

**DR. A. P. J. ABDUL KALAM TECHNICAL UNIVERSITY**  
**UTTAR PRADESH, LUCKNOW**



**Syllabus**  
**(Elementary Mathematics Bridge Course)**  
A Non-Credit subject

*for*  
**Masters of Computer Application (MCA)**  
**(Two Years Program)**

*[Note: The Students who have passed graduation in any stream are eligible for admission to MCA. But Students those who don't have mathematics at 10+2 level or graduation level have to qualify Non-Credit subject Elementary Mathematics Bridge Course in first year]*

**(Effective from the Session: 2025-26)**

## Elementary Mathematics Bridge Course Syllabus

BCA-Elementary Mathematics Bridge Course Syllabus		
Course Outcome (CO)		Bloom's Knowledge Level (KL)
At the end of course, the student will be able to understand		
CO1	Understand the concepts of Determinants and Matrices.	K <sub>2</sub> ,K <sub>3</sub>
CO2	Describe and interpret the concept of number theory. Understand the concept of set, relation and functions.	K <sub>2</sub> ,K <sub>3</sub>
CO3	Understand the concepts of Probability & Statistics.	K <sub>2</sub>
CO4	Develop and understanding on concepts of Algebra and Limit & Continuity.	K <sub>2</sub> ,K <sub>4</sub>
CO5	Understand the various concepts of differentiation and integration.	K <sub>2</sub> ,K <sub>3</sub>
DETAILED SYLLABUS		
Unit	Topic	Proposed Lecture
<b>I</b>	<b>Determinants:</b> Definition of Determinant, Properties of determinants, Minors, Cofactors, Product of two determinants. <b>Matrices:</b> Introduction to Matrix, Types of Matrices, Addition & Subtraction of matrices, Matrix Multiplication, Inverse of a Matrix, Rank of Matrix, Dependence of Vectors, Eigen Vectors of a Matrix.	<b>08</b>
<b>II</b>	<b>Number Theory:</b> Number system, Division algorithm, Factorization Theorem, H.C.F. and L.C.M. <b>Set Theory:</b> Introduction, Types of Sets, Size of sets and Cardinals, Venn diagrams, Operation on Sets, Ordered pairs and Set Identities. <b>Relation:</b> Definition, Operations on Relations, Types of Relation, Equivalence Relation. <b>Function:</b> Definition, Types of Function and its Applications.	<b>08</b>
<b>III</b>	<b>Probability:</b> Introduction to Probability, Sample Space and events, Addition & Multiplication Theorem, Bayes theorem. <b>Statistics:</b> Definition of Statistics, Classification of Data, Frequency distribution, Presentation of data through Histogram, Frequency Curve & Polygon, Computation of Arithmetic mean, median and mode for ungrouped data and grouped data.	<b>08</b>
<b>IV</b>	<b>Algebra:</b> Arithmetic, Geometric and Harmonic progressions, Exponential and Logarithmic Series, Binomial Theorem, Groups, Types of Groups, Properties of Groups. <b>Limit &amp; Continuity:</b> Limit at a Point, Properties of Limit, Computation of Limits of Various Types of Functions, Continuity at a Point.	<b>08</b>
<b>V</b>	<b>Differentiation:</b> Derivative, Derivatives of Sum, Differences, Product & Quotients, Derivatives of Composite Functions, L-Hospitals Rule, Maxima & Minima. <b>Integration:</b> Integral as Limit of Sum, Fundamental Theorem of Calculus (without proof.), Indefinite Integrals, Methods of Integration Substitution, By Parts.	<b>08</b>

**Suggested Readings:**

1. David M. Burton, “Elementary Number Theory”, Mc Graw Hill.
2. R.D. Sharma, “Mathematics, Volume1”, Dhanpat Rai & Co. Pvt. Ltd.
3. Kenneth Hoffman and Ray Kunze, “Linear Algebra”, Pearson.
4. H.K. Dass, Dr. Rama Verma, “Introduction to Engineering Mathematics –Volume I”, S. Chand Publishing.
5. H.K. Dass, Dr. Rama Verma, “Introduction to Engineering Mathematics-Volume II”, S. Chand Publishing.
6. N.P. Bali, Dr. Manisha Goyal, “A Textbook of Engineering Mathematics – Volume I, Laxmi Publications (P) Ltd.
7. N.P. Bali, Dr. Manisha Goyal, “A Textbook of Engineering Mathematics – Volume II, Laxmi Publications (P) Ltd.