



Course Specification

— (Postgraduate)

Course Title: Abstract Algebra

Course Code: 202508-3

Program: Master of Pure Mathematics

Department: Mathematics and Statistics

College: Science

Institution: Taif University

Version: 1

Last Revision Date: 20/05/2023



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A. General information about the course:

1. Course Identification:

1. Credit hours: (3)			
2. Course type			
A.	<input type="checkbox"/> University	<input type="checkbox"/> College	<input checked="" type="checkbox"/> Department <input type="checkbox"/> Track
B.	<input checked="" type="checkbox"/> Required		<input type="checkbox"/> Elective
3. Level/year at which this course is offered: (1st level)			
4. Course general Description:			
Direct product and direct sum of groups – The fundamental theorem of finitely generated abelian groups – Free groups – Nilpotent groups – Solvable groups – Sylow's theorems – Direct product and direct sum of Rings and ideals – Polynomial Rings – Euclidean Domains – Principal Ideal Domains – Unique Factorization Domains – Field Extensions – Finite Fields.			
5. Pre-requirements for this course (if any):			
None			
6. Pre-requirements for this course (if any):			
None			
7. Course Main Objective(s):			
<ol style="list-style-type: none"> 1. Study direct product and direct sum of groups. 2. Study the fundamental theorem of finitely generated abelian groups. 3. Study free groups, nilpotent groups and solvable groups. 4. Study Sylow's theorems 5. Study direct product and direct sum of rings and ideals. 6. Study Euclidean domains, principal ideal domains and unique factorization domains. 7. Study field extensions. 8. Study finite fields. 			

2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	3	100%
2	E-learning		
3	Hybrid <ul style="list-style-type: none"> • Traditional classroom • E-learning 		
4	Distance learning		

3. Contact Hours: (based on the academic semester)



No	Activity	Contact Hours
1.	Lectures	45
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	
5.	Others (specify).....	
Total		45

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0 Knowledge and understanding				
1.1	Recognize direct product and direct sum of groups and free groups, Nilpotent groups and Solvable groups.	K1	• Lectures	- Quizzes - Exams - Assignments
1.2	Describe Euclidean domains, principal ideal domains and unique factorization domains.	K3	• Lectures	- Quizzes - Exams - Assignments
2.0 Skills				
2.1	Apply direct product and direct sum of groups and free groups on the fundamental theorem of finitely generated abelian groups.	S1	• Lectures	- Quizzes - Exams - Assignments
2.2	Demonstrate finite fields	S5	• Lectures	- Quizzes - Exams - Assignments
3.0 Values, autonomy, and responsibility				
3.1	Participate effectively within groups and independently.	V1	Projects.	Through the oral presentation of the projects.
3.2	Give responsibility for	V2	Projects.	Through the oral





Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	learning importance and continuing personal and professional development.			presentation of the projects.

C. Course Content:

No	List of Topics	Contact Hours
1,2	Direct product and direct sum of groups	6
3,4	The fundamental theorem of finitely generated abelian groups	6
5,6	Free groups, Nilpotent groups and Solvable groups.	6
7,8	Sylow's theorems.	6
9,10	Direct product and direct sum of rings and ideals.	6
11	Polynomial rings.	3
12,13	Euclidean domains, principal ideal domains and unique factorization domains.	6
14	Field extensions.	3
15	Finite fields.	3
Total		45

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes and HomeWorks	Continues	10 %
2.	Midterm exam	7 th -8 th	20 %
3.	Final exam	16 th	70%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities:

1. References and Learning Resources:

Essential References	Tomas W. Hungerford, Algebra, Springer, 2000.
Supportive References	Thomas W. Hungerford, Abstract Algebra, sunders college publishing, 2002
Electronic Materials	YouTube Lecturers, Abstract Algebra, https://youtu.be/VdLhQs_v_E8
Other Learning Materials	None



2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms
Technology equipment (Projector, smart board, software)	data show
Other equipment (Depending on the nature of the specialty)	None

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of students assessment	Students	Indirect
Quality of learning resources	Students	Indirect
The extent to which CLOs have been achieved	Peer reviewer	Direct
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

COUNCIL /COMMITTEE	Department of Mathematics and Statistics
REFERENCE NO.	
DATE	7-04-1445 H

