

# MATH 4043/5043, INTRODUCTION TO NUMBER THEORY, FALL 2007

## COURSE INFORMATION

**Class Hour:** 5:30-6:45pm MW

**Classroom:** Boyd 302

**Instructor:** Dr. Jeong-Hyun Kang

**Course webpage:** [www.westga.edu/~jkang/4043.html](http://www.westga.edu/~jkang/4043.html)

**E-mail Address:** [jkang@westga.edu](mailto:jkang@westga.edu)

**Office and Phone:** Boyd 316, (678)839-4143

**Office Hours:** 11:50pm-4:20pm MW, 6:45pm-7:15pm MW

**Textbook:** David M Burton, *Elementary Number Theory*, 6th edition

**Homework:** Homework will be assigned almost every class, and due on Mondays. Among those, only one or two problems will be graded (they will be specified.) Homework must be submitted at the beginning of class on the due date. It should be written legibly. Late homework will not be accepted. In case you miss class, it should be handed-in **before** the class. **Ten highest scores** (out of 12) will count at the end of the semester.

**Quiz:** On Mondays, we will have 5-minute quizzes at the end of class. It usually covers the materials from the previous week. The questions on the quizzes will be mostly of the “quickie” variety which can be answered on the spot, without much calculations. If you attend the lectures and are diligent in doing the homework assignments, you should have no problems with the quizzes. **Missed quizzes cannot be made up for any reason**, and instead, only **ten highest scores** (out of 12) will count at the end of the semester.

**Hour Exam:** There will be **2** one-hour exams. Missed hour exams may be made up **prior** to the actual test date if the student has a **provable excuse** such as official university travel or doctor’s note.

- Exam #1 on Mon., Oct. 1 or Oct. 8 (will be decided later), Ch.1– Ch.5
- Exam #2 on Mon., Nov. 19, Ch.6–Ch.9

**Presentation:** Each student will give a 20-30-minute presentation on a topic from number theory during last two weeks of the semester (and at the date of the final exam Monday, 5:30–7:30pm, Dec. 10, depending on the number of students left). The topics will be independent of the regular materials of the class and a bit challenging. I will give several topics throughout the semester and you can choose any (but should not overlap with others’.) If you have something particular in your mind, you can discuss with me in advance and can present your choice.

**Final Exam:** There is no in-class final exam. (However, you are responsible to attend if there is a presentation on Monday, 5:30–7:30pm, Dec. 10.)

### Grading Policy:

- Homework 10 %
- Quiz 10 %
- Hour exams 60 % (30% each)
- Presentation 20%

**Letter Grades:**  $\geq 90\%$  A;  $\geq 80\%$  B;  $\geq 70\%$  C;  $\geq 60\%$  D; below 60%

**Curving** : The exams will be quite standard, hence probably any curve won't be needed. However, exams can be graded on a curve **at most by 3-4 points** depending on the difficulty of the exam and the overall performance of the class. The curve will be announced after grading is complete. There will be **no additional curving** at the end of the semester.

**Calculator Policy**: You will **not** use calculators during the quizzes and the exams.

**Advice for Students**: There are eight levels of mathematical understanding, according to Dudley:

1. Being able to do arithmetic.
  2. Being able to substitute number in 'formulas'.
  3. Given 'formulas', being able to get other 'formulas'.
  4. Being able to understand hypotheses and conclusions of theorems.
  5. Being able to understand the proofs of theorems, step by step.
  6. Being able to really understand proofs of theorems: that is, seeing why the proof is as it is, and comprehending the underlying ideas of the proof and its relation to other proofs and theorems.
  - 6 1/2. Non-trivial applications of math can be placed here.—
  7. Being able to generalize and extend theorems
  8. Being able to see new relationships and discover and prove entirely new theorems.
- Calculus courses focus on level 1&2.
  - Lower level undergrad math courses (such as elementary linear algebra) focus on 3&4.
  - **Math 4043 focuses on 3,4,&5 with some of 6.**
  - Levels 5&6 are considered as basic mathematical abilities for math majors.
  - Levels 7&8 are researching mathematics.

**REMEMBER THAT NUMBER THEORY IS NOT ARITHMETIC BUT PROOF-BASED MATHEMATICS!!**