DEPARTMENT OF MATHEMATICS
SRM INSTITUTE OF SCIENCE AND TECHNOLOGY
SRM NAGAR, KATTANKULATHUR – 603 203
B.Tech –First Year/ First Semester
Academic year 2021-2022

LESSON PLAN

Subject Name: Calculus and Linear Algebra
Subject Code: 18MAB101T

Module I			
Lecture Hour		**Description**	**Reference**
S-1	SLO-1	Characteristic equation	Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi,2008, Page: 1.27-1.45
	SLO-2	Eigen values of a real matrix	
S-2	SLO-1	Eigen vectors of a real matrix	Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi,2008, Page: 1.27-1.45
	SLO-2	Eigen vectors of a real matrix	
S-3	SLO-1	Properties of Eigen values	Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi,2008, Page: 1.27-1.45
	SLO-2	Cayley – Hamilton theorem	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:64-67
S-4	SLO-1	Problem solving using tutorial sheet 1	
	SLO-2	Problem solving using tutorial sheet 1	
	SLO-1	Finding A inverse using Cayley – Hamilton theorem	B.S. Grewal, Higher Engineering Mathematics,

S-5	SLO-2	Finding higher powers of A using Cayley – Hamilton theorem	Khanna Publishers, 36th Edition, 2010, Page:64-67
S-6	SLO-1	orthogonal reduction of a symmetric matrix to diagonal form	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:67-69
	SLO-2	orthogonal reduction of a symmetric matrix to diagonal form	
S-7	SLO-1	orthogonal reduction of a symmetric matrix to diagonal form	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:67-69
	SLO-2	orthogonal reduction of a symmetric matrix to diagonal form	
S-8	SLO-1	Problem solving using tutorial sheet 2	
	SLO-2	Problem solving using tutorial sheet 2	
S-9	SLO-1	Reduction of Quadratic form to canonical	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:70-72
	SLO-2	Quadratic form to canonical form by orthogonal transformations	
S-10	SLO-1	Quadratic form to canonical form by orthogonal transformations	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:70-72
	SLO-2	Orthogonal matrices	
S-11	SLO-1	Reduction of quadratic form to canonical form	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page :70-72
	SLO-2	Reduction of quadratic form to canonical form	
S-12	SLO-1	Problem solving using tutorial sheet 3	
	SLO-2	Applications of Matrices in Engineering	Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi,2008, Page: 1.64-1.73
		Cycle Test-I	

Module-II			
Lecture Hour		**Description**	**Reference**
S-1	SLO-1	Function of two variables – Partial derivatives	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:211-217
	SLO-2	Total differential	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page :223-229
S-2	SLO-1	Total differential	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page :223-229
	SLO-2	Taylor's expansion with two variables up to second order terms	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:235-237
S-3	SLO-1	Taylor's expansion with two variables up to third order terms	
	SLO-2	Maxima and Minima	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:240-249
S-4	SLO-1	Problem solving using tutorial sheet 4	
	SLO-2	Problem solving using tutorial sheet 4	
S-5	SLO-1	Maxima and Minima	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:240-249
	SLO-2	Maxima and Minima	
S-6	SLO-1	Maxima and Minima	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:240-249
	SLO-2	Constrained Maxima and Minima by Lagrangian Multiplier method	Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New

			Delhi,2008, Page:
S-7	SLO-1	Constrained Maxima and Minima by Lagrangian Multiplier method	Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi,2008, Page:2.50-2.64
	SLO-2	Constrained Maxima and Minima by Lagrangian Multiplier method	
S-8	SLO-1	Problem solving using tutorial sheet 5	
	SLO-2	Problem solving using tutorial sheet 5	
S-9	SLO-1	Jacobians of two Variables	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:229-233
	SLO-2	Jacobians of Three variables	
S-10	SLO-1	Jacobians problems	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:229-233
	SLO-2	Jacobians Problems	
S-11	SLO-1	Properties of Jacobians and Problems	Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi,2008, Page:2.27-2.30
	SLO-2	Properties of Jacobians and problems	
S-12	SLO-1	Application of Taylor's series Maxima Minima Jacobians in Engineering	Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi,2008, Page:2.50-2.64 B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:240-249
	SLO-2	Application of Taylor's series Maxima Minima Jacobians in Engineering	

Module III			
Lecture Hour		**Description**	**Reference**
	SLO-1	Linear equations of second order with constant coefficients when PI=0 or	B.S. Grewal, Higher Engineering Mathematics,

S-1		exponential	Khanna Publishers, 36th Edition, 2010, Page:512-528 Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi,2008, Page: 5.14-5.33
	SLO-2	Linear equations of second order with constant coefficients when PI=sinax or cosax	
S-2	SLO-1	Linear equations of second order with constant coefficients when PI=polynomial	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:512-528 Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi,2008, Page: 5.14-5.33
	SLO-2	Linear equations of second order with constant coefficients when PI=exponential with sinax or Cosax	
S-3	SLO-1	Linear equations of second order with constant coefficients when PI= exponential with polynomial	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:512-528 Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi,2008, Page: 5.14-5.33
	SLO-2	Linear equations of second order with constant coefficients when PI=polynomial with sinhax or coshax	
S-4	SLO-1	Problem solving using tutorial sheet 6	
	SLO-2	Problem solving using tutorial sheet 6	
S-5	SLO-1	Linear equations of second order variable coefficients	Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi,2008, Page:5.33-5.47
	SLO-2	Linear equations of second order variable coefficients	
S-6	SLO-1	Homogeneous equation of Euler type	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page: 533-536
	SLO-2	Homogeneous equation of Legendre's Type	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th

			Edition, 2010, Page:536-538
S-7	SLO-1	Homogeneous equation of Legendre's Type	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:536-538 Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi,2008, Page:5.33-5.47
	SLO-2	Equations reducible to homogeneous form	
S-8	SLO-1	Problem solving using tutorial sheet 9	
	SLO-2	Problem solving using tutorial sheet 9	
S-9	SLO-1	Equations reducible to homogeneous form	Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi,2008, Page:5.33-5.47
	SLO-2	Variation of parameters	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:528-531
S-10	SLO-1	Variation of parameters	
	SLO-2	Simultaneous first order with constant co-efficient.	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:540-543
S-11	SLO-1	Simultaneous first order with constant co-efficient.	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:540-543
	SLO-2	Simultaneous first order with constant co-efficient.	
S-12	SLO-1	Problem solving using tutorial sheet 10	
	SLO-2	Applications of Differential Equation in engineering	Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi,2008, Page:5.14-5.47
		Cycle Test-II	

Module IV			
Lecture Hour		**Description**	**Reference**
S-1	SLO-1	Radius of Curvature – Cartesian coordinates	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:179-184
	SLO-2	Radius of Curvature – Cartesian coordinates	
S-2	SLO-1	Radius of Curvature – Polar coordinates	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page179-184
	SLO-2	Radius of Curvature – Polar coordinates	
S-3	SLO-1	Circle of curvature	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:185-187
	SLO-2	Circle of curvature	
S-4	SLO-1	Problem solving using tutorial sheet 11	
	SLO-2	Applications of Radius of curvature in engineering	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page
S-5	SLO-1	Centre of curvature	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:185-187
	SLO-2	Centre of curvature	
S-6	SLO-1	Centre of curvature	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:185-187
	SLO-2	Evolute of a parabola	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:187-188
S-7	SLO-1	Evolute of an ellipse	
	SLO-2	Envelope of standard curves	B.S. Grewal, Higher Engineering Mathematics,

			Khanna Publishers, 36th Edition, 2010, Page:185-187
S-8	SLO-1	Problem solving using tutorial sheet 12	
	SLO-2	Applications of Curvature in engineering	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:179-188
S-9	SLO-1	Beta Gamma Functions	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page :328-336
	SLO-2	Beta Gamma Functions and Their Properties	
S-10	SLO-1	Sequences – Definition and Examples	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:399-400
	SLO-2	Series – Types of Convergence	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:400-402
S-11	SLO-1	Series of Five terms – Test of Convergence-	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page: 400-402
	SLO-2	Comparison test – Integral test-	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:402-407
S-12	SLO-1	Problem solving using tutorial sheet 13	
	SLO-2	Problem solving using tutorial sheet 13	

Module V			
Lecture Hour		**Description**	**Reference**
	SLO-1	Series of Five terms – Test of	B.S. Grewal, Higher Engineering Mathematics,

S-1		Convergence-	Khanna Publishers, 36th Edition, 2010, Page: 400-402
	SLO-2	Comparison test – Integral test-	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:402-407
S-2	SLO-1	Comparison test – Integral test-	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:402-407
	SLO-2	Comparison test – Integral test-.	
S-3	SLO-1	D'Alemberts Ratio test,	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:407-411
	SLO-2	D'Alemberts Ratio test,	
S-4	SLO-1	Problem solving using tutorial sheet 14	
	SLO-2	Problem solving using tutorial sheet 14	
S-5	SLO-1	Raabe's root test.	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:412-414
	SLO-2	Raabe's root test.	
S-6	SLO-1	Covergent of Exponential Series	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:415-417
	SLO-2	Cauchy's Root test	
S-7	SLO-1	Log test	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:412-414
	SLO-2	Log test	
S-8	SLO-1	Problem solving using tutorial sheet 15	
	SLO-2	Problem solving using tutorial sheet 15	
S-9	SLO-1	Alternating Series: Leibnitz test	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:417-423
	SLO-2	Alternating Series: Leibnitz test	
	SLO-1	Series of positive and Negative terms.	B.S. Grewal, Higher

S-10	SLO-2	Series of positive and Negative terms.	Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:417-423
S-11	SLO-1	Absolute Convergence	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:417-423
	SLO-2	Conditional Convergence	
S-12	SLO-1	Problem solving using tutorial sheet 13	
	SLO-2	Applications Convergence of series in engineering	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010, Page:400-423
		Cycle Test-III	

Course Coordinator

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14/09/2021

HOD/Mathematics

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