Faculty of Computer Science & Applications
Bachelor of Computer Applications in Data Science
(W. E. F.: 2023-24)
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Name of Faculty	:	Faculty of Computer Science & Applications
Name of Program	:	Bachelor of Computer Applications in Data Science
Course Code	:	2BCA04
Course Title	:	Object Oriented Principles with Programming Methods
Type of Course	:	Professional Core
Year of Introduction	:	2023-24

Prerequisite	:	-
Course Objective	:	Learn various of Programming Methodologies and Approach, Understanding the problem, identifying the solution, applying techniques for solution. Represent solution by the algorithm, flowchart. Writing the program. Learn debugging for correctness, Understand Object Oriented paradigm, and it's Principals, Learn Modelling Language -UML
Course Outcomes	:	At the end of this course, students will be able to:
	CO 1	Define and classify various Programming Methodologies and Approach
	CO 2	Learning to identifying the problem, and it's solution, applying techniques for solution
	CO 3	Draw solution by the algorithm, flowchart. Writing the program.
	CO 4	Learn the Programming Construct, Writing the program. Learn debugging for correctness,
	CO 5	Know the Object, Object Oriented (OO) paradigm and Object elements, OO Principals, Learn Modelling Language -UML

Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			**Credits**	**Examination Marks**				
				Theory Marks		**Practical Marks**		**Total Marks**
L	**T**	**P**	**C**	**SEE**	**CIA**	**SEE**	**CIA**	
2	0	0	2	50	25	0	0	75

*Legends: **L**-Lecture; **T**–Tutorial/Teacher Guided Theory Practice; **P**–Practical, **C** – Credit, **SEE** – Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations /MCQ Tests, etc.))*

Course Content

Unit No.	Topics	Teaching Hours	Weightage	Mapping with CO
1	**Introduction:** Types of Programming Methodologies, Top-down or Modular Approach, Bottom-up Approach **Understanding the problem:** Requirement Gathering, Problem Definition **Identifying the solution:** Flowcharting, Data Flow Diagram, Pseudocode, Identifying Mathematical Operations **Applying modular techniques:** Advantages of Modular Programming, Identifying the Modules, Step-by-Step Solution, Control Structures **Writing the algorithm** **Flowchart**: Know flowchart elements, Draw Flowcharts. **Using clear instructions:** Clarity of Expressions Simplicity of Instructions.	10	20%	CO 1 CO 2
2	**Correct programming techniques:** Proper Identifier, Names, Comments, Indentation **Debugging:** Syntax Errors, Semantic Errors, Runtime Errors, Code Optimization, Execution Time Optimization, Memory Optimization. **Program documentation:** Advantages of Documentation, Example Documents **Program maintenance:** Types of Maintenance, Maintenance Tools.	4	20%	CO 3
3	**Introduction OO paradigm:** Paradigms of Programming Languages, Evolution of OO Methodology, Basic Concepts of OO Approach, Comparison of Object Oriented and Procedure Oriented Approaches, Benefits of OOPs	6	20%	CO 4
4	**Basic Object Oriented Principals:** Encapsulation, Data hiding, polymorphism, Inheritance, Abstraction. Introduction to Common OO Language	6	30%	CO 4 CO 5
5	**Introduction to UML:** Various UML Diagrams	4	10%	CO 5

Suggested Distribution of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
Weightage	**30**	**30**	**20**	**20**	**-**	**-**

NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Suggested List of Experiments/Tutorials

Sr. No.	Name of Experiment/Tutorial	Teaching Hours
1	Compare various types of Programming Methodologies,	2
2	State advantages of Modular Approach, Top-down, Bottom-up Approaches.	2
3	Do the Requirement Gathering, and define Problem Definition of application ADDRESS BOOK,	4
4	Write the algorithm of application ADDRESS BOOK	4
5	Write the Flow chart of application ADDRESS BOOK	4
6	Write the steps for Debugging a program.	4
7	Define the object ADDRESS Entity and Explain Encapsulation, Data hiding, polymorphism, Inheritance, Abstraction in ADDRESS Entity.	6
8	Define and explain Various UML Diagrams of object ADDRESS	4

Major Equipment/ Instruments and Software Required

Sr. No.	Name of Major Equipment/ Instruments and Software
1	UML Tools - Visual Paradigm, VISIO, STARUML

Suggested Learning Websites

Sr. No.	Name of Website
1	https://www.tutorialspoint.com/programming_methodologies/programming_methodologies_tutorial.pdf
2	http://www.cectl.ac.in/images/pdf_docs/studymaterial/cse/s3/ds1.pdf

Reference books:

Sr. No.	Name of Reference Books
1	Venit, S & Drake E., Prelude to Programming: Concepts & Design, 4th Ed., Addison Wesley (Pearson)
2	Matt Weisfeld, The Object Orient Thought Process,3rd Ed., Addison Wesley