

# Scheme for Choice Based Credit System (CBCS)

## B.A/B.Sc. Mathematics

### From Year 2016 and onwards

Semester	Name of the course	Course No.	Nature of course	Credits
1	Calculus	BMM-CR-16101	Core	6
2	Differential Equations	BMM-CR-16201	Core	6
3	Real Analysis	BMM-CR-16301	Core	6
	Complex Trigonometry	BMM-SEC-16301	SEC	2
	Logic and Sets	BMM-SEC-16302	SEC	2
4	Algebra	BMM-CR-16401	Core	6
	Theory of Equations	BMM-SEC-16401	SEC	2
	Vector Calculus	BMM-SEC-16402	SEC	2
5	Plane and Solid Geometry	BMM-DSE-16501	DSE	6
	Advanced calculus	BMM-SEC-16501	SEC	2
	Probability & Statistics	BMM-SEC-16502	SEC	2
6	Linear Algebra	BMM-DSE-16601	DSE	6
	Graph Theory	BMM-SEC-16601	SEC	2
	Boolean Algebra	BMM-SEC-16602	SEC	2

**Note:** The students have to opt one course from SEC in each of the semester III, IV, V & VI.

## Syllabus for B.A/B.Sc., Mathematics, Semester - I

**Course Name: Calculus (6 credits)**

**Course No: BMM-CR-16101**

### Unit-I

Limit and Continuity ( $\epsilon$  and  $\delta$  definition), types of discontinuities, properties of continuous functions on closed intervals, differentiability of functions, Successive differentiation, Leibnitz's theorem, partial differentiation, total differentials, Euler's theorem on homogenous functions.

### Unit-II

Tangents and normals (polar coordinates only), pedal equations, curvature and radius of curvature, asymptotes, singular points, tracing of curves in cartesian and polar coordinates.

### Unit-III

Rolle's theorem, Mean value theorems, Taylor's theorem with Lagrange's Cauchy's forms of remainder, Taylor's series, Maclaurin's series of  $\sin x$ ,  $\cos x$ ,  $e^x$ ,  $\log(1+x)$ ,  $(1+x)^m$ , maxima and minima, indeterminate forms.

### Unit-IV

Integration by partial fractions, integration of rational and irrational functions, definite integrals and their properties, reduction formulae for integrals of rational, trigonometric, exponential and logarithmic functions and of their combinations.

### **Books recommended**

1. G.B. Thomas and R. L. Finney, *Calculus*, Pearson Education, 2007.
2. H. Anton, I. Birens and S. Davis, *Calculus*, John Wiley and Sons, Inc., 2002.
3. S. D. Chopra, M. L. Kochar and A. Aziz, *Differential Calculus*, Kapoor Publications.