M.Sc. (Information Technology)
Semester I

Course Code	PS01CINT22	Title of the Course	Advanced Programming Concepts & Data Structures
Total Credits of the Course	4	Hours per Week	4

Main Focus of the Course outcomes	Employability	Skill Development	Entrepreneurship
	✓	✓	
Course Objectives:	1. To understand the concepts related to Object Oriented Programming. 2. To understand the concepts related to data structures and file management.		

Course Content		
Unit	Description	Weightage* (%)
1.	**Introduction to Object Oriented Concepts** - Introduction to Object Oriented Programming (OOP) - Advantages of OOP - Difference between Object Oriented Programming and Procedure Oriented Programming - An anatomy of C++ Program - Classes and Objects - Data members, member functions - Constructors, Destructors, new and delete operators - Basic input/output - Different types of inheritance - Abstraction - Encapsulation	25
2.	**Object Oriented Programming**	25

	- Access controls - Input/output in detail - Polymorphism, virtual functions - Function overloading - Operator overloading - Exception handling - Introduction to namespace	
3.	**Introduction to Data Structures** - Time and space efficiency of algorithms - Primitive and Composite data types - Arrays - Stacks - Queues and its types - Linked Lists and its types	25
4.	**Randomization & File Management** - - Inverted lists, Multi-lists - Concepts of fields, records and files - Variable length records - Hashing techniques for direct files - Sequential file organization - Indexed Sequential Access Method (ISAM) - B trees and B+ trees	25

Teaching-Learning Methodology	Blended learning approach incorporating traditional classroom teaching as well as online / ICT-based teaching practices

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%

2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%
3.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	gain knowledge of the concepts related to OOPs.
2.	gain knowledge of data structures and file management.

Suggested References:	
Sr. No.	References
1.	Tremblay J. & Sorenson P.G: An Introduction to Data Structures with Applications 2nd Edition – TMH.
2.	Stroustrup, Bjarne : The C++ Programming Language, Special Edition, Parson Education Asia, 2001.
3.	Liberty Jesse & Keogh Jim, C++ - An Introduction to Programming, Prentice Hall India Ltd., 2001.
4.	Hubbard J. R., Schaum's Outlines Programming with C++, Tata McGraw-Hill Publishing Co. Ltd., 2006.
5.	Object Oriented Programming With C++. Author, E. Balagurusamy

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