

AICTE Sponsored

**On-line Short Term Course on
Advanced Scientific Computing in
C++ Programming Language**

25 - 30 March 2021

Organized by



**Department of Ocean Engineering
Indian Institute of Technology Madras
Chennai (TN) - 36, PIN - 600 036, India.**

www.doe.iitm.ac.in/

Sponsored by



AICTE, New Delhi - 110 070, India

www.aicte-india.org

Course Coordinator

Prof. R. Sharma, Professor, Department of Ocean Engineering, Indian Institute of Technology Madras, Chennai (Tamil Nadu) - 600 036, India.

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Research gate profile: www.researchgate.net/profile/R_Sharma3

About the institution

IIT Madras is a premier centre for teaching, research and industrial consultancy in the country. IIT Madras is one of the old IITs, that were established in keeping with India's vision to become a world leader in Science and Technology and to usher in a new revolution immediately after gaining independence. Our institute offers different courses in Engineering, Management, Basic Sciences, and Humanities and Social Sciences.

About the course

Focus of this course is to train applicants on aspects of software development like programming on high-performance computers, object-oriented software design, generic (template-based) programming, and the efficient implementation of numerical algorithms. Additionally experience in analysis, application and extension of software and software libraries is developed. Our focus will be on software development with the programming language C++ and applications will be on problems related to engineering sciences.

Practical lab sessions and short term project using the general-purpose C++ programming will be key of this course.

To build a research and knowledge base in the advanced area of 'Computing with C++' and to initiate first concrete effort in continuous educational training, we are operating this short term course on 'Advanced Scientific Computing with C++ Programming Language' with financial support from the AICTE, India.

Objectives and Scope

Our objectives are: - To teach how to program with modern C++, using generic programming and advanced techniques, like meta programming, expression templates, and concepts. - To train on how to use programming tools and application of these tools to debug, benchmark, and manage your code. List of tools include compilers, build systems, version control, debuggers, and profilers. - To ensure that applicants read, understand, and utilize (scientific) software libraries, like BLAS (Basic Linear Algebra Subroutines), LAPACK (Linear Algebra Package), STL (Standard template library), Dune (framework for the discretization of partial differential equations), MTL4 (Matrix Template Library), Boost (portable C++ library). Extensive lab sessions will be arranged to practice the C++ programming.

Course Contents

C++ as a better C, C++ Classes and Objects, Objects in Scientific Computing, Inheritance & Polymorphism, Templates, Exceptions & Observations, Basic arithmetic, including types and overflow, Branching constructs, Loop constructs, Functions, pass by reference and value, Arrays, pointers, and heap allocation, Use of the pre-processor, include-files, and linking, Object orientation in C++: Concept of a class, Private, public and protected class members, Constructors, Operator overloading, Function overloading - templates, Defining functions that may take default values, Exceptions, STL containers and algorithms, and Simple uses of templates.

Important dates

Last date of registration: March, 23, 2021

Intimation of selection: March, 24, 2021

Course dates: 25 - 30 March 2021

Participation certificate

Certificate of participation will be issued to all the participants only after successful completion of the course.

How to apply?

- By e-mail: Scanned copy of the filled in application form duly endorsed by the forwarding authority to be mailed at rajivatri@gmail.com and cc to the rajivatri@yahoo.com by March 23, 2021.
- By post: Prof. R. Sharma, Professor, Department of Ocean Engineering, Indian Institute of Technology Madras, Chennai (Tamil Nadu) - 600 036, India.
- Application format is given in this brochure.

Note 1: Please send your duly filled-in application form to the course coordinator at the earliest.

Course notes

Course notes and other supplementary materials will be provided to all the selected participants.

Course teachers

This course will be taught by world renowned subject area experts drawn from IITs, Indian IT companies, DRDO, and other national/international industries.

Course Fee

The course is mainly organized for the faculties of engineering and polytechnic colleges approved by the AICTE, India.

No course fee will be charged to the participants sponsored by the AICTE, India approved institutions.

Interested participants from other government departments and industries will need to pay a fee of Rs. 4000/- and Rs. 8000/- respectively. For students the registration fee is: 3000 Rs.

This fee is to be paid by a demand draft drawn on any of the nationalized/private banks in favor of 'Indian Institute of Technology Madras'.

Course assistants

The following course assistants can be contacted for any clarification needed on doubts or in case any other detail or information is needed:

- Mr. B. K. Tiwari, e-mail: trybktiwari@gmail.com

- Mr. P. P. Sahoo, e-mail: patit.lucky@gmail.com

Also, the course coordinator can be contacted.

AICTE Sponsored Short Term Course on "Advanced Scientific Computing in C++ Programming Language (ASCwC++)", 25 - 30 March 2021

REGISTRATION FORM

1. Name (block letter):
2. Designation & pay scale:
3. Organization:
4. Address for communication:
-
-
- Ph. No.: Fax No.:
- E-mail:
5. Highest Academic Qualification:
6. Specialization:
7. Experience (in years):
(a) Teaching:
- (b) Industrial:
8. Mastery in Matlab™: Novice/Medium/Expert user

Please register me for the course on "(ASCwC++)" to be held at IIT Madras, India.

Place:
Date:

(Signature of the applicant)

SPONSORSHIP

Prof./Dr./Mr./Ms./Mrs. _____ is an employee of our institute and his/her application is hereby sponsored. The applicant will be permitted to attend (on-line) the short term course on "ASCwC++" at IIT Madras during the duration of STC, if selected.

Date: (Signature of Sponsoring Authority)

Designation:

Official Seal: