



## Course Specifications

<b>Course Title:</b>	Abstract Algebra (1)
<b>Course Code:</b>	MATH 342
<b>Program:</b>	Bachelor of Science in Mathematics
<b>Department:</b>	Mathematics
<b>College:</b>	Science
<b>Institution:</b>	University of Tabuk

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## A. Course Identification

<b>1. Credit hours:</b> 03 Hours/Week
<b>2. Course type</b>
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: L5/Y3
4. Pre-requisites for this course (if any): Math 251
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	45	100%
2	Blended		
3	E-learning		
4	Distance learning		
5	Other		

## 7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	45
2	Laboratory/Studio	
3	Tutorial	
4	Others (specify)	
	<b>Total</b>	45

## B. Course Objectives and Learning Outcomes

### 1. Course Description

The main purpose of this course is to provide students with the fundamental concepts and structures of abstract algebra.

### 2. Course Main Objective

- Students will be able to recall the basic properties of sets, relations and groups.
- Students will be able to perform algebraic operations on groups and sets.
- Students will be able to apply the tools and theorems of group theory to solve problems.

### 3. Course Learning Outcomes

CLOs		Aligned PLOs
1	<b>Knowledge and Understanding</b>	
1.1	Students will define new theories and concepts of Abstract Algebra	K1
1.2	Students will be aware of the importance of Abstract algebra in all pure mathematics and its applications in mathematics.	K2
2	<b>Skills :</b>	

CLOs		Aligned PLOs
2.1	Students will be able to apply the fundamentals of group theory that they have learnt in this course to proof the several theorems and problems .	S3
2.2	Students will be able to identify the correct information and the analytical procedures to find the right solution.	S1
2.3	Students will be able to communicate concepts of Abstract Algebra clearly.	S5
2.4		
<b>3</b>	<b>Values:</b>	
3.1	Students will be able to develop enhanced self-learning.	V1
	Students will be able to work independently and in groups.	V2

### C. Course Content

No	List of Topics	Contact Hours
1,2	Sets and relations – Binary operation, Definition and basic properties - Theorems - Solutions of equations in any group	6 Hrs
3	Power of element in a group Examples- The order of a group and the order of element - Examples	3 Hrs
4	Definition of Cyclic group – generators of a Cyclic group- Review of chapter 1	3 Hrs
5,6	Definition and elementary properties – Theorems of a subgroups - Definition of function – one to one and onto function – definition of permutation – composition of permutation – cyclic notation – even and odd permutation	6 Hrs
6	<b>Mid-Exam 1</b>	
7	Cosets of a subgroup - Examples	3 Hrs
8,9	Lagrange's theorem and its corollaries – multiplication of two subgroups	6 Hrs
10	Normal subgroup	3 Hrs
11	Quotient group	3 Hrs
11	<b>Mid-Exam 2</b>	
12	Homomorphisms	3 Hrs
13	The fundamental theorem of homomorphism	3 Hrs
14,15	<b>Revision &amp; Final Exam</b>	6 Hrs
<b>Total</b>		<b>45 Hrs</b>

### D. Teaching and Assessment

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

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
<b>1.0</b>	<b>Knowledge and Understanding</b>		
1.1	Students will define new theories and concepts of Abstract Algebra	Introducing new ideas through case study Lectures Class Discussions	Quizzes I II Midterm Exams Final Exams Homework assignments
1.2	Students will be aware of the importance of Abstract algebra in all pure mathematics and its applications in mathematics.		
<b>2.0</b>	<b>Skills</b>		
2.1	Students will be able to apply the		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	fundamentals of group theory that they have learnt in this course to proof the several theorems and problems.	Lectures Class Discussions	Quizzes I II Midterm Exams Final Exams Homework assignments.
2.2	Students will be able to identify the correct information and the analytical procedures to find the right solution.		
2.3	Students will be able to communicate concepts of Abstract Algebra clearly.		
<b>3.0</b>	<b>Values</b>		
3.1	Students will develop enhanced self-learning.	Lectures Class Discussions Group discussion	Quizzes Homework assignments Group work
3.2	Students will be able to work independently and in groups.		

## 2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Home works and Assignments and Quizzes	Weekly basis	10%
2	Mid Exam-I	6 <sup>th</sup> week	25%
3	Mid Exam-II	11 <sup>th</sup> week	25%
4	Final Exam	At end of the Semester	40%

\*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 :**  
Six office hours per week in the lecturer schedule.

## F. Learning Resources and Facilities

### 1. Learning Resources

<b>Required Textbooks</b>	Matej Brešar, Undergraduate Algebra (ISBN 978-3-030-14053-3), Springer Nature Switzerland (2019).
<b>Essential References Materials</b>	1- A first course in Abstract Algebra , J. B. Fraigh, 6 <sup>th</sup> ed. 2- Ramji Lal, Algebra 1, (ISBN 978-981-10-4252-2), Springer Nature Singapore Pte Ltd (2017).
<b>Electronic Materials</b>	- <a href="https://ocw.mit.edu/courses/mathematics/">https://ocw.mit.edu/courses/mathematics/</a>
<b>Other Learning Materials</b>	None

## 2. Facilities Required

Item	Resources
<p><b>Accommodation</b> (Classrooms, laboratories, demonstration rooms/labs, etc.)</p>	<p>1.Lecture room with maximum capacity of 30 students and equipped with White Board, Overhead projector and internet connection.</p> <p>2.Library</p>
<p><b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)</p>	Projectors
<p><b>Other Resources</b> (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)</p>	None

## G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Students	Direct and Indirect
Extent of achievement of course learning outcomes	Teachers	Direct
Quality of learning resources	Students	Indirect

**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

<b>Council / Committee</b>	Program and study plan committee
<b>Reference No.</b>	
<b>Date</b>	25/08/2021