20BSM103T					Elementary Algebra					
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs. / Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
3	0	0	3	3	25	50	25	--	--	100

COURSE OBJECTIVES

- To make familiarize with various number systems.
- To be able to form and solve equations up to degree 4.
- To make students understand the role of scalars and vectors and their applications.
- To acquaint the students with computing inverse of a matrix.

UNIT 1 NUMBER SYSTEMS **09 Hrs.**

Natural numbers, Integers, Rational and Irrational numbers, Real numbers, Complex numbers, Mappings, Equivalence relation and partitions, Congruence modulo n.

UNIT 2 ROOTS OF EQUATIONS **11 Hrs.**

Fundamental Theorem of Algebra, Relations between Roots and Coefficients, transformation of equations, *Descartes rule of signs, Algebraic Solution of a cubic equations (Cardan's method), Bi-quadratic Equations.

UNIT 3 SCALARS AND VECTORS **10 Hrs.**

Introduction to vectors and scalars, Vector addition and subtraction, Scalar multiplication, Magnitude of vectors, Unit vectors, Dot Product, Cross Product, vector triangle inequality, Properties, Application of vectors: pushing a box, tug of war, hiking.

UNIT 4 MATRICES AND DETERMINANTS **10 Hrs.**

Introduction, Matrix notations, Types of matrices- symmetric, skew-symmetric, Hermitian and skew-Hermitian, Matrix Multiplication, elementary operations on matrices, *Determinants- Properties and value of a determinant, adjoint and inverse of a matrix.

40 Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1 – Define various number systems and identify the domain of their applications.

CO2 – Classify scalars and vectors and understand their individual role.

CO3 – Apply theory of equations to solve real life problems.

CO4 – Classify various types of matrices and apply elementary operations.

CO5 – Evaluate inverse of a matrix.

CO6 – Formulate a problem and incorporate its solution using an appropriate tool.

TEXT/REFERENCE BOOKS

1. Leonard E. Dickson, First Course in the Theory of Equations, Wentworth Press, 2019.
2. John Bird, Engineering Mathematics, 5th ed., Oxford, 2005.
3. K. Hoffman and R. A. Kunze, Linear Algebra, Prentice Hall of India, 2002.
4. Aufmann, Barker, and Lockwood, Beginning Algebra with Applications, 6th ed., Houghton Mifflin Company, 2004.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100	**Exam Duration: 3 Hrs**
Part A : 6 questions of 4 marks each	24 Marks
Part B: 6 questions of 8 marks each	48 Marks
Part C: 2 questions of 14 marks each	28 Marks