King Fahd University of Petroleum and Minerals
Department of Mathematical Sciences
Math 232-Syllabus
2006-2007 (Semester 061)
Prepared by Dr. Ibrahim Al-Rasasi

Course #: Math 232
Course Title: Introduction to Sets and Structures

Textbooks:

1. O'Leary, Michael L., The Structure of Proof: with Logic and Set Theory, Prentice Hall, New Jersey, 2002.
2. Gallian, Joseph A., Contemporary Abstract Algebra, 6th edition, Houghton Mifflin Co., Boston, 2006.

Objectives/Course Description: The main objective of this course is to train students and develop their abilities to read, write, and create mathematical proofs. The material to be covered in this course is so fundamental that every prospective mathematician must know. The main topics to be covered are elementary logic, methods of proof, elements of set theory, Mathematical Induction and the Well-Ordering principle, functions and relations, countable and uncountable sets, divisibility and prime numbers, groups, subgroups, cyclic groups, permutation groups, cosets and Lagrange's Theorem.

Grading Policy:

1. Exam I- 20% (Date: Monday, November 6, 2006)
2. Exam II- 20% (Date: Monday, December 18, 2006)
3. Homework- 10%
    a. The homework is to be submitted every Monday
    b. Always try doing the homework *first* by yourself.
    c. You may discuss the homework problems with your classmates. But, when it comes to writing the solution, you *must* write it by yourself.
4. One Project- 5%
5. Attendance- 5% (9 unexcused absences will yield a DN grade + 1 unexcused absence will yield a deduction of 0.5 of the attendance marks)
6. Final Exam- 40%

Office Hours: (5-326, Phone#: 1268, E-mail: irasasi@kfupm.edu.sa)

- SMW: 08:00- 08:50 am & 11:00- 11:40 am.
- By appointment.

Detailed Syllabus is on the Next Page

Detailed Syllabus (Math 232)
(061)

Week	Date	Sec. #	Section Title (27 sections)
1	Sep. 9-14*	1.1 1.2 1.3	Propositions Propositional Forms Rules of Inference
2	Sep. 16-20	1.4 2.1 2.2	Rules of Replacement Predicates and Sets Quantification
3	Sep. 23		National Holiday
	Sep. 25-27	2.3 2.4	Negating Quantifiers Proof with Quantifiers
4	Sep. 30- Oct. 4	2.5 2.6	Direct and Indirect Proof More Methods
5	Oct. 7-11	3.1 3.2 3.3	Set Basics Subsets Equality of Sets
			Id Al-Fitr Vacation (Oct. 12- 27)
6	Oct. 28- Nov. 1	3.4 3.5	Families of Sets Generalized Union and Intersection
7	Nov. 4-8	4.1 4.3 4.4	The First Principle (Mathematical Induction) The Second Principle (Mathematical Induction) The Well-Ordering Principle
8	Nov. 11- 15	5.2** 5.3 5.4	Divisibility Primes Congruences
9	Nov. 18- 22	6.1 6.2 6.3	Relations Equivalence Relations Functions
10	Nov. 25- 29	6.4 6.5 6.6	Function Operations One-to-One and Onto Images and Inverse Images
11	Dec. 2-6	6.7	Cardinality
12	Dec. 9-13	Ch. 2	Groups (Definitions, Examples, Basic Properties)
13	Dec. 16- 20	Ch. 3 Ch. 4	Finite Groups and Subgroups Cyclic Groups
			Id Al-adha Vacation (Dec. 21- Jan 5)
14	Jan. 6-10	Ch. 4 Ch. 5	Continued Permutation Groups
15	Jan. 13-17	Ch. 7	Cosets and Lagrange's Theorem

*: Thursday, Sep. 14 is a normal Saturday class.

**: Students are advised to go over Section 5.1 by themselves.