Mathematics Curriculum for Semester II

I	Course Code	**MA 181002**			
II	Course Title	**Mathematics II: Linear Algebra with vector calculus and ODE**			
III	Credit Structure	L	T	P	C
		4	2	0	6
IV	Prerequisites	MA 181001			
V	Course Content	**Linear Algebra with Vector Calculus:** Double Integrals over Rectangles, Iterated Integrals, Double Integrals over General Regions, changing the order of integration, Change of Variables in Multiple Integrals, Double Integrals in Polar Coordinates, Applications of Double Integrals Triple Integrals, Triple Integrals in Cylindrical Coordinates, Triple Integrals in Spherical Coordinates, Applications Line Integrals, The Fundamental Theorem for Line Integrals, conservative vector fields and path independence, Green's Theorem Parametric Surfaces and Their Areas, Surface Integrals, Stokes' Theorem, The divergence theorem Vectors in , Systems of Linear equations, Matrices and Gauss elimination, Elementary matrices, Determinants and rank of a matrix Eigenvalues and eigenvectors, Characteristic polynomials, Eigenvalues of special matrices, Multiplicity, Diagonalizability Abstract vector spaces, Subspaces, Linear independence, dependence, basis and dimension Linear transformations, Matrix of a linear transformation, Change of basis and similarity, Rank-nullity theorem Inner product spaces, Gram-Schmidt process, Orthonormal Bases, Diagonalization, Spectral theorem, Quadratic forms **ODE:** Exact equations, Integrating factors and Bernoulli's equation Orthogonal trajectories; Lipschitz condition, Picards theorem, Reduction of order Linear ODEs with constant coefficients, Cauchy-Euler equations Wronskians, Abel-Liouville formula, Method of undetermined coefficients, Method of variation of parameters Laplace transforms, Shifting theorems, Convolution theorem				
V	Text/References	1. Anton, H., Elementary linear algebra with applications, 8th edition, John Wiley & Sons, 1995. 2. David Poole, Linear Algebra:A modern Introduction, Cengage Learning, 4th edition 3. Apostol, T.M., Calculus, Volume 2, 2nd Edition, Wiley Eastern, 1980. 4. Boyce, W.E., and DiPrima, R., Elementary Differential Equations, 9th Edition, John Wiley & Sons, 2005. 5. Kreyszig, E., Advanced Engineering Mathematics, (9th Edition), Wiley India 6. Strang, G., Linear algebra and its applications, 4th Edition, Thomson, 2006.				