

1. Introduction

IIT Bombay has conducted many large-scale teacher training workshops under the Train 10,000 Teachers (T10KT) programme, sponsored by the National Mission on Education through ICT (NMEICT), MHRD, Govt. of India, and trained over 2,00,000 teachers.

Another successful technology developed at IIT Bombay is Spoken Tutorial, using which about 50 lakh students have been trained on various ICT topics. The effectiveness of this method can be seen from the testimonials available here: <https://spoken-tutorial.org/testimonials/media/?foss=70> and the [TEDx talk](#). This project is funded by NMEICT, MHRD.

It is now proposed to offer the highly effective Spoken Tutorial based ICT training to a large number of teachers, across the country, through the T10KT methodology, with C and C++ training being taken up next.

C and C++ are used for developing operating systems, compilers, parsers, interpreters, word processors, search engines and graphic programmes.

* **Support:** C requires less runtime support.

* **Portable programming language:** A variety of C and C++ programmes written for one computer system, can be compiled and run on another system, with little or no change.

* **Modular:** Written in routines called functions and classes, (C++) programs can be used in other applications or programs.

* **Preferred by professional programmers:** A variety of C and C++ resources and helpful supports are widely available.

* **Standardized:** Many standards have been documented, maintained and updated for C and C++ as standard references.

The Spoken Tutorial project at IIT Bombay (<https://spoken-tutorial.org>) has been promoting C and C++, and other FLOSS (Free/Libre and Open Source Software), such as Advanced C++, Java, Scilab, Python, PHP & MySQL, RDBMS, Linux, BASH, AWK, eSim, DWSIM, OpenModelica, Moodle, Drupal and R, and open source hardware such as Arduino.

The C and C++ workshop is organised by the Teaching Learning Centre (TLC) at IIT Bombay, funded by the *Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT)*, MHRD, Govt. of India. As Spoken Tutorial method offers hands-on practice, with 100% active learning, those who undergo this training will be able to

start using C and C++ immediately after the workshop. They will also be able to conduct C and C++ workshops for their students, using Spoken Tutorials, without requiring any help from anyone else.

The one day C and C++ Coordinators' workshop will be conducted on **Saturday, 15 February 2020**, through the select Remote Centres of IIT Bombay (the details will be shared later). This will be a blended training programme that uses A-VIEW for live interactions and Spoken Tutorials to learn to use C and C++. Details of the workshop will be announced later. The medium of instruction for this workshop is English. Language dubbed Spoken Tutorials in 15+ Indian languages will also be available.

2. Methodology of the Large-scale Workshop

It will be a one day workshop, on **29 February 2020**. All participants will have to go to their chosen Remote Centre. They will learn C and C++ through the active method of reproducing every command demonstrated in the award-winning Spoken Tutorials. As learning happens through self-learning, the self-confidence of the learners is very high. Moreover, they can use the same method to train their students on the important topic of C and C++, using Spoken Tutorials.

All the participants from all the Remote Centres, will be able to interact with the C and C++ team at IIT Bombay, ask them questions, etc. through the video conferencing software A-VIEW. There will be about 4 hours available for C and C++ training and 2 hours for interactions.

A timed discussion forum <https://forums.spoken-tutorial.org/> will be used to answer the questions that the participants may have in different Remote Centres. One has to select the Spoken Tutorial, and the exact time (minute and second) when the doubt arises. It will be answered immediately by one of the volunteers. Answers can also be provided by other participants in the same Remote Centre or in other Centres. These answers double as additional learning material. Course Coordinators at Remote Centres, already trained for this purpose, ensure that workshop goes through smoothly.

Using this approach, we have trained 3,500, 4,200, 4,300, 5,300, 2380, 2400 and 2800 teachers, respectively, on Koha,

Moodle, Scilab, Python, eSim, Linux and R workshop in the past 1 year.

3. Syllabus for the workshop

Basic Level

- 1) First C Program
- 2) First C++ Program
- 3) Tokens in C and C++
- 4) Functions in C and C++
- 5) Scope of Variables in C and C++
- 6) If And Else If statement in C and C++
- 7) Nested if and switch statement in C and C++
- 8) Increment and Decrement Operators in C and C++
- 9) Arithmetic Operators in C and C++
- 10) Relational Operators in C and C++
- 11) Logical Operators in C and C++
- 12) Loops in C and C++

Intermediate level

- 13) Arrays in C and C++
- 14) Working with 2-D Arrays in C and C++
- 15) Strings in C and C++
- 16) String Library Functions in C and C++
- 17) Working with Structures in C and C++
- 18) Understanding Pointers in C and C++
- 19) Function call in C and C++
- 20) File Handling in C

4. Teaching faculty

- **Prof. Kannan Moudgalya**, Department of Chemical Engineering, IIT Bombay
- **Prof. Bhaskaran Raman**, Department of Computer Science & Engineering, IIT Bombay
- **Prof. Kameswari Chebrolu**, Department of Computer Science & Engineering, IIT Bombay
- **Prof. Varsha Apte**, Department of Computer Science & Engineering, IIT Bombay
- **System Administrators**, FOSSEE and Spoken Tutorial projects, IIT Bombay

5. Course Fee

The course fee for the Coordinators' workshop is **Rs. 200/-**, which has to be paid at the time of online registration.

Please note that the registration fee once paid is neither refundable nor adjustable under any circumstances.

6. Who should attend?

It is mandatory for each participating Remote Centre to send a teacher, who will learn how to conduct the Spoken Tutorial based C and C++ workshop and implement it during the main workshop. The Remote Centre Coordinator should inform by **20 January 2020, 12 noon** if they want to host the main workshop in their Remote Centre. The online registration of the nominated teacher (who will later act as a Course coordinator) from the remote centre, is available from **11 January to 31 January 2020, 12.30 pm**. We will be sending the registration link to nominated Course Coordinator from the remote centres.

Why You Should Attend?

- You can help your colleagues who may not be good in C and C++, answer forum questions, etc.
- You will learn the pedagogy of Spoken Tutorials, which you can implement in your own college/school, without need of help from anyone else.
- You can possibly contribute to the creation of Spoken Tutorials in C and C++ or in any other topic.
- A series of activities are planned for those who do well in tests. For example, top 1,000 teachers to get trained on C and C++ lab course, through a more detailed, longer duration, course; getting shortlisted for courses, such as Data Structures, etc.

7. Criteria for issuing Certificates

E-certificate will be provided to the participants after successful completion of the workshop.

8. Duration and Venue

The workshop will be conducted on **Saturday, 15 February 2020 from 9.30 AM to 6.00 PM at select Remote Centres of IIT Bombay (These details will be shared later)**. This workshop will be conducted through a blended mode, using both live video conferencing facility (A-VIEW) and hands-on sessions using Spoken Tutorials. A detailed workshop schedule will be available soon.

9. How to apply?

Enrollment will be strictly online, and no other mode of application will be entertained. The online registration for Coordinators' workshop will start within one working day after the remote centre express the willingness, an invitation link will be sent to the nominated Course Coordinator to register. **The last date of registration is 31 January 2020, 12.30 pm**. The URL for registration is: <http://www.it.iitb.ac.in/nmeict/announcements.html>

Register on the Spoken Tutorial Website:

1. Before the workshop, participants should register on <https://spoken-tutorial.org/>
2. Fill up the registration form and submit.
3. An email will be received.
4. The account should be activated by clicking the link in the email.
5. The Username and Password should be noted. This is an extremely important step.
6. One needs the above information to post questions on the forum, which will be explained at the time of the workshop.

Note

- All Course Coordinators, who have to go to other Remote Centres for Coordinators' Training have to bear the travel expenses. Boarding and Lodging for one day will be provided, subject to availability.
- All participants are required to bring **earphones**, as they will have to listen to video tutorials. Without earphones, the workshop will not at all be effective.
- Computers with Linux OS to practise the Spoken Tutorials, will be available at the Remote Centres. But if they wish, participants can bring their own laptops with Linux installed.

10. Address for communication

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C and C++ One day Coordinators' Workshop

Conducted by the
Teaching Learning Centre (ICT)

Funded by the
Pandit Madan Mohan Malaviya
National Mission on Teachers and Teaching,
MHRD, Govt. of India

Supported by Spoken Tutorial project

on

15 February 2020

Coordinated from
IIT Bombay



C and C++ Course Instructor

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Prof. Kannan M. Moudgalya

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