

Tentative lectures break up for MATHEMATICS-II(Spring 2016-17)	
Chapter	Linear Algebra(10 Lectures)
1	<p>i. Algebra of matrices, Vector spaces, basis and dimension, Linear Transformation, linear dependence and independence of vectors, [K 7.1, 7.2, 7.9] (3 Lectures)</p> <p>ii. Gauss elimination method to solve system of linear equations (homo & non-homo) [K 7.3, 20.1] (1 Lecture)</p> <p>iii. Rank of a matrix and its properties, Solution of system of equations using rank concept [K 7.4, 7.5] (2 Lectures)</p> <p>iv. Hermitian, Skew Hermitian and Unitary matrices, eigenvalues, eigenvectors and eigenvalues of Hermitian, Skew Hermitian and Unitary matrices [K 8.1, 8.3] (3 Lectures), 18-5</p> <p>v. Similarity of matrices & Diagonalization [K 8.4] (1 Lecture)</p>
2	Numerical Analysis(7 Lectures)
	<p>i. Iterative method for solution of system of linear equations, Jacobi and Gauss Seidal method [K 20.3] (1 Lecture)</p> <p>ii. Solution of transcendental equations: Bisection, Fixed point Iteration, Newton-Raphson methods [K 19.2, and Page 805 in K or page 796 in K1] (2 Lectures)</p> <p>iii. Finite differences, interpolation, error in interpolation polynomial, Newton's forward and backward interpolation formulae, Lagrange's interpolation [K 19.3] (2 Lectures)</p> <p>iv. Numerical integration, Trapezoidal and Simpson's 1/3rd rules and geometrical interpretation [K 19.5, Except differentiation] (2 Lectures)</p>
3	Integral Calculus(11 Lectures)
	<p>i. Convergence of improper integrals, test of convergence [P-I: 11.7, SN 13.4, SN 13.63] (2 Lectures)</p> <p>ii. Beta and Gamma functions with their elementary properties [SN- 7.1-7.5] (2 Lectures)</p> <p>iii. Differentiation under integral sign, differentiation of integrals with variable limits - Leibnitz rule [P-I: 11.10] (1 Lecture)</p> <p>iv. Double [P-II: 2.1-2.3], Change in order of integration [SN 12.4] (2 Lecture)</p> <p>v. Change of variables in double integrals - Jacobians of transformations [P-II: 2.6, 2.13], Triple integrals [P-II: 2.11, --2.12] (2 Lectures)</p> <p>vi. Computations of surfaces, area and volumes [P-II: 2.4, 2.7] (1 Lecture)</p> <p>vii. Integrals dependent on parameters applications [P-II: 2.15] (1 Lecture)</p>
4	Vector Calculus(7 Lectures)
	<p>i. Scalar and vector fields, level surfaces; limit, continuity and differentiability of vector functions, Curves and Arc-Length [K 9.4, 9.5(except curvature and Torsion)] (2 Lectures)</p> <p>ii. Directional derivative, Gradient, Curl and Divergence and geometrical interpretation [K 9.7, 9.8, 9.9] (2 Lectures)</p> <p>iii. Line and surface integrals, theorems of Green, Gauss and Stokes, line integrals independence of path. [K 10.1, 10.2, 10.4, 10.5, 10.6, 10.7, 10.9] (3 Lectures)</p>

References: [K]: Kreyszig: Advanced Engineering Mathematics, 9th Edition (K1) OR 10th Edition (K)
[SN] : S. Narayan and R. K. Mittal: Integral Calculus, Revised Edition
[P-I, P-II respectively]: N. Piskunov: Differential and Integral Calculus Volume I & II, Reprint 1999