

Branch Name:	B.Sc.Mathematics
Program Code:	SC104
Course Name:	Group Theory
Course Code:	2SC1040501
Pre-requisite Course:	

Course Objectives:

1. To understand the basic concept of group.
2. To understand the concept of subgroup and normal subgroup.
3. To know about permutation and transposition.
4. To understand the concept of direct product and Betti number of group.

Teaching and Examination Scheme:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
3	--	--	3	70	30	--	--	100

Subject Contents:

Sr. No	Topic	Total Hours	Weightage (%)
1	Definition of a Group and illustrations, Elementary property of a Group, Equivalent definitions of a Group, Generalized form of Associative Law, Finite Groups and their tables, Definition of a Subgroup and illustrations, Lagranges theorem and its applications.	15	33
2	Definition of a Permutation and illustrations, Transpositions and cycle, definition of a Normal subgroup and illustrations, Quotient group, Definition of an isomorphism of a group and its illustrations.	15	33
3	Direct Product, The fundamental theorem of finitely generated abelian groups, Elementary divisors of groups, Betti number of group, obtaining elementary divisors from invariant factors, any cyclic decomposition.	18	34

Reference Books:

1. Abstract Algebra, I H Sheth, Prentice Hall of India (PHI) Publication.
2. Topics in Algebra, I N Herstein, Wiley Eastern Ltd.
3. Basic Algebra Vol I & II, N. Jacobson, Hindustan Publishing company.
4. A text book of Modern Algebra, Shanti Narayan, S. Chand & Co.
5. Basics Abstract Algebra, (second Edition), P.B.Bhattacharya, S.K.Jain, S R Nagpal, Cambridge University Press.
6. University Algebra, N.S. Gopalkrishna, Wiley Eastern, New Delhi
7. Algebra, MacLane Saunders and Birkhoff Garrett, MacMillan, New York.
8. Introduction to Topology and Modern Analysis, G.F.Simmons, MacGraw Hill Inc., U.S.A.
9. Abstract Algebra, 3rd edition, David S. Dummit, Richard M. Foote, John Wiley & Sons, Inc.

List of Open Source Software/learning website:

1. <https://www.youtube.com/watch?v=j5uRjQXuYeI>
2. <https://www.youtube.com/watch?v=B577ZWagAN8>
3. <https://www.youtube.com/watch?v=4A25wEp5opo>

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Describe elementary properties of a Group.	1 Remembering
CLO2	Discuss the knowledge on finite groups and their tables.	2 Understanding
CLO3	Use definition of a normal subgroup and using it solve the example of its.	3 Applying
CLO4	Explain an isomorphism of a group and using it solve the example of its.	4 Analysing, 3 Applying
CLO5	Know the Lagranges theorem to Justify the application of its.	5 Evaluating
CLO6	Create an example of Betti number of group.	6 creating

Mapping of CLOs with POs & PSOs:

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CLO1		L	H						M				M	L		
CLO2		L			L				M					M		L
CLO3	L			L			L						L			M
CLO4	L			L			L						M			L
CLO5		H							M		L		H	L		L
CLO6		L	H		M				L	L		L		M		L

H: High, M: Medium, L: Low