

**STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI**

**COURSE PLAN (November 2024 – April 2025)**

**Department** : Mathematics  
**Name/s of the Faculty** : S Mercy Soruparani  
**Course Title** : Integral Calculus  
**Course Code** : 23MT/MC/IC23  
**Shift** : I

**COURSE OUTCOMES (COs)**

| COs | Description  | CL |
|-----|--|----|
| CO1 | Recall and reproduce various integration techniques                                      | K1 |
| CO2 | Understand the concept of multiple and improper integrals                                | K2 |
| CO3 | Employ various techniques in evaluating multiple integrals                               | K3 |
| CO4 | Analyze and explain the results of multiple integral through illustrations with examples | K4 |
| CO5 | Predict appropriate methods to find the solution of problems on integral calculus        | K5 |

| Week                                 | Unit No. | Content  | Cognitive Level | Teaching Hours | COs    | Teaching Learning Methodology | Assessment Methods |
|--------------------------------------|----------|--|-----------------|----------------|--------|-------------------------------|--------------------|
| Nov 18 – 25, 2024<br>(Day Order 1-6) | 1<br>1.1 | <b>Methods of Integration</b><br>$\frac{1}{(x-k)\sqrt{ax^2+bx+c}}$ , $\frac{1}{(Ax^2+B)\sqrt{Cx^2+D}}$ | K1-K5           | 4              | CO 1-5 | Derivation                    | Problem solving    |

|   |                                     |   |       |        |        |                 |                                  |
|---|-------------------------------------|---|-------|--------|--------|-----------------|----------------------------------|
|   |                                     | $\frac{1}{(ax^2+bx+c)\sqrt{Ax^2+Bx+C}}$   |       |        |        |                 |                                  |
| Nov 26- Dec 3, 2024<br>(Day Order 1 to 6) | 1.1                                 | $\sqrt{(x-\alpha)(\beta-x)}, \frac{1}{\sqrt{(x-\alpha)(\beta-x)}}, \sqrt{\frac{x-\alpha}{\beta-x}}$                     | K1-K5 | 4      | CO 1-5 | Problem solving | Quiz                             |
| Dec 4-11, 2024<br>(Day Order 1 to 6)      | 1.2<br>2<br>2.1                     | $\frac{1}{a+b \cos x}, \frac{1}{\sqrt{a^2 \cos^2 x + b^2 \sin^2 x}}$<br><b>Improper Integrals</b><br>Infinite Integrals | K1-K5 | 3<br>1 | CO 1-5 | Lecture         | Questioning                      |
| Dec 12-19, 2024<br>(Day Order 1 to 6)     | 2.1<br>2.2                          | Infinite Integrals(cont.)<br>Discontinuous Integrands   | K1-K5 | 4      | CO 1-5 | Derivation      | Test – 25<br>Marks<br>Unit 1:1.1 |
| Dec 20, 2024<br>(Day Order 1)             | 2.2                                 | Discontinuous Integrands (cont.)  | K1-K5 | 1      | CO 1-5 | Problem solving | Problem<br>solving               |
| Jan 3 – 7, 2025<br>(Day Order 3 to 6)     | 2.3                                 | Comparison Test   | K1-K5 | 2      | CO 1-5 | Lecture         | Quiz                             |
| Jan 8 – 17, 2025<br>(Day Order 1 to 6)    | 3<br>3.1<br>3.2                     | <b>Double Integrals</b><br>Iterated Integrals<br>Double Integrals over General<br>Regions                               | K1-K5 | 4      | CO 1-5 | Derivation      | Questioning                      |
| Jan 18 - 23, 2025                         | <b>C.A. Test – I Unit 1 &amp; 2</b> |   |       |        |        |                 |                                  |

|   |                                     |  |       |        |        |                 |                                  |
|---|-------------------------------------|--|-------|--------|--------|-----------------|----------------------------------|
| Jan 24 -31, 2025<br>(Day Order 1 to 6)      | 3.3                                 | Double Integrals in Polar Coordinates  | K1-K5 | 4      | CO 1-5 | Derivation      | Problem solving                  |
| Feb 3-8, 2025<br>(Day Order 1 to 6)         | 3.4<br>4.1                          | Surface Area using Double Integrals<br>Triple Integrals                          | K1-K5 | 3<br>1 | CO 1-5 | Problem solving | Test – 25<br>Marks<br>Unit 3:3.1 |
| Feb 10– 18, 2025<br>(Day Order 1 to 4)      | 4.1                                 | Triple Integrals   | K1-K5 | 3      | CO 1-5 | Lecture         | Questioning                      |
| Feb 19- 26, 2025<br>(Day Order 1-6)         | 4.2                                 | Applications of Triple Integrals   | K1-K5 | 4      | CO 1-5 | Derivation      | Interaction                      |
| Feb 27- Mar 6, 2025<br>(Day Order 1 to 6)   | 4.3                                 | Change of Variable in Double and<br>Triple Integral                              | K1-K5 | 4      | CO 1-5 | Problem solving | Problem solving                  |
| Mar 7 – 11, 2025<br>(Day Order 1 to 3)      | 5.1                                 | <b>Beta and Gamma Integrals:</b><br>Definitions                                  | K1-K5 | 2      | CO 1-5 | Lecture         | Quiz                             |
| Mar 12 –17, 2025                            | <b>C.A. Test – II Unit 3&amp; 4</b> |  |       |        |        |                 |                                  |
| Mar 18 – 20, 2025<br>(Day 4 to 6)           | 5.2<br>5.3                          | Recurrence Formula for Gamma<br>Functions(cont.)<br>Properties of Beta Functions | K1-K5 | 2      | CO 1-5 | Derivation      | Quiz                             |
| Mar 21 - 28, 2025<br>(Day Order 1 to 6)     | 5.4                                 | Relation between Beta and Gamma<br>Functions                                     | K1-K5 | 4      | CO 1-5 | Problem solving | Questioning                      |
| Mar 29- April 2, 2025<br>(Day Order 1 to 3) | <b>REVISION</b>                     |  |       |        |        |                 |                                  |