KINGDOOM OF SAUDI ARABIA
Ministry of Education
Al-Imam Mohammad Ibn Saud Islamic University
College of Sciences
Department of Mathematics & Statistics

المملكة العربية السعودية
وزارة التعـلـيـم
جامعة الإمام محمد بن سعود الإسلامية
كلية العلوم
قسم الرياضيات والإحصاء

SYLLABUS

Course Code	Course Num.	Course Name	Credit Hours	Lec.	Lab.	Tut.	Private study	Pre-requisites	Course Level	Teaching Language
MAT	**623**	**Algebra I**	**4**	**3**	**0**	**1**	**8**		**1**	**English**

A. Course Description

The main goal of this course is to introduce the fundamentals of modern abstract algebra. It also aims to raise student's proficiency in writing proofs and to acquire more familiarity with abstract mathematical reasoning and proofs in general. The course is a transition to more advanced mathematical courses.

B. Course Outcomes

At the end of this course the student will be able to:

- Study basic concepts of groups, rings, fields and modules, Symmetry groups, linear groups, Sylow theorems, quotient rings, polynomial rings, ideals, unique factorization,

- Know Nullstellensatz; field extensions, finite fields, Jordan–Hölder theorem and composition series.

C. References

Required Textbook

Abstract Algebra, D. Dummit, R. Foote, 3rd ed., John Wiley, 2003.

Other references:

1. *An Introduction to Abstract Algebra*, D. Robinson, De Gruyter, 2003.
2. *Algebra*, T.W. Hungerford, Springer, 1st ed. 1980.

Course Website: Google Classroom Webpage: http://www.imamm.org/

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D. Topics Outline

1. **Groups**: Review of Basics, Direct Products (External and Internal), The Fundamental Theorem of Finitely Generated Abelian Groups with Applications, Group Action, The Class Equation, Sylow Theorems with Applications, Cauchy Theorem.

2. **Rings and Fields**: Review of Basics, Direct Product and Direct Sum of Rings, Polynomial Rings and their Factorizations, UFD's, PID's and Euclidean Domains, Gaussian Rings, Field Extensions, Finite Algebraic Extensions, Finite Fields.

E. Office Hours

Office hours give students the opportunity to ask in-depth questions and to explore points of confusion or interest that cannot be fully addressed in class.

F. Exams & Grading System

The semi-official dates of the exams for this course are:

- **Midterm:** 8th or 9th week.
- **Quizzes & Homework:** During the semester.
- **Final Exam:** 16th week.

Your course grade will be based on your semester work as follows:

Midterm : 30 %	Final Exam: 40 %
4 Quizzes + 4 Homeworks, Attendance & Participation: 30 %	

The grading distribution:

A^+	A	B^+	B	C^+	C	F
[95, 100]	[90, 95)	[85, 90)	[80, 85)	[75, 80)	[70, 75)	[0, 70)

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G. Student Workload:

#	Teaching/learning activities	Contact Hours	Frequency	Total Contact hours	Self-study hours	Total self-study hours	Student Learning Time
1	Lecture	3	15	45	1.5	22.5	67.5
2	Tutorial	1	15	15	3	45	60
3	Lab\Practical	0	0	0	0	0	0
4	Homework	0	4	0	1.5	22.5	22.5
5	Quiz	0.25	4	1	1	4	5
6	Test (Midterm)	2	1	2	12	12	14
7	Final Exam	2	1	2	12	12	14
Total				65		118	183

Independent self-study = 118/15 $\cong$ 8 hrs per week

H. Student Attendance/Absence

Only three situations will be considered as possible excused absences:

- Occurrence of a birth or death in the immediate family will be excused. ("Immediate family" is defined by the University as spouse, grandparents, parents, brother, or sister).
- Severe illness in which a student is under the care of a doctor and physically unable to attend class will be excused. Students are not excused for a doctor's appointment. Do not make appointments that conflict with rehearsals. Notes from the University Health Center will be accepted.

Executive Rules for Study Regulations and Examsgoo.gl/ykm7t3