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| Instructor: | Nathan Pflueger (pronounced “fleeeger”) | office hours: | Tuesday | 2:00-3:30 |
| email: | npflueger@amherst.edu | (tentative) | Wednesday | 2:30-4:00 |
| office: | SMUD 401 | | Friday | 1:30-2:30 |

Math Fellows: Aidee Hernandez
Admire Madyira
Ali Sbeih

Times and locations: Mon, Wed, Fri 11:00-11:50 SMUD 204

Course webpage <http://npflueger.github.io/121/> (I rarely use Moodle)

How to reach me Come to office hours! No appointment is needed. Besides that, I generally reply to email within 24 hours. However, **I may not read or reply to email on weekends, outside business hours, or on Thursdays**, which is the day I devote primarily to research.

Course content

Math 121 combines a few different topics that grow out of introductory calculus. The unifying theme of the course is that you will develop confidence and problem-solving skills in situations where there are **many possible solution techniques** and some strategy is required. Furthermore, this course emphasizes **constructing short, convincing arguments**, which builds a bridge towards the proof-based courses of the math major.

Topics The three main topics of this course are integration techniques, infinite series, and parametric equations / polar coordinates. The tentative course schedule is as follows:

- 1/30-2/8 (2 weeks): Inverse functions, exponentials and logarithms (Chapter 6)
- 2/10-2/27 (2 weeks): Integration techniques (Chapter 7)
- 3/1-4/19 (6 weeks): Sequences and series (Chapter 11)
- 4/21-5/8 (3 weeks): Parametric equations and polar coordinates (Chapter 10)

What to expect Math 121 will require a significantly larger commitment than Math 111 or most high school versions of Calculus I or II. You should expect a higher workload and more conceptually difficult problems than you have seen in previous calculus courses. The first time you find yourself struggling to solve a problem or understand a concept from class, please seek help from me, the Q Center, or your peers.

Prerequisites Calculus 1 (MATH 111, or equivalent). You should have studied and be familiar with limits, differentiation and early integration. We will assume basic notions from pre-calculus (e.g. functions and graphing) material, but some of this will be reviewed as needed.

Textbook James Stewart, *Single Variable Calculus*, **8th edition**, by James Stewart. Brooks/Cole 2016.

Course structure

Grading: Grades are based on the following categories. The exact cutoffs for each letter grade are not set in advance; I calibrate them at the end based the difficulty and score distribution of the exams. There is no set curve, but typically the median grade is around B+.

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| Participation | 5% | |
| Homework | 15% | usually due Wednesdays and Fridays at midnight |
| Midterm 1 | 12% | Friday 2/24 in class |
| Midterm 2 | 12% | Friday 3/31 in class |
| Midterm 3 | 12% | Friday 4/28 in class |
| Final exam | 30% | Date/time to be set by registrar (will be three hours) |
| Your best exam | 14% | (midterm or final; added to its original weight) |

Expectations You should expect to spend at least eight hours studying and working on problem sets outside of class each week. Of that time, I recommend that you spend at least two hours reviewing your notes, the textbook, and previous assignments. Distributing your practice and review throughout the semester will be much more effective than concentrating your review and studying right before exams or due dates. You are expected to attend class every day, arrive on time, and be respectful. You are expected to know about any announcement I make in class or by email.

I encourage you to **stop me to ask questions**. Active participation helps but your brain in the mode that will make new connections and learn well. If you are feeling lost, there is almost certainly someone else feeling the same thing; asking a question may help many of your classmates as well!

Course policies

Dropped assignments To compensate for illness and other emergencies, your **lowest four homework scores will be dropped**. If you cannot make a due date due to an emergency, my advice is to skip the assignment, but study and understand the problems when you have time, and focus on keeping up with the new material in the course. You do not need to apologize or provide any reasons for skipping an assignment or turning it in unfinished; please choose what is best for your time, health, and well-being.

Homework deadlines and late policy Homework will be **due at midnight**, typically on Wednesdays and Fridays, via Gradescope. To allow for technical difficulties or other last-minute issues, Gradescope will allow you to submit homework after the deadline, however your score will be reduced by 2% per hour after the deadline (scaled continuously, e.g. being fifteen minutes late results in a 0.5% deduction). Please try to turn in your work by midnight (I don't want to be responsible for lost sleep!), but don't worry about short delays. **I generally do not grant extensions**, but instead drop two assignments (see above).

Missed exams The midterm dates are listed above. **Put them on your calendar now**. Exam dates/times are fixed and may not be rescheduled except in the case of an extenuating circumstance (illness, emergency, religious conflict, etc.) with a note from a health professional or dean. In such a case, please let me know at the start of the semester, or as soon as possible. Other than by reason of a valid extenuating circumstance, a missed exam will be counted as 0. In valid

extenuating circumstances, I will often simply excuse the exam and count your final exams grade in its place. This is because I usually release exam solutions soon after the exam.

The final exam date is set by the registrar, and should be available on the registrar's website partway through the term. The final exam will be sometime in the week of May 15-19. **Do not schedule travel before the end of exam week unless the final exam date has been determined by the registrar.**

Accommodations I strive to make this course welcoming to all students. If you would like to discuss your learning needs with me, please schedule a meeting so that we can work together to support your academic success. Anyone who may require an accommodation based on the impact of a disability should contact me to make arrangements. I rely on Accessibility Services for assistance in verifying the need for accommodations and developing accommodation strategies, so you should contact them at accessibility@amherst.edu or 413-542-2337. If you require accommodations on exams, please arrange this with me at least one week in advance.

Intellectual responsibility

- **Homework:** Mathematics is a collaborative subject; open and generous communication is one of its core values. Therefore you are strongly encouraged to work with other students, ask many questions, and learn from as many people as possible. However, you must write up the solution yourself. **All your submitted work must be your work, written in your own words.** Copying solutions from other students, solutions manuals, online databases, or artificial intelligence tools is plagiarism; such copying will result in a 0 on the assignment and will be reported to Community Standards. You are also expected to **list each person your worked with** on the front of your homework assignment.
- **Exams:** You will be allowed **one page of notes (front and back)** for each exam. No calculators or other aids are permitted. Cell phones should be stowed out of sight during exams. Use of cell phones or other devices during the exams will be grounds to receive a 0 on the exam. You are bound by the college's honor code, and all work must be entirely your own on exams.

For homework and exams, I reserve the right to give no credit for any work that appears suspicious.

Tips and resources

Come to office hours! I am happy to answer your questions and also talk about the course in general. Even if you don't have specific questions, you can come to review material, listen to other students' questions, or just to chat. There is a desk in my office and several just outside where you are welcome to work, chat, and listen in. Office hours are the best way I have to learn about you and how you're doing in the course and the college, so please visit!

Focus on practice and improvement. Every homework problem, or example and class or the book is an opportunity to practice. Take these opportunities, and make the most of them!

Distribute your practice. Study a bit every day, not just before exams. Treat every homework problem as a chance to practice and study.

Actively seek opportunities to practice. Ask me questions, ask classmates questions, read examples in the book, and try problems that haven't been assigned.

Frustration is normal. Learning is a long process, and you will struggle often. As a professional mathematician who proves theorems for a living, I can tell you: at least 95% percent of doing math is trying things that don't work, and feeling frustration. The reward is worth it! **You are welcome to talk to me about whatever difficulty you're facing.** I want all of my students to be successful and take satisfaction from their mathematical work.

Resources and additional help Be sure to take advantage of office hours, and your peers, to answer questions and think through the material. The staff at the **Moss Quantitative Center** in the Science Center will host regular help hours, and are available for individual appointments. We also have a Math Fellow for the course, who will hold regular office hours, host exam review sessions, and be available to help with LaTeX. The schedule of these help hours will be posted on the course website once they are set. Finally, some students may benefit from a peer tutor, if they are already using the available help hours and require additional support. Peer tutoring is a limited resource, so please speak with me about it before requesting tutoring.