

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

Department : Physics
Name/s of the Faculty : DR. RACHEL DARTHY. R
Course Title : ASTROPHYSICS
Course Code : 23PH/PE/AP15
Shift : II

COURSE OUTCOMES (COs)

COs	Description						CL
CO1	recall and relate the violent Universe (white dwarfs, neutron stars, black holes etc.) beyond our planet and to describe the measurements of space and time.						K1
CO2	explain the origin of our universe and apply basic physical principles from the wide range of topics in physics to astronomical situations.						K2
CO3	demonstrate the relation between the temperature of a stellar core to its strength, colour and chemical composition and to manipulate them algebraically.						K3
CO4	categorize the importance of stellar magnetic fields, stellar populations, their classification and also to visualize the position of solar system, galactic objects in scale models.						K4
CO5	critically analyse the astronomical/physical concepts which enable them to interpret quantitative observations of celestial objects.						K5
Week	Unit No.	Content	Cognitive Level	Teaching Hours	COs	Teaching Learning Methodology	Assessment Methods

Jun 22, 2026 (Day Order 6)	1	General Astronomy 1.1 System of Coordinates - Altazimuth, Equatorial (local and Universal),	K1- K5	2	1-5	Introduction of topics, concept mapping	Oral Questioning
Jun 23 – July 1, 2026 (Day Order 1- 6)	1	Ecliptic and Galactic systems --Conversion of co- ordinates. Time scale - Magnitude scale and magnitude systems -	K1- K5	5	1-5	Lecture with PPT	Minute paper test
July 2 – July 8, 2026 (Day Order 1- 6)	1	correction for observed magnitudes 1.2 The proper motion - stellar parallax - Trigonometric, cluster and secular parallaxes. Method of Luminosity distance	K1- K5	5	1-5	Real world integrated lecture.	One minute summary
July 9 – 16, 2026 (Day Order 1- 6)	2	Stellar temperatures and sizes 2.1 Colour and effective temperatures - defining stellar temperatures by matter laws- - HR diagram - Spectral and luminosity classification of stars	K1- K5	5	1-5	Concept mapping and lecture	Think pair- share activity
July 17 – 24, 2026 (Day Order 1- 6)	2	2.2 Measurement of stellar radii - Relation of luminosity with mass, radii and surface temperature - Binary stars – visual, spectroscopic and eclipsing binaries.	K1- K5	5	1-5	Lecture with PPT	Third Component (Presentation – 20 Marks K2&K3)

July 25 – 28, 2026 (Day Order 1- 3)	3	Stellar structure 3.1 Equations of stellar structure - Russel -	K1- K5	2	1-5	Introduction of topics, concept mapping	Mock test using old question paper
July 29 – Aug 3, 2026	C.A. Test - I						
Aug 4 - 6, 2026 (Day Order 4 - 6)	3	Vogt theorem– Ideas of polytropic model - stellar opacity - Free - Free transitions, Bound	K1- K5	3	1-5	Lecture with PPT	Group Discussion
Aug 7 – 14, 2026 (Day Order 1- 6)	3	- Free transitions and electron scattering 3.2 Eddington's standard model -	K1- K5	5	1-5	Lecture and discussion	Third Component (Assignment – 20 Marks K4& K5)
Aug 17 - 24, 2026 (Day Order 1- 6)	3	Homologous model for main sequence stars - Schwarzschild's model for real stars	K1- K5	5	1-5	Real world integrated lecture.	Think pair-share activity
Aug 25 – Sep 2, 2026 (Day Order 1- 6)	4	Stellar evolution 4.1 The virial theorem - application to an isothermal gas sphere - evolution of stars near the main sequence -	K1- K5	5	1-5	ICT enabled teaching	Mock test using old question paper
Sep 3 – 11, 2026 (Day Order 1- 6)	4	effect of hydrogen depletion - 4.2 Schoenberg - Chandrasekhar limit of an	K1- K5	5	1-5	Lecture with PPT	Think pair-share activity

