

Math 215: Introduction to Advanced Mathematics

UIC – Spring 2018

Instructor: Sherwood Hachtman

email: hachtma1@uic.edu

Section 41817: MWF 10:00-10:50 in Adams Hall 311

Section 42482: MWF 4:00-4:50 in Adams Hall 302

Office Hour: W 3-4pm in SEO 616.

Course page: <http://math.uic.edu/~shac/math215-F18/>

Text: Peter J. Eccles: *An Introduction to Mathematical Reasoning: numbers, sets and functions*, Cambridge University Press, 1997.

Course objectives: Students will practice reasoning and communicating about math with the goal of improving precision and effectiveness. Activities emphasize reading and writing proofs, as well as sharing mathematical ideas verbally in a collaborative environment. The topics covered are essential preparatory material for advanced proof-based courses (e.g. analysis and abstract algebra) required for the math major; in the process of learning this material, students are expected to become acquainted and comfortable with approaches to abstract reasoning which are more widely applicable, e.g. in physics computer programming.

Course topics: Logic: Truth tables, quantifiers. Proof methods: proof by contradiction, induction, etc. Set theory: Set operations, functions and maps, equivalence relations, order. Elementary number theory, including prime numbers and modular arithmetic. Elementary combinatorics: Counting arguments and topics in discrete math (graphs, probability).

Prerequisites: A C or better in math 181 and departmental approval.

Grading: Final grades will be determined as follows:

- 25% Homework, a total of between 8 and 10 assignments, due on Fridays.
- 15% Midterm 1, given in class on Friday, October 5
- 15% Midterm 2, given in class on Friday, November 2
- 30% Final Exam, Wednesday May 9, 1:00-3:00 PM, Location TBD.
- 15% Attendance and participation.

Readings and attendance: Time in class will regularly dedicated to working in groups on problems, as well as on critiquing and workshopping one another's mathematical writing. Therefore class attendance is important.

Furthermore, students are expected to read the course text in advance of the material being covered in class. These readings will be posted on the course web page, and short pop quizzes will be given on this material at the beginning of most class meetings; these quizzes will count towards the attendance grade.

Homework: Between 8 and 10 assignments will be given during the semester, each at least 10 days in advance of its due date. A select portion of homework will be graded based on correctness and presentation; the remainder will be graded for completeness.

You are encouraged to discuss the homework and course material with your classmates; however, your final write-up must be entirely your own work.

It is **strongly** recommended that you avoid using outside sources (e.g. the internet), but if you must, then any sources used must be cited in your write-up. **The use of outside sources without attribution is plagiarism, which is a serious violation of university policy, and will be reported appropriately** (see “Academic Integrity” below).

Make-up Exams: Make-ups for the midterms will be given only in the event of serious documented emergency or unavoidable conflict. Make-up exams will be more difficult, to compensate for the fact that a student making up the exam will have had more time to study.

The final exam is scheduled as follows:

- 10am section: Friday, December 14: 10:30-12:30pm
- 4pm section: Tuesday, December 11: 3:30-5:30pm.

Locations TBA. Students with a scheduling conflict (e.g. 3 exams scheduled on the same day) must contact the instructor as soon as possible **and before November 1** in order to reschedule.

Special accommodations: Students with disabilities must inform the instructor of the need for accommodations. Those who require accommodations for access and participation in this course must be registered with the Disability Resource Center. Please contact ODS at 312/413-2183 (voice) or 312/413-0123 (TTY)

More information at the Disability Resource Center: <https://drc.uic.edu/>

Academic integrity: Students are expected to abide by the UIC guidelines for academic integrity, see:

<https://dos.uic.edu/docs/Guidelines%20for%20Academic%20Integrity.pdf>

Instances of academic misconduct (including cheating, fabrication, plagiarism, threats, examination by proxy) shall be handled pursuant to the student Disciplinary Policy, <http://go.uic.edu/disciplinarypolicy>