# Syllabus
## Mid Exam
## Mathematics I (3110014)

**Semester: I**
**Branch: All Branches**


### Partial Derivatives

- *Function of two variables*
- *Limit, continuity of function of several variables*
- *Partial derivatives*
- *Tangent plane, Normal line, directional derivative*
- *Chain rule, implicit differentiation*
- *Euler's theorem for homogeneous function*
- *Maximum and minimum values by second derivative test & Lagrange multipliers*
- *Taylor's formula for  one & two variables*

### Indeterminate Forms

- *Indeterminate form $(\frac{0}{0}, \frac{\infty}{\infty}, \infty \cdot 0, \infty - \infty)$*
- *Indeterminate form  $0^0, \infty^\infty, 1^\infty$*

### Improper Integral

- *Improper integrals of Type- I and Type - II*
- *Convergence and divergence of improper integrals*
- *Beta & Gamma function & their properties*

### Matrix Algebra

- *Elementary  row operation in Matrix*
- *Row Echelon & reduced row Echelon form*
- *Rank of matrices by Echelon forms*
- *Inverse of matrix by Gauss Jordan method*
- *Solution of system of  linear by Gauss elimination*
- *Eigenvalues and eigenvectors*
- *Diagonalization of a matrix*