Course Plan

First: Course Information

Course Name	Abstract Algebra 1	Course Number	0301753
Credit Hours	3 hours	Theoretical	3 hours	Practical	0 hours
Prerequisite	_____	Section Number: 1	Lecture Time: 4:30-7:30 Tuesday
Level in JNQF	9		

Type Of Course	☐ Obligatory Faculty Requirement	☐ Elective University Requirement
	☐ Obligatory University Requirement	☐ Faculty Requirement
	☐ Course Elective Specialty Requirement	■ Obligatory Specialization Requirement

Type of Learning	☐ Face-to-Face Learning
	■ Blended Learning (1 Face-to-Face + 1 Asynchronous)
	☐ Online Learning (1 Synchronous + 1 Asynchronous)

Second: Instructor's Information

Course Coordinator		
Name: Aliaa Burqan	Academic Rank: Associate Professor	
Office Number: 326 D	Phone Number: 1500	E-mail: aliaaburqan@zu.edu.jo
Instructor		
Name: Aliaa Burqan	Academic Rank: Associate Professor	
Office Number: 326 D	Phone Number: 1500	E-mail: aliaaburqan@zu.edu.jo
Office Hours: 02:00-03:00 Sunday, Tuesday, Thursday		

Third: Course Description

Isomorphism theorems of groups, group automorphism, finite direct products, finitely generated groups, groups actions, Sylow theorems, rings and ideals, prime and maximal ideals, polynomial rings and irreducibity tests, unique factorization domains, Euclidean domains.

Fourth: Course Objectives

Aims of the course:

- Make a good background on abstract algebra.
- Study isomorphism theorems, group automorphisms and inner automorphisms.
- Study commutator subgroups.
- Understand group acting on sets and its applications.
- Understand and demonstrate the Sylow theorems.
- Classify Abelian groups of finite order.
- Understand and determine simple groups.
- Study rings, integral domains, fields, ideals, PID, ring homomorphisms, and polynomial rings.
- Apply irreducibility tests.
- Analyze and prove theorems and exercises on each subject that studied.

Fifth: Learning Source

Main References	- Algebra by Thomas Hungerford, 2nd edition. - Abstract Algebra by David Dummit and Richard Foote, 3rd edition, 2003
Additional Sources & Websites	- Singh, Modern Algebra, Vikas Publishing House - Contemporary Abstract Algebra, Joseph Gallian, 7th Edition.
Teaching Type	■ Classroom ☐ Laboratory ☐ Workshop ☐ MS Teams ■ Moodle

Sixth: Learning Outcomes

Level descriptor according to (JNQF)	CILOs Code	CILOs If any CILO will not be assessed in the course, mark NA.	Associated PILOs Code Choose one PILO for each CILO*	Assessment method** Choose at least two methods	Scores out of 100 State the total score identified for each CILO
Knowledge	K1	1. Illustrate the concepts and properties of isomorphism, automorphism and inner automorphism, commutator subgroup, group actions, direct product, rings, fields, ideals, polynomial rings.	PK2	Midterm Exam Final Exam	15
	K2	1. Study automorphism groups and calculate the automorphism group for some groups. 2. Understand the group actions on sets and Sylow's Theorems and use them to explore simple groups and to classify groups of some finite order. 3. Classify up to isomorphism finitely generated abelian groups. 4. Study prime ideal, maximal ideal and polynomial rings.	PK3	Midterm Exam Final Exam	15
Skills	S1	1. Use different technique to proof theorems and solving problems. 2. Reach to new results by combining different theorems.	PS1	Midterm Exam Final Exam	20
	S2	1. Apply isomorphism theorems. 2. Apply the group actions in studying specific properties of groups. 3. Classify an Abelian group of finite order. 4. Use Sylow theorems to classify groups of finite orders. 5. Construct a field of finite number of elements.	PS2	Midterm Exam Final Exam	20
Competences	C1	Self-learning specific topics in abstract algebra.	PC1	Quizzes, Assignments	15
	C2	Give presentations and write small projects.	PC2	Assignments	10
	C3	Fostering an ability to work together in teams, engaging in group work, and to develop skills motivating others to accomplish goals.	PC3	Assignments	5

Seventh: Course Structure

Lecture Date	Intended Teaching Outcomes(ILOs)	Topics	Teaching Procedures	Teaching Methods and Activities	References
15-10-2024	K1, K2	General Revision.	Face-to-Face	Lectures and discussion	Gallian Book
22-10-2024	K1, K2, C1, C3	Group Homomorphism, Properties, Kernal, Image, Examples.	Asynchronous	Self-Reading, Videos Homework 1 (2 points)	Pdfs, videos, assignments on Moodle
29-10-2024	K1, K2, S1, S2	Isomorphism Theorems, The Subgroup Generated by a Set, Automorphism, Inner Automorphism..	Face-to-Face	Lectures and discussion	Hungerford Book
05-11-2024	K1, K2, S1, S2, C1, C2, C3	Applications on Automorphisms; Theorems Related to Automorphism; $Aut(G)$ is a Group, $G = \langle f(a) \rangle$, $Aut(Z_n) \approx U(n)$, Normalizer and Centralizer of Subgroup.	Asynchronous	Self-Reading Videos Link: Presentation 1: Third Isomorphism Theorem (3 points)	Pdfs, videos, links, assignment on Moodle
12-11-2024	K1, K2, S1, S2	Commutator Subgroups.	Face-to-Face	Lectures and discussion	Hungerford Book
		Short Exam			
19-11-2024	K1, K2, S1, S2, C1, C3	Applications on Commutator Subgroups.	Asynchronous	Self-Reading Videos Homework 2 (3 points)	Pdfs, videos, assignment on Moodle
26-11-2024	K1, K2, S1, S2	Group Actions, Cayley's Theorem.	Face-to-Face	Lectures and discussion	Dummit and Foote book, Hungerford Book
03-12-2024	K1, K2, S1, S2, C1, C2, C3	Orbit Stabilizer Theorem, The Class Equation, Cauchy Theorem.	Asynchronous	Self-Reading Videos Presentation 2: Cauchy Theorem (4 points)	Pdfs, videos, assignment on Moodle
10-12-2024		**Midterm Exam**			
17-12-2024	K1, K2, S1, S2	Direct product, Fundamental Theorem of Finite Abelian Group, Sylow Theorems	Face-to-Face	Lectures and discussion	Dummit and Foote Book
24-12-2024	K1, K2, S1, S2, C1, C2, C3	Applications on Sylow Theorems	Asynchronous	Self-Reading Link: Proof of Sylow Theorems Homework 3 (3 points) Presentation 3: First Sylow Theorem (3 points)	Pdfs, link, assignment on Moodle
31-12-2024	K1, K2, S1, S2	Rings, Integral domains, Fields, Boolean Ring, Characteristic of Ring.	Face-to-Face	Lectures and discussion	Hungerford Book
07-01-2025	K1, K2, S1, S2, C1, C3	Subring, Ideals, Factor Ring, Ring Homomorphisms, Ring Automorphism, Isomorphism Theorems for Rings	Asynchronous	Self-Reading Videos Homework 4 (2 points)	Pdfs, videos, assignment on Moodle
14-01-2025	K1, K2, S1, S2	Prime and Maximal Ideals, Polynomial Rings, Factorization of Polynomials	Face-to-Face	Lectures and discussion	Hungerford Book
		Final Exam			

* Learning procedures: (Face-to-Face, synchronous, and asynchronous). * * Teaching methods: (Lecture, video…..).
* * * Reference: (Pages of the book, recorded lecture, video….).

Eighth: Assessment methods

Methods	Fully Electronic Education	Integrated Teaching	Direct Teaching	Specific Course Output to be measured *State the score identified for each CILO for each method of assessment out of 100 **If any CILO will not be assessed in the course, mark NA.						
				K1	K2	S1	S2	C1	C2	C3
Midterm Exam		30		5	5	10	10			
Final Exam		40		10	10	10	10			
Assignments		20						5	10	5
Quizzes		10						10		
Total out of 100		100		15	15	20	20	15	10	5

Ninth: Course Policies

- All course policies are applied to all teaching patterns (online, blended, and face-to-face Learning) as follows:
  a. Punctuality.
  b. Participation and interaction.
  c. Attendance and exams.
- Academic integrity: (cheating and plagiarism are prohibited).

Approved by	Name	Date	Signature
Head of Department	Dr. Mohammad Al-Amleh	13-10-2024	
Faculty Dean	Dr. Aliaa Burqan	13-10-2024	