UMass Boston 2017-01-23 19:03
Department of Mathematics
Math 458 - Theory of Numbers
Spring 2017

Course Name: Math 458 - Theory of Numbers (3 credits)

Description: This course is an elementary introduction to number theory. Topics to be covered include:

- divisibility, primes, greatest common divisor, Euclidean algorithm;
- congruences, the Chinese Remainder Theorem, Diophantine equations;
- arithmetic functions, Euler's and Fermat's Theorems;
- Pythagorean triples, quadratic Diophantine equations;
- quadratic residues and quadratic reciprocity;
- approximations of real numbers, continued fractions.

Pre-requisites: Aptitude for mathematics and mathematical curiosity. Some familiarity with formal proofs will be helpful; these skills will be developed during the course.

Audience: Math majors, both those planning on graduate school and those planning to teach high school. Computer Science majors looking for a theoretical elective. High school math teachers. Anyone who likes mathematics and wants to learn more.

Instructor: Catalin Zara, Associate Professor of Mathematics.
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Office: Science 3-091
Website: `czara.aczsite.net`
Phone: 617 287-6463

Goals: By fully participating in all course activities, students should be able to:

- Understand the fundamental concepts of number theory;
- Enjoy learning number theory;
- Practice reading and writing mathematics.
- Appreciate the beauty and power of mathematics.

Expectations: Students enrolled in this course are expected to be:

- Motivated and disciplined;
- Adequately familiar with background material;
- Committed and actively involved in their own learning;
- Able to work in groups;
- Secure enough to ask for help.

Schedule: TuTh 9:30am - 10:45am in M-02-417.
For every hour in class, you should dedicate at least three additional hours studying for this course. Students should not make any travel plans that would require them to leave before Saturday, May 20, 2017.

Textbook: Lecture Notes - provided by the instructor.
Recommended readings:

- A Friendly Introduction to Number Theory, 4th edition, by Joseph H. Silverman. ISBN: 978-0321816191. First chapters available at `http://www.math.brown.edu/~jhs/frint.html`.
- An Introduction to the Theory of Numbers, by Niven, Ivan, Herbert S. Zuckerman, and Hugh L. Montgomery. Wiley, 1991. ISBN: 9780471625469.
- Elementary Number Theory: Second Edition (Dover Books on Mathematics) by Underwood Dudley. ISBN: 978-0486469317

Office hours: **By appointment.** Times: TuTh 8:50am-9:20am, Tu 1:20pm - 1:50pm, and Th 12:30pm - 1:50pm in S-03-091. Please use the online form at
`http://catazara.youcanbook.me/`
to schedule a 10 or 20 minute appointment, at least 2 hours in advance. You can stop by without a confirmed appointment, but I may be unavailable.

Assignments: *Exams*: There will be a midterm exam (March 23rd) and a final exam (date TBD). Both exams will have an in-class and a take-home component. Make-up exams will be allowed only with an official excuse. In all other situations, a missed exam will get a score of zero.

Homework: There will be about seven homework assignments, due roughly every other week. Late homework will be penalized.

Grading:

Midterm exam:	25 points	A : 90%
Final exam:	35 points	B : 80%
Homework:	40 points	C : 50%
		D : 60%

Attendance: Regular class attendance is required and active class participation is expected. Students are responsible for material and announcements missed due to an absence. Please come to class on time and turn off your cell phone before the class begins.

Student conduct: Students are required to adhere to the University Policy on Academic Standards and Cheating, to the University Statement on Plagiarism and the Documentation of Written Work, and to the Code of Student Conduct as delineated in the University Catalog and Student Handbook. The Code is available online: `http://www.umb.edu/life_on_campus/policies/community/code`

Special accommodations: Section 504 of the Americans with Disabilities Act of 1990 offers guidelines for curriculum modifications and adaptations for students with documented disabilities. If applicable, students may obtain adaptation recommendations from the Ross Center for Disability Services, Campus Center, UL Room 211, (617-287-7430). The student must present these recommendations and discuss them with each professor within a reasonable period, preferably by the end of Drop/Add period.

Additional help: We will be using Piazza for class discussion. Rather than emailing questions to me, I strongly encourage you to post your questions on Piazza. If you have any problems accessing the site or you have feedback for the developers, email team@piazza.com. Find our class page at:
`https://piazza.com/umb/spring2017/math458/home`

Changes: Any changes or class cancellations will be announced in class or by e-mail or will be posted online. Course materials and announcements are posted on the piazza account: `https://piazza.com/umb/spring2017/math458`