

MODERN ALGEBRA

Spring 2021

COURSE INFORMATION

TEXT: *Abstract Algebra: A Concrete Introduction*, by Robert Redfield.
The Princeton Companion to Mathematics, edited by Bowers-Green, Leader, and Gowers (via the library)

We will also use the online discussion platform Piazza; think of it as office hours in the comfort of your pajamas. Lecture notes will be posted on Piazza, too.

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GRADES

Grade	HW	ME&FE	WA	FP
A+	98%	95%	$n - 2$ E	E
A	95%	92%	$n - 2$ E	E
A-	92%	88%	$n - 2$ E	E
B+	88%	85%	$n - 2$ M	E
B	85%	82%	$n - 2$ M	M
B-	82%	78%	$n - 2$ M	M
C+	78%	75%	$n - 2$ P	M
C	75%	72%	$n - 2$ P	M
C-	72%	68%	$n - 2$ P	P
D+	68%	65%	$n - 4$ P	P
D	“65%”	62%	$n - 4$ P	P
D-	62%	58%	$n - 4$ P	R

This course uses **specifications-based grading**; each row above lists the **minimum thresholds** for achieving that letter grade in the course; numbers percentages should be read as averages and the letters should be read as “or better.” If you are deficient in one column but have been an active Piazza participant, I will take that into account in assigning your final course grade. I reserve the right to change minimum grade thresholds (only in your favor) at the end of the semester.

Find all course documents on [Blackboard](#).
This syllabus may be updated.

The word “algebra” and its mathematical connotation stem from a 9th century Arabic treatise entitled, *The Concise Book on Calculation by Restoration and Compensation*, by al-Ḳwārizmī.¹ This historical text dealt with finding the roots of a general quadratic polynomial, $ax^2 + bx + c$ where $a \neq 0$, by completing the square—hence “restoration” and “compensation.” This is where our journey begins. By the end of the course, we’ll have an understanding of what tools and techniques “modern” (19th and 20th century) algebra brings to bear on polynomials and their roots. This course gets more abstract as the semester progresses, so set good habits early.

SKILLS AND PRACTICES

Writing Intensive: We will focus on writing during class, and you will have several revision opportunities on writing assignments and the writing portions of exams. The final paper in the course will allow you to tie together what you’ve learned (and what you’ve already written in earlier writing assignments) into a mathematical survey paper written for a mathematically literate audience.

To support your progress as a writer of mathematics, I can help you during open hours or on [Piazza](#), and the QSR Center and the Writing Center both have a number of peer tutors who are familiar with mathematical proof writing and \LaTeX .

Educational Goals: This course supports several of Hamilton’s [Educational Goals](#).

Much of the **Disciplinary Practice**, **Creativity**, and **Communication and Expression** within mathematics comes through the process of solving a problem/proving a proposition and then writing it up. In this class, you will refine your proof writing skills and develop new mathematical prose writing skills.

TYPES OF ASSESSMENTS

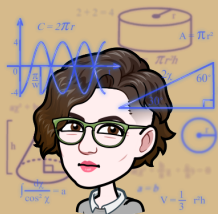
Homework (HW): *Due Tuesdays at 4pm (rigid).* The homework is graded by a Hamilton student and will be returned in 2-3 class periods. Because the written homework is graded by a student who is super-busy just like you, homework is due when it’s due! (Don’t @ me!) However, to help you out, I drop your lowest 2 homework scores.

Midterm Exams (ME): *Two 2-hour self-scheduled midterms.* Before the first exam, I will post a “preview” that describes the kinds of questions, the point distributions, and other information that will help you study.

Final Exam (FE): *One 3-hour cumulative self-scheduled exam.* The material on the final, though cumulative, will be weighted toward the material covered at the end of the course that was not tested on midterms.

Writing Assignments (WA): *Due Thursdays at 4pm (flexible).* You will write up solutions to problems and responses to writing prompts roughly once a week using \LaTeX (and in partners). There is a detailed rubric on Blackboard, but the big picture is that each writing assignment is graded among the options **E** (exemplary), **M** (mastered), **P** (passing), **R** (major revisions required). Of the n total writing assignments in the course, if you have received $n - 2$ scores of **M** or above after revision, you have met the minimum threshold for that column in the $B-$ and above rows of the table to the left.

Final Paper (FP): *Due by beginning of final exam.* This will be graded like a writing assignment; most of the content of this paper will come from writing assignments you’ve already completed, so think of it as a way to study for the final and get a chance to revise your writing one last time.



I'm Courtney Gibbons, Associate Professor of Mathematics, and I have been at Hamilton College since July, 2013.

I'm an alumna of Amity High School (2000), Colorado College (B.A. 2006), and the University of Nebraska–Lincoln (M.S. 2009, Ph.D. 2013). You might notice a little gap in the timeline; that's because I dropped out of college the first time around. Then I went back, transferred to a third college, graduated, took another “gap year” to work, and finally went to grad school to become a professional mathematician. No regrets.

My goal as a mathematician is to move the field forward: I want to prove new theorems, pave the way for a more diverse profession, and educate the next generation of mathematical problem solvers.

TIPS FOR SUCCESS

Office hours are great, but we can't always meet when it suits you. That's why this course uses Piazza as an online, asynchronous office hours forum. Here's how to get the most out of Piazza (and an additional incentive to use it):

- By using Piazza, you and your classmates leave a record of questions and answers for everyone. Check out what's been asked.
- You can answer questions, add to others' answers, and see if you missed something in your answer.
- If you use Piazza, I'll take that into account in your final grade if you don't meet one of the minimum thresholds.
- Finally: I will post our course lecture notes on Piazza, too, under “Resources” (you might find other stuff there, too).
- If you, as a class, prefer Piazza for organizing course material, I would love to move stuff out of Blackboard and into Piazza!

CLASSROOM ENVIRONMENT

The American Mathematical Society (the largest professional society for mathematicians) outlines its vision for a welcoming environment as follows:

The AMS strives to ensure that participants in its activities enjoy a welcoming environment. In all its activities, the AMS seeks to foster an atmosphere that encourages the free expression and exchange of ideas. The AMS supports equality of opportunity and treatment for all participants, regardless of gender, gender identity or expression, race, color, national or ethnic origin, religion or religious belief, age, marital status, sexual orientation, disabilities, veteran status, or immigration status.... A commitment to a welcoming environment is expected of all attendees at AMS activities, including mathematicians, students, guests, staff, contractors and exhibitors, and participants in scientific sessions and social events.²

I am committed to the same vision for our classroom environment, and I sincerely thank you for your contributions toward making our classroom (and open hours sessions) a lively and respectful community of thinkers. Please let me know if you feel that we have strayed from this vision at any point during the semester.

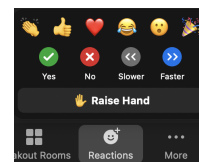
REMOTE CLASS POLICIES

Joining Class: You must login through your Hamilton Zoom account to join class. The reason is that I'd like to be able to create breakout rooms that I can use over and over again, and it's hard to do without making sure you're logged on to your Hamilton account. I know it's a pain, but if you've seen me create breakout rooms live, you'll probably agree that it's worth it to have the rooms created and ready to go.

Cameras: Whatever you feel comfortable with. I like to see your faces but that's no reason to require it! If you do have your camera off, I request that you make liberal use of Zoom reactions so I don't feel so alone up here.... I will tell jokes during class (to help you out, I'll often tell you that they are jokes). This is a great time to use a Zoom reaction.

Displayed Name: You can rename yourself on Zoom to whatever you would like to be called. You'll notice that my Zoom name is “Courtney Gibbons (she/her)” so you can call me Courtney, Prof. Gibbons, Gibbons, Dr. Courtney, Courtney Dr. Gibbons Prof., or any combination that you like. My pronouns are she/her, as in, “Have you taken a class with Prof. Gibbons? I like her, but she tells terrible jokes.”

Zoom Controls: The “Reactions” button on the Zoom controls has lots of options, including applause (use liberally), thumbs up (use liberally), heart (use liberally), cringey cry-laugh (use liberally), shocked face (use liberally), confetti cone (use liberally), as well as yes and no (use either when it seems appropriate), slower (use when you would like me to slow down), and faster (I think we probably won't need this one). You can also raise your hand, which means I will see a little blue hand icon on your Zoom box and in the participants list. If I don't notice that your hand is up for a few minutes, feel free to unmute and stop me!



Screen sharing: If I am talking as though I am sharing my screen but have forgotten to actually share my screen, please tell me.

Updating Zoom: Please check for Zoom updates every once in awhile. I'll remind you now and then to do this (the updates add features and security and stuff; they are worthwhile!).

RESOURCES

QSR Center: Provides free drop-in tutoring most afternoons and evenings; individual tutors can be arranged, too. The tutors are advanced students who can help you with homework problems and studying.

[QSR Schedule & Services](#)

Need support in your other classes?

[Academic Resource Centers](#)

Counseling Center: Offers individual and group therapy, peer counselors, psychiatric treatment, and a 24-hour hotline. If you need immediate assistance, phoning the Counseling Center and selecting option 2 will connect you with a counselor, 24 hours a day, 7 days a week. (315) 859-4340; [Counseling Center](#)

Health Center: Offers a variety of medical services for students. [Health Center](#)

Dean of Students Office: Offers a lot! [Dean of Students Office](#)

Associate Dean of Students for Student Support, Lorna Chase directs case management services involving referrals, follow-up as necessary, and working with students who need time off. (315) 859-4600; lhase@hamilton.edu

Associate Dean of Students for Academics, Tara McKee coordinates the academic advising program. (315) 859-4600; tmckee@hamilton.edu

Assistant Dean of Students for International Students and Accessibility, Allen Harrison coordinates services like disability documentation, academic adjustments, and accommodations. (315) 859-4021; aharriso@hamilton.edu

Residential Life: Your RA, your residential area director, and Res Life Director Ashley Place can help you with your living situation. [Res Life](#)

Chaplain's Office: Provides religious, spiritual, and meditative programming. [Chaplaincy](#)

Wellness Classes: Wellness PE courses are listed in the catalog, and you can find additional programming (eg, Chair Massage Tuesday!) through the Blood Fitness Center. [Recreation and Wellness](#)

National Talk and Text Suicide Lines: 1 (800) 273-TALK or text "START" to 741-741. If you want a counselor of color, text "STEVE" to 741-741

YOUR RESPONSIBILITIES

Piazza This term we will be using Piazza for online discussions (and virtual office hours). The system is highly catered to getting you help fast and efficiently from classmates and me. Rather than emailing questions to the me, I encourage you to post your questions on Piazza, and I will try to keep a record of office hours questions on Piazza, too. If you have any problems or feedback for the developers, email team@piazza.com.

Accommodations, Conflicts, & Makeup Exams Except in the case of severe illness or emergency, I need advance notice so that I can schedule a make-up midterm for you. Give me notice **at least one week prior to the exam** that you have an academic accommodation or a conflict due to academics, a religious observance, work, athletics, or a student organization event. The final exam can be rescheduled only in very specific circumstances: travel plans home for break don't count, but three finals on the same day do.

Attendance & Honor By enrolling in this class, you are agreeing to be an engaged student, to come to class with a learner's attitude, and to encourage your fellow students to do the same.³ You are part of a community that believes in the power of the Honor Code to make Hamilton College a great place to be a student and a teacher. We are *all* bound by the responsibility to actively create and maintain a culture of learning, academic integrity, and personal honor. I do not take my responsibility lightly; nor should you!

Getting Stuck Being stumped is part of learning mathematics, so please attempt to solve homework problems on your own before asking for help on them. Collaboration on the homework is encouraged as long as you are collaborating with your peers currently enrolled in any section of Math 325W. However, make sure to write up your final drafts separately to ensure that you have each fully understood the answer(s). Similarly, even though you will be assigned a writing partner for the writing assignments, it is your responsibility to make sure you understand and approve of all the mathematics your team turns in.⁴ Please check with me before using resources other than your classmates, piazza.com, tutors at the QSR or Writing Centers, or online \LaTeX help; for example, check with me **before** asking other professors, students not currently enrolled in Math 325W, the internet, a magic eight ball, the ghost of Gauss, etc. Mathematical plagiarism is a subtle business, and it's easy to accidentally plagiarize by copying a solution you've read somewhere else.⁵

HELP!

Depressed? Anxious? Overwhelmed? Sick? Tired?

Talk to me! I'm not a counselor, but I am a human being (I think). Together, we can come up with a plan to use campus resources to help you feel better. Please know that I assume every student is putting forth a good effort in my classes, and more than anything, I want to help you succeed in my class and at Hamilton. You can also see a list of resources at the side of the page.

NOTES

¹The Oxford English Dictionary, retrieved January 30, 2021.

²AMS Policy on a Welcoming Environment, retrieved January 30, 2021.

³If you wantonly skip class, aside from missing out on the learning community within the walls of our classroom, you'll penalize yourself by getting lower homework and test scores than you otherwise would. And anyway, I **do** notice if you're not in class.

⁴Honor Code issues aside, you're doing your education a disservice if you turn in work you have not personally thought through carefully. Plus, some Writing Assignment problems will reappear on exams or on the final paper.

⁵Seriously, though: you can't "unsee" someone else's solution. There are deep and interesting ethical conundra lurking here; Googling unwisely (or at all) may lead you down a path you didn't intend to follow.

