Instruction Hours / week: L: 0 T: 0 P: 3   **Marks:** Internal: **40**   External: **60** Total: **100**

End Semester Exam: 3 Hours

Course Objectives
This course enables the students to learn
- Problem-solving through programming.
- Hands-on training using lab components.

Course Outcomes (COs)
On successful completion of this course, the student will be able to
1. Demonstrate comprehension in fundamental topics of computing, algorithms, computer organization and software systems.
2. Have applied knowledge of areas of computing to create solutions to challenging problems, including specify, design, implement and validate solutions for new problems.
3. Be aware of current research activity in computing through activities including reading papers, hearing research presentations, and successfully planning and completing an individual research project in computing or its application.

List of Practical (Any 8 programs)

1. Plotting of second order solution family of differential equation.

2. Growth model (exponential case only).

3. Decay model (exponential case only).

4. Lake pollution model (with constant/seasonal flow and pollution concentration).

5. Case of single cold pill and a course of cold pills.

6. Limited growth of population (with and without harvesting).

7. Predatory-prey model (basic volterra model, with density dependence, effect of DDT, two prey one predator).

8. Plotting of recursive sequences.

9. Verify Bolzano-Weierstrass theorem through plotting of sequences and hence identify convergent subsequences from the plot.

10. Study the convergence/divergence of infinite series by plotting their sequences of partial sum.

11. Cauchy's root test by plotting nth roots.

12. Ratio test by plotting the ratio of nth and $(n+1)^{th}$ term.