



**Faculty of Engineering and Technology**

Bachelor of Technology (Semester II / First year)

In Effect from Academic Year 2026-27

|                              |                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Branch Name:</b>          | Computer Engineering / Information Technology / Artificial Intelligence and Data Science / Information and Communication Technology / Mechanical Engineering / Civil Engineering/ Electrical Engineering / Robotics & Automation / Artificial Intelligence & machine learning / Electronics& Communication Engineering/ AI Powered Cloud and DevOps |
| <b>Program Code:</b>         | ET103 / ET105 / ET108 / ET107 / ET101 / ET106 / ET109 / ET113/ ET114 / ET115/ ET116                                                                                                                                                                                                                                                                 |
| <b>Course Title:</b>         | Engineering Mathematics-II with Computing tools Practical                                                                                                                                                                                                                                                                                           |
| <b>Course Code:</b>          | 2ET1000102P                                                                                                                                                                                                                                                                                                                                         |
| <b>Pre-requisite Course:</b> | Basic about computer operating system.                                                                                                                                                                                                                                                                                                              |

### Course Objectives:

The objective of this course is to learn mathematical concepts using SCILAB

### Teaching and Examination Scheme:

| Credit | Teaching Scheme<br>Hours per week |   |    |       | Evaluation Scheme (Marks) |      |      |      |                   |      |      |      |                  |
|--------|-----------------------------------|---|----|-------|---------------------------|------|------|------|-------------------|------|------|------|------------------|
|        |                                   |   |    |       | Theory (Marks)            |      |      |      | Practical (Marks) |      |      |      | Total<br>(Marks) |
|        | L                                 | T | P  | Total | SEE                       |      | CCA  |      | SEE               |      | CCA  |      |                  |
|        |                                   |   |    |       | Min.                      | Max. | Min. | Max. | Min.              | Max. | Min. | Max. |                  |
| 01     | -                                 | - | 02 | 02    | -                         | -    | -    | -    | 10                | 25   | 10   | 25   | 50               |

### Course Contents:

| Sr. No | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Contact Hours |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 1      | a. Creating vectors, row vectors and column vectors.<br>b. Create different matrices and explore its rows, columns, and diagonals.<br>c. Perform different basic operation of vectors on above created matrices.<br>d. Perform different basic operation of matrices on above created matrices.<br>e. Explore length (), dim (), ncol (), nrow () operators on above matrices and vectors.<br>f. Explore commands for Selecting and extracting elements from above matrices and arrays. | 08            |
| 2      | a. Solution of system of equations using matrix method.<br>b. Solution of system of equations using Gauss elimination method.<br>c. Finding eigen values and eigen vectors.<br>d. Checking stability of the system                                                                                                                                                                                                                                                                      | 08            |
| 3      | a. Understanding plotting Techniques and its interpretations<br>b. Understanding subplots<br>c. Understand 3-D plots and its interpretation                                                                                                                                                                                                                                                                                                                                             | 04            |
| 4      | a. Applying looping techniques to solve mathematical problems.<br>b. Understanding conditional statements and applying the same to mathematical problems                                                                                                                                                                                                                                                                                                                                | 04            |
| 5      | <b>a.</b> Writing small program using loops and conditional statements for solution of mathematical expansions and problems.<br><b>b.</b> Executing the written programs and getting the output.                                                                                                                                                                                                                                                                                        | 06            |

### Reference Books:

1. Programing using SCILAB Theory and Practical by Akhilesh Kumar
2. Introduction to SCILAB by Michael Baudin

**Course Outcomes: On completion of this course, the students will be able to**

| <b>Course Outcomes</b> | <b>Description</b>                                                                                    | <b>Bloom's Taxonomy Level</b> |
|------------------------|-------------------------------------------------------------------------------------------------------|-------------------------------|
| <b>CO1</b>             | Discuss the basic structure of SCILAB tool box                                                        | Understanding (2)             |
| <b>CO2</b>             | Demonstrate the concepts of variables, vectors, and matrices                                          | Understanding (2)             |
| <b>CO3</b>             | Use symbolic math toolbox in SCILAB to solve the system of linear equations                           | Applying (3)                  |
| <b>CO4</b>             | Interpret functions using plotting techniques. Write a small program to solve mathematical equations. | Applying (3)                  |

**Mapping of CLO with PO and PSO:**

| <b>Course Learning Outcomes</b> | <b>Program Outcomes (POs)</b> |            |            |            |            |            |            |            |            |             |             |             | <b>Program Specific Outcomes (PSOs)</b> |             |             |             |
|---------------------------------|-------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-----------------------------------------|-------------|-------------|-------------|
|                                 | <b>PO1</b>                    | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> | <b>PO7</b> | <b>PO8</b> | <b>PO9</b> | <b>PO10</b> | <b>PO11</b> | <b>PO12</b> | <b>PSO1</b>                             | <b>PSO2</b> | <b>PSO3</b> | <b>PSO4</b> |
| <b>CLO1</b>                     | H                             | M          | M          |            | M          |            |            |            |            |             |             |             |                                         |             |             |             |
| <b>CLO2</b>                     | H                             | M          |            |            | M          |            |            |            |            |             |             | L           |                                         |             |             |             |
| <b>CLO3</b>                     | H                             | M          | M          |            | M          |            |            |            |            |             |             |             |                                         |             |             |             |
| <b>CLO4</b>                     | M                             | M          | M          |            | M          |            |            |            |            |             |             | L           |                                         |             |             |             |

**H: High, M: Medium, L: Low**