

**Semester: I (SEC)**

**Subject Title: SCILAB (Theory & Practical)**

**Course Code: SEC-1650**

**No. of Credits: 2(1+1)**

**Learning Hours: 3 Hours/Week**

**Theory:**

Introduction to SCILAB, installations and SCILAB environment, Workspace and working directory. Codes and commands. Input and output commands. Conditional and logical commands. Loop commands. User defined functions. Creating matrices, some simple matrix operations. Some advanced matrix algebra through SCILAB, polynomials and its roots. Commands for basic graph plotting.

**Practical:**

**(A) Elementary operations on matrices.**

- (1) To input row vectors, column vectors, square and rectangular matrices.
- (2) To obtain addition, subtraction and multiplication, division of matrices and multiplication of matrix with scalar.
- (3) To obtain sub matrices of given matrix and to delete rows and columns.
- (4) To find minors, cofactors and adjoint of a matrix.
- (5) To find inverse of the matrix using adjoint of a matrix.
- (6) To learn commands zeros, ones, eye, rand, det(), inv(), command for transpose.

**(B) Solving simultaneous linear equations and advanced matrix algebra.**

- (7) To find the inverse of a matrix using GAUSS-ELIMINATION method.
- (8) To find inverse of given matrix using GAUSS-JORDAN method
- (9) To find Eigen values and Eigen vectors of given matrix
- (10) To find inverse of given matrix using CAYLEY-HAMILTON theorem
- (11) Inserting polynomials and finding its roots.
- (12) Plotting of basic graphs.

**Reference books:**

1. An Introduction to Scilab-Satish Annigeri, December 2009
2. Scilab for very beginners-Scilab enterprises.