DEPARTMENT OF MATHEMATICS				*Certificate Course*				
Sem	**Course Type**	**Course Code**	**Course Title**	**Credits**	**Total Contact Hours**	**CIA**	**Ext**	**Total**
	Certificate course	21MATC07	SCILAB	2	30	50	50	100

Learning Objectives:

To make the students aware of SCILAB programming environment.

Students will understand the basics of SCILAB software and code development.

Learning out comes:

The course contents will enable the students to learn basic SCILAB programming

Students will learn to execute SCILAB codes for Vectors, Matrix, ordinary differential equations , Linear and Non-Linear Equations

UNIT - I: Introduction to Scilab

About Scilab and its benefits-Scilab is reliable-Use of Scilab in CNES-Use of Scilab for space mission analysis and flight dynamics-Industrial application of Scilab-Matrix calculation in Scilab-Installing Scilab-Expressions: Show mathematical expressions with numbers-Variables-Diary command-Define symbolic constants-Basic functions-suppressing output- Conditional Branching- 'if' and 'then' with the example- use of the 'else' keyword- use of the 'elseif' keyword- example for select-Iteration-syntax of 'for' statement- Scripts and Functions

UNIT - II: Vector Operations and Matrix Operations

Define vector-Calculate length of a vector-Perform mathematical operations on Vectors such as addition,subtraction and multiplication.Define a matrix-Calculate size of a matrix-Perform mathematical operations on Matrices such as addition, subtraction and multiplication-Matrix Operations-Access the elements of Matrix ,Determine the determinant, inverse and eigen values of a matrix.-Define special matrices-Perform elementary row operations-Solve the system of linear equations.

UNIT - III: Ordinary Differential Equations

Solving ODEs using Euler Methods-Solve ODEs using Euler and Modified Euler methods Develop Scilab code to solve ODEs- Solving ODEs using Scilab ode Function-Use Scilab ode function-Solve typical examples of ODEs -Plot the solution

UNIT - IV: Solving Linear Equations

Explain Gauss Elimination method algorithm-Explain code for Gauss Elimination method and solve an example using this code- Explain Gauss Jordan method algorithm- Explain code for Gauss Jordan method and solve an example using this code-Solve system of linear equations using iterative methods-. Use Jacobi and Gauss Seidel iterative methods

UNIT - V: Solving Non-Linear Equations

Numerical methods- Solving Non- linear Equations - Learn how to solve nonlinear equations using numerical methods- Learn Bisection method- Learn Secant method- Learn how to develop Scilab code for solving nonlinear equations

TEXT BOOK:

SCILAB—A Beginner's Approach 1st Edition, by Anil Kumar Verma (January 2018)

Course Designer

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