AN INTRODUCTION TO PROGRAMMING THROUGH C++

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TYPE OF COURSE : New | Core | UG/PG

COURSE DURATION : 12 weeks (29 Jul’19 - 18 Oct’19)

EXAM DATE : 17 Nov 2019

PRE-REQUISITES : Standard XII in the Science stream.

INTENDED AUDIENCE : First and second year students in degree programs including Engineering and Science degree programs.

COURSE OUTLINE :
This course provides an introduction to problem solving and programming using the C++ programming language. The topics include: Basic programming notions, Program design, Programming applications, Standard Library of C++

ABOUT INSTRUCTOR :
Prof. Abhiram G. Ranade is a Professor of Computer Science and Engineering at IIT Bombay. He obtained a B. Tech degree in Electrical Engineering from IIT Bombay in 1981. In 1988, he obtained a Ph.D in Computer Science from Yale University, USA. His research interests are Algorithms, Combinatorial Optimization, Scheduling in Transportation Systems, and Programming Education.

COURSE PLAN:
Week 1: Introduction to computers using graphics
Week 2: Basic data types, Variables Assignment statement
Week 3: Statements of C++ for conditional execution and looping, Applications such as computing mathematical functions, root finding.
Week 4: Statements of C++ for conditional execution and looping, Applications such as computing mathematical functions, root finding.(Contd)
Week 6: Functions. Parameter passing. Recursion, Correctness issues, Breaking larger programs into functions.(Contd)
Week 7: Basic array processing strategies including passing arrays to functions, Applications illustrating use of arrays to store ordered and unordered sequences, sets, Multidimensional arrays.
Week 8: Basic array processing strategies including passing arrays to functions, Applications illustrating use of arrays to store ordered and unordered sequences, sets, Multidimensional arrays. (Contd)
Week 9: Recursive algorithms involving arrays, Structures and classes
Week 10: Recursive algorithms involving arrays (Contd), Structures and classes
Week 11: Heap memory management, Issues such as memory leaks and dangling pointers, How to design classes which hide memory management
Week 12: Standard Library, String, vector and Map classes, Applications