MATH 052: FUNDAMENTALS OF MATHEMATICS
FALL 2012

JOHN VOIGHT

Course Info

- **Lectures**: Monday, Wednesday, Friday, 9:35 a.m.–10:25 a.m.
- **Dates**: 27 August 2011–5 December 2011
- **Room**: Perkins 107
- **Course Record Number (CRN)**: 90766

- **Instructor**: John Voight
- **Office**: 16 Colchester Ave, Room 207C
- **Phone**: (802) 656-2271
- **E-mail**: jvoight@gmail.com
- **Instructor's Office Hours**: Mondays and Wednesdays, 2:00–3:30 p.m.; or just make an appointment!
- **Course Web Page**: http://www.cems.uvm.edu/~jvoight/52/
- **Instructor's Web Page**: http://www.cems.uvm.edu/~jvoight/

- **Prerequisites**: Math 21 (corequisite).
- **Required Text**: Gary Chartrand, Albert Polimeni, and Ping Zhang, *Mathematical Proofs: A Transition to Advanced Mathematics*, 2nd edition, 2007.
- **Grading**: Daily "readiness" problems will count for 10% of the grade. Weekly homework assignments will count for 40% of the grade. Class participation and preparedness will count for 5% of the grade. There will be two 50-minute exams that will each count for 10% of the grade and one comprehensive final exam that will count for 25% of the grade.

Homework

The homework assignments are posted on the course webpage. Late homework will not be accepted. There will be two types of homework.

(1) The first type of homework, counting for 40% of the grade, consists of standard weekly homework assignments, typically due on Fridays.
(2) The second type of homework, counting for 10% of the grade, consists of one "readiness" problem due each class. You will be graded on 20 of these problems, and you may turn these 20 problems on whatever days you like. We will go over these problems in class; you may take notes during this discussion but only if you use a red pen.

Be sure to show your work and explain how you got your answer. Correct but incomplete answers will only receive partial credit. Part of the beauty of mathematics is in the elegance of its proofs, and one goal of this course is for you to learn to write mathematics excellently.

Cooperation on homework is permitted (and encouraged), but if you work together, do not take any paper away with you—in other words, you can share your thoughts (say on a blackboard), but you have to walk away with only your understanding. In particular, write the solution up on your own. Please write on your assignment the names of any other collaborators you worked with.

Plagiarism, collusion, or other violations of the Code of Academic Integrity

(see http://www.uvm.edu/policies/student/acadintegrity.pdf)

will be referred to the The Center for Student Ethics and Standards.

Class participation and preparedness

You are expected to read the section before we cover it in class. Come with good questions! Your participation and preparedness in class is essential for your success and will be assessed accordingly.

As a requirement for class participation, you must come to my office at least once before Thanksgiving break. A short visit suffices; if you cannot come during office hours, please email me to set up an appointment.

Exams

Outside of exceptional circumstances, make-up exams will not be given. Please record the dates of exams (below) in your calendar.

- **Exam 1**: Monday, 24 September 2012
- **Exam 2**: Wednesday, 31 October 2012
- **Final exam**: Friday, 14 December 2012, 1:30–4:15 p.m.

Accommodation

Appropriate and fair accommodations will be provided for students with documented special needs; please contact the ACCESS office (http://www.uvm.edu/~access/) directly and early in the semester.

Students have the right to practice the religion of their choice. Each semester students should submit in writing by the end of the second full week of classes their documented religious holiday schedule for the semester.

Syllabus

According to the "official" catalog description, we will cover:

> Emphasizing proofs, fundamental mathematical concepts and techniques are investigated within the context of number theory and other topics.

Math 52 serves to introduce students to the key principles of higher mathematics and to the mathematical community at UVM. Some explicit goals of Math 52 are that students will learn to:

(1) write sound logical proofs on course topics, including proofs by contradiction and by induction;

(2) use correct mathematical notation and terminology;

(3) distinguish between definitions and theorems;

(4) apply general mathematical results appropriately to specific cases; and

(5) make connections between different branches of mathematics.

The core topics include integers, algorithms, sets, logic, relations (including equivalence relations and equivalence classes), functions, methods of proof, recursion, and modular arithmetic. A selection of additional topics will be covered, possibly including: enumeration, number representations, introductory graph theory, fractals and chaos, complex numbers, elementary number theory, error-correcting codes, public-key encryption, and cardinality.