

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

Department : PHYSICS
Name/s of the Faculty : Dr. ANNIE VINOSHA. P
Course Title : ELECTRICITY, MAGNETISM AND ELECTROMAGNETISM
Course Code : 23PH/MC/EM54
Shift : I

COURSE OUTCOMES (COs)

COs	Description						CL
CO1	Acquire knowledge on basic concepts and terms related to electromagnetism, such as electric field, magnetic field, Gauss's Law, and Ampere's Law.						K1
CO2	Describe the principles behind electromagnetic phenomena, including how electric charges interact and how magnetic fields are generated in various medium.						K2
CO3	Apply Maxwell's equations to analyze and solve complex electromagnetic problems.						K3
CO4	Deduce expressions related to Coulomb’s Law, Gauss’s law, Biot-Savart's law, Ampere’s law and Faraday's laws in various systems.						K4
CO5	Assess electric field, electric potential, electric flux, and magnetic field in different symmetry systems.						K5
Week	Unit No.	Content	Cognitive Level	Teaching Hours	COs	Teaching Learning Methodology	Assessment Methods

Jun 15 – 22, 2026 (Day Order 1- 6)	1	Electrostatics 1.1 Electrostatic Field - Coulomb's Law – Gauss's Law - Electric potential - Equipotential surfaces - Work done in moving a charge	1-5	5	1-5	Lecture	Problem- solving
Jun 23 – July 1, 2026 (Day Order 1- 6)	1	1.1 Electric potential as line integral of electric field. 1.2 Capacitors - Spherical Capacitor – Cylindrical capacitor - Capacitance of spherical and cylindrical capacitors - Capacitance of a parallel plate capacitor (with and without dielectric slab)	1-5	5	1-5	Lecture	Problem- solving
July 2 – July 8, 2026 (Day Order 1- 6)	1 & 2	1.2 Effect of dielectric – Guard ring condenser – Fixed condenser – Electrolytic condenser – Quadrant electrometer. Steady Currents	1-5	5	1-5	Lecture	Problem- solving

		2.1 Current and current density - Equation of continuity					
July 9 – 16, 2026 (Day Order 1- 6)	2	2.1 Electrical conductivity Drude– Lorentz theory - Wiedemann-Franz law 2.2 Carey foster bridge – Determination of resistivity	1-5	5	1-5	Lecture cum demonstration, Problem solving	Quiz on the content taught
July 17 – 24, 2026 (Day Order 1- 6)	2 &3	2.2 – Temperature coefficient of resistance Potentiometer – Calibration of ammeter and voltmeter (low and high range). Magnetostatics 3.1 Biot–Savart Law – Steady currents – Magnetic fields due to steady currents flowing	1-5	5	1-5	Lecture cum demonstration, Problem solving	Quiz on the content taught
July 25 – 28, 2026 (Day Order 1- 3)	3	3.1 (i) In a long straight wire at a point near it (ii)	1-5	3	1-5	Lecture cum demonstration,	IIIrd Component –

		Along a circular coil at a point on its axis (iii) Along a solenoid at a point on its axis- Divergence and curl of B.				Problem solving	I, K3 and K4 Level (20 Marks) theory Unit 1, 2 and 3.1
July 29 – Aug 3, 2026	C.A. Test - I						
Aug 4 - 6, 2026 (Day Order 4 - 6)	3	3.2 Ampere's Law – (i) Magnetic field at a point near a long straight wire carrying Steady current –	1-5	2	1-5	Lecture cum demonstration, Problem solving	Quiz on the content taught and problem sheet
Aug 7 – 14, 2026 (Day Order 1- 6)	3	(ii) Magnetic field of a long solenoid - (iii) Magnetic field of a toroidal coil – Comparison of magnetostatics and electrostatics- Ballistic galvanometer - Dead beat and BG conditions – Damping- Applications of BG.	1-5	5	1-5	Lecture cum demonstration, Problem solving	Working Model making K3 Level (10 marks)
Aug 17 - 24, 2026 (Day Order 1- 6)	4	Transient currents and	1-5	5	1-5	Lecture cum demonstration,	Quiz on the content

		Alternating current 4.1 Transient currents – Growth of current in a circuit containing resistance and inductance – Decay of current in a circuit containing L and R -				Problem solving	taught and problem sheet
Aug 25 – Sep 2, 2026 (Day Order 1- 6)	4	4.2 Alternating E.M.F applied to a circuit with resistance and capacitance in series and parallel.	1-5	5	1-5	Lecture cum demonstration, Problem solving	Group discussion and problem sheet
Sep 3 – 11, 2026 (Day Order 1- 6)	5	Electromagnetic induction and Maxwell's equation 5.1 Faraday's Laws - Electromagnetic Induction - Inductance	1-5	3	1-5	Lecture cum demonstration, Problem solving	Component – II, K5 Level (20 Marks) theory Unit 1,2, 4 and 5
Sep 15-17, 2026 (Day Order 1 - 3)	5	5.1 Self Inductance - Mutual Inductance	1-5	3	1-5	Lecture cum demonstration, Problem solving	Group discussion and problem sheet

Sep 18 –23, 2026	C.A. Test - II						
Sep 24 - 28, 2026 (Day 4 – 6)	5	5.1 Energy in Magnetic Fields – Relation between Self -inductance and Mutual inductance.	1-5	2	1-5	Lecture cum demonstration, Problem solving	Problem solving
Sep 29 – Oct 7, 2026 (Day Order 1 - 6)	5	5.2 Maxwell’s equations in vacuum, material media – Physical significance of Maxwell’s equations	1-5	5	1-5	Lecture cum demonstration, Problem solving	Problem - solving
Oct 8 - 14, 2026 (Day Order 1 - 6)	5	Displacement current – Plane electromagnetic waves in free space.	1-5	5	1-5	Lecture cum demonstration, Problem solving	Problem - solving
Oct 15 - 21, 2026 (Day Order 1- 4)	REVISION						