King Fahd University of Petroleum & Minerals
Department of Mathematics & Statistics

Math 455-Syllabus

2006-2007 (071)

Title: Math 455- Number Theory
Credit: 3-0-3
Textbook: An Introduction to the Theory of Numbers, by Niven, Zuckerman, and Montgomery, 5th edition, 1991, Wiley & Sons.
Reference: Elementary Number Theory, by David M. Burton, 6th edition, 2007, McGraw-Hill.
Description: This is a first course in Number Theory. It will cover the fundamental concepts of Number Theory: Divisibility, Prime numbers, Congruences, Fermat's and Wilson's theorems, Mersenne numbers, Fermat's numbers, Pseudoprime numbers, Carmichael numbers, Primitive roots, Quadratic residues and Quadratic reciprocity, Arithmetic functions, Perfect numbers, Diophantine equations, and Applications: Cryptography.
Prerequisite: Math 232 or senior standing.

Grading Policy:

- Exam 1: 15%
- Exam 2: 15%
- Exam 3: 15%
- Homework: 15%. You may discuss the homework problems with each other, but when it comes to writing, please write your solution by yourself.
- One Project: 10%
- Final Exam: 30%

Office Hours:

- **Office Location:** 5-326
- **Office Phone Number:** 1268
- **Times:** SMW: 9:30- 11: 00 am.
- If the time is not convenient for you, you may arrange for an appointment.
- **E-mail:** irasasi@kfupm.edu.sa

Wishing you all the best,

Dr. Ibrahim Al-Rasasi
The Course Instructor

Math 455 – Syllabus
2007-2008 (071)

Week	Date	Sec.	Topics
1	Sep. 8-12, 2007	1.1 1.2	Introduction Divisibility
2	Sep. 15-19	1.3 1.4	Primes The Binomial Theorem
3	Sep. 22-26	2.1	Congruences
Sunday, Sep. 23, 2007: National Holiday			
4	Sep. 29-Oct. 3	2.2 2.3	Solutions of Congruences The Chinese Remainder Theorem
Eid Al-Fitr Break: Oct. 4- Oct. 19, 2007			
5	Oct. 20-25*	2.6 2.7	Prime Power Moduli Prime Modulus
6	Oct. 27-31	2.8	Primitive Roots & Power Residues
7	Nov. 3-7	3.1	Quadratic Residues
8	Nov. 10-14	3.2 3.3	Quadratic Reciprocity The Jacobi Symbol
9	Nov. 17-21	4.1 4.2	Greatest Integer Function Arithmetic Functions
10	Nov. 24-28	4.3	The Mobius Inversion Formula
11	Dec. 1-5	5.1 5.3	The Equation ax+by=c Pythagorean Triangles
12	Dec. 8-12	5.4	Assorted Examples of Diophantine equations
Eid Al-Adha Break: Dec. 13- Dec. 28, 2007			
13	Dec. 29-Jan 2		Introduction to Cryptography Affine Ciphers
14	Jan 5-9, 2008		Block Ciphers Exponential Ciphers
15	Jan 12-16		Public Key Cryptography Knapsack Ciphers

*: Thursday, October 25, 2007 is a Normal Saturday Class.