



Course Specifications

Course Title:	Group Theory
Course Code:	MATH 2455
Program:	Bachelor of Science in Mathematics
Department:	Mathematics
College:	College of Science and Humanities Alkharj
Institution:	PRINCE SATTAM BIN ABDUALZIZ UNIVERSITY

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A. Course Identification

1. Credit hours:	4(4,0,0)
2. Course type	
a.	University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b.	Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered:	Level 6
4. Pre-requisites for this course (if any):	MAT 2240
5. Co-requisites for this course (if any):	None

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	04	100%
2	Blended		
3	E-learning		
4	Distance learning		
5	Other		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	48
2	Laboratory/Studio	0
3	Tutorial	0
4	Others (specify) – (5 Office Hours in a week)	60
	Total	108

B. Course Objectives and Learning Outcomes

1. Course Description

Binary operation – Associate – Commutative – Identity Element – Inverse of an Element – Fundamental properties of Groups – Subgroups – Cyclic Groups – Permutation Groups – Symmetric Groups – Group Homomorphism and Cayley’s Theorem – Cosets and Lagrange’s theorem – Quotient Groups – Finite Groups – Discrete Groups – Finite Rotation Groups – Normal and Factor Groups – Bi-linear forms – Symmetric Forms – Hermitian Forms – The Rotation Group – Abelian Groups – Finitely generated Abelian Groups – P Group – The Isomorphism - Theorems of Groups – Simple Group – Group Representation – Normal and Subnormal Series – Composition Series – Soluable Groups – Nilpotent Groups

2. Course Main Objective

The aim of the course is to provide basic knowledge about abstract algebraic structure such as Binary Operation, Groups its types and properties, functions and its types such as homeomorphism, isomorphism, automorphism etc.. between groups

Course will be reviewed based on the report received from Course Coordinators and curriculum review committee

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge and Understanding	
1.1	Be conversant with the concept of binary operation and its properties.	K1
1.2	Acquire knowledge about group homeomorphism, isomorphism, finitely generated abelian groups, p group	K2
		K2
2	Skills :	
2.1	Able to perform binary operation between sets	S1, S2
2.2	Evaluate order of an element	S2

C. Course Content

No	List of Topics	Contact Hours
1	Mathematical Logic and Various types of statements	6
2	Truth Tables	4
3	Methods of Proof	6
4	Sets and Operations	3
5	De Morgan's Laws , Cartesian Products	4
6	Relations and different types of relations	3
7	Functions, Domain, Range and types of functions	4
8	Review of basic Concepts of Analytic Geometry	4
9	Straight Lines	6
10	Circles	4
11	Conic Sections	4
Total		48

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge and Understanding		
1.1	Be conversant with the concept of binary operation and its properties.	1. Class Room Lectures	1. Two Internal Exams
1.2	Acquire knowledge about group homeomorphism, isomorphism, finitely generated abelian groups, p group	2. Interactive sessions 3. Exclusive Office Hours for clearing doubts in small groups	2. At least two Quiz 3. End Semester Exam
2.0	Skills		
2.1	Able to perform binary operation between sets	1. Application oriented exercises	1. Homework
2.2	Evaluate order of an element	2. Homework to improve the analytical skills	2. Assignments 3. Quiz 4. Exams

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Mid Term Exam I	6	20%
2	Quiz	4 & 10	5%
3	Mid Term Exam II	13	20%
4	Continuous Assessment – Homework, Assignment, Attendance etc.	--	5%
5	End Semester Exam	15	50%

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

1. Exclusive Office Hours – 5 Hours per week
2. Academic Advising for Students – 1 Hour per week

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	- Englewood Cliffs, NJ Prentice – Hall, ISBN:013004763 - Introduction to Abstract Algebra, Jonathan D H Smith - Artin M “Algebra
Essential References Materials	Paul’s online series
Electronic Materials	
Other Learning Materials	Lecture Notes Prepared by the Department of Mathematics

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms with Smart boards with seating facilities for at least 30 students
Technology Resources (AV, data show, Smart Board, software, etc.)	Smartboard, Internet Connection for Blackboard Computer Lab with software packages such as Excel etc.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Nil

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
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Evaluation Areas/Issues	Evaluators	Evaluation Methods
Course Evaluation	Quality Assurance Committee of the Department	Review all the course documents and course report
Peer Review	Senior Faculty Members / HoD	Attend the lecture and fill in a form
End Semester online survey	students	online survey

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	