

Course Syllabus

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Office Hours: Mondays and Fridays from 11 – 12, Wednesdays from 4 – 5. Meeting at other times is possible by appointment; to make arrangements, send email with availability.

Lectures: MWF from 10:05 am – 10:55am in CULC 129.

Textbook: G. Chartrand, A. D. Polimeni, and P. Zhang. *Mathematical Proofs: A Transition to Advanced Mathematics*, Third Edition, Pearson, 2012.

Course Description: “An introduction to proofs in advanced mathematics, intended as a transition to upper division courses including Math 4107, 4150 and 4317.”

Prerequisites: Math 1502: Calculus II or equivalent.

Fine Print: Successful completion of Math 4803–HEH will replace Math 2406 as the prerequisite for Math 4107, Math 4317, and Math 4150. Together with Math 4305, Math 4803–HEH will serve as a prerequisite for Math 4347. Math 4803–HEH can be substituted for math 2406 in BS MATH/DMTH curriculum. Students will not receive graduation credit for both Math 4803–HEH and Math 2406. Math 4803–HEH does not count as an upper level Math Elective course in the BS MATH curriculum. For any further questions, concerns, or clarifications, please contact Dr. Enid Steinbart, the SoM Director of Advising and Assessment.

Course Topics: Fundamentals of mathematical abstraction including sets (Ch. 1), logic (Ch. 2), equivalence relations (Ch. 8), and functions (Ch. 9). Thorough development of the basic proof techniques (Ch. 3 – 7): direct, contrapositive, existence, contradiction, and induction. Introduction to proofs in algebra (Ch. 13) and analysis (Ch. 12). Selected additional topics (from Ch. 0, 10, 11 as well as partial orders, upper/lower bounds, and \limsup/\liminf).

Learning Outcomes: Students should be able to understand and prove simple mathematical statements. For instance, in analysis, students will be able to prove that a given sequence diverges to infinity. In algebra, students will be able to prove that up to isomorphism there are two distinct groups of order four.

Grading Scheme: Grades will be based on **exams (80%)** and **assignments (20%)** according to the standard scale: **A** (90 – 100), **B** (80 – 89), **C** (70 – 79), **D** (60 – 69), **F** (0 – 59).

Exams: There will be four hourly exams, each worth 20% of the final grade. The exams will be closed book, closed notes, no calculator, individual tests. No makeup exams will be given.

Three exams will be in-class. Exam dates will be reconfirmed at least a week in advance. Hourly 1 is scheduled for Wednesday, **Sept. 10th**, Hourly 2 for Wednesday, **Oct. 8th**, and Hourly 3 for Wednesday, **Nov. 5th**.

Hourly 4 will be during the final exam period from **11:30 – 2:20pm** on Friday, **Dec. 12th**.

Assignments: There will be three types of assignments: in-class, online, and homework worth a total of 20% of the final grade. Beyond this, additional “practice problems” from the textbook will be suggested. You are strongly encouraged to work these (and others!) on your own and/or with other students to master fundamental course material.

ICAs: In-Class Assignments will be given regularly, typically on Mondays and Wednesdays (including “Dead Week”), and worth 5% of the total course grade. They will be graded on a scale of 0 – 2 based on effort only, and the lowest 4 scores will be dropped when computing the average.

WeBWorK: Online problem sets will be assigned regularly, typically due on Mondays and Wednesdays mornings (including “Dead Week”), and worth 5% of the total course grade. No partial credit will be given, and the lowest 4 scores will be dropped when computing the average.

Homework: Written problems will be assigned most weeks, and due one week later (including “Dead Week”) at the beginning of class, typically on Fridays. **Late homework will not be accepted.** They will be worth 10% of the total course grade, and the lowest 2 scores will be dropped when computing the average. For full credit, all directions must be followed.

A subset of the assigned problems will be selected for grading.

Solutions must meet the formatting requirements below. **Illegible and/or unintelligible solutions will receive no credit.**

1. Be neatly and clearly written in complete, correct sentences.
2. Be written on the front side of the page only.
3. Be stapled together if having multiple pages.

Collaboration is allowed (and even encouraged) when working on homework problems. However, solutions must adhere to the following content guidelines.

1. Be written independently in a student’s own words.
2. Clearly acknowledge any person with whom any part of the assignment was discussed.
3. Properly credit any outside resource consulted in completing the assignment.

Any solution which violates the content guidelines will receive no credit. Flagrant or repeated violations will be dealt with as a matter of academic integrity.

Attendance: Regular attendance is expected. Exceptions will be accommodated only for valid, documented reasons including (1) official representation of the Institute and (2) medical emergencies. Makeup exams and assignments will not be given.

Exceptions: Any student who may not be able to meet the requirements of the class as stated must speak with me individually within the first two weeks of class.

Academic Integrity: Students are reminded of the obligations and expectations associated with the Georgia Tech *Academic Honor Code* and *Student Code of Conduct*, available online through the Office of Student Integrity and the Honor Advisory Council.

Any violations must be reported directly to the Dean of Students.

More Information:

- Announcements and grades will be posted on T-Square — <http://t-square.gatech.edu>
- There is a Math 2803–HEH Piazza forum (available via T-Square) for online discussion. Any questions, comments, etc. of interest to more than one student should be posted on Piazza. Obviously, posts should be respectful and courteous at all times.
- Everything else will be posted on the course website — <http://www.math.gatech.edu/~heitsch/2803heh-fa14.html>

Updates: This syllabus is subject to modification. Any changes will be announced in class and posted on T-Square.