Semester	**III**
Course	**Major**
Paper Code	C2MT230321T
Paper Title	**Algebra-2**
No. of Credits	**4**
Theory / Practical / Composite	**Theory**
Minimum No. of preparatory hours per week a student has to devote	**4**
Number of Modules	Nil
Syllabus	Homomorphism and Isomorphism of group--definition and examples (3) Homomorphism theorems relating to identity, inverse, image and inverse image of a subgroup, order of an image of an element, Kernel of a homomorphism—related results (5). Normal subgroups, Quotient group - Examples, (3) First Isomorphism theorem. Monomorphism, epimorphism, isomorphism—related results; (3) Infinite cyclic group is isomorphic to (Z,+) and finite cyclic group is isomorphic to(Zn,+), Isomorphism of a group with subgroup and quotient of another groups. Isomorphic classes of groups.(5) Natural homomorphism of G onto G/N, N being a normal subgroup of G. Second and Third Isomorphism Theorems, Isomorphism results relating to normal subgroups (5). Introduction to vector space and its subspaces (4) Algebra of subspaces, quotient spaces (3) linear combination of vectors, linear span, linear independence (3), basis and dimension. Infinite dimensional vector spaces : only examples (3). Linear transformations, null space, range, rank and nullity of a linear transformation (4), matrix representation of a linear transformation (2), algebra of linear transformations. Isomorphisms. Isomorphism theorems, invertibility and isomorphisms, properties of isomorphism (6) change of coordinate matrix (2).

Learning Outcomes	• To learn the constructions of new group from the old, group transformations, • Classification of groups through group transformations. • Learning Abstract Vector Spaces, Linear Transformations and their salient properties.	
Reading/Reference Lists	• Contemporary Abstract Algebra by Joseph Gallian. • Abstract Algebra by Sen, Ghosh, Mukhopadhyay. • Matrix and Linear Algebra Kanti Bhushan Datta. • Linear Algebra by Arnold J. Insel, Lawrence E. Spence, and Stephen H. Friedberg. • Elementary Linear Algebra by Howard Anton, Chris Rorres. • Linear Algebra Done Right by Sheldon Axler. • Abstract Algebra by Dummit and Foote. • Higher Algebra by S.K. Mapa. • Linear Algebra: A geometric Approach by S. Kumaresan. • . Topics in Algebra by I.N. Herstein • . Introduction to linear Algebra by Gilbert Strang. • Linear Algebra by K.Hoffman and R.. Kunz.	
Evaluation	70	30
Paper Structure for Theory Semester Exam	7 questions each carrying 10 marks needs to be answered out of 12/13 questions.	