STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI

COURSE PLAN (June - November 2026)

Department : **PHYSICS**

Name/s of the Faculty : **Dr. D. Anceila**

Course Title : **PHYSICS FOR MATHEMATICS - I**

Course Code : **25PH/ME/PM12**

Shift : **I**

COURSE OUTCOMES (COs)

COs	Description	CL
CO1	acquire knowledge on elasticity, bending of beams and theories of surface tension and viscosity of liquids, mechanics, and the basic concepts of relativity.	K1
CO2	describe the elastic behaviour of solids, the physical properties of liquids that impact fluid motion, and explain the concepts of mechanics and relativity.	K2
CO3	apply the mathematical tools to solve simple and complex problems in physics.	K3
CO4	illustrate the behaviour of rigid bodies and liquids utilizing theoretical concepts.	K4
CO5	evaluate problems related to work, power, simple harmonic motion, elasticity, viscosity and relativity.	K5

Week	Unit No.	Content	Cognitive Level	Teaching Hours	COs	Teaching Learning Methodology	Assessment Methods
Jun 22, 2026 (Day Order 6)							
Jun 23 – July 1, 2026 (Day Order 1- 6)	1	1.1 Impulse-Impact-Conservation of linear momentum	K1-K5	3	1-5	Lecture	Mini quiz
July 2 – July 8, 2026 (Day Order 1- 6)	1	Internal forces and momentum conservation – center of mass- examples General elastic collision of particles of different masses.	K1-K5	3	1-5	Lecture, Power point presentation	Problem solving
July 9 – 16, 2026 (Day Order 1- 6)	1	1.2 Significance of conservation laws- law of conservation of Energy- concepts of work- power – energy – potential energy. Mechanics II 2.1 Simple Harmonic Motion: Periodic and Harmonic Motion	K1-K5	3	1-5	Lecture, Power point presentation	Experiments using digital tools
July 17 – 24, 2026 (Day Order 1- 6)	2	Formula for acceleration, velocity and displacement - Energy of a Harmonic Oscillator - oscillation in spring mass-springs in series and parallel.	K1-K5	3	1-5	Lecture, Demo, Experiments	Short theory test

July 25 – 28, 2026 (Day Order 1- 3)				0			
July 29 – Aug 3, 2026	**C.A. Test - I**						
Aug 4 - 6, 2026 (Day Order 4 - 6)	2	2.2 Classical mechanics: Degrees of freedom and constraints Generalized Coordinates principle of virtual work - De Alembert's principle - Explanation of Lagrangian equation (No derivation) Application of Lagrangian equation in Atwood's machine and Simple pendulum.	K1-K5	3	1-5	Lecture	Component Test 1 - THEORY TEST- UNIT 1. K1,k2,k3 level assessment
Aug 7 – 14, 2026 (Day Order 1- 6)	3	Elasticity 3.1 Elastic properties: Hooke's law - Elastic limit moduli of Elasticity Poisson's ratio 3.2 Expression for Bending Moment -	K1-K5	3	1-5	Lecture, Demonstration	Interaction through experiments
Aug 17 - 24, 2026 (Day Order 1- 6)	3	Depression at the loaded end of the cantilever – depression and elevation at the midpoint of a loaded beam (non-uniform and uniform bending) Torsion in a wire –	K1-K5	3	1-5	Lecture, Power point presentation	Group discussion

		Torque per unit twist – torsional oscillations – Expression for period Viscosity and Surface Tension					
Aug 25 – Sep 2, 2026 (Day Order 1- 6)	4	4.1 Coefficient of viscosity Stream Line Flow and Turbulent Flow Velocity – Euler's Equation for unidirectional flow	K1-K5	3	1-5	Lecture, video presentations	quiz
Sep 3 – 11, 2026 (Day Order 1- 6)	4	4.2 Surface Tension: molecular theory of surface tension Determination of Surface Tension by Drop Weight Method- Interfacial Surface Tension	K1-K5	3	1-5	Lecture, pictorial representation	Component Test 2 – Problem solving – K5level
Sep 15-17, 2026 (Day Order 1 - 3)							
Sep 18 –23, 2026	**C.A. Test - II**						
Sep 24 - 28, 2026 (Day 4 – 6)	5	Relativity 5.1 Inertial Frames of Reference- Newtonian Relativity – Galilean Transformation Equations	K1-K5	3	1-5	Lecture	Third component test – III Assignment – K 4 level
Sep 29 – Oct 7, 2026 (Day Order 1 - 6)	5	5.1 Postulates of Special Theory of Relativity- Lorentz Transformation	K1-K5	3	1-5	Lecture, video watching	One minute paper

		Equations- Length Contraction Time Dilation - Twin Paradox and Meson Paradox					
Oct 8 - 14, 2026 (Day Order 1 - 6)	5	5.3 Relativistic Momentum (no derivation) – Mass Energy Relation- Physical Significance.	K1-K5	3	1-5	Lecture, Problem solving	Short theory test
Oct 15 - 21, 2026 (Day Order 1- 4)	**REVISION**						