# **COMPUTATION LAB**

(Skill Oriented Lab Elective - I)

#### Course Code: 20CE11S4

### L T P C 0 1 2 2

**Pre-requisites:** Problem solving using C, Mathematics.

**Course Outcomes:** At the end of the course, the student will be able to (using MATLAB programming Language):

CO1: Perform matrix operations. (L2)

CO2: Plot two dimensional, three dimensional graphs and draw inferences (L2)

**CO3:** Perform linear and non-linear regression analysis for the given data (L2)

CO4: Determine steady state, unsteady state solutions of Ordinary differential equations (L2)

CO5: Compute two & three dimensional integrals and apply Conditional statements and Loops (L3)

# (Any 12 out of 16 experiments)

### LIST OF EXPERIMENTS:

- 1. Apply basic MATLAB commands like representing arrays, matrices, reading elements of a matrix, row and columns of matrices, random numbers.
- 2. Use Script files and Managing data.
- 3. Use Relational and Logical Operators.
- 4. User-Defined Functions and Function Files
- 5. Use Round, Floor, ceil, and fix commands.
- 6. Eigen values and Eigen vectors of a matrix.
- 7. Plot two dimensional and three dimensional plots, putting legends, texts, using subplot tool for multiple plots.
- 8. Perform Polynomial Regression, Curve Fitting, and Interpolation commands.
- 9. Perform Non-linear regression.
- 10. Solve non-linear algebraic equations.
- 11. Solve ODE IVP problems using Runge Kutta method.
- 12. Solve ODE BVP problems using shooting method.
- 13. Use quadrature to evaluate integrals (1, 2 and 3 dimensional cases).
- 14. Evaluate Laplace and Fourier transforms.
- 15. Apply Conditional statements and Loops.
- 16. Finding the minimum of an unconstrained function.

# **References:**

- 1. Amos Gilat, MATLAB An Introduction with Applications, 4<sup>th</sup> Edition, John Wiley & Sons, Inc, 2011.
- 2. Attaway, S. MATLAB A Practical Introduction to Programming and Problem Solving, 2<sup>nd</sup> Edition, Elsevier Butterworth-Heinemann, 2012.