STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI

Course Schedule: November 2023 - April 2024

Department : **Mathematics**

Name/s of the Faculty : **A. Josephine Lissie**

Course Title : **Elements of Space Science**

Course Code : **19MT/ME/ES45**

Shift : **Shift -1**

Week & No. of hours	Units & Topics	Teaching Methodology	Text & References	Method of Evaluation
Nov 22 – 23, 2023 (Day1 & 2)	**Unit 1: Spherical Trigonometry** 1.1 Spherical Trigonometry	Demonstration and Lecture	***Kumaravelu S., Susheela Kumaravelu***, Astronomy**.** Sivakasi: A.Bhaskara Selvan, Revised and Enlarged Edition 2005, Reprint 2009	Questioning
Nov 24-30, 2023 (Day Order 1 to 6)	**Unit 1** 1.2 Spherical triangle – Polar triangle 1.3 Some properties spherical triangles 1.4 Relation between the sides and angles of an spherical triangle 1.5 Napier's analogies &rules 1.6 Simple worked examples based on only concepts	Demonstration and Lecture	***Kumaravelu S., Susheela Kumaravelu***, Astronomy**.** Sivakasi: A.Bhaskara Selvan, Revised and Enlarged Edition 2005, Reprint 2009.	Discussion
Dec 1-7, 2023 (Day Order 1 to 6)	**Unit 1: The Earth** 1.7 Dip of Horizon and effects of Dip 1.8 Twilight-Duration of Twilight – Civil, Nautical and Astronomical Twilights	Demonstration and Lecture	***Kumaravelu S., Susheela Kumaravelu***, Astronomy**.** Sivakasi: A.Bhaskara Selvan, Revised and Enlarged, Reprint 2009.	Questioning
Dec 8-9, 2023 (Day Order 1, 3)	**Unit 2** 2.1 Celestial Sphere, Diurnal Motion 2.2 Cardinal points 2.3 Annual motion of the sun First point of Aries and Libra	Power point presentation Video presentation	e-resource	Discussion
Dec 11-15, 2023 (Day Order 2 to 6)	**Unit 2** **Celestial Sphere, Diurnal Motion** 2.4 Celestial Co-ordinates 2.5 To Represent the Different Coordinates in the Same Figure 2.6 To find the Relation between Right Ascension and Longitude of the Sun	Demonstration and Lecture	***Kumaravelu S., Susheela Kumaravelu***, Astronomy**.** Sivakasi: A.Bhaskara Selvan, Revised and Enlarged Reprint 2009.	Questioning
Dec 16 – 22,	**Unit 2** 2.7 To find the Longitude of Sun	Power point presentation	e-resource	III compt_1

2023 (Day Order 1 to 6)	on any Day 2.8 Latitude of a place 2.9 To find the Hour Angle of a Body at Rising or Setting Morning and evening stars – Circumpolar stars	Video presentation		Quiz -20 Units **1&2**
Jan 3 – 6, 2024 (Day Order 1 to 4)	**Unit 3** **Refraction** 3.1 Astronomical refraction- General effects of refraction 3.2 To find the Effect of Refraction on the Right Ascension and Declination of a Star 3.3 Horizontal Refraction – Effect of Refraction on Dip and Distance of Visible Horizon, Influence of Temperature and Pressure of Atmosphere on Refraction 3.4 Simple worked examples	Lecture and Demonstration	***Kumaravelu S., Susheela Kumaravelu***, Astronomy**.** Sivakasi: A.Bhaskara Selvan, Revised and Enlarged Edition 2005, Reprint 2009.	Discussion
Jan 8 – 12, 2024	**C.A. Test – I Unit 1&2**			
Jan 13, 2024 (Day 1)				
Jan 18 -20, 2024 (Day Order 4 to 6)	**Unit 3 : Geocentric parallax** 3.5 Geocentric Parallax – Effects of geocentric parallax 3.6 Changes in Right Ascension and Declination of a Body, Angular Diameter- Geocentric Parallax and Refraction compared - Equatorial Horizontal Parallax 3.7 Simple worked examples	Power point presentation Video presentation	***Kumaravelu S., Susheela Kumaravelu***, Astronomy**.** Sivakasi: A.Bhaskara Selvan, Revised and Enlarged Edition 2005, Reprint 2009.	Questioning
Jan 22-29, (Day Order 1 to 6)	**Heliocentric parallax** 3.8 Heliocentric Parallax - Effect 3.9 Aberration of a Star – Effect, kinds and comparison	Lecture and Demonstration	***Kumaravelu S., Susheela Kumaravelu***, Astronomy**.** Sivakasi: A.Bhaskara Selvan, Revised and Enlarged Reprint 2009.	III- comp_2 Unit 3 Assignment 15 marks
Jan 30 – Feb 2, 2024 (Day Order 1-4)	**Unit 4: Kepler's laws** 4.1 Keplers laws of planetary motion 4.2 Eccentricity of Earth's orbit 4.3 Verification of Kepler's law 4.4 Mass of planet	Lecture and Demonstration	e-resource	Discussion

Feb 3, 2024 (Day Order 2)	**Unit 4: Eclipse** 4.5 Lunar and Solar eclipse	Power point presentation Video presentation	Kumaravelu S., Susheela Kumaravelu, Astronomy, Sivakasi: A. Bhaskara Selvan, 2005	
Feb 5- 6, (Day5 - 6)	**Unit 4: Eclipse** 4.6 Condition for the occurrence of eclipse	Lecture and Demonstration	John Scalzi, The Rough Guide to Universe, London: Rough Guides Ltd., 2003	Questioning
Feb 7 – 14, (Day Order1-6)	**Unit 4: Eclipse** 4.7 Ecliptic limits 4.8 Eclipse seasons 4.9 Occultations	Lecture and Demonstration	John Scalzi, The Rough Guide to Universe, London: Rough Guides Ltd., 2003	Discussion
Feb 15 – 22, 2024 (Day Order 1 to 6)	**Unit 4: Planetary Phenomena** 4.10 Elongation of a planet 4.11 Direct and retrograde motion of planets 4.12 Position of two planets	Power point presentation Video presentation	e-resource	Questioning
Feb 23 – 24, (Day Order 1 & 5)	**Unit 5: Conversion of Time** 5.1 Relation between sidereal time and mean time 5.2 Conversion of sidereal time into mean solar time and vice versa	Power point presentation Video presentation	Kumaravelu S., Susheela Kumaravelu, Astronomy, Sivakasi: A. Bhaskara Selvan, 2005	Discussion
Feb 26 – Mar 1, 2024 (Day Order 2 to 6)	**Unit 5: Conversion of Time** 5.3 Standard times Problem Solving 5.4 The difference between local times & Problem solving	Power point presentation Video presentation	Kumaravelu S., Susheela Kumaravelu, Astronomy, Sivakasi: A. Bhaskara Selvan, 2005	III comp-3 Unit -5 Project-15marks
Mar 2, 2024 (Day Order 1)				
Mar4 –8,2024	**C.A. Test – II Unit 4 &5 (5.3&5.4)**			
Mar 9 – 16, (Day 6 & Day 1-6)	Night sky observation	Lecture and Demonstration	John Scalzi, The Rough Guide to Universe, London: Rough Guides Ltd., 2003	
Mar 18 - 19, 2024 (Day 2 to 3)	Problem solving and General information sharing on Space Science	Power point presentation Video presentation	Kumaravelu S., Susheela Kumaravelu, Astronomy, Sivakasi: A. Bhaskara Selvan, 2005	
Mar 20-22, (Day 4 - 6)	Some celestial Observations			