King Fahd University of Petroleum & Minerals
Department of Mathematics
Spring 2026 (Term 252)
SYLLABUS

Course : **Math 323**
Title : **Modern Algebra I**
Textbook : Contemporary Abstract Algebra, by J. A. Gallian, 8th edition.
Objective : Introduce students to the basic notions and techniques of Abstract Algebra.

Weeks	Part	Chapters	Titles
1 – 9	Groups	2	Groups
		3	Finite groups and subgroups
		4	Cyclic groups
		5	Permutation groups
		6	Isomorphisms
		7	Cosets and Lagrange's Theorem
		8	External direct products
		9	Normal subgroups and factor groups
		10	Group homomorphisms
		11	Fundamental theorem of finite abelian groups
10 – 15	Rings	12	Introduction to rings
		13	Integral domains
		14	Ideals and factor rings
		15	Ring homomorphisms
		16	Polynomial rings
		~~17~~ 4.2	Factorization of polynomials over a field [from **W. K. Nicholson**'s Book]
		~~18~~ 4.3	Factor rings of polynomials over a field [from **W. K. Nicholson**'s Book]

Eid Al-Fitr Holidays: March 15 – 26, 2026

Grading Policy (*)	Weight	Dates
Homework	40	-
Exam 1 (Ch. 2 – 11)	80/60	Wed. March 11, 7 p.m. 4-210
Exam 2 (Ch. 12 – 16)		Wed. April 29, 7 p.m. 4-210
Final Exam (Comp.)	120	tba
TOTAL	300	**Maghrib prayer**: March 10 @ **5:46 p.m.** | April 28 @ **6:11 p.m.**

Homework (**)		
HW 1/**10**	Ch. 2, 3, 4	10 Pbs
HW 2/**10**	Ch. 5, 6, 7, 8	10 Pbs
HW 3/**10**	Ch. 9, 10, 11	10 Pbs
HW 4/**10**	Ch. 12, 13, 14	10 Pbs
HW 5/**10**	Ch. 15, 16	10 Pbs

(*) **No Makeup** is given under any circumstance. If a student misses an assessment for a legitimate reason (e.g., medical emergency), his final grade will be determined based on the non-missed assessments.

(**) The homework should be emailed (in PDF) to the TA (see coordinates below).

Learning Outcomes: Upon completion of this course, students should be able to

- Define normal subgroups, factor groups, homomorphisms
- Discuss the fundamental theorem of finite Abelian groups
- Explain integral domains and fields
- Define ideals, factor rings and ring homomorphisms
- Explain factorization of polynomials over a field, factor rings of polynomials over a field
- Define irreducible elements and unique factorization
- Discuss principal ideal domains

. **Academic Integrity**: All KFUPM ethic policies apply in this course.
. **University Policy on Attendance**: A DN grade will be awarded to any student who accumulates 9 absences.
. **Office Hours**: Office hours: UT 9:00 a.m. – 10:30 a.m. and via Email & MS Teams
. **Instructor**: Salah-Eddine Kabbaj, Office: 5-428, Email: kabbaj@kfupm.edu.sa
. **TA**: Yousef Odeh, Email: g202416340@kfupm.edu.sa