MAT 541 – Elementary Number Theory Spring 2012

Instructor: Prof Declan Quinn, 229D Physics Building.   **Phone:** 443-1484

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Office Hours: Monday 12:45pm – 1:40pm, Tuesday 3:10pm – 4:00pm and Friday 10:35am – 11:30 am. (Any changes will be announced in class.)

Course Description: This is a first course in Number Theory. We will cover most of Chapters 1-9. Topics will include divisibility theory, congruence, and prime numbers. The course will be both computational and theoretical. You will be solving problems using the material, and writing proofs.

Text: *Elementary Number Theory,* 7th edition, by David M. Burton, McGraw-Hill 2011

Mathematics Prerequisites: Mat 331 and either Mat 275 or CIS 275.

Grading: Grades for the course will be determined by the total number of points accumulated on quizzes, homework, two midterm tests and a comprehensive final. Each midterm test will count 20%, the final 30%, homework 20% and quizzes 10% toward your grade. The dates for exams and quizzes are listed below. Quizzes will be based on the material and homework since the most rcent quiz or test.

Homework: Assignments are listed for each section. Some changes may be made from time to time and problems on some material not covered in the text will be handed out. It is imperative that you attempt all assigned problems. The best way to learn this material is to do problems. Time will be spent at the beginning of each class period answering questions. Some problems will be assigned for handing in and these will be graded. You are encouraged to work together on homework, but each student must write up a solution independently. No late homework will be accepted!

Quizzes: There will be 5 short quizzes during the semester. No make-ups for quizzes will be given, but to allow for emergencies, you may miss one quiz. If you take all quizzes, your lowest score will be dropped. The dates are (always on a Friday) January 27th, February 10th, March 2nd, March 23rd and April 13th.

Exams: The dates for exams are as follows

Exam I	Friday, February 17th
Exam II	Friday, March 30th
Final Exam	Tuesday, May 8th (5:13 pm – 7:15 pm)

There will be no make-ups for midterm exams. If you have an excused absence during a midterm exam, the grade will be made up from the corresponding portion of the final exam. For an absence to be excused, you must let your instructor know as soon as possible, preferably before the test. Upon returning to class you need to provide evidence that the absence was unavoidable – for example a doctor's note if you are sick or a letter from a Syracuse University coach if you have a team commitment.

Academic Integrity: The Syracuse University Academic Integrity Policy holds students accountable for the integrity of the work they submit. Students should be familiar with the Policy and know that it is their responsibility to learn about instructor and general academic expectations with regard to proper citation of sources in written work. The policy also governs the integrity of work submitted in exams and assignments as well as the veracity of signatures on attendance sheets and other verifications of participation in class activities. Serious sanctions can result from academic dishonesty of any sort.

Disabilities: Students who may need academic accommodations due to a disability are encouraged to discuss their needs with the instructor at the beginning of the semester. In order to obtain authorized accommodations, students should be registered with the Office of Disability Services (ODS), 804 University Avenue, Room-309, 315-443-4498 and have an updated accommodation letter for the instructor. Accommodations and related support services such as exam administration are not provided retroactively and must be requested in advance.

Course Learning Outcomes: Learning elementary facts and computational methods of number theory. Being able to solve problems related to number theory and work with some number theory functions. Understanding methods of proof and applying them to the results of elementary number theory, including being able to provide proofs for basic facts. Modeling situations from everyday life and other branches of science.

Assignments:

Section	Problems (These should be attempted as soon as section is covered.)
1.1	1abe, 4, 5b, 7, 12, 14
1.2	1, 3abd
2.1	1ac, 3(Ignore hint, use induction), 6, 8
2.2	2, 3, 4, 5, 11
2.3	2, 3, 4, 6c, 8a, 13, 20ae, 21
2.4	2ad, 3, 4abc, 7, 8
2.5	1, 2, 3ab, 5b, 6, 9b
3.1	1, 3abce, 4, 5, 6bd, 7, 12, 15
3.2	1, 3, 4, 9, 12c
3.3	1, 2, 3, 7, 8, 9a, 10, 13, 25, 26a
4.2	1, 2, 3, 4, 5, 6b, 8a, 10, 13
4.3	1, 2, 4, 6, 11, 15, 19
4.4	1, 2a, 3, 4ac, 5, 10, 17
5.2	1, 2, 3, 6, 7, 11(a), 15, 17
5.3	1, 2, 4, 10, 17
5.4	1ab, 5
6.1	2, 7a, 8, 9, 11, 12, 13, 17, 18, 19
6.2	1, 3, 4, 6, 7
6.3	1, 2bc, 3, 4, 5
7.2	1, 3, 4ab, 5, 6, 7b, 8, 9a, 11b, 13,14a, 17
7.3	1, 4, 7, 8, 10, 11
7.4	1, 2, 3, 6, 8
8.1	1ab, 2ac, 3, 4, 6ab, 11, 12ab
8.2	1 , 3, 4, 6, 7, 10
9.1	1ab, 3, 4, 5ab, 7, 9a, 11a, 12
9.2	1, 3, 5, 6, 8, 9, 17
9.3	1abcd, 2, 3ab, 4, 5, 9, 10a