**BCA1C01 – Mathematical Foundation for Computer Applications**

**Course Number: 5**

**Contact Hours per Week: 4**

**Number of Credits: 3**

 **Number of Contact Hours: 64 Hrs.**

**Course Evaluation: Internal – 15 Marks + External – 60 Marks**

 **Objectives**

 **To learn the basic principles of linear algebra and vectors.**

**• To learn the basic principles of differential and integral Calculus.**

**• To learn mathematical modeling using ordinary and partial equations.**

**• Prerequisites Basic mathematical knowledge**

**• Course Outline**

 **UNIT I (12T)**

 **Linear Algebra and Vector Calculus: Matrices: Matrix definition, order of a matrix, types of matrices, addition of matrices, multiplication of matrices, various kinds of matrices, transpose of a matrix.**

**UNIT II (12T)**

 **Linear system of equations and solutions using gauss elimination , Gauss Jordan, and Gauss Siedel methods. Linear independence and rank , determinants, inverse, Eigen values. Vectors: Vectors in 2- and 3-space, dot and cross products.**

 **UNIT III (14T)**

**Differentiation: Limits (definition only).Derivative at a point, Derivative of a Function, Differentiation from first principle, Differentiation of important functions, Product rule, Quotient rule, Differentiation of a function of a function (problem based)**

 **UNIT IV (12T)**

 **Integration: Integral as Anti-derivative, Indefinite integral &constant of integration, Fundamental theorems, Elementary Standard results**

 **UNIT V (14T)**

 **Methods of Integration, Integration through Partial Functions , Integration by parts. Definite Integral: Evaluation by Substitution, Properties of definite integrals (Problem Based)**

 **Textbooks 1. Advanced Engineering Mathematics, Erwin Kreyszig, Wiley**

 **References:**

**1. Higher Engineering Mathematics, John Bird, Elsevier Direct**

 **2. Skills in Mathematics: Algebra, S.K.Goyal**

 **3. Higher Engineering Mathematics, B S Grewal, Khanna Publishers**

 **4. Higher Engineering Mathematics, Ramana, Tata McGraw Hill**

**5. Engineering Mathematics, P Kandasamy, S. Chand Group**