Kannan M. Moudgalya, *Ph.D*

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Chair Professor
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Powai, Mumbai 400 076, India.

कण्णन मणि मौद्गल्या
इरेच तथा मेहरू मेहता
प्रगत शिक्षा प्रौद्योगिकी
पीठासीन प्राध्यापक
रासायनिक अभियांत्रिकी विभाग
भारतीय प्रौद्योगिकी संस्थान मुंबई
पवई, मुंबई 400 076, भारत.

08 April 2019

Dear Sir/Madam,

Greetings from IIT Bombay!

We are glad to announce a **One Day Scilab workshop** for **Teachers.** This is being organised by the Teaching Learning Centre (ICT) at IIT Bombay, funded by the *Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT),* an initiative of the Ministry of Human Resource Development, Government of India. I am writing this mail to invite you to attend this workshop at a Remote Centre convenient to you.

Details of this programme are given below:

Workshop Name: One Day Scilab workshop for Teachers

Who should attend? Teachers

Date: Saturday, 4 May 2019

Venue: 160+ Remote Centres of ours, a list of which will be available through this link https://www.it.iitb.ac.in/nmeict/announcements.html

How the workshop will be conducted:

It will be a one day workshop, on **4 May 2019**. We will interact live through A-VIEW at the beginning. After that, all of you will learn Scilab using spoken tutorials, guided by the Course Coordinator in the Remote Centre you attend. We will answer your questions, if any, using a Forum, especially designed for distributed learning. In the evening, we shall connect through A-VIEW again, carry out discussions and end the programme. There will be about 4 to 5 hours available for Scilab training and two hours for interactions, a detailed schedule of which will be made available later.

You will have to pay Rs. 100 as a course fee to IIT Bombay at the time of registration, and Rs. 400 to the Remote Centre directly at the time of the workshop, using which, they will make available lunch and coffee/tea/snacks. Balance amount, if any, will be used by the Remote Centre to pay for the maintenance of their infrastructure.

Procedure to participate in the workshop:

To participate in this workshop, please register at (https://www.it.iitb.ac.in/nmeict/) and follow the instructions. The registration portal will open on 9 April 2019 and will close on **30 April 2019, at 12.30 pm**.

Please feel free to bring this information to the attention of your colleagues and friends, anywhere in India, and encourage them to join. Please note that this workshop may be useful to senior teachers of schools as well.

We look forward to your enthusiastic participation in this initiative.

Regards,

Prof. Kannan Moudgalya
PI, TLC (ICT), PMMMNMTT

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पवई, मुंबई 400 076, भारत.

19 March 2019

Dear Remote Centre Coordinator,

Greetings from IIT Bombay!

We are glad to announce a **One Day Scilab workshop** for **Teachers.** This is being organised by the Teaching Learning Centre (ICT) at IIT Bombay, funded by the *Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT)*, an initiative of the Ministry of Human Resource Development, Government of India. I am writing this mail to invite you to host this workshop in your Remote Centre.

Details of this programme are given below:

Coordinators' Workshop (1 day): Tuesday, 16 April 2019 at a Nearby Remote Centre

Main Workshop (1 day): Saturday, 4 May 2019 at various participating remote centres

How the main workshop will be conducted:

It will be a one day workshop, on **4 May 2019**. There will be interactions through A-VIEW at the beginning. After that, all participants at your remote centre will learn Scilab using spoken tutorials. In the evening, we shall connect through A-VIEW again, carry out discussions and end the programme. There will be about 4 hours available for Scilab training and 2 hours for interactions, a detailed schedule of which will be sent to you later.

The participants of the main workshop will pay Rs. 100 as a course fee to IIT Bombay, and Rs. 400 to the RC directly at the time of the workshop, from which, you will have to provide lunch and tea/snacks. The balance amount can be kept as a partial compensation for the use of your infrastructure.

IIT Bombay will pay Rs. 2,000 as an honorarium to the following two people, from each participating remote centre: (1) RCC (2) Teacher, who is the Course Coordinator. In addition to the above, we will also pay Rs. 1,000 as an honorarium to your support/technical staff. In this way, each participating RC will receive a total of Rs. 5,000 from IIT Bombay.

Coordinators' workshop:

If you want to offer your RC for this course, you will have to nominate one of your representatives i.e. a **Teacher, who will later be considered as a Course Coordinator.** If your Course Coordinator has already conducted the Koha or Moodle workshop then he/she has to

attend the Coordinators' workshop, only briefly, that too, through A-VIEW. If your institute has missed to conduct both of the earlier workshops i.e., Koha or Moodle, then your nominated Course Coordinator will have to travel to a nearby Remote Centre on 16 April 2019. The meal and accommodation (for 1 night) will be provided at the remote centre as this shall be taken care by IIT Bombay. Stay arrangement in all the remote centres is not guaranteed and it is subject to availability. You will have to bear their travel expense, as we will NOT pay. In addition, there will be a nominal **course registration fee of Rs. 200.** There will be a certificate of participation to all who undergo the Coordinators' Workshop.

Procedure to participate in the Coordinators' Workshop:

If your RC is willing to participate in this workshop, please login to the website (https://www.it.iitb.ac.in/nmeict/) using your RCC email id credentials and express your willingness by filling the seating capacity **before 5 pm on Friday, 5 April 2019.** Please also send an email to eoutreach@cse.iitb.ac.in with the name, email address, and phone number of your representative that you will be nominating.

Please also ask your Course Coordinator to register on our website between **26 March and 5 April 2019**. The registration website is here: https://www.it.iitb.ac.in/nmeict

We look forward to your enthusiastic participation in this initiative.

Regards,

Prof. Kannan Moudgalya
PI, TLC (ICT), PMMMNMTT

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. The Spoken Tutorial project is also implemented successfully at IIT Bombay, with funding from 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 **Scilab** training being taken up next.

Scilab is a Free/Libre and Open Source Software (FLOSS), created mainly for numerical computations. It uses the state of the art numerical libraries, such as LINPACK, EISPACK and LAPACK, and hence, its results are highly reliable. Scilab implements the user friendly language, similar to the one used in the popular software Matlab. But unlike Matlab, Scilab can be freely downloaded, freely copied, freely modified and also freely distributed. Naturally, Scilab can be used absolutely free of cost, unlike Matlab, which can be extremely expensive, especially to the industry. Scilab comes with a graphical programming interface Xcos, which is similar to Simulink. A good knowledge of Scilab will help improve the employment potential of your students.

The FOSSEE (Free/Libre and Open Source Software for Education) project at IIT Bombay ((https://fossee.in) has been promoting Scilab, and other FLOSS software, such as Python, OpenFOAM, eSim, Osdag, OpenModelica, DWSIM & R, and Open Source hardware, such as Arduino and OpenPLC. FOSSEE is also funded by NMEICT, MHRD. Government of India has mandated the use of open source software.

The Scilab workshop is organised by the **T**eaching **L**earning **C**entre (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 Scilab immediately after the workshop. They will also be able to conduct Scilab workshops for their students, using Spoken Tutorials, on their own, without requiring any help from anyone else.

The one day Scilab Coordinators' workshop will be conducted on **Tuesday, 16 April 2019,** through select Remote Centres of IIT Bombay (the details will be shared later). This will be a blended training programme that uses AVIEW for live interactions and Spoken Tutorials to learn to use Scilab. Details of the workshop will be announced later. The medium of instruction for this workshop is English. Language dubbed Spoken Tutorials in Hindi and a few other languages will also be available.

2. Methodology of the Large-scale Workshop

It will be a **one day workshop, on 4 May 2019.** All participants will have to go to their chosen Remote Centre. They will learn Scilab through Spoken Tutorials, with help from Coordinators, already trained for this purpose at IIT Bombay. As the learning will happen only through carefully designed Spoken Tutorials designed and developed at IIT Bombay, the quality of learning will be very high. All the participants, from all the Remote Centres, will be able to interact with the Scilab team at IIT Bombay, ask them questions, etc., through the video conferencing software A-VIEW. There will be about 4 hours available for Scilab training and 2 hours for interactions.

3. Outline of the workshop

The workshop will have two parts:
(a) About 3.5 hours will be used in Learning Scilab from Spoken Tutorials.
(b) About 30 minutes will be used to learn about the excellent Scilab content, developed by FOSSEE.

3(a). Learning Scilab from Spoken Tutorials

Depending on the level of the user, one can learn any/all of the topics mentioned below. If one cannot complete all the topics, one can complete them later on,

through self learning, as all required Spoken Tutorials are freely available.

Basic level: Getting started with Scilab, Vector Operations, Matrix Operations, Conditional branching, Iterations, Scripts and Functions, Plotting 2D graphs, Introduction to Xcos.

Intermediate level: File handling, User defined input and output, Integration, Solving non-linear equations, Linear equations - Gaussian methods, Linear equations - Iterative Methods, Interpolation, ODE Euler methods, and ODE Applications.

Advanced level: Optimization Using Karmarkar Function, Digital Signal Processing, Control systems, Discrete systems, Calling User Defined Functions in XCOS, and Simulating a PID controller using XCOS.

3(b). Useful Scilab content developed by FOSSEE

A major problem with open source software is the lack of documentation. A solution to this problem is the Textbook Companion (TBC). A Scilab TBC is a collection of Scilab code for all solved examples of standard textbooks. The FOSSEE team has coordinated the creation of Scilab TBC for 600 books in science and engineering, all branches, with Scilab code for about 75,000 examples. Such a large collection is not available for any other software, including commercial ones. Students and faculty from various parts of the country have created this collection. FOSSEE provides a handsome honorarium to any one who creates TBC.

One may use the Scilab TBC (1) to understand the steps of examples (2) to do what if studies by changing parameters (3) to locate the syntax for a command and (4) to locate all examples that use a particular command, and so on. Scilab TBC are available at https://scilab.in/Completed_Books, absolutely free of cost. Scilab TBC is also hosted on the cloud.

The FOSSEE Team also helps colleges migrate their labs to Scilab. This allows colleges that cannot afford Matlab to run their labs with Scilab. Codes of migrated labs are available at https://scilab.in/lab_migration/completed_labs.

The FOSSEE Team has also developed a few useful toolboxes, available at https://scilab.in/fossee-scilab-toolbox. We invite talented people to join us in improving these toolboxes and to develop new toolboxes. We have also created a cloud version of Xcos and 130 Xcos examples that can run on this cloud. Depending on the time available, one can try out all of the above.

4. Teaching faculty

- **Prof. Kannan Moudgalya,** Principal Investigator, TLC (ICT), Spoken Tutorial and FOSSEE projects
- **Scilab Team members,** 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 act as the "domain expert" for the main Scilab workshop. The last date of remote centres' acceptance by the Remote Centre Coordinator is available till **26 March 2019**.

7. Criteria for issuing Certificates

E-certificate will be provided to the participants after successful completion of the workshop and filling up the feedback form.

8. Duration and Venue

The workshop will be conducted on Tuesday**, 16 April 2019 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 last date of registration is 5 April 2019, 5.30 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

- Neither IIT Bombay nor the Remote Centre will bear the travel expense of the participating representatives. There shall also be no accommodation provided to the participants.
- All participants are required to bring **ear phones**, as they will have to listen to video tutorials. Without ear phones, the workshop will not at all be effective.
- Computers to practise Spoken Tutorials and to do Scilab programming will be available at the Remote Centres. But if they wish, participants can bring their own laptops with Scilab installed.

10. Address for communication

Dr. Kalpana Kannan
Project Coordinator, ESOS Project
Department of CSE, Kanwal Rekhi Building,
Indian Institute of Technology Bombay,
Mumbai - 400 076
Tel.: +91-22-2576 4989
Email: eoutreach@it.iitb.ac.in

One day Coordinators' Workshop

Under
'Pandit Madan Mohan Malaviya
National Mission on Teachers and Teaching
(PMMMNMTT)',
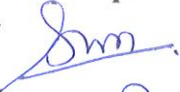MHRD, Govt. of India

on

Scilab

16 April 2019

Conducted by the
Teaching Learning Centre (ICT),
Supported by FOSSEE & Spoken Tutorials
at
IIT Bombay

Prof. Kannan Moudgalya
Department of Chemical Engineering
Indian Institute of Technology Bombay
Powai, Mumbai 400076

'Coordinators' Workshop on Scilab'

(16 April 2019) RC ID-1401

Sr.No.	Participants Name	Name of Institute & Department	In sign 9.30am	Out sign 5.30pm
1	Mr. Sufiyan. Mukadam	VPM's MPCOE, Velneshwar. EXTC dept	*(signature)*	*(signature)*
2	Mr. Ganesh Dervankar	VPM's MPCOE, velneshwar, Server room	*(signature)*	*(signature)*
3				

Note:-

This workshop is being organised for the project Teaching Learning Centre (ICT) at IIT Bombay, a scheme of 'Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching' (PMMMNMTT), an initiative of the Ministry of Human Resource Development, Government of India.

Workshop Coordinator   RC Coordinator   for Principal
16/04/19

One day Workshop on Scilab - 4 May 2019

Timing	Description of the Session	Session type
9.00 AM - 9.30 AM	Connect online on A-VIEW and testing session	Online through A-VIEW
9.30 AM - 10.00 AM	Inaugural Session: Overview of the project and workshop, conduct of the workshop, answering through Forum, efficacy of the method, etc.	
10.00 AM - 10.30 AM	Interaction with Remote Centres	
10.30 AM – 10.45 AM	Tea Break	
10.45 PM - 1.00 PM	Self Learning of Scilab using Spoken Tutorials	At Remote Centres
1.00 PM - 2.00 PM	Lunch Break	
2.00 PM- 3.45 PM	Scilab Learning (contd.)	At Remote Centres
3.45 PM- 4.00 PM	Tea Break	
4.00 PM- 5.00 PM	Scilab Learning (contd.)	At Remote Centres
5.00 PM - 6.00 PM	Interaction with Remote Centres and Valedictory Session	Online through A-VIEW

1 The procedure to practise

1. You have been given a set of spoken tutorials and files.

2. You will typically do one tutorial at a time.

3. You may listen to a spoken tutorial and reproduce all the steps shown in the video.

4. If you find it difficult to do the above, you may consider listening to the *whole* tutorial once and then practise during the second hearing.

2 Side-by-Side learning video (only for offline content)

1. Go to the folder named `spoken` on your machine.

2. Locate `index.html` file.

3. Open this file with either `Firefox` or `Chrome` web browser.

4. The Side-by-Side learning video will appear. This video will explain how to learn from the spoken tutorials.

5. Click on the Play button to play the video.

6. Note all the steps explained therein.

3 Scilab

1. Click on `"Select FOSS"` or `"All FOSS Categories"` drop-down and choose `"Scilab"`.

2. Click on `"Select Language"` or `"All Languages"` drop-down and choose the language (English, Hindi, Marathi ...) in which you wish to learn.

3. Click on `"Submit"` button.

4. You will see a list of tutorials based on your selection.

5. Start with the first tutorial in the displayed list.

4 First 4 Tutorials

1. The first 4 tutorials in the displayed list, explain about `Scilab`, its benefits, how to learn `Scilab` from spoken tutorials, `Scilab Textbook Companion` and `Scilab Lab Migration` activities.

2. It is recommended that you view these 4 tutorials one-by-one for a deeper understanding of Scilab and FOSSEE project's Scilab activities.

3. To view a tutorial, click on the `Play` icon which is located in the player.

5 Fifth Tutorial: Installing

1. Locate the topic `"Installing"` and click on it.

2. To view the tutorial, click on the `Play` icon which is located in the player.

3. Adjust the size of the browser in such a way that you are able to practice in parallel.

4. Refer to the `Installation Sheet` for additional instructions on installing `Scilab`.

5. Skip this tutorial if you already installed `Scilab`.

6 Sixth Tutorial: Getting Started

1. Locate the topic `"Getting Started"` and click on it.

2. To view the tutorial, click on the `Play` icon which is located in the player.

3. Adjust the size of the browser in such a way that you are able to practice in parallel.

4. Play-pause-practise all the commands shown in the tutorial.

6.1 Open Scilab on Linux OS

(a) The tutorials are explained on the `Linux OS`.

(b) It will be easy for the Linux users to follow as instructed in the tutorial.

6.2 Open Scilab on Windows OS

(a) To open `"Scilab"` on `Windows OS`, double click on `"Scilab"` shortcut icon.

(b) Else click on `Start>> All programs>>Scilab>>Scilab Console`.

(c) This will open the "Scilab" console window.

5. At 5:34, pause the tutorial.

6. The `diary()` command stores the `Scilab session` in a file, **after** you issue the command and **not before that**.

7. At 5:34 - Change the directory to a destination where you have write access, preferably to a folder on the `Desktop.`

6.3 Instructions to practise

(a) Create a folder on the "Desktop" with your "Name-RollNo-Component". (Eg. "vin-04-scilab").

(b) Give a unique name to the files you save, so as to recognize it next time. (Eg. "Practice-1-vin").

(c) Remember to save all your work in your folder.

(d) This will ensure that your files don't get over-written by someone else.

(e) Save your work from time to time, instead of saving it at the end of the tutorial.

6.4 Common instructions for Assignments

(a) Attempt the `Assignments` as instructed in the tutorial.

(b) Save your work in your folder.

6.5 Common instructions to use Code files

(a) Click on the link "Code files" located near the player and save it in your folder.

(b) Extract the downloaded zip file.

(c) You will see all the code/source files used in the particular tutorial.

(d) Use these files as per the instructions given in the particular tutorial.

8. Follow all the above instructions, till you complete the next 4 tutorials.

9. Once each tutorial is complete, choose the next tutorial from the playlist which is located near the player.

7 Eleventh Tutorial: Scripts and Functions

1. Locate the topic "Scripts and Functions" and click on it.

2. At 2:20 The video shows `Load into Scilab`. This is now changed to `File with Echo`.

3. At 3:25 pause the tutorial.

4. Type `pwd` to check the present working directory.

5. Change the directory using `Change Directory` shortcut icon, to the directory where you have saved the `helloworld.sce` file before using the `exec` command.

6. Now resume the tutorial.

7. Follow all the above instructions, till you complete all the tutorials in the series.

8 Thirteenth, Twenty-seventh, Twenty-eighth Tutorials: XCOS Introduction, Calling User defined functions in XCOS & Simulating a PID Controller using XCOS

For all `Xcos` tutorials, to add grids, legends, titles and borders, please type the following in the `Scilab Console`, after you have obtained the plot:

1. For grid, type: xgrid

2. For legend, type (if you have plotted two lines): hl = legend(["title for line 1", "title for line 2"]);

3. For title, type: xtitle("Title of graph");

4. For borders, type: a = gca(); a.box = "on";

9 Twenty-fourth Tutorial: Digital Signal Processing

1. Pause the tutorial at 3:28

2. The video shows how to execute `dft function`. This function has been deprecated.

3. Instead of typing `dft`, type `fft`.

4. This will cause the 3rd term to NOT have the imaginary component, which has a magnitude of 10^{-16}.

5. Resume the tutorial.

10 Twenty-fifth Tutorial: Control System

1. At 11:58 The video shows a unit circle. In Scilab version 5.5.2 the unit circle is replaced by a line, which defines stability of the system.

One Day Workshop on Scilab-4th May 2019
Attendance Sheet (RC ID-1401)

Sr.No	Name of Participant	Name of Institute & department	In sign 09.30am	Out sign 05.30pm
1	Mr. Arun S. Sargar	MPCOE, A.S.H.	ASSargar	ASSargar
2	Mr. P.R. Shankar	MPCOE, Electrical	P.R.Shankar	P.R.Shankar
3	Mr. Anand Biradar	MPCOE, Mechanical	AABD	AABD
4	Mr. Vinayak Hiremath	MPCOE, Mechanical		
5	Mr. Santosh M H	MPCOE, Electrical	SMHH	SMHH
6	Ms. Bhakti S. Gangan	MPCOE, EXTC	Gangan	Gangan
7	Mr. Anish P. Yadav	MPCOE, electrical		
8	MS Priti Lathe	MPCOE Electrical	Lathe	Lathe
9	Mr. Ratnadeep V. Keer	MPCOE Electrical		
10	Mr. Deepak J. Dange	MPCOE, EXTC/ASH.	Deepak	Deepak
11	Mr. Dayanand B. vyavahare	MPCOE, A.S.H.		
12	Mr. M.J. Puwar	MPCOE, Civil		
13	Mr. Gajanan Pukhapar	MPCOE EXTC		
14	Mr. Prathamesh Ghanekar	MPCOE EXTC	PPGhanekar	PPGhanekar
15	Mr. Ganesh N. Demankar	Technical Assistant		
16	Mr. Atul Samant	MPCOE, EXTC		
17	Mr. Porshuram More.	MPCOE, Instrumentation		
18	Mr. Umesh M. Satpute	MPCOE, Instrumentation	Umesh	Umesh
19	Mr. Vinod P. Salunkhe	MPCOE, EXTC		
20	Mr. Nikhil Gokhale	MPCOE, Comp		

Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT), MHRD, GoI

Sr.No	Name of Participant	Name of Institute & department	In sign 09.30am	Out sign 05.30pm
21	Gondhalekar R.S.	MPCOE, ASH		
22	Ms. Komal Shinde	MPCOE, Civil		
23	Ms. Gauri Kadam	MPCOE, Civil		
24	Mr. Lankesh Gajbhiye	PCS		
25	Ms. Vikas Nandeshwa	MPCOE, Instru		
26	Mr. Sadanand Git	mpcoE, Ehstry		
27	Mr. Mahesh kale	MPCOE, mechanical		
28	Mr. A.D. Chandham	MPCOE, Mechanical		
29	Mr. Atul Samant	MPCOE		
30	Mr. Prashant Mahajan	MPCOE EXTC		

Note:-

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Workshop Coordinator

(Mr.Sufiyan Mukadam)

RC Coordinator

(Mr.Avinash Pawar)

Principal

(Dr.Avinash M.Chincholkar)