

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

**COURSE PLAN (June - November 2026)**

**Department** : Mathematics  
**Name/s of the Faculty** : Dr. A Josephine Lissie and Dr. Sindiya Therese S  
**Course Title** : PRINCIPLES OF REAL ANALYSIS  
**Course Code** : 23MT/MC/RA55  
**Shift** : I

**COURSE OUTCOMES (COs)**

| COs | Description                                                                                                                        | CL |
|-----|------------------------------------------------------------------------------------------------------------------------------------|----|
| CO1 | define and recall the abstract mathematical concepts on the real line and metric spaces                                            | 1  |
| CO2 | illustrate the theoretical concepts using relevant examples                                                                        | 2  |
| CO3 | identify potential solutions to problems involving limit, continuity, uniform continuity, convergence, derivatives and integration | 3  |
| CO4 | analyse the abstract concepts and choose appropriate methods for proving the theoretical results                                   | 4  |
| CO5 | compare the various methods in mathematical analysis that can be applied to evaluate analytical problems                           | 5  |
|     |                                                                                                                                    |    |

| Week              | Unit No. | Content                                                                                             | Cognitive Level | Teaching Hours | COs | Teaching Learning Methodology | Assessment Methods      |
|-------------------|----------|-----------------------------------------------------------------------------------------------------|-----------------|----------------|-----|-------------------------------|-------------------------|
| Jun 15 – 22, 2026 | I & II   | <b>Limits and Continuity on <math>\mathbb{R}</math></b><br>1.1 Limit of a Function on the Real Line | 1-5             | 2+3            | 1-5 | Lecture, group discussions,   | Questioning & slip test |

|                                          |                   |                                                                                                                                                                                                     |     |     |     |                                                |                                                                                   |
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| (Day Order 1-6)                          |                   | <b>Limits and Continuity on Metric Spaces</b><br>2.1 Limits in Metric Spaces                                                                                                                        |     |     |     | problem solving                                |                                                                                   |
| Jun 23 – July 1, 2026<br>(Day Order 1-6) | <b>I &amp; II</b> | <b>Limits and Continuity on <math>\mathbb{R}</math></b><br>1.2 Functions Continuous at a Point on the Real Line<br><br><b>Limits and Continuity on Metric Spaces</b><br>2.1 Limits in Metric Spaces | 1-5 | 2+3 | 1-5 | Lecture, group discussions,<br>problem solving | Questioning & slip test                                                           |
| July 2 – July 8, 2026<br>(Day Order 1-6) | <b>I &amp; II</b> | <b>Limits and Continuity on <math>\mathbb{R}</math></b><br>1.3 Reformulation<br><br><b>Limits and Continuity on Metric Spaces</b><br>2.2 Functions Continuous on a Metric Space                     | 1-5 | 2+3 | 1-5 | Lecture, group discussions,<br>problem solving | Questioning & slip test                                                           |
| July 9 – 16, 2026<br>(Day Order 1-6)     | <b>I &amp; II</b> | <b>Metric Spaces</b><br>1.4 Definitions with Examples<br><br><b>Limits and Continuity on Metric Spaces</b><br>2.3 Open Sets                                                                         | 1-5 | 2+3 | 1-5 | Lecture, group discussions,<br>problem solving | Questioning & slip test                                                           |
| July 17 – 24, 2026<br>(Day Order 1-6)    | <b>II &amp; V</b> | <b>Limits and Continuity on Metric Spaces</b><br>2.3 Open Sets<br><br><b>Riemann Integration</b><br>5.1 Definition of the Riemann Integral                                                          | 1-5 | 2+3 | 1-5 | Lecture, group discussions,<br>problem solving | <b>III Component part 1 – 25 marks - Unit I and V – Theorem and problems test</b> |
| July 25 – 28, 2026<br>(Day Order 1-6)    | <b>II &amp; V</b> | <b>Limits and Continuity on Metric Spaces</b><br>2.4 Closed Sets<br><br><b>Riemann Integration</b>                                                                                                  | 1-5 | 2+1 | 1-5 | Lecture, group discussions,                    | Questioning & slip test                                                           |

|                                          |                                      |                                                                                                                                                                              |     |     |     |                                                |                                                               |
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| 3)                                       |                                      | 5.2 Properties of the Riemann Integral<br>5.3 Derivatives                                                                                                                    |     |     |     | problem solving                                |                                                               |
| July 29 – Aug 3, 2026                    | <b>C.A. Test – I (Unit I and II)</b> |                                                                                                                                                                              |     |     |     |                                                |                                                               |
| Aug 4 - 6, 2026<br>(Day Order 4 - 6)     | <b>II</b>                            | <b>Limits and Continuity on Metric Spaces</b><br>2.4 Closed Sets                                                                                                             | 1-5 | 0+2 | 1-5 | Lecture, group discussions,<br>problem solving | Questioning & slip test                                       |
| Aug 7 – 14, 2026<br>(Day Order 1- 6)     | <b>III &amp; V</b>                   | <b>Connectedness and Completeness on Metric Spaces</b><br>3.1 Connected Sets<br><br><b>Riemann Integration</b><br>5.4 Rolles' Theorem                                        | 1-5 | 2+3 | 1-5 | Lecture, group discussions,<br>problem solving | Questioning & slip test                                       |
| Aug 17 - 24, 2026<br>(Day Order 1- 6)    | <b>III &amp; V</b>                   | <b>Connectedness and Completeness on Metric Spaces</b><br>3.1 Connected Sets<br><br><b>Riemann Integration</b><br>5.5 The Law of the Mean                                    | 1-5 | 2+3 | 1-5 | Lecture, group discussions,<br>problem solving | Questioning & slip test                                       |
| Aug 25 – Sep 2, 2026<br>(Day Order 1- 6) | <b>III &amp; V</b>                   | <b>Connectedness and Completeness on Metric Spaces</b><br>3.2 Bounded Sets and Totally Bounded Sets<br><br><b>Riemann Integration</b><br>5.6 Fundamental Theorem of Calculus | 1-5 | 2+3 | 1-5 | Lecture, group discussions,<br>problem solving | <b>III Component part 2 – 25 marks - Unit II and III –MCQ</b> |

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| Sep 3 – 11,<br>2026<br>(Day Order 1-6)    | <b>III &amp; IV</b>                      | <b>Connectedness and Completeness on Metric Spaces</b><br>3.2 Bounded Sets and Totally Bounded Sets<br><br><b>Compactness on Metric Spaces</b><br>4.1 Compact Metric Spaces | 1-5 | 2+3 | 1-5 | Lecture, group discussions,<br>problem solving | Questioning & slip test |
| Sep 15-17,<br>2026<br>(Day Order 1 - 3)   | <b>IV</b>                                | <b>Compactness on Metric Spaces</b><br>4.2 Continuous Functions on a Compact Metric Space                                                                                   | 1-5 | 2+1 | 1-5 | Lecture, group discussions,<br>problem solving | Questioning & slip test |
| Sep 18 –23,<br>2026                       | <b>C.A. Test – II (Unit III &amp; V)</b> |                                                                                                                                                                             |     |     |     |                                                |                         |
| Sep 24 - 28,<br>2026<br>(Day 4 – 6)       | <b>III</b>                               | <b>Connectedness and Completeness on Metric Spaces</b><br>3.2 Bounded Sets and Totally Bounded Sets                                                                         | 1-5 | 0+2 | 1-5 | Lecture, group discussions,<br>problem solving | Questioning & slip test |
| Sep 29 – Oct 7, 2026<br>(Day Order 1 - 6) | <b>III &amp; IV</b>                      | <b>Connectedness and Completeness on Metric Spaces</b><br>3.3 Complete Metric Spaces<br><br><b>Compactness on Metric Spaces</b><br>4.3 Continuity of an Inverse Function    | 1-5 | 2+3 | 1-5 | Lecture, group discussions,<br>problem solving | Questioning & slip test |
| Oct 8 - 14,<br>2026<br>(Day Order 1 - 6)  | <b>III &amp; IV</b>                      | <b>Connectedness and Completeness on Metric Spaces</b><br>3.3 Complete Metric Spaces<br><br><b>Compactness on Metric Spaces</b>                                             | 1-5 | 2+3 | 1-5 | Lecture, group discussions,<br>problem solving | Questioning & slip test |

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|                                         |          | 4.4 Uniform Continuity |  |  |  |  |  |
| Oct 15 - 21,<br>2026<br>(Day Order 1-4) | REVISION |                        |  |  |  |  |  |