TOPICS IN NUMBER THEORY
MATH 6043
M,W 5:30-8:00PM; Boyd 307

Instructor: Dr. Landman
Office: Boyd 330
Office Hours: (on-campus) M 5:00-5:30, R 3:00-4:00PM, or by Appointment; (remote) TBA
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Texts:
2. Ramsey Theory on the Integers, 2nd Ed., by B. Landman and A. Robertson, American Mathematical Society

Prerequisite: Math 3003 (Transition to Higher Mathematics) or equivalent

Topics:
1. Division algorithm – Section 1.7 (Text 1)
2. Divisibility properties – Sections 2.1 – 2.5, 2.7 (Text 1)
3. Prime numbers – Chapter 3 (Text 1)
4. Congruences – Sections 4.1 – 4.3 (Text 1)
5. Conditional congruences – Sections 5.1, 5.2, 5.4 – 5.7 (Text 1)
6. Pigeonhole principle and introduction to Ramsey theory – Chapter 1 (Text 2)
7. Van der Waerden’s theorem – Sections 2.1-2.5 (Text 2)
8. Generalized triples – Section 5.1 (Text 2)
10. Diffsquences – Section 10.3 (Text 2)
11. Other topics (as time allows) – selected topics from Section 2.6, (Text 1), and Sections 3.1 and 6.1 (Text 2)

Graded Take-Home Assignments: Approximately every two weeks, a set of take-home problems will be assigned. These will be graded. Your work on these assignments is to be your own (no credit given otherwise). Late papers will not be accepted; if for some reason you are absent on the day they are due, then I must receive your work BEFORE they are due.

Homework (not graded): Additional homework will be assigned. Although these assignments will not be collected or graded, it is very
important for your success in the course that you do the homework regularly and on time. We will go over these in class.

**Tests:** There will be two in-class tests, and a cumulative final exam. These tests will be 75-minutes; with the rest of the class meeting devoted to new material. No make-up tests will be given without a university-approved excuse or doctor’s note, and I must be informed of your absence no later than the day of the test.

**Grading Procedure**

**Your grade in the course will be determined as follows:**

- Take-Home Assignments 40%
- Tests 35%
- Final Exam 25%

- An average of 85 or above earns a grade of A
- An average of 70 or above, but below 85, earns a grade of B
- An average of 55 or above, but below 70, earns a grade of C
- An average below 55 earns a grade of F

**Other:** It is **strongly recommended** that you allow at least 6-7 hours outside of class, each week, for homework and study (more would be better).

If you find yourself confused about a topic, please do not wait more than a day or two to come see me or email me to get the confusion cleared up.

In addition to my regularly scheduled “remote” office hours, you are welcome to e-mail me with questions anytime, and I should get back to you within a day.

**Important Dates:**

- February 22, Monday: Test 1
- March 3, Thursday: Last day to withdraw with grade of W
- April 11, Monday: Test 2
- April 25, Monday: Final Exam (5:00-7:30 p.m.)