Shri Swami Vivekanand Shikshan Sanstha

VIVEKANAND COLLEGE, KOLHAPUR (EMPOWERED AUTONOMOUS)

Department of Mathematics

"IIT Bombay Spoken Tutorial MOOC Courses"

Vivekanand College, Kolhapur has been at the forefront of providing quality education and fostering a culture of continuous learning. In collaboration with IIT Bombay Spoken Tutorial, the college has been offering a diverse range of Massive Open Online Courses (MOOCs) to empower students with cutting-edge skills. These courses include Scilab, PHP, and MySQL etc.

Course Structure: The IIT Bombay Spoken Tutorial courses are designed to meet the evolving needs of the industry and equip students with practical skills. The courses cover a spectrum of topics, including proficiency in programming languages like Scilab, PHP, and MySQL.

Online Sessions: Conducted by experts from IIT Bombay, the online sessions offer an interactive and engaging learning experience. Students have the opportunity to interact with seasoned professionals, clarifying doubts and gaining insights into real-world applications of the concepts they are learning. The virtual format ensures flexibility, allowing students to access the sessions at their convenience, fostering a conducive learning environment.

Examinations at Vivekanand College, Kolhapur: One of the unique aspects of this collaboration is the provision for examinations conducted online at Vivekanand College, Kolhapur. This not only adds a layer of convenience for students but also ensures a seamless transition from online learning to the evaluation process. The examinations are designed to assess the practical application of the skills acquired during the course. Benefits for Students: •

Skill Enhancement: The courses cater to the demands of contemporary industries, enhancing the employability of students by providing them with relevant skills. • Flexibility: The online format allows students to balance their academic commitments while acquiring valuable skills. • Certification: Successful completion of the courses results in certification from IIT Bombay, a testament to the students' proficiency in the respective domains. •

Community Impact: By establishing an IIT Bombay Spoken Tutorial Courses center, Vivekanand College has not only elevated the learning experience for its students but has also contributed to the larger goal of creating a skilled workforce. This initiative aligns with the national agenda of fostering digital literacy and technological proficiency. The collaboration between Vivekanand College, Kolhapur and IIT Bombay Spoken Tutorial has proven to be a commendable effort in providing quality education to students. The combination of online learning and localized examinations ensures a holistic educational experience. As students continue to benefit from these courses, the college remains committed to its mission of nurturing well-rounded and skilled individuals ready to excel in the professional landscape.

The Spoken Tutorial project

*Self explanatory - uses simple language

*Audio-video - uses multisensory approach

*Small duration - has better retention

*Learner-centered - learn at your own pace

*Learning by doing - learn and practice
 simultaneously

*Empowerment - learn a new FOSS

Target Group

*Students - High School and College

*Working professional - Software users,
 developers and trainers

*Research scholars

*Community at large

Workshops
The Spoken Tutorial Projects Team
conducts workshops on Scilab and other
FOSS using Spoken tutorials and gives
certificates to those who pass an online test.

For more details,please write to
contact@spoken-tutorial.org

Scilab is a major component of the FOSSEE
(Free and Open Source Software for Science
and Engineering Education) project,
funded by the
National Mission on Education through
Information and Communication Technology,
launched by the
Ministry of Human Resource Development,
Government of India

For Announcements:
http://scilab.in/cgi-bin/mailman/listinfo/announce

For Discussions:
http://scilabin/cgi-bin/mailman/listinfo/discuss

For more information contact us at:
contact@scilab.in

IIT Bombay

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Scilab is a cross-platform, free
(free of cost and free to distribute and modify)
and open source
numerical computational package.
http://scilab.in
http://scilab.org
http://fossee.in

National Mission on Education through
Information and Communication Technology
(NMEICT)
www.sakshat.ac.in

Funded by MHRD, Goverment of India

http://spoken-tutorial.org

Scilab is a cross-platform, free and open source numerical computational package and an easy-to-use, interpreted, high-level, matrix based programming language with a versatile inbuilt mathematical library.

It can be used for
  Graphing and data visualization
  Control
  Signal and Image processing
  Statistical analysis
  Fluid dynamics
  Linear algebra
  Numerical optimization
  Modeling and simulation of dynamical systems
Its capabilities can be extended through the use of readily available or custom made toolboxes where the extensions can be written in ubiquitous lower level languages like Fortran and C.

Xcos Xcos is a graphical dynamical system modeler and simulator. With this, the user can create block diagrams to model and simulate the dynamics of sophisticated dynamical systems and compile such models into executable code. Xcos is used for signal processing, systems control, queuing systems, and to study physical and biological systems. It can be used to model and simulate mechanical systems, hydraulic systems, electrical systems, chemical systems, biological systems and many more.

Lab Migration Project
Is your lab still paying hefty amounts for mathematical tools which can be replaced by a nifty, free-of-cost software called Scilab? Then we suggest its the time to switch to the world of free knowledge and also to grace your annual balance-sheets significantly.
Please get in touch with us at
contact@scilab.in and we will help you.

Please allow us to assist your lab in shifting to Scilab.
http://scilab.in/lab_migration/proposal
For more information please visit
http://scilab.in/Lab_Migration_Project

The Textbook Companion Project
The Textbook Companion Project aims to port worked out examples (and optionally, select exercise problems) from standard textbooks using an open source software system, such as Scilab. In the following writeup, the word Scilab can be replaced by any other open source software as well. Any "standard" text-book can be used for this purpose. It will be referred to simply as textbook.
What is the objective of this exercise?
* To make it easy for the users of the textbook
  to start using Scilab
* To improve the documentation available for Scilab
  For more details please visit

http://scilab.in/Textbook Companion Project

Hardware Project
SBHS: Single Board Heater System (SBHS) is a lab-in-a box setup which is primarily used for teaching/studying the theory of control systems. The setup has been designed to cater the needs of undergraduate and postgraduate control courses. You can perform various control experiments on it - from tests as simple as Step Tests to complicated closed loop tests! This setup is also available for remote access under Virtual labs project
http://vIabs.iitb.ac.in/sbhs/index.php
http://fossee.in/moodle/
Data Acquisition System: Project aims to setup virtual labs based on standard DAQ cards available. (eg PCI) 1711 Advantech DAQ card). Open source drivers ,tools and libraries are available from COMEDI (linux controland measurement device interface). HART toolbox provides interface between comedi and scilab to access ADC and DAC

http://comedi.org/
http://hart.sourceforge.net/doc.html
Workshops
We propose to organise Level-0 Scilab workshops using spoken tutorials of ten minutes each. We believe that the extent of learning possible in the above mentioned scheme would be better than a usual workshop of much longer time duration.Possibly, the scheme proposed here could be considered as equivalent to a one week typical workshop. Hence it may be possible to give a certificate to this effect. For more details please visit: http://scilab.in/wiki/index.php/Workshops GNU Radio GNURadio is an open source Software Defined Radio (SDR) that was designed to convert all hardware problems into software problems. GNURadio package is provided with a complete HDTV transmitter and re-ceiver, a spectrum analyzer, an oscillo-scope, a multichannel receiver and a wide collection of modulators and demodulators. Its applications are primarily written using the Python programming language, while the supplied, performance-criticalsignal processing path is implemented in C++ using processor floating point extensions where available. For more details please visit http://spoken-tutorial.org/script/index.php/GNURadio
The Links Project Links Project provides a mechanism to list all the available scilab documents and to rank them. This project allows community participation for both listing and ranking. For more information, please visit http://scilab.in/links
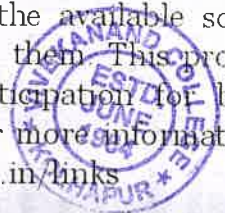
1.Introduction to Scilab and its benefits

Foss : Scilab - English

Outline: What is FOSS? Why FOSS ? About Scilab and its benefits Scilab is reliable Use of Scilab in CNES Use of Scilab for space mission analysis and flight dynamics Industrial applic..

2.Self learning of Scilab through Spoken Tutorials

Foss : Scilab - English

Outline: About Spoken Tutorial Created for self learning Dubbed in all 22 languages Scilab spoken tutorials 25 spoken tutrials on Scilab Side by side learning Spoken tutorial used as ..

3.The amazing resource of Scilab Textbook Companion

Foss : Scilab - English

Outline: Opensource software problem, no good documentation for FLOSS Solution: Textbook companion project Scilab code for standard textbooks Demo of Textbook companion Download Scilab ..

4.Scilab Lab migration, Toolboxes and Forums

Foss : Scilab - English

Outline: Lab migration Demo of Lab migration on FOSSEE Scilab website Download PDF for lab solution Scilab Toolboxes FOSSEE Optimisation toolbox available on atoms website IEEE paper ..

5.Installing

Foss : Scilab - English

Outline: Installing Show where to download from and how to decide which version to choose (OS and 32/64bit) (www.scilab.org/download) Windows installation (Internet Connection i..

6.Getting Started

Foss : Scilab - English

Outline: Getting Started *Expressions: Show mathematical expressions with numbers *Variables *Diary command *Define symbolic constants. *Basic functions *suppressing output(;) *he..

7.Vector Operations

Foss : Scilab - English

Outline: Vector Operations *Define vector *Calculate length of a vector. *Perform mathematical operations on Vectors such as addition,subtraction and multiplication. *Define a matrix...

8.Matrix Operations

Foss : Scilab - English

Outline: Matrix Operations *Access the elements of Matrix *Determine the determinant, inverse and eigen values of a matrix. *Define special matrices. *Perform elementary row operation..

9.Conditional Branching

Foss : Scilab - English

Outline: Conditional Branching * 'if' and 'then' with the example * use of the 'else' keyword * use of the 'elseif' keyword * example for select

10.Iteration

Foss : Scilab - English

Outline: Iteration Explain syntax of 'for' statement- tell that the variable iterates over a list/vector/matrix (or an expression that evaluates to any of these). Give example: ..

11.Scripts and Functions

Foss : Scilab - English

Outline: Scripts and Functions *Introduction to the file formats in Scilab. *SCRIPT files. *sce versus .sci *Inline functions.

12.Plotting 2D graphs

Foss : Scilab - English

Outline: Plotting 2D graphs About linspace: linspace is a linearly spaced vector. Plot a simple graph: x=linspace(12,34,10), y=linspace(-.1,2,10), plot(x,y) plot2d Using clf() clear..

13.Xcos Introduction

Foss : Scilab - English

Outline: Xcos Introduction What is XCOS. What is palette. To collect the blocks from the palette and connect them to construct the block diagram. Set the parameters of different blocks..

14.File handling

Foss : Scilab - English

Outline: File Handling- Scilab File handling Writing to a file using write() Reading from a file using read() Opening an existing file using mopen() Closing an already opened file usi..

15.User Defined Input and Output

Foss : Scilab - English

Outline: User Defined Input and Output in Scilab Input Function. mprintf() save() and load() Used to quit scilab midway through calculation and continue at later stage.

Advanced

16.Integration

Foss : Scilab - English

Outline: *Develop Scilab code for different Composite *Numerical Integration algorithms *Divide the integral into equal intervals *Apply the algorithm to each interval *Calculate the com..

Advanced

17.Solving Non linear Equations

Foss : Scilab - English

Outline: Numerical methods- Solving Non- linear Equations Learn how to solve nonlinear equations using numerical methods Learn Bisection method Learn Secant method Learn h..

Advanced

18.Linear equations Gaussian Methods

Foss : Scilab - English

Outline: * Explain Gauss Elimination method algorithm * Explain code for Gauss Elimination method and solve an example using this code * Explain Gauss Jordan method algorithm ..

Advanced

19.Linear equations Iterative Methods

Foss : Scilab - English

Outline: 1. Solve system of linear equations using iterative methods 2. Use Jacobi and Gauss Seidel iterative methods 3. Learn how to iterate until we converge at the solution 4. Learn h..

Advanced

20.Interpolation

Foss : Scilab - English

Outline: Numerical Interpolation Develop Scilab code for different Numerical Interpolation algorithms Calculate new value of function from given data points

1.ODE Euler methods

Foss : Scilab - English

Outline: Solving ODEs using Euler Methods 1. Solve ODEs using Euler and Modified Euler methods 2. Develop Scilab code to solve ODEs

Advanced

2.ODE Applications

Foss : Scilab - English

Outline: Solving ODEs using Scilab ode Function Use Scilab ode function Solve typical examples of ODEs Plot the solution

Advanced

3.Optimization Using Karmarkar Function

Foss : Scilab - English

Outline: * About Optimization * Use of Scilab function Karmarkar in Optimization

Advanced

4.Digital Signal Processing

Foss : Scilab - English

Outline: Plotting continuous and discrete sine waves. Plotting step function. Plotting ramp function.

Advanced

5.Control systems

Foss : Scilab - English

Outline: 1. Define a continuous time system: second and higher order 2. Response plot for step input 3. Response plot for sine input 4. Bode plot 5. Study numer and denom Scilab functio..

Advanced

6.Discrete systems

Foss : Scilab - English

Outline: * Define discrete time system variable z * Define first order discrete time system * Explain ones, flts, dscr, ss2tf functions

Advanced

7.Calling User Defined Functions in XCOS

Foss : Scilab - English

Outline: * Write a squaring function * Use of scifunc block in XCOS * Use of MUX block * Call functions having multiple inputs and outputs

Advanced

8.Simulating a PID controller using XCOS

Foss : Scilab - English

Outline: Simulating a PID controller using Xcos: 1. Modifying firstorder.xcos file to implement a PID controller 2. Closing the loop 3. Setting PID gains and observing its response 4...

Advanced

9.Developing Scilab Toolbox for calling external C libraries

Foss : Scilab - English

Outline: Compiling an external C library Generating shared library Copying the shared library to Scilab Toolbox Interfacing the shared library with Scilab Understanding the important co..

Advanced

10.Developing Scilab Toolbox for calling Python and its functions

Foss : Scilab - English

Outline: About Scithon toolbox About header folder Interfacing between Scilab and Python Files used for starting the python instance and overloaded virtual functions Links to understa..

Advanced

11.Interactive Simulation in Xcos using slider

Foss : Scilab - English

Outline: * What is Interactive Simulation? * Learn about Interactive Simulation using a slider. * What is TKSCALE block? * How to use TKSCALE block as slider? * Collecting all the requi..

Advanced

12.User-defined variables in Xcos

Foss : Scilab - English

Outline: * Ways to define variables in Xcos * Creating a simple simulation * Importing necessary blocks * Interconnecting the blocks * Show error of using variable without defining it ..

Advanced

13.Loading and saving data in Xcos

Foss : Scilab - English

Outline: * Load the code file for a simple simulation using the Ramp Input block * Use the TOWS_c block to the save data values in the workspace * Comment on the parameters of the TOWS_c ..

Advanced

14.Conditional operations in Xcos

Foss : Scilab - English

Outline: * Loading the code file for a simple simulation using Ramp Input block * Using TOWS_c block to save values in the workspace * Using WRITEC_f block to save simulation data to a C ..

Advanced

15.Super Blocks in Xcos

Foss : Scilab - English

Outline: Use of Super Blocks What is a Super block? Explain CONST, POWBLK_f, AFFICH_m and ClOCK_c blocks of super-initial.xcos file. Change the value of CONST block and run it. ..

Courses and Participants List

Academic Year 2019-20

- **July - December, 2019**

#	Semester Start Date	Software Course	Department	Participant List Status	Action
1	July 27, 2019	Scilab	B.Sc. Mathematics	23		Participant List	Participation certificates available	
2	July 29, 2019	PHP and MySQL	Bachelor of Science (Bsc)	47		Participant List	Participation certificates available	

- ## Scilab

Participants list

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Spoken Tutorial
Project at
IIT Bombay

Certificate of Participation

This is to certify that **SUMAN UMARANIKAR** participated in the **Scilab** training

organized at **Vivekanand College** in **July 2019** semester, with course material provided

by the Spoken Tutorial Project, IIT Bombay.

A comprehensive set of topics pertaining to **Scilab** were covered in the training. This

training is offered by the Spoken Tutorial Project, IIT Bombay.

September 25th 2019

Prof. Kannan M Moudgalya
Prof. Kannan M Moudgalya
IIT Bombay

Certificate of Participation

This is to certify that **RAHUL DINDE** participated in the **Scilab** training organized at **Vivekanand College** in **July 2019** semester, with course material provided by the Spoken Tutorial Project, IIT Bombay.

A comprehensive set of topics pertaining to **Scilab** were covered in the training. This training is offered by the Spoken Tutorial Project, IIT Bombay.

September 25th 2019

Prof. Kannan M Moudgalya
IIT Bombay

Spoken Tutorial
Project at
IIT Bombay