

**Semester 1**

S. No.	Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
								Sessional	Final Exam	Total
1	BSC-101	Engineering Mathematics-I	BSC	5	4	1	0	50	100	150

**Course Outcomes:**

At the end of the course the student will be able to	
CO1	Apply the knowledge of calculus to plot graphs of functions and solve the problem of maxima and minima.
CO2	Determine the convergence/divergence of infinite series, approximation of functions using power and Taylor's series expansion and error estimation.
CO3	Apply the concept of definite integrals to calculate area under the curves.
CO4	Understand and apply the concepts of matrices
CO5	Demonstrate knowledge of vector space by solving associated problems

**Detailed Syllabus**

**Section-A**

**Unit 1:** Differential Calculus I: Leibnitz theorem (without proof), Partial differentiation, Euler's theorem on homogeneous functions, Asymptotes, Double points, curvature, Curve tracing in Cartesian, polar and parametric forms.

**(11 Hrs)**

**Unit 2:** Differential Calculus II: Rolle's Theorem, Mean value Theorem, Taylor's and Maclaurin's series with remainder, indeterminate forms, Taylor series in two variables, Maxima and Minima of functions of two variables, method of Lagrange's multipliers.

**(11 Hrs)**

**Unit 3:** Integral Calculus: Definite integrals with important properties, differentiation under the integral sign, Gamma, Beta and error functions with simple problems, applications of definite integrals to find length, area, volume and surface area of revolutions, transformation of coordinates, double and triple integrals with simple problems.

**(10 Hrs)**

**Section-B**

**Unit 4:** Matrices- Matrices, vectors: addition and scalar multiplication, matrix multiplication, Linear systems of equations, linear Independence, rank of a matrix, determinants, Cramer's Rule, inverse of a matrix, Gauss elimination and Gauss-Jordan elimination.

**(15 Hrs)**

**Unit 5:** Vector Space, linear dependence of vectors, basis, dimension, Linear transformations, range and kernel of a linear map, rank and nullity, Inverse of a linear transformation, rank nullity theorem, composition of linear maps, Eigenvalues, eigenvectors, symmetric, skew-symmetric, and orthogonal matrices, eigenbases.

**(10 Hrs)**

**Text Books**

S. No.	Name of the Books	Author	Publisher	Edition (Pub. Yr.)
1	Engineering Mathematics	B.S. Grewal	Khanna Publications, New Delhi	44 <sup>th</sup> (2018)
2	Calculus and Analytic Geometry	Thomas and Finney	Addison Wesley, Narosa.	1 <sup>st</sup> (2010)

**Reference Books**

S. No.	Name of the Books	Author	Publisher	Edition (Pub. Yr.)
1	Advanced Engineering Mathematics	V. P. Mishra, Jyoti Sharma, Pratibha Mishra	Bhavya Books	2 <sup>nd</sup> (2019)
2	Integral Calculus	S. Narayan	S. Chand, New Delhi	35 <sup>th</sup> (2005)
3	Engineering Mathematics	N.P Bali	Laxmi Publications	13 <sup>th</sup> (2016)