Course: Scilab

Course Code:

Session: 2016-17

Duration: 4 Months

Assessment procedures: No Assesment

Curriculum of the Course:

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.

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.

17.Solving Nonlinear 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..

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.

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..

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

21.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

22.ODE Applications

Foss : *Scilab - English*

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

23.Optimization Using Karmarkar Function

Foss : *Scilab - English*

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

24.Digital Signal Processing

Foss : *Scilab - English*

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

25.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..

26.Discrete systems

Foss : *Scilab - English*

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

27.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

28.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...

29.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..

30.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..

31.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.

32.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.

33.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.

34.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.

35.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.

List of students enrolled

S. No.	First Name	Last Name
1	DIVYANSHU	MITTAL
2	SANDEEP	CHOUDHARY
3	ARBAZ	KHAN
4	NAGESH KUMAR	VAISHNAV
5	AAKRITI	MATHUR
6	AISHWARYA	BHATNAGAR
7	ESHANI	JAIN
8	KRATIKA	BANSAL
9	MAMTA	RATHORE
10	AADHAR	AGARWAL
11	ABHISHEK	KASERA
12	ABHISHEK	SHARMA
13	ADITI	JOSHI
14	AJAY	KUMAR
15	AKSHAY	SINGH
16	ARCHIKA	SINGH
17	ASHISH	TIWARI
18	AVATANSH	JAIMAN
19	CHANCHAL	JAIN
20	CHETAN	KUMHAR
21	CHIRAG	ARORA
22	DIVYA	MATHUR
23	KALPESH	JAIN
24	KRITIMA	GUPTA
25	LAVEENA	AGARWAL
26	MOHIT	SUKHWAL
27	MUKTI	AGRAWAL
28	NATWAR SINGH	SHEKHAWAT
29	NEEL KUMAR	SINGHAL
30	NEHA	BELI
31	PRATEEK	PANDEY
32	SAKSHI	JAIN
33	SHREE	SONI
34	SHUBHAM	SHARMA
35	TAMANNA	MIDHA
36	UCHREET	INSAN
37	VIKAS	SHARMA
38	VISHAL KUMAR	TURI
39	DEEPSHRI	PHOGAWAT
40	AMAN	KUMAR
41	KAVITA	PINDEL
42	JYOT	PRAKASH
43	KHUSHBU	CHAUHAN