

**STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI****COURSE PLAN (June - November 2026)**

**Department** : **Mathematics**  
**Name of the Faculty** : **Dr. Arputha Christy K**  
**Course Title** : **ALGEBRA & TRIGONOMETRY**  
**Course Code** : **25MT/MC/AT15**  
**Shift** : **II**

**COURSE OUTCOMES (COs)**

| <b>COs</b> | <b>Description</b>                                                                                                               | <b>CL</b> |
|------------|----------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>CO1</b> | recall basic concepts in algebraic, transcendental and trigonometric equations                                                   | K1        |
| <b>CO2</b> | gain understanding of the different expansions of circular functions and relation between circular and hyperbolic functions      | K2        |
| <b>CO3</b> | identify diagonalizable matrices, apply Cayley Hamilton theorem in solving higher order matrix equations and to compute inverses | K3        |
| <b>CO4</b> | use the concepts of trigonometry to solve applications                                                                           | K4        |
| <b>CO5</b> | use the various series expansions to compute the sum of infinite series and to find limits                                       | K5        |

| Week                                      | Unit No. | Content                                                                                                                                             | Cognitive Level | Teaching Hours | COs   | Teaching Learning Methodology                  | Assessment Methods |
|-------------------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------------|-------|------------------------------------------------|--------------------|
| Jun 22, 2026<br>(Day Order 6)             | 1        | <b>Theory of Equations</b><br>1.1 Reciprocal Equations<br>1.2 Standard Form                                                                         | K1- K5          | 1              | CO1-5 | Lecture,<br>Discussions and<br>Problem Solving | Questioning        |
| Jun 23 – July 1, 2026<br>(Day Order 1- 6) | 1        | <b>Theory of Equations</b><br>1.2 Standard Form<br><br>1.3 Increasing or<br>decreasing the roots of a<br>given equation<br><br>1.4 Removal of terms | K1- K5          | 5              | CO1-5 | Lecture,<br>Discussions and<br>Problem Solving | Questioning        |
| July 2 – July 8, 2026<br>(Day Order 1- 6) | 1        | <b>Theory of Equations</b><br><br>1.3 Increasing or<br>decreasing the roots of a<br>given equation<br><br>1.4 Removal of terms                      | K1- K5          | 5              | CO1-5 | Lecture,<br>Discussions and<br>Problem Solving | Questioning        |
| July 9 – 16, 2026<br>(Day Order 1- 6)     | 1 & 2    | <b>Theory of Equations</b><br><br>1.4 Removal of terms<br>normal forms.                                                                             | K1- K5          | 5              | CO1-5 | Lecture,<br>Discussions and<br>Problem Solving | Questioning        |

|                                        |                                           |                                                                                                                       |        |   |       |                                                |                                                                                   |
|----------------------------------------|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|--------|---|-------|------------------------------------------------|-----------------------------------------------------------------------------------|
|                                        |                                           | <b>Series Expansions</b><br>2.1 Exponential Series                                                                    |        |   |       |                                                |                                                                                   |
| July 17 – 24, 2026<br>(Day Order 1- 6) | 2                                         | <b>Series Expansions</b><br>2.1 Exponential Series<br>2.2 Logarithmic Series                                          | K1- K5 | 5 | CO1-5 | Lecture,<br>Discussions and<br>Problem Solving | III Component-Part 1<br><br>MCQ Quiz- Unit 1:1.1-<br>1.2<br><br><b>(15 marks)</b> |
| July 25 – 28, 2026<br>(Day Order 1- 3) | 2                                         | <b>Series Expansions</b><br>2.2 Logarithmic Series                                                                    | K1- K5 | 2 | CO1-5 | Lecture,<br>Discussions and<br>Problem Solving | Questioning                                                                       |
| July 29 – Aug 3, 2026                  | <b>C.A. Test – I ( Units 1 &amp; 2.2)</b> |                                                                                                                       |        |   |       |                                                |                                                                                   |
| Aug 4 - 6, 2026<br>(Day Order 4 - 6)   | 2                                         | 2.3 Application of<br>exponential and<br>logarithmic Series                                                           | K1- K5 | 3 | CO1-5 | Lecture,<br>Discussions and<br>Problem Solving | Questioning                                                                       |
| Aug 7 – 14, 2026<br>(Day Order 1- 6)   | 3                                         | <b>Properties of Matrices</b><br>3.1 Eigenvalues and<br>Eigenvectors<br><br>3.2 Cayley-Hamilton<br>Theorem (Statement | K1- K5 | 5 | CO1-5 | Lecture,<br>Discussions and<br>Problem Solving | Questioning                                                                       |

|                                          |      |                                                                                                                                                                                                                                              |        |   |       |                                                |                                                                                                                                                 |
|------------------------------------------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---|-------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
|                                          |      | only)                                                                                                                                                                                                                                        |        |   |       |                                                |                                                                                                                                                 |
| Aug 17 - 24, 2026<br>(Day Order 1- 6)    | 3    | <b>Properties of Matrices</b><br>3.3 Diagonalization of a Matrix                                                                                                                                                                             | K1- K5 | 5 | CO1-5 | Lecture,<br>Discussions and<br>Problem Solving | Questioning                                                                                                                                     |
| Aug 25 – Sep 2, 2026<br>(Day Order 1- 6) | 3 &4 | <b>Properties of Matrices</b><br>3.4 Application –<br>Computing areas using<br>matrices<br><br><b>Trigonometry</b><br>4.1 Expansions of $\cos n\theta$ , $\sin n\theta$ and $\tan n\theta$<br>4.2 Expansion of $\tan (A + B + C + \dots )$   | K1- K5 | 5 | CO1-5 | Lecture,<br>Discussions and<br>Problem Solving | <b>III Component –<br/>Part II</b> -Assignment<br>on Real life<br>applications of Eigen<br>Values and Eigen<br>vectors<br><br><b>(10 marks)</b> |
| Sep 3 – 11, 2026<br>(Day Order 1- 6)     | 4    | <b>Trigonometry</b><br>4.1 Expansions of $\cos n\theta$ , $\sin n\theta$ and $\tan n\theta$<br>4.2 Expansion of $\tan (A + B + C + \dots )$<br><br>4.3 Expansion of $\cos n\theta$ and $\sin n\theta$ in a series of<br>sines and cosines of | K1- K5 | 5 | CO1-5 | Lecture,<br>Discussions and<br>Problem Solving | Questioning                                                                                                                                     |

|                                           |                                          |                                                                                                                                                                                                                |        |   |       |                                          |                                                    |
|-------------------------------------------|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---|-------|------------------------------------------|----------------------------------------------------|
|                                           |                                          | multiples of $\theta$                                                                                                                                                                                          |        |   |       |                                          |                                                    |
| Sep 15-17, 2026<br>(Day Order 1 - 3)      | 4                                        | <b>Trigonometry</b><br>4.3 Expansion of $\cos n\theta$ and $\sin n\theta$ in a series of sines and cosines of multiples of $\theta$<br>4.4 Expansions of $\cos \theta$ and $\sin \theta$ in powers of $\theta$ | K1- K5 | 2 | CO1-5 | Lecture, Discussions and Problem Solving | Questioning                                        |
| Sep 18 –23, 2026                          | <b>C.A. Test – II (Unit 3 &amp; 4.4)</b> |                                                                                                                                                                                                                |        |   |       |                                          |                                                    |
| Sep 24 - 28, 2026<br>(Day 4 – 6)          | 4                                        | <b>Trigonometry</b><br>4.4 Expansions of $\cos \theta$ and $\sin \theta$ in powers of $\theta$                                                                                                                 | K1- K5 | 3 | CO1-5 | Lecture, Discussions and Problem Solving | Questioning                                        |
| Sep 29 – Oct 7, 2026<br>(Day Order 1 - 6) | 5                                        | <b>More on Trigonometry</b><br>5.1 Hyperbolic Functions<br>5.2 Relation between circular and hyperbolic functions                                                                                              | K1- K5 | 5 | CO1-5 | Lecture, Discussions and Problem Solving | Questioning                                        |
| Oct 8 - 14, 2026<br>(Day Order 1 - 6)     | 5                                        | <b>More on Trigonometry</b><br>5.3 Inverse hyperbolic functions in terms of                                                                                                                                    | K1- K5 | 5 | CO1-5 | Lecture, Discussions and Problem Solving | <b>III Component-3</b><br>Test<br>Sections 4.4-5.2 |

|                                       |                 |                       |  |  |  |  |                   |
|---------------------------------------|-----------------|-----------------------|--|--|--|--|-------------------|
|                                       |                 | logarithmic Functions |  |  |  |  | <b>[25 marks]</b> |
| Oct 15 - 21, 2026<br>(Day Order 1- 4) | <b>REVISION</b> |                       |  |  |  |  |                   |