

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI

Course Schedule: June - November 2024

Department : Mathematics
Name/s of the Faculty : Dr. P. Subbulakshmi & Dr. Arputha Christy K
Course Title : Vector Analysis and Applications
Course Code : 19MT/MC/VA53
Shift : II

Week & No. of hours	Units & Topics	Teaching Methodology	Text & References	Method of Evaluation
Jun 19 – 26, 2024 (Day Order 1 - 6) (3 hours + 1 hour)	Unit 1: 1.1 Scalar and Vector Functions 1.2 Scalar Fields and Vector Fields 1.3 Derivative of a Vector Function 1.8 Gradient of a Scalar Point Function	Lecture Problem Solving	Shalini Singh, Vector Calculus, New Delhi: Sarup & Sons, 2013.	Questioning
Jun 27 – July 4, 2024 (Day Order 1 - 6) (3 hours + 1 hour)	Unit 1: 1.4 Geometrical Significance of $\frac{d\vec{r}}{dt}$ 1.5 Unit Tangent Vector of a Curve 1.6 Derivative of Sum, Scalar and Vector Product of Vector Function 1.9 Formulas involving gradient	Lecture Problem Solving	Shalini Singh, Vector Calculus, New Delhi: Sarup & Sons, 2013.	Quiz [Third component] [10 marks] (Unit 1 – 1.1 to 1.3)
July 5 – 12, 2024 (Day Order 1 - 6) (3 hours + 1 hour)	Unit 1: 1.7 Partial Derivatives of a Vector Function 1.10 Directional Derivative of a Scalar Function Unit 2: 2.1 Divergence of a Vector Point Function	Lecture Problem Solving	Shalini Singh, Vector Calculus, New Delhi: Sarup & Sons, 2013.	Assignment
July 15 – 23, 2024 (Day Order 1 - 6)	Unit 2: 2.2 Curl of a Vector Point Function	Lecture Problem Solving	Shalini Singh, Vector Calculus, New Delhi: Sarup & Sons, 2013.	Slip Test

(3 hours + 1 hour)	2.3 Solenoidal and Irrotational Vectors Unit 3: 3.1 Integration of Vector Functions		Seymour Lipschutz, Dennis Spellman, Murray R. Spiegel, Vector Analysis and an Introduction to Tensor Analysis (Second Edition), Schaum's Outline Series, New Delhi: Tata McGraw Hill, 2009	
July 24 – 31, 2024 (Day Order 1 - 6) (3 hours + 1 hour)	Unit 2: 2.4 Laplace's Equations Unit 3: 3.1 Integration of Vector Functions	Lecture Problem Solving	Shalini Singh, Vector Calculus, New Delhi: Sarup & Sons, 2013.	Questioning
Aug 1 – 5, 2024 (Day Order 1 - 3) (1 hour)	Unit 2: 2.5 Vector Identities	Lecture Problem Solving	Shalini Singh, Vector Calculus, New Delhi: Sarup & Sons, 2013.	Assignment
Aug 6 – 10, 2024	C.A. Test – I (Unit 1 (fully), Unit 2 – until 2.4)			
Aug 12 – 14, 2024 (Day Order 4-6) (2 hours + 1 hour)	Unit 5: 5.1 Geometrical Significance of the gradient Unit 3: 3.2 Definite Integrals	Lecture Problem Solving	Shalini Singh, Vector Calculus, New Delhi: Sarup & Sons, 2013.	Problem Solving
Aug 16 – 23, 2024 (Day Order 1-6) (3 hours + 1 hour)	Unit 5: 5.2 Physical Interpretation of Divergence 5.3 Physical Interpretation of Curl Unit 3: 3.2 Definite Integrals	Lecture Problem Solving	Shalini Singh, Vector Calculus, New Delhi: Sarup & Sons, 2013.	Presentation [Third Component] [20 marks] (Unit 2 – 2.5)
Aug 27 – Sep 3, 2024 (Day Order 1-6) (3 hours + 1 hour)	Unit 5: 5.4 Unit Normal Vector to given Surfaces Unit 3: 3.2 Definite Integrals	Lecture Problem Solving	Shalini Singh, Vector Calculus, New Delhi: Sarup & Sons, 2013.	Questioning

<p>Sep 4 – 11, 2024 (Day Order 1-6) (3 hours + 1 hour)</p>	<p>Unit 5: 5.5 Orthogonal Curvilinear Coordinate Systems – Cylindrical and Spherical Coordinate Systems 5.6 Divergence and Curl of a Vector Point Function in terms of a Curvilinear Coordinates Unit 3: 3.2 Definite Integrals</p>	<p>Lecture Problem Solving</p>	<p>Shalini Singh, Vector Calculus, New Delhi: Sarup & Sons, 2013. Seymour Lipschutz, Dennis Spellman, Murray R. Spiegel, Vector Analysis and an Introduction to Tensor Analysis (Second Edition), Schaum's Outline Series, New Delhi: Tata McGraw Hill, 2009</p>	<p>Questioning</p>
<p>Sep 12 - 20, 2024 (Day Order 1- 6) (3 hours + 1 hour)</p>	<p>Unit 4: 4.1 Relation between the Line Integral and Surface Integral: Stokes' Theorem (statement only) 4.2 Relation between the Surface Integral and Volume Integral: Gauss Divergence Theorem (statement only) Unit 3: 3.3 Line Integral, Surface Integral, Volume Integral</p>	<p>Lecture Problem Solving</p>	<p>Shalini Singh, Vector Calculus, New Delhi: Sarup & Sons, 2013.</p>	<p>Questioning</p>
<p>Sep 23 - 26, 2024 (Day Order 1- 4) (1 hour + 1 hour)</p>	<p>Unit 4: 4.3 A Special Case of Stokes' Theorem: Green's Theorem in Two Dimensions (statement only) Unit 3: 3.3 Line Integral, Surface Integral, Volume Integral</p>	<p>Lecture Problem Solving</p>	<p>Shalini Singh, Vector Calculus, New Delhi: Sarup & Sons, 2013.</p>	<p>Questioning</p>

Sep 27 – Oct 3, 2024	C.A. Test – II (Unit 5 (fully), Unit 3 – 3.1, 3.2)			
Oct 4 – 5, 2024 (Day 5 & 6) (1 hour + 1 hour)	Unit 4: 4.4 Verification of the Theorems Unit 3: 3.3 Line Integral, Surface Integral, Volume Integral	Lecture Problem Solving	Shalini Singh, Vector Calculus, New Delhi: Sarup & Sons, 2013. Seymour Lipschutz, Dennis Spellman, Murray R. Spiegel, Vector Analysis and an Introduction to Tensor Analysis (Second Edition), Schaum's Outline Series, New Delhi: Tata McGraw Hill, 2009	Problem Assignment [20 marks] (Unit 4 – 4.1 to 4.3)
Oct 7 - 15, 2024 (Day Order 1 - 6) (3 hours + 1 hour)	Unit 4: 4.4 Verification of the Theorems Unit 3: 3.3 Line Integral, Surface Integral, Volume Integral	Lecture Problem Solving	Shalini Singh, Vector Calculus, New Delhi: Sarup & Sons, 2013.	Questioning
Oct 16 - 22, 2024 (Day Order 1 - 6) (3 hours + 1 hour)	Unit 4: 4.4 Verification of the Theorems Unit 3: 3.3 Line Integral, Surface Integral, Volume Integral	Lecture Problem Solving	Shalini Singh, Vector Calculus, New Delhi: Sarup & Sons, 2013.	Questioning
Oct 23 - 24, 2024 (Day Order 1 - 2)	REVISION			