Math 255: Elementary Number Theory
Spring 2017

For all of this and more, visit our course website `https://www.uvm.edu/~cvincen1/math255.html`.

Instructor Information: Professor Christelle Vincent, office 407 in Henry Marcus Lord House (16 Colchester Avenue).

 For content (i.e. mathematical) questions, please post your question to Piazza at `piazza.com/uvm/spring2017/math255/home`. For personal matters, please reach me by email at christelle.vincent@uvm.edu.

Course Description and Goals: In Math 255 we will study properties of integers, more particularly congruences, prime numbers, quadratic reciprocity, and time allowing continued fraction expansions. The class is aimed at students with no or limited knowledge of abstract algebra.
 The goals for this class are the following:
1. To solidify your conception of mathematics as a language and a way to make sense of and solve problems
2. For you to become proficient in proof writing using several common proof techniques such as proof by induction and contradiction
3. To help you become confident in your ability to learn mathematics from a book
4. To teach you some cool facts about integers and for you to become comfortable with some number-theoretic algorithms

Office Hours: I will have four hours of office hours each week, they are:
- Monday 2:20-4:20pm
- Wednesday 1:10-2pm
- Friday 10:30-11:40am

Textbook: *Elementary Number Theory*, 7th edition, by David M. Burton. The suggested problems will be assigned from the book and the reading quizzes will ask about its content, so you should have access to a copy.
 The book is available to rent and to buy used on Amazon. There is also a paperback version available. This is also the book that was used last year for Math 255, so there might be used copies on campus.
 It is not recommended that you use a copy of a different edition, since the homework problems will come from the 7th edition and the numbering may be different.

Attendance: You are expected to attend every lecture. If for whatever reason you cannot attend lecture, you are responsible for asking a classmate to tell you what you have missed.
 You can always send a friend to turn in your homework in class or during my office hours (see the homework policy below).
 If you miss lecture and a quiz is given that day, you will get a score of zero on that quiz.

ROTC, military, athletics: If you are a student-athlete or if you are in ROTC or have active military duty and you believe you might need accommodations due to commitments related to these

activities, please submit in writing to me by the end of the second full week of classes your planned schedule of athletic competition or your planned schedule of military duties for the semester. For all homework and reading quizzes, you will be expected to turn in your work on time, or in advance, as necessary, except in very special circumstances.

If you are a student-athlete, the department of Vermont Catamount Athletics has various resources to help you manage your academic load. Do not hesitate to avail yourself of these resources.

Religious accommodations: Students have the right to practice the religion of their choice. If you believe you might need accommodations to take part in religious celebrations, please submit in writing to me by the end of the second full week of classes your religious holiday schedule for the semester. Together we will work on arranging a way to make up any work you might miss. For all homework and reading quizzes, you will be expected to turn in your work on time, or in advance, as necessary, except in very special circumstances.

SAS: In keeping with University policy, any student with a documented disability interested in utilizing accommodations should contact SAS, the office of Student Accessibility Services (previously ACCESS). Once you have this letter, I will be available to meet with you privately to discuss the accommodations you plan to use in this course.

Grading: Your grade for this class will be based on your performance in the following activities, weighted as follows:

Quizzes: 15%
Homework: 15%
Midterm Exam 1: 20%
Midterm Exam 2: 20%
Final Exam: 30%

All of your work will be graded on correctness as well as legibility and clarity. I reserve the right to assign a score of zero to any problem or assignment that is unreasonably difficult to understand or read.

Suggested problems: After most classes I will suggest some problems from the book for you to work on. These problems are not for credit and you should not turn them in, although I am happy to give you feedback on your work if you come to my office hours. In-class quiz questions will be taken from these suggested problems. Seriously working on these problems regularly will be crucial to success in the class.

Quizzes: Approximately twice a week and certainly every Monday (Wednesday when Monday is a holiday), we will have a short in-class quiz at the beginning of class. The in-class quiz will be one of two kinds:

- An announced reading quiz. Reading quizzes will be on Monday (Wednesday when Monday is a holiday) and will be announced in advance on the course website. For the reading quiz, you may bring one page, double-sided, of notes from the assigned reading to help you answer the question.

- An unannounced quiz. The other days of the week, we may have a normal quiz. These quizzes will be closed-book and closed-notes, but the question(s) will be substantially similar to the

suggested problems. A suggested problem might be covered by a quiz as early as the next class period after which it has been posted.

Only your top ten quiz scores will count as part of your final quiz grade. There will not be any any make-up quizzes *under any circumstances*. If you must miss so many classes that you are not present for at least ten quizzes, please arrange a private meeting with me. If you can present me with documentation explaining your circumstances, we can work out some alternative way to assess your learning.

Homework: There will be a few problems assigned as written homework, due on Monday (Wednesday when Monday is a holiday). The homework will be graded and returned to you.

Homework will be due on the announced due date by 5pm. You must turn in your homework either to me in class or drop it off at my office. I do not guarantee that I will find, or grade, homework that is turned in anywhere else.

I will drop your two lowest homework scores from your total score at the end of the semester when computing your final grade. Late homework will be accepted only under very exceptional circumstances; the purpose of the dropped homework scores is exactly to account for the less exceptional circumstances when you are unable to hand in your homework on time.

Your homework *must* be stapled, and have your full name.

Exams: There will be two in-class midterm exams and a university scheduled final exam. The problems on the exams will be similar to the problems on the homework and the quizzes. All exams for Math 255 will be closed-book, closed-notes, with no calculators or other electronic aids permitted. Individual exams will not be curved nor scaled.

The tentative dates for the in-class exams are
• Wednesday, March 1
• Wednesday, April 12

If you have a conflict with an exam in this class, you must inform me in writing at least one week before the date of the exam, or one week before the last day of classes for the final exam.

If an emergency occurs and you need to miss an exam, you must notify me in writing within 24 hours of the exam. Please include the reason and documentation. Except if you are missing the final exam, your final grade will be based solely on the rest of the scores in the class.

The final exam is on May 11, from 10:30am to 1:15pm, in Votey 254.

Statement on diversity: Mathematics can be learned and enjoyed by everyone, regardless of gender, age, race, sexual orientation, or other personal characteristics. As a group we will work to create a space where we all feel welcomed and encouraged, and any actions or speech that detract from this atmosphere will not be tolerated.

In particular, we will be mindful of encouraging others to let us know if they do not already know something and do everything to support them in their learning. We will not say that things are "trivial." We will offer corrections gently and with the intention of helping the other, as opposed to making ourselves feel good.