DR. A. P. J. ABDUL KALAM TECHNICAL UNIVERSITY

UTTAR PRADESH, LUCKNOW

Elementary Mathematics Bridge Course Syllabus

for

Bachelor of Computer Application (BCA)

(Three Year Program)

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

(Effective from the Session: 2025-26)

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:		
CO1	Understand and apply number theory concepts, including divisibility rules, factorization, and logarithms, to solve mathematical problems.	K_3
CO2	Apply and analyze set theory, relations, and functions to solve problems involving sets, relations, and functional mappings.	K_4
CO3	Apply algebraic concepts, including progressions and binomial expansions, to solve real-world and mathematical problems.	K_3
CO4	Understand and apply properties of determinants and matrices to solve system equations and related mathematical problems.	K_3
CO5	Apply trigonometric ratios, identities, and mensuration formulas to solve problems in geometry and measurement.	K_3
DETAILED SYLLABUS		
Unit	**Topic**	**Proposed Lecture**
I	**Number Theory:** Number system, Division algorithm, Prime and composite numbers, Tests of divisibility by 2, 3, 4, 5, 9 and 11, Multiples and factors, Factorization Theorem, H.C.F. and L.C.M, Euclidean algorithm, Logarithms to base 10, laws of logarithms.	**08**
II	**Set Theory:** Definition, Types of Sets, Operation on Sets, Venn diagram, Equality of Sets. **Relation:** Definition, Types of Relation, Equivalence Relation and its Applications. **Function:** Definition, Types of Function, Injective, surjective, and bijective functions and its Applications.	**08**
III	**Algebra:** Arithmetic, Geometric and Harmonic progressions, Exponential and Logarithmic Series, Binomial Theorem.	**08**
IV	**Determinants:** Definition of Determinant, Properties of determinants, Minors, Cofactors, Product of two determinants. **Matrices:** Definition of Matrix and Its types, Addition, Subtraction, Scalar and Matrix Multiplication, Inverse of a Matrix.	**08**
V	**Trigonometry:** Pythagoras Theorem, Trigonometric Ratios, Trigonometric Ratios of Some Specific Angles, Trigonometric Identities. **Mensuration:** Area of Square, Rectangle, Triangle, Volume of Cone, Cylinder, Cuboid.	**08**

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. Samuel Ratcliffe Knight and Henry Sinclair Hall, "Elementary Trigonometry", Legare Street Press.