

STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI

Course Schedule: June - November 2024

Department : Mathematics
Name/s of the Faculty : Dr. Sindiya Therese S
Course Title : Vector Analysis and Applications
Course Code : 19MT/MC/VA53
Shift : I

Week & No. of hours	Units & Topics	Teaching Methodology	Text & References	Method of Evaluation
Jun 19 – 26, 2024 (Day Order 1 - 6) 4 hours	Unit 1 Vector Differentiation 1.1 Scalar and Vector Functions 1.2 Scalar Fields and Vector Fields 1.3 Derivative of a Vector Function 1.4 Geometrical Significance of $\frac{\vec{dr}}{dt}$ 1.5 Unit Tangent Vector of a Curve	Lecture Group Discussion	Prasun Kumar Nayak, Vector Algebra and Analysis with Applications, Hyderabad: Universities Press Pvt. Ltd., 2017	Questioning
Jun 27 – July 4, 2024 (Day Order 1 - 6) 4 hours	1.6 Derivative of Sum, Scalar and Vector Product of Vector Functions 1.7 Partial Derivatives of a Vector Function	Lecture & Problem Solving	Shalini Singh, Vector Calculus , New Delhi: Sarup & Sons, 2013	Questioning
July 5 – 12, 2024 (Day Order 1 - 6) 4 hours	Gradient 1.8 Gradient of a Scalar Point Function 1.9 Formulas involving Gradient 1.10 Directional Derivative of a Scalar Function Unit 2 Divergence and Curl 2.1 Divergence of a Vector Point Function	Lecture & Problem Solving Group Work	Absos Ali Shaikh and Sanjib Kumar Jana, Vector Analysis with Applications, New Delhi: Narosa, 2009	Slip Test
July 15 – 23, 2024 (Day Order 1 - 6) 4 hours	2.2 Curl of a Vector Point Function 2.3 Solenoidal and Irrotational Vectors	Lecture & Presentation	Shalini Singh, Vector Calculus , New Delhi: Sarup & Sons, 2013	Questioning
July 24 – 31, 2024 (Day Order 1 - 6) 4 hours	2.4 Laplace's Equation 2.5 Vector Identities	Lecture Group Discussion	Shalini Singh, Vector Calculus , New Delhi: Sarup & Sons, 2013	Questioning

Aug 1 – 5, 2024 (Day Order 1 - 3) 3 hours	Unit 3 Vector Integration 3.1 Integration of Vector Functions	Lecture & Problem Solving	Shalini Singh, Vector Calculus , New Delhi: Sarup & Sons, 2013	Questioning
Aug 6 – 10, 2024	C.A. Test – I (Unit I and II)			
Aug 12 – 14, 2024 (Day Order 4-6) 1 hour	3.1 Integration of Vector Functions (Contd.)	Lecture Group Discussion	Shalini Singh, Vector Calculus , New Delhi: Sarup & Sons, 2013	Questioning
Aug 16 – 23, 2024 (Day Order 1-6) 4 hours	3.2 Definite Integrals 3.3 Line Integral, Surface Integral, Volume Integral	Lecture & Presentation	Shalini Singh, Vector Calculus , New Delhi: Sarup & Sons, 2013	Slip Test
Aug 27 – Sep 3, 2024 (Day Order 1-6) 4 hours	3.3 Line Integral, Surface Integral, Volume Integral (Contd.) Unit 4 Vector Integration (contd.) 4.1 Relation between the Line Integral and Surface Integral: Stokes' Theorem (statement only)	Lecture & Problem Solving	Absos Ali Shaikh and Sanjib Kumar Jana, Vector Analysis with Applications, New Delhi: Narosa, 2009	III Component test Part I: Problem test on Unit III (30 marks)
Sep 4 – 11, 2024 (Day Order 1-6) 4 hours	4.2 Relation between the Surface Integral and Volume Integral: Gauss Divergence Theorem 4.3 A Special Case of Stokes' Theorem: Green's Theorem in Two Dimensions	Lecture Group Discussion	Shalini Singh, Vector Calculus , New Delhi: Sarup & Sons, 2013	Slip Test
Sep 12 - 20, 2024 (Day Order 1- 6) 4 hours	4.4 Verification of the Theorems Unit 5 Application of Vector Differentiation and Vector Integration to Differential Geometry and Mechanics 5.1 Geometrical Significance of the gradient	Seminar & Presentation	Absos Ali Shaikh and Sanjib Kumar Jana, Vector Analysis with Applications, New Delhi: Narosa, 2009	Questioning
Sep 23 - 26, 2024 (Day Order 1-4) 3 hours	5.2 Physical Interpretation of Divergence 5.3 Physical Interpretation of Curl	Seminar & Presentation	Shalini Singh, Vector Calculus , New Delhi: Sarup & Sons, 2013	Slip Test

Sep 27 – Oct 3, 2024	C.A. Test – II (Unit III and IV)			
Oct 4 – 5, 2024 (Day 5 & 6) 1 hour	5.4 Unit Normal Vector to given Surfaces	Seminar & Presentation	Prasun Kumar Nayak, Vector Algebra and Analysis with Applications, Hyderabad: Universities Press Pvt. Ltd., 2017	III Component test Part II: Unit V Seminar (20 marks)
Oct 7 - 15, 2024 (Day Order 1 to 6) 4 hours	5.5 Orthogonal Curvilinear Coordinate Systems – Cylindrical and Spherical Coordinate Systems	Seminar & Group Discussion	Shalini Singh, Vector Calculus , New Delhi: Sarup & Sons, 2013	Questioning
Oct 16 - 22, 2024 (Day Order 1 to 6) 4 hours	5.6 Divergence and Curl of a Vector Point Function in terms of a Curvilinear Coordinates	Seminar & Group Discussion	Shalini Singh, Vector Calculus , New Delhi: Sarup & Sons, 2013	Questioning
Oct 23 - 24, 2024 (Day Order 1 to 2)	REVISION			