SYRACUSE UNIVERSITY
MAT 541 – ELEMENTARY NUMBER THEORY SS-I 2016

Instructor: Prof. D. Quinn, Room 306A Carnegie **Phone:** 443-1484 **Email:** dpquinn@syr.edu

Office Hours: Monday, Tuesday and Wednesday 11am - 11.50am and Wednesday 2pm – 3pm (Any changes will be announced in class and by email.)

Course Description: Prime numbers, greatest common divisors, congruences. Euler's function, Fermat's theorem, primitive roots, indices, quadratic residues, Legendre and Jacobi symbols, and the quadratic reciprocity law.

Text: *Elementary Number Theory,* sixth edition, by David M. Burton, McGraw-Hill 2007

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 tests and the final.   The two tests will each count 20%, the final 25%, homework 15% and quizzes 20% toward your grade.   The dates for exams and quizzes are listed on the day-by-day syllabus below. Quizzes will be based on the most recent material and homework. Your best 7 quizzes will count towards your quiz grade. Check blackboard for solutions to quizzes and midterms, a copy of this syllabus and other announcements.

Homework: Homework is listed for each section below. It is imperative that you attempt all assigned problems. The best way to learn this material is to do problems. Time will be allotted at the beginning of each class to answering questions on the homework. Homework problems to hand in will be assigned. You are encouraged to work together on homework, but each student must write up a solution independently. It is important to develop your ability to communicate mathematics. No late homework will be accepted, but you may miss one assignment during the session without penalty.

Makeups: There will be no makeups for quizzes. To allow for emergencies, you may miss up to two quizzes without penalty. If you have an excused absence during a midterm exam, the grade will be made up from the corresponding part of the final exam. For an absence to be excused, you must let your instructor know as soon as possible, preferably before the exam. 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. Under no circumstances will the final exam be given early.

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; they 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 theoretic functions. Understanding methods of proof and apply 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.

Day-by-Day Syllabus: The following is an approximation to what will be covered in class each day. We may get a little ahead or even behind this schedule.

Mon	5/23	1.1	1(a,b.e), 4, 5(b), 7, 12, 14	
		1.2	1, 3(a, b, d)	
		2.1	1(a, c), 6	
Tues	5/24	2.2	2, 3, 4, 5, 11	
		2.3	2(b,d), 3, 4(b), 6(c), 8(a), 13(b), 20,(a.e), 21(a)	**Quiz 1**
Wed	5/25	2.4	2(a,d), 3, 4(a, b, c), 7, 8(b)	
Thurs	5/26	2.5	1, 2, 3(a, b), 5(b), 6, 8(b))	**Quiz 2**
Mon	5/30	3.1	1, 3(a, b, c, e), 4, 5, 6, (b, d), 7, 12, 15	
		3.2	3, 4, 5, 9	
Tues	5/31	3.3	2, 3, 7, 8, 9(a), 10, 13, 25, 26(a))	**Quiz 3**
Wed	6/1	4.1		
		4.2	1, 2, 3, 4, 5, 6(b), 8(a), 10, 13	
Thurs	6/2		Catchup/Questions	**Exam I** (55 mins.)
Mon	6/6	4.3	1(a), 2(a, c), 4, 6(a), 7(b), 9, 11, 14, 18	
Tues	6/7	4.4	1, 2(a), 3, 4(a, c), 5, 10, 17)	**Quiz 4**
Wed	6/8	5.1		
		5.2	1, 2(c), 3, 4(a, c), 6(b), 9(a), 11, 13	
		5.3	1(a), 3, 7, 11(a), 15, 17	
Thurs	6/9	6.1	2, 7(a), 8, 9, 11, 12, 13, 17, 18	**Quiz 5**
Mon	6/13	6.2	1, 3, 4(b), 6	
		6.3	1, 2(b, c), 3, 5	
Tues	6/14	7.1		
		7.2	1, 3, 4(a, b), 5, 6, 7(b), 8, 9(a), 11(b)	**Quiz 6**
Wed	6/15	7.3	1, 4, 7, 8, 10, 11	
Thurs	6/16		Catchup/Questions	**Exam II** (55 mins.)
Mon	6/20	7.4	1, 2, 3, 6	
Tues	6/21	8.1	1(a, b), 2(a, c), 3, 6(a, b), 11, 12(a, b)	**Quiz 7**
Wed	6/22	8.2	1(a, b), 2, 3, 4, 6, 7	
Thurs	6/23	9.1	1(a, b), 3(b), 4, 5(a, b), 7, 9(a), 11(a)	**Quiz 8**
Mon	6/27	9.2	1, c, 5, 6, 8, 9, 17	
Tues	6/28	9.3	1(a, b, c, d), 2, 3(a, b), 4, 5(a, b), 9	**Quiz 9**
Wed	6/29		Catchup/Review/Questions	
Thurs	6/30		**Final Exam** (cumulative, 105 mins.)	