# UMA005 Introductory Mathematics-I

|   |   |   |    |
|---|---|---|----|
| **L** | **T** | **P** | **Cr** |
| **3** | **1** | **0** | **3.5** |

**Course objective**: The objective is to develop the basics of computing skills and application of quantitative and statistical operations required for biological studies.

**Algebra**: Complex numbers, Solution of quadratic equations, Permutations and combinations, Binomial theorem for positive/negative index and its simple applications, Arithmetic and geometric progression.

**Trigonometry:** Review of trigonometric functions, Sum and product formulae for trigonometric functions, Trigonometric equations and sum - to - product formulae for trigonometric functions, Identities related to double angle formulae.

**Determinants and Matrices:** Matrices, Operations on matrices, Determinants and its properties, Singular and non-singular matrices, Adjoint and inverse of a matrix and its properties, Solution of system of linear equations using Cramer's rule and matrix method.

**Coordinate Geometry:** Rectangular coordinate system, Straight lines, Circles (in standard form only).

**Statistics:** Measure of dispersion: mean deviation, Variance and standard deviation of grouped/ungrouped data. Correlation and regression.

**Course learning outcome:** Upon completion of this course, the students will be able to:

1. solve simple algebraic problems of complex numbers, arithmetic and geometric progression.
2. solve real life problems using permutations and combinations.
3. apply sum and product formulae of trigonometric functions for solving trigonometric problems.
4. find the solution of system of linear algebraic equations using matrix inversion and Cramer's rule.
5. find equations of straight lines and circles in rectangular coordinates.
6. find mean, variance and standard deviation of grouped/ungrouped data.

**Text Books:**

1) Mathematics, A Text book (Parts I & II), NCERT, New Delhi (2011).
2) Kreyszig, Erwin, Advanced Engineering Mathematics, John Wiley, (1999).

**Reference Books:**

1) Krishnamurthy V.K., Mainra V.P. and Arora J.L. An introduction to Linear Algebra, Associated East West Press (2007).
2) Loney, S. L., The elements of Coordinate Geometry, Michigan Historical Reprint series, (2012)
3) Meyer, P. L., Introductory Probability and Statistical Applications, Addison Wesley (1970).

**Evaluation Scheme:**

| Sr.No. | Evaluation Elements | Weight age (%) |
|--------|---------------------|----------------|
| 1. | MST | 30 |
| 2. | EST | 45 |
| 3. | Sessionals (May include assignments/quizzes) | 25 |