

JYOTI NIVAS COLLEGE
AUTONOMOUS
SYLLABUS FOR 2021-22 Batch Onwards
Programme: B.Sc.
FIRST SEMESTER SYLLABUS
Title: ALGEBRA-I AND CALCULUS-I (MATHS MAJOR)

Algebra - I and Calculus - I

COURSE OBJECTIVES:

- Recognize echelon forms of Matrices, the relation between matrices and system of linear equations
- Analyse the solvability and when solvable compute the solutions of the system of linear equations.
- Discover the relation between Eigen values and Eigen vectors of square matrices.
- Compute limits, derivatives, and partial derivatives.
- Analyse the nth derivative of standard functions.
- Connect the concept of limits with continuity and differentiability of a real valued function.
- Summarize and connect all continuity theorems and mean value theorems

LEARNING OUTCOMES:

The students

- Apply elementary row operations to solve linear systems of equations.
- Characterize the consistency of a system of linear equations.
- Relate an augmented matrix to a system of linear equations and find the solution/solutions if they exist.
- Evaluate Eigen values and Eigen vectors from the characteristic equation of a matrix.
- Derive the nth derivatives of polynomial, exponential, Trigonometric and logarithmic functions and apply them to relevant problems.
- Identify and apply the various theorems of calculus in the appropriate contexts.
- Recognise the different indeterminate forms and evaluate their limits using L'Hospital rule.
- Determine the Taylor's and Maclaurin's series for functions of one and two variables.
- Evaluate Maxima-Minima of functions of two variables using partial derivatives.

LEARNING OUTCOMES – DIFFERENTIAL CALCULUS

1. Use formulas to find
2. Relate the first derivative to velocity and the second derivative to acceleration.
3. Use the product and quotient rules to take derivatives.
4. Solve applied problems involving derivatives. Find absolute extrema on a closed interval.
5. Find relative extrema using the first derivative test.
6. Solve application problems. Multi-Variable Functions
7. Evaluate a multi-variable function at a point.
8. Compute 1st and 2nd order partial derivatives.