MT-332 Advanced Calculus & Linear Algebra

Linear Algebra:

Linearity and linear dependence of vectors, basis, dimension of a vector space, field matrix and type of matrices (singular, non- singular, symmetric, non- symmetric, upper, lower, diagonal tri-diagonal matrix), Rank of a matrix using row operations and special method, echelon and reduced echelon forms of a matrix, determination of consistency of a system of linear equation using rank, transitions matrix, basic concept of tensors, eigen value and eigen vectors of a matrix, Diagonolization, Cayley-Hamiton theorem. Applications of linear algebra in Engineering.

Euclidean Spaces and Transformation:

Geometric representation of vector, norm of vector, Euclidean inner product, projections and orthogonal projections, Euclidean n spaces n properties Cauchy-Schwarz inequality, Euclidean transformations, apply geometric transfom1ations to plane figure, composition or transformations.

Advance calculus:

Define a stationary point of a function of several variables, define local maximum and saddle point for a function of two variables the stationary points of a several variables, obtain higher partial derivatives of simple functions of two or more variables, iterated integrals, double and triple integrations with applications (area, centoroid, moment of inertia, surface area, and volume, use multiple integrals in solutions of engineering problems.

Vector Calculus):

Vector differential operator, directional derivative, gradient, divergence, curl of a vector field, and Laplacian operators with applications. (Solenoid, conservative, etc).
Vector Integrations; Evaluate line integrals along simple paths, apply line integrals to calculate work done, apply Green's theorem in the plane to simple examples, evaluate surface integrals over simple surface, use the Jacobean to transform a problem a new coordinate system, apply Gauss' divergence theorem to simple problems, apply Stokes theorem to simple examples.

Recommended Books

1.	Elementary Linear Algebra	Howard Anton	Seven Edition
2.	Advance Engineering Mathematics	Erwin Kreyszig	Seven Edition
3.	Calculus & Analytical Geometry	Howard Anton	Fifth
4.	Elementary Linear Algebra	Bernald Kolman	Eight