

Syllabus for Mathematics 2 recruitment test

IITM Online Degree Project

1. Linear algebra
 - a. Vectors and matrices
 - b. Systems of linear equations and their solution
 - i. Determinants + Cramer's rule
 - ii. Solution using inverses
 - iii. Gaussian elimination
2. Vector spaces
 - a. Linear dependence and independence
 - b. Basis, rank
 - c. Linear mappings and affine mappings
3. Analytic geometry
 - a. Norms, inner product, lengths and distances
 - b. Angles and orthogonality, orthonormal basis
 - c. Projections, rotations
4. Derivatives and basic calculus
 - a. Functions of one variable
 - b. Graph of functions and tangent lines
 - c. Derivatives
 - d. Linear approximation
 - e. Maximum and minimum values
5. Multivariate thinking
 - a. Visualization of multivariable functions
 - b. Plane and hyperplane equations
 - c. Slopes of lines, cross sections of planes, secant and tangent lines for curves
6. Vector calculus
 - a. Scalar-valued functions
 - b. Gradients and linear approximation
 - c. Maximum and minimum values