Lecture Plan

Name of the College: Government College of Arts, Science and Commerce, Sanquelim-Goa

Name of Faculty: Vishal Vinayak Gawas	**Subject:** Mathematics	
Paper code: MAT-301 -Group Theory I	**Program:** B.Sc.	**Division: -**
Academic year: 2025-26	**Semester:** V	**Total Lectures:** 60

Course Objectives:

1. The course is designed keeping in mind that it is the first course in abstract algebra. The course will give the student a gentle introduction to basic group theory. The various topics covered in this course are Binary Structures, Groups and Subgroups, Cyclic Groups, Permutations Groups, The Fundamental Theorem of Finitely Generated Abelian Groups, Homomorphisms and The Fundamental Homomorphism Theorem.

Expected Course Outcome:

1) Recollect the basic definitions and theorems in Group Theory
2) Explain the various proofs and concepts in Group Theory.
3) Explain the various proofs and concepts in Group Theory.
4) Solve problems using the concepts learnt in the course.

Student Learning Outcome: Student will be able to

1) Recollect the basic definitions and theorems in Group Theory and explain the various proofs and concepts involved
2) Apply the concepts of Group Theory to explain proofs and solve problems effectively.

Month	Lecture From	Lecture To	No. of lectures allotted	Topic, Subtopic to be covered	Exercise/ Assignment	ICT Tools	Reference books
June	20/06/2025	21/06/2025	1	Discussion of prerequisites			**John B. Fraleigh, A First Course in Abstract Algebra, Seventh Edition, Pearson, 2013**
	23/06/2025	28/06/2025	4	Multiplication of Complex Numbers, Euler's Formula		Smart Board PDF	John B. Fraleigh, A First Course in Abstract Algebra, Seventh Edition, Pearson, 2013
	30/06/2025	05/07/2025	4	Roots of Unity, Binary Operations,		Smart Board PDF	John B. Fraleigh, A First Course in Abstract Algebra, Seventh Edition, Pearson, 2013
July	07/07/2025	12/07/2025	4	Isomorphic Binary Structures			John B. Fraleigh, A First Course in Abstract Algebra, Seventh Edition, Pearson, 2013
	14/07/2025	19/07/2025	4	Groups, Examples of Groups		Data projector	John B. Fraleigh, A First Course in Abstract Algebra, Seventh Edition, Pearson, 2013

	21/07/2025	26/07/2025	4	Groups, Examples of Groups and properties			**John B. Fraleigh, A First Course in Abstract Algebra, Seventh Edition, Pearson, 2013**
July August	28/07/2025	02/08/2025	4	Subgroups, Cyclic Groups			John B. Fraleigh, A First Course in Abstract Algebra, Seventh Edition, Pearson, 2013
August	04/08/2025	09/08/2025	4	Generating Sets and Cayley Digraphs		Smart Board	John B. Fraleigh, A First Course in Abstract Algebra, Seventh Edition, Pearson, 2013
	11/08/2025	16/08/2025	3 Independ enceDay	Groups of Permutations, Orbits			John B. Fraleigh, A First Course in Abstract Algebra, Seventh Edition, Pearson, 2013
	18/08/2025	23/08/2025	4	Cycles, and the Alternating Groups, Cosets and the Theorem of Lagrange		Smart Board PDF	John B. Fraleigh, A First Course in Abstract Algebra, Seventh Edition, Pearson, 2013
	25/08/2025	30/08/2025	0 Chaturthi Break 26/08/25				**John B. Fraleigh, A First Course in Abstract Algebra,**

			To 01/09/25				**Seventh Edition, Pearson, 2013**
September	02/09/2025	06/09/2025	3	Direct Products and Finitely Generated Abelian Groups (Proof of Fundamental Theorem of Finitely Generated Abelian Groups is not included.),		Smart Board	John B. Fraleigh, A First Course in Abstract Algebra, Seventh Edition, Pearson, 2013
	08/09/2025	13/09/2025	4	Plane Isometries, Discussion of groups $D3$, $D4$ and $D5$			John B. Fraleigh, A First Course in Abstract Algebra, Seventh Edition, Pearson, 2013
	15/09/2025	20/09/2025	4	Group Homomorphisms, Properties of Homomorphisms and kernel of a homomorphism		Smart Board	John B. Fraleigh, A First Course in Abstract Algebra, Seventh Edition, Pearson, 2013
	22/09/2025	27/09/2025	4	Normal Subgroups and Factor Groups		Smart Board	John B. Fraleigh, A First Course in Abstract Algebra, Seventh Edition, Pearson, 2013
September October	29/09/2025	04/10/2025	3 Gandhi Jayanti / Dussehra	The Fundamental Homomorphism Theorem			John B. Fraleigh, A First Course in Abstract Algebra, Seventh Edition, Pearson, 2013
October	06/10/2025	11/10/2025	4	Definitions of automorphisms and inner automorphisms			John B. Fraleigh, A First Course in Abstract Algebra,

							Seventh Edition, Pearson, 2013
	13/10/2025	18/10/2025	4	Revision.			

*** Assessment Rubrics**

Component	Max Marks
ISA 1	10
ISA 2	10
Practical	Nil
Project	Nil
Semester End Exam	80