



## math sem1 syllabus

Mathematics (Lovely Professional University)



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## MTH165:MATHEMATICS FOR ENGINEERS

**Course Outcomes:** Through this course students should be able to

CO1 :: recall the concepts of matrices and its application to solve the system of linear equations.

CO2 :: review the basic concept of calculus of one variable.

CO3 :: apply the concept of calculus to evaluate extreme values of functions.

CO4 :: describe calculus of multivariate functions and their applications.

CO5 :: evaluate surface and volume integral using multiple integral.

CO6 :: describe the concept of Fourier series and its application.

### Unit I

**Linear Algebra** : Review of matrices, Elementary operations of matrices, Rank of a matrix, Linear dependence and independence of vectors, Solution of Linear system of equations, Inverse of matrices, Eigen values and Eigen vectors, Properties of Eigen values, Cayley-Hamilton theorem

### Unit II

**Differentiatial and integral calculus** : General rules of differentiation, Derivatives of standard functions, Derivatives of Parametric forms, Derivatives of implicit functions, Logarithmic differentiation,, properties of indefinite integral, Methods of integration-By Parts, Methods of integration-By Partial fractions, Properties of definite integral

### Unit III

**Application of derivatives** : Rolle's theorem, Mean value theorems, Taylor's theorems with remainders, Maclaurin theorems with remainders, indeterminate forms, L' Hospital's rule, maxima and minima.

### Unit IV

**Multivariate functions** : Functions of two variables, Limits and Continuity, Partial derivatives, Total derivative and differentiability, Chain rule, Euler's theorem for Homogeneous functions, Maxima and Minima, Lagrange method of multiplier

### Unit V

**Multiple Integrals** : Double integrals, change of order of integration, Triple integrals, change of variables, Application of double integrals to calculate area and volume, Application of triple integrals to calculate volume.

### Unit VI

**Fourier series** : Introduction and Euler's formulae, Conditions for a Fourier Expansion and Functions having points of discontinuity, Change of interval, Even and odd functions, Half Range series, Perseval's Formula, Complex form of Fourier Series

### Text Books:

1. ADVANCED ENGINEERING MATHEMATICS by R.K.JAIN, S.R.K. IYENGER, NAROSA PUBLISHING HOUSE

### References:

1. HIGHER ENGINEERING MATHEMATICS by B.S. GREWAL, KHANNA PUBLISHERS
2. MATHEMATICS TEXT BOOK FOR CLASS XII PART I by -, NCERT
3. MATHEMATICS TEXT BOOK FOR CLASS XII PART II by -, NCERT