Course Type	Course Code	Name of the Course	L	T	P	Credits
DP	NMCC533	Computational Programming for Data Analytics Lab	0	0	3	1.5

Course Objective
To develop computational problem-solving and analytical programming skills using C++, focusing on data structures, algorithms, functional and object-oriented programming, data analytics, visualization, and database-driven application development.
Learning Outcomes
Students will be able to design efficient C++-based analytical applications involving data processing, advanced programming paradigms, visualization, and database manipulation for solving real-world computational and data analytics problems.

Unit No.	Lab Experiment Name	Lecture Hours	Learning Outcome
1	Computational Problem Solving using C++	3	Students will learn about basic computational programming.
2	Standard Template Library (STL)-Based Data Manipulation	3	Students will learn about data manipulation techniques using STL.
3	Matrix and Numerical Computing	3	Students will learn about implementing matrix and numerical computing.
4	Object-Oriented Analytical System Design	9	Students will learn about OOPS concepts.
5	C++ function overriding, Templates and Exception handling	6	Students will learn about typecasting, C++ function overriding, templates, exception handling in data-centric applications.
6	File Handling and Dataset Processing	3	Students will learn about file handling and dataset processing.
7	Statistical Data Analytics and Data Visualization using C++	6	Students will learn about statistical data analytics and data visualization concepts.
9	Database Connectivity	3	Students will learn about connecting database with data-centric application.
10	Mini Project and Lab Examination	6	Students will develop a mini-project followed by lab examination.
	Total	**42**	

Text Books:

1. C++ How to Program, Paul Deitel and Harvey Deitel, 10th Edition, Pearson Education, 2022.
2. Programming: Principles and Practice Using C++ Bjarne Stroustrup, Programming: Principles and Practice Using C++, 3rd Edition, Addison-Wesley, 2024.

Reference Books:

1. The C++ Programming Language, Bjarne Stroustrup, 4th Edition, Addison-Wesley, 2013.
2. Effective Modern C++, Scott Meyers, 1st Edition, O'Reilly Media, 2014.