King Fahd University of Petroleum & Minerals
Department of Mathematics & Statistics
Math 232 Syllabus
Second Semester 2017-18 (172)
Instructor: Dr. A. Laradji

Title: Introduction to Sets and Structures

Textbook: Mathematical Proofs, A Transition to Advanced Mathematics (3rd edition) by Chartrand, Polimeni, and Zhang (Pearson, 2014).

Description: Elementary logic. Methods of proof. Set theory. Relations and functions. Finite and infinite sets. Equivalence relations and congruence. Divisibility and the fundamental theorem of arithmetic. Well-ordering and axiom of choice. Groups, subgroups, symmetric groups, cyclic groups and order of an element, isomorphisms, cosets and Lagrange's Theorem.

Assessment:

- Exam 1: 20% (Saturday 3 March 2018, 4:00—5:30 PM, Chapters 2,3,4,5)
- Exam 2: 20% (Saturday 7April 2018, 4:00—5:30 PM, Chapters 6,7,9,10)
- Tests/Quizzes: 20%
- Homework: 5%
- Final Exam: 35% (Sunday 13 May 2018, 7:00-10:00 PM, Comprehensive)

Attendance and Academic Integrity: KFUPM policies regarding attendance and ethics will be enforced.

Course Plan:

Chapter	Topic Title	Number of weeks	Homework Exercises
2	Logic	2	4, 14(a,c), 18(b), 24(a,c,e), 32(c), 40(b), 48, 54, 62, 68, 72, 78
3	Sets	1	2, 16, 30, 36, 48, 64
4	Direct Proof and Proof by Contrapositive	1	4, 12, 24, 32, 42
5	More on Direct Proof and Proof by Contrapositive	1	10, 18, 28, 46, 58, 68, 75
6	Existence and Proof by Contradiction	1	6, 20, 34, 48, 50
7	Mathematical Induction	1	4, 12, 24, 34, 42, 62
9	Equivalence Relations	1	4, 22, 28, 34, 40, 42
10	Functions	1	8, 14, 26, 32, 48, 58
11	Cardinalities of Sets	2	4, 10, 20, 24, 28, 41(a)
12	Proofs in Number Theory	1	6, 24(a), 34, 38(c), 56, 62(d), 68
14	Proofs in Group Theory	2	12, 23, 24, 25, 28, 32(a,c), 40, 41, 45, 48(a,b)
-	Posets and Well-ordering	1	See handouts