operators & Expressions. Instructions: Input output, Arithmetic, Control (Decision, Case, Loop) and nesting. Classes: data member, member functions, objects, Access specifiers (private, public, protected) arrays of class objects, pointers and classes,	To understand the difference between functional programming & OOPS and where to apply these.	PPT, Practical Implementation MCQ's, assignments, group discussion	Able to use the basic features of oops in the programming	What is Classes & Objects? Comparison of different types of Polymorphism	

2021-22

Page 2



MARCH	constructors(default, parameterized, copy), constructor overloading, destructor, static class member, friend functions. Dynamic memory allocation: New & Delete operator. Inheritance: types of inheritance, member access control, abstract class.	<p>Learn to make classes and use of different features of class.</p> <p>Use of dynamic memory allocation</p>	PPT, Quiz, practical implementation	Understand the tree data structure and implement its traversing	<p><u>Higher Order Thinking Skills Based</u></p> <p>Write a program to implement real life inheritance.</p>	
APRIL	Polymorphism: Binding, Function overloading, Function overriding, Virtual functions, Operator overloading (as a member function & as a friend function) File Handling: ofstream, ifstream, fstream, opening, closing, writing & reading from the file.	<p>How inheritance can be implemented in different ways and comparison of their complexities.</p> <p>Concept of Polymorphism and its types</p>	PPT, Practical, Live Examples,assignments	Analyze inheritance, polymorphism and applying them in the programming	<p>Is Polymorphism is necessary for the OPPS programming define how.</p>	

Sr. Pearl
 PRINCIPAL
 SOPHIA GIRLS' COLLEGE
 (AUTONOMOUS)
 AJMER



SOPHIA GIRL'S COLLEGE, AJMER (AUTONOMOUS)
B.C.A/ IMSC (SEMESTER IV) 2021-22

BCA/IMSC – 403 Python Programming

Max. Marks :75 (50Ext; 25 Int)

Min. Marks: 30 (20 Ext;10 Int)

COURSE PLAN

SEM IV Month	UNIT / TOPIC	Concepts / facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
JANURARY	Introduction: History, Versions, Features, Advantages, Application areas. Python Basics: IDLE, Editors, Keywords, Identifiers, Indents, Input Output Basic Syntax, Variable, Dynamic Typing, Data Types (Mutable and Immutable), Built-in Conversion Methods. Operator: Arithmetic, Comparison, Logical, Identity, Membership. Control Statements: Conditional (If, If- else, Elself, Nested if-else), Looping (While, For, Nested loops), Break, Continue, Pass.	Use of Python, and its basic features operators & control statements	PPT, Practical Implementation, Hands- on Exercise,group discussion	Apply basic features of Python programming	<u>Knowledge Based</u> What is Membership operator? Define Loop control Statements of Python <u>Understanding Based</u> Implement Array traversing	Knowledge--50 Understanding-35 Higher Order-15
FEBURARY	Array: Introduction, Creation, Traverse, Insertion, Deletion, Search, Update. String: Introduction, Types, Escape Sequences, Formatting, Operators, Built-in Methods (Capitalize, Upper, Lower, Title, Find, Count, Isalpha, Isdigit, Islower, Isupper), Basic Operations (Accessing, Updating, Concatenation).	Need of Array and how to use them in Python. Use of Strings & their built in functions	PPT, Practical Implementation, Hands - on Exercise,problem solving activities	Able to recognize the use of array & strings with their features	Give the utility of built in methods of string	

2021-22

Page 4



MARCH	<p>List & Tuple: Introduction, Accessing Operators, Built-in Methods (Len, Max, Min, Append, Insert, Remove, Pop, Reverse, Sort, List), Basic Operations (Updating, Delete, Concatenation, Indexing, Slicing).</p> <p>Set: Introduction, Accessing, Built-in Methods (Add, Update, Clear, Copy, Discard, Remove), Operations (Union, Intersection, Difference).</p> <p>Dictionary: (Single Dimensional) Introduction, Accessing, Updating, Deleting, Viewing values in dictionaries, Built-in Methods (Len, Max, Min, Pop, Clear, Items, Keys, Values, Update).</p>	Understand the concept & use of List, Tuple, Set & Dictionary with all their features.	PPT, Practical Implementation, practice Exercise, problem solving activities	Understand difference between List, Tuple, Set & Dictionary	<p><u>Higher Order Thinking Skills Based</u></p> <p>Write a program to create a List & Dictionary and differentiate them</p> <p>Is Polymorphism is necessary for the OPPS programming define how.</p>	
APRIL	<p>Function: Defining, Calling, Function Arguments (Required, Keyword, Default, Variable Length) Anonymous Functions, Global and Local Variables. Modules: Introduction, Importing Module, Built-in Modules (Math, Statistics, Random).</p> <p>Package: Creating, Installing, Importing Modules from the Package.</p> <p>Errors & Exception: Error Types, Exception Handling - Introduction, Try, Except, Else, Finally.</p> <p>File Input-Output: Opening and Closing files, Reading and Writing files.</p>	Understand the use of functions, Packages and need of exception handling	PPT, Practical Implementation, practice on Exercise, problem solving activities	Ability to Text Processing scripts		



SOPHIA GIRL'S COLLEGE, AJMER (AUTONOMOUS)
B.C.A /IMSC (SEMESTER VI) 2021-22

BCA/IMSC– 606 Project

Max. Marks :75 (50Ext; 25 Int)

Min. Marks: 30 (20 Ext;10 Int)

COURSE PLAN

SEM VI Month	UNIT / TOPIC	Concepts / Facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
JANURARY	Allotment of the Groups and Topics	Learning Team Work & Leadership Responsibilities	Presentation, Library Visit ,E content	Formulate a real world problem and develop its requirements	<u>Knowledge Based</u> Define Qualities of user friendly interface	Knowledge-- 60 Understanding- 30 Higher Order- 10
FEBURARY	Creation of User Interface (Forms / WebPages)	Understand user need & trying to make user friendly Interface	PPT, Practical, Live Examples,group discussion	Develop a design solution for a set of requirements	<u>Understanding Based</u> Which function is best suitable to take input from the user and why?	
MARCH	Connectivity with the Database & Report Writing	Understand the technical issues of connecting the interface with the Database	PPT, Practical Implementation	Generate alternative solutions, compare them and select the optimum one	<u>Higher Order Thinking Skills Based</u> Can creation of multi dimensional arrays help in managing the large amount of data systematically? Justify with example.	
APRIL	Final Submission of the Project Report & Presentation	Learn to make Project Report & its presentation	PPT, Practical Implementation,group discussion			

2021-22

Dr. Pearl
 PRINCIPAL
 SOPHIA GIRLS' COLLEGE
 (AUTONOMOUS)
 AJMER

Page 6



SOPHIA GIRL'S COLLEGE, AJMER (AUTONOMOUS)

M.Sc. CS (SEMESTER II) 2021-22

MSC – 203 Programming in Python

Max. Marks :100 (70Ext; 30 Int)

Min. Marks: 40 (28 Ext;12 Int)

COURSE PLAN

SEM II Month	UNIT / TOPIC	Concepts / facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
MARCH	Introduction: History, Versions, Features, Advantages, Application areas. Python Basics: IDLE, Editors, Keywords, Identifiers, Indents, Input Output Basic Syntax, Variable, Dynamic Typing, Data Types (Mutable and Immutable), Built-in Conversion Methods. Operator: Arithmetic, Comparison, Logical, Identity, Membership. Control Statements: Conditional (If, If- else, Elself, Nested if-else), Looping (While, For, Nested loops), Break, Continue, Pass.	Use of Python, and its basic features operators & control statements	PPT, Practical Implementation, Hands- on Exercise, group discussion	Apply basic features of Python programming	<u>Knowledge Based</u> What is Membership operator? Define Loop control Statements of Python <u>Understanding Based</u> Implement Array traversing	Knowledge--50 Understanding-35 Higher Order-15
APRIL	Array: Introduction, Creation, Traverse, Insertion, Deletion, Search, Update. String: Introduction, Types, Escape Sequences, Formatting, Operators, Built-in Methods (Capitalize, Upper, Lower, Title, Find, Count, Isalpha, Isdigit, Islower, Isupper), Basic Operations (Accessing, Updating, Concatenation).	Need of Array and how to use them in Python. Use of Strings & their built in functions	PPT, Practical Implementation, Hands - on Exercise, problem solving activities	Able to recognize the use of array & strings with their features	Give the utility of built in methods of string	

2021-22

Page 7



MAY	<p>List & Tuple: Introduction, Accessing Operators, Built-in Methods (Len, Max, Min, Append, Insert, Remove, Pop, Reverse, Sort, List), Basic Operations (Updating, Delete, Concatenation, Indexing, Slicing).</p> <p>Set: Introduction, Accessing, Built-in Methods (Add, Update, Clear, Copy, Discard, Remove), Operations (Union, Intersection, Difference).</p> <p>Dictionary: (Single Dimensional) Introduction, Accessing, Updating, Deleting, Viewing values in dictionaries, Built-in Methods (Len, Max, Min, Pop, Clear, Items, Keys, Values, Update).</p>	Understand the concept & use of List, Tuple, Set & Dictionary with all their features.	PPT, Practical Implementation, practice Exercise, problem solving activities	Understand difference between List, Tuple, Set & Dictionary	<p><u>Higher Order Thinking Skills Based</u></p> <p>Write a program to create a List & Dictionary and differentiate them</p> <p>Is Polymorphism is necessary for the OPPS programming define how.</p>	
JULY	<p>Function: Defining, Calling, Function Arguments (Required, Keyword, Default, Variable Length) Anonymous Functions, Global and Local Variables. Modules: Introduction, Importing Module, Built-in Modules (Math, Statistics, Random).</p> <p>Package: Creating, Installing, Importing Modules from the Package.</p> <p>Errors & Exception: Error Types, Exception Handling - Introduction, Try, Except, Else, Finally.</p> <p>File Input-Output: Opening and Closing files, Reading and Writing files.</p>	Understand the use of functions, Packages and need of exception handling	PPT, Practical Implementation, practice on Exercise, problem solving activates	Ability to Text Processing scripts		



SOPHI GIRL'S COLLEGE, AJMER (AUTONOMOUS)
V.C.A. (SEMESTER IV) 2021-22

VCA- 401 Programming in C++

Max. Marks :75 (50Ext; 25 Int)

Min. Marks: 30 (20 Ext;10 Int)

LESSON PLAN

SEM - IV Month	UNIT / TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
DECEMBER	<ul style="list-style-type: none"> Classes Objects Features of OOPS Advantages and disadvantages Characteristics of OOPS languages Terminology of OOPS 	Classes, objects, polymorphism, data abstraction, inheritance, over loading	PPT	Understanding the basic concept of OOPS languages and its different terminologies and their meaning	<u>Knowledge Based</u> What are classes? What are objects	Knowledge--45 Understanding-15 Higher Order-15
JANURARY	<ul style="list-style-type: none"> How to make class? How to create objects? Member functions Data members Array of objects Constructor Destructor Function overloading 	Classes, objects, data members, creating constructors and destructors, implementing function overloading	PPT , Quiz	Understand the basic concept of OOPS programming language, its structure. Implementing various oops technologies in a program.	<u>Understanding Based</u> Give difference between structure and class.	

2021-22

Page 6



FEBURARY		Utility of Compression and various standards, privacy aspects of project	PPT	Study laws of multimedia and importance of compression technique	<u>Higher Order Thinking Skills Based</u> WAP with a class called student having a friend function fees which would print the fess of a student. Also inherit a class called defaulter from the above class.
	<ul style="list-style-type: none">• Static class member• Dynamic memory allocation• Friend functions	Understanding the concept of static class members. Using dynamic memory allocation.	PPT, Practical Implementation	Using friend functions in c++.	
MARCH	<ul style="list-style-type: none">• Inheritance• Types of Inheritance• Advantages and disadvantages of inheritance• Function overriding• Function over loading	Understanding the basic concept of Inheritance, its need and importance	PPT, Practical Implementation	Understand the difference between function over loading and function over riding.	

Head

Department of Computer Science
Sophia Girls' College
(Autonomous), Ajmer

PRINCIPAL
SOPHIA GIRLS' COLLEGE
(AUTONOMOUS)
AJMER



SOPHIA GIRL'S COLLEGE, AJMER (AUTONOMOUS)
V.C.A (SEMESTER IV) 2021-22

VCA – 402 Data Structure and Algorithms

Max. Marks :75 (50Ext; 25 Int)

Min. Marks: 30(20 Ext;10 Int)

LESSON PLAN


SEM IV Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
DECEMBER	<ul style="list-style-type: none">• Introduction to algorithms• Introduction to data types• Arrays, two and three dimensional and their storage policy• Characteristics of an algorithm	<ul style="list-style-type: none">• Understanding the need and importance of an algorithm.• Understand the different data types and their importance.• Understanding the concept of arrays	PPT, Practical Implementation, Practice questions, worksheet	Write meaningful algorithms with best characteristics. Understanding the storage mechanism of arrays.	<u>Knowledge Based</u> What is algorithm? What are primitive data types and composite data types? <u>Understanding Based</u> Explain a good algorithm.	Knowledge--45 Understanding-15 Higher Order-15
JANUARY	<ul style="list-style-type: none">• Sorting and Searching.• Binary and Linear Search algorithm• Sorting – External and Internal Sorting algorithms.• Merge Sort, Selection Sort	<ul style="list-style-type: none">• Understanding the need and importance of searching and sorting.• Understanding different algorithms used for searching and sorting	PPT, Practical Implementation MCQ's	Able to code the searching and sorting algorithms. Implement different searching and sorting techniques	WAP to implement Binary Search algorithm in C++.	

2021-22

Page 8

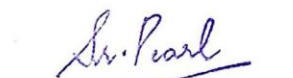


FEBRUARY	<ul style="list-style-type: none">• Linked List : Introduction• Representation of linked list in memory• Traversing a linked list• Searching a linked list• Sorting a linked list• Types of linked list	Understanding the need and importance of a linked list. Understanding different types of linked list. Using programming techniques to search, traverse and sort a linked list	PPT, Quiz	Understand the linked list data structure and implement it through coding.	<u>Higher Order Thinking Skills Based</u> Write a program to implement a stack in c++ using class.	
MARCH	<ul style="list-style-type: none">• Introduction to various data structures like Stacks , Queues, Graph, Tree• Traversing a tree – Pre order, post order, in order• Breadth First Search• Depth First Search	Understanding data structures like stacks, queue and tree. Understanding their working mechanism. Understanding the traversing and searching mechanism in these data structures.	PPT, Practical, Live Examples	Understand the basic concept of data structure. Understand the need, importance and meaning of various data structures. Understanding the different traversing mechanisms used in different data structures.	What is the difference between Stack and Queue working methodology?	


Head

Department of Computer Science
Sophia Girls' College
(Autonomous) , Ajmer




PRINCIPAL
SOPHIA GIRLS' COLLEGE
(AUTONOMOUS)
AJMER

2021-22

Page 9



SOPHIA GIRL'S COLLEGE, AJMER (AUTONOMOUS)
B.C.A (SEMESTER IV) 2021-22

BCA-401 – E Commerce

Max. Marks :100 (70Ext; 30 Int)

Min. Marks: 40(28 Ext;12 Int)

LESSON PLAN

SEM IV Month	UNIT/TOPIC	Concepts/facts	Teaching Pedagogy	Learning Outcomes	Questions	Marks Weightage (%)
DECEMBER	<ul style="list-style-type: none"> Introduction to E Commerce Different terminologies related to E Commerce Different platforms available on E Commerce for Business 	<ul style="list-style-type: none"> Understanding the basic terminologies. Understanding the need and importance of E Commerce platform for business 	PPT	Understand the impact of Ecommerce platform.The growth and need of ECommerce	<u>Knowledge Based</u> What is E Commerce? <u>Understanding Based</u> Define E Ecommerce Explain difference between traditional and Non Traditional Business.	Knowledge--60 Understanding-30 Higher Order-30
JANUARY	<ul style="list-style-type: none"> Impact Advantages Disadvantages 	<ul style="list-style-type: none"> Understanding the impact of Ecommerce on our daily life and business Understanding the advantages and disadvantages of E Commerce 	PPT	Able to code differentiate between the advantages and disadvantages of E Commerce		

2021-22

Page 10



FEBRUARY	<ul style="list-style-type: none">Anatomy of E CommerceDifferent Business Models	Understand the anatomy of E Commerce. Understand the basic Business Models of E Commerce and their working style. The advantages and disadvantages of various Ecommerce business models	PPT, Quiz	Understand the various models working on ecommerce models and their working. Understanding the basics of E Commerce Anatomy	<u>Higher Order Thinking Skills Based</u> Difference Advertising and Information Model. Difference between B2B and B2C Model. Explain how EDI systems work and their importance in modern business.
MARCH	<ul style="list-style-type: none">E Payment SystemsThreat to different E Payment SystemsEDI	Understanding the various E Payment systems available to customers. Advantages and disadvantages of various E Commerce platforms.	PPT	Understand what is EDI and various Payment systems. Their advantages and disadvantages.	


Head
Department of Computer Science
Sophia Girls' College
(Autonomous), Ajmer




PRINCIPAL
SOPHIA GIRLS' COLLEGE
(AUTONOMOUS)
AJMER