



COMPUTER SCIENCE & ENGINEERING

PROGRAMMING IN C++



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TYPE OF COURSE : Rerun | Core | UG/PG

COURSE DURATION : 8 weeks (28 Jan'19 - 22 Mar'19)

INTENDED AUDIENCE : BCA, MCA, B.Tech., M.Tech.

EXAM DATE : 31 Mar 2019

PRE-REQUISITES : Basic knowledge of programming & Data structure, C Programming, Attending a course on OOP with this course will help

INDUSTRIES APPLICABLE TO : Programming in C++ is so fundamental that all companies dealing with systems as well as application development (including web, IoT, embedded systems) have a need for the same. These include – Microsoft, Samsung, Xerox, Yahoo, Google, IBM, TCS, Infosys, Amazon, Flipkart, etc.

COURSE OUTLINE :

There has been a continual debate on which programming language/s to learn, to use. As the latest TIOBE Index for April 2016 indicates – Java (21%), C (14%), C++ (6%), C#(4%), and Python (3%) together control nearly half the programming community. Given this, it is still important to learn C and C++ because of the efficiency they offer. While we appreciate that Java is good for applications, for graphics; and we acknowledge that Python is appropriate for portable software, engineering problem solving, and graphics; it is worth bearing in mind that the JVM and Python interpreter are indeed written in C++, making C++ the father of all languages today. Well, hence, C++ is the systems language. Why should I learn it if my primary focus is on applications? This is where the recent updates of C++, namely, C++11, C++14, and C++17 offer excellent depths and flexibility for C++ that no language can match. These extensions attempt to alleviate some of the long-standing shortcomings for C++ including porous resource management, error-prone pointer handling, expression semantics and better readability. The present course builds up on the knowledge of C programming and basic data structure (array, list, stack, queue etc.) to create a strong familiarity with C++98 and C++03. Besides the constructs, syntax and semantics of C++ (over C), we also focus on various idioms of C++ and attempt to go to depth with every C++ feature justifying and illustrating them with several examples and assignment problems. On the way, we illustrate various OOP concepts.

ABOUT INSTRUCTOR :

Dr. Partha Pratim Das received his B.Tech, M.Tech and PhD degrees in 1984, 1985 and 1988 respectively from IIT Kharagpur. He served as a faculty in Department of Computer Science and Engineering, IIT Kharagpur from 1988 to 1998. In 1998, he joined Alumnus Software Ltd as a Business Development Manager. From 2001 to 2011, he worked for Interra Systems, Inc as a Senior Director and headed its Kolkata Center. In 2011, he joined back at Department of Computer Science and Engineering, IIT Kharagpur as Professor. Dr. Das has also served as a Visiting Professor with Institute of Radio Physics and Electronics, Calcutta University from 2003 to 2013.

COURSE PLAN :

- Week 01** : Programming in C++ is Fun : Build and execute a C program in C++, Write equivalent programs in C++.
- Week 02** : C++ as Better C : Procedural Extensions of C.
- Week 03** : Overview of OOP in C++ : Classes and basic Object-Oriented features (encapsulation).
- Week 04** : Overview of OOP in C++ : More OO features, overloading, namespace and using struct and union.
- Week 05** : Inheritance : Generalization / Specialization of Object Modeling in C++.
- Week 06** : Polymorphism : Static and Dynamic Binding.
- Week 07** : Type Casting & Exceptions : C++ cast operators; C++ Exceptions & standard exception classes.
- Week 08** : Templates & STL – Function and Class templates and using STL like containers, algorithms.