

M305G – Precalculus

Summer II 2008

Time and place: Monday through Friday, 11:30 – 1:00 PM, RLM 6.122

Course text: *Precalculus*, Custom Edition for the University of Texas at Austin (from the Eighth Edition), by Michael Sullivan.

Instructor: Cody L. Patterson (**Note:** Please just call me “Cody.”)

E-mail: cpatters@math.utexas.edu

Webpage: <http://www.ma.utexas.edu/users/cpatters/cpatters.html>

Office: RLM 9.144

Office hours: Monday through Friday, 1:00 – 2:00 PM, or by appointment

Welcome to M305G!

The purpose of this course is to develop mathematical skills and knowledge that you need to master in order to succeed in calculus. Depending on your degree and career goals, you may or may not intend to take calculus in the future; however, please understand that the pace and level of sophistication of the course will be geared towards future calculus students, and you will be evaluated on your level of readiness for M408C or M408K (first-semester calculus). In addition to exploring mathematical concepts, we will also develop useful critical thinking and problem solving skills. My goal is to help you gain confidence in your mathematical abilities and to help you master skills that will serve you well in future math and science courses.

Grading and expectations

Your grade will consist of the following components:

- Three exams (including the final) – 25% each
- Homework (approximately 10 problem sets) – 15%
- Best exam score – 10% **or** Class participation – 15%

The last category listed above is a “wild-card” category. One option will add an additional 10% weight to the best of your three exam scores. The other option will award you up to 15 percentage points based on your attendance and class participation. At the end of the semester, I’ll use the option that benefits you the most to compute your final grade. Note that under the “participation” option, the percentages add up to 105% rather than 100%; since you’ll be graded on the standard 90%-80%-70%-60% scale in either option, this gives you the opportunity to earn some extra credit for being active in class. I find that a class as a whole performs much better when students are actively engaged in what we’re doing, and thus I want to provide some incentive for you to be a part of this.

When deciding your final grade, I will be no stingier than the following scale: A = 90%–105%, B = 80%–89.9%, C = 70%–79.9%, D = 60%–69.9%, F = 0%–59.9%. I may be more generous than this if I feel that students’ grades are not indicative of their performance and effort. However, I will not lower my expectations for students who perform poorly or are not ready for first-semester calculus.

Exams

We’ll have three exams in this class. The first two will be given during class on **Wednesday, July 23** and **Monday, August 4**. The third will be given during the class’s designated final exam time and will only cover the material we have discussed after the second exam.

Each exam will consist of two parts. On Part I, you will not be allowed to use any notes, books, or calculators; the questions on this part will be things that I expect you to remember or be able to work out by hand. On Part II, you will be allowed to use a calculator and one 8.5”-by-11” page of notes. The questions on this part will require you to apply what you’ve learned and solve some more involved problems.

If for some reason you must miss an exam, please notify me as soon as possible so that we can arrange

a make-up exam. Make-up exams will only be given for University-excused absences; you must provide documentation (such as a doctor's note) explaining your absence.

Homework

We will have homework due every Monday, Wednesday, and Friday, unless there is an exam the same day. Homework will be collected just after class begins; papers handed in at the end of class will not be accepted. If you expect to miss class, you may turn in your homework by sliding it under my office door **before** the class when it's due. (Please keep in mind, however, that I cannot guarantee that I will get every paper that is left under the door.) Late homework will not be accepted under any circumstances. To allow for unexpected absences, I plan to assign a large number of extra-credit problems which you may solve for bonus points.

I will grade your papers for the correctness and completeness of your work. I will assign a mix of odd-numbered problems (whose answers are provided in the text) and even-numbered problems, but the grading will be focused more on the latter. I reserve the right to deduct points for sloppy work or for papers that are unstapled, so please be neat and staple your work.

Participation

You will receive a "participation grade" of up to 15 points for the semester. Everybody's participation grade will start at zero. You may increase your grade in any of the following ways:

- Write a paper on one of several mathematical topics. (See the instructions posted on my webpage.) Worth up to 5 points. **If you do not write a paper, your participation grade will be capped at 12 points.**
- Give a solution to a homework problem someone asks about in class. Worth up to 2 points each time.
- Do well on a pop quiz given in class. Worth up to 2 points each time.

There's really only one way to decrease your grade, and that is to miss class. Each unexcused/undocumented absence will cost you 3 points. And there's a hidden penalty for missing class as well – I'm far less willing to hold extra office hours for students who don't come to class regularly.

A note on courtesy

Please silence your cell phones before we begin class, make every effort to get to class on time, and don't leave until class is dismissed. I lose my train of thought rather easily when I am distracted, and (far more importantly) this may be the case for some of your classmates as well. We appreciate your cooperation.

Academic dishonesty

You are encouraged to work together on the homework for this class, but the solutions you write down must be your own, not copied from a classmate's or from any other source. Obviously, no collaboration or unauthorized help is allowed on the exams. Cheating has a detrimental effect not only on the class in which the cheating occurs, but on the academic culture of the entire university. Accordingly, I will vigorously prosecute any instance of academic dishonesty that takes place in this class.

Students with disabilities

The University of Texas at Austin provides, upon request, appropriate academic accommodations for qualified students with disabilities. For more information, contact the office of the Dean of Students at 471-6259, TTY 471-4641.

One more thing...

As your instructor, I am committed to doing everything I can to help you make the most of this course. If you have questions, comments, or suggestions regarding our class, please do not hesitate to contact me.

"Always do the right thing. This will gratify some people and astonish the rest." – Mark Twain

Some Advice on How to Succeed in This Class

1. Taking a math class during a five-week summer session presents certain challenges that you will have to overcome if you wish to succeed in this class. We'll be covering in five weeks what most people learn in a full semester during the fall or spring at UT, and what some people learn in a full academic year (!) in high school. This task is daunting enough when you're taking a history or literature course, but in a mathematics course, you are asked to develop thinking skills that take considerable time and practice to mature. This means that if you wish to learn precalculus in the limited time we have together, you will have to **work hard**.
2. In case it's not clear what constitutes "hard work," here is a guideline you may want to keep in mind. The conventional wisdom in higher education is that you should expect to put in three hours of work outside of class for each hour spent in class. By this standard, since we'll be meeting for about 7.5 hours per week, you should expect to put in 22.5 additional hours per week working on homework, reading the text, and studying for exams. Of course, your mileage may vary: if you are naturally skilled at mathematics, you may need far less time than this to succeed. On the other hand, if you tend to work slowly, or if it's been a while since you took a math class, you may need more time to get comfortable with the material.
3. Sullivan's book is very nicely laid out as math textbooks go (and I tend to be a pretty harsh critic of math books); I think you'll find it to be pretty user-friendly. So **read the book, preferably before you come to class**. Math is much easier when you're learning it for the second time than when you're learning it for the first time. If you'll make a commitment to read the sections in the text before we cover them in class, you'll find my lectures much easier to follow than if you're hearing the material for the first time.
4. **Ask questions during class**. You'd be surprised how often a math teacher makes small (but potentially confusing) mistakes during a lecture, or uses a term that hasn't been properly introduced, or says something that is just plain impossible to follow. A lot of students refuse to ask questions because they're worried about holding up the class or looking foolish. I know that I can't talk you out of feeling that way – after all, I'm a student, and I feel that way too sometimes. But believe me, if you ask a question, somebody else in the class who had the same question will appreciate your courage. And I absolutely will not abide rudeness towards students who ask questions, from myself or from other students (and neither should you).
5. **Do the homework**. Not only is homework a fairly important part of your grade, it's pretty much the only way to really learn to do mathematics. When working on the homework, you should keep in mind that you will eventually be responsible for being able to do problems without books, notes, or calculators. If you are unable to do the homework problems without frequently referring to the text and without using a calculator, this is a good sign that you aren't yet familiar enough with the material.
6. **When studying for an exam, do extra problems**. The exams in this class will consist almost entirely of problems (rather than definitions, theorem statements, *etc.*). Therefore, the best barometer of your ability to succeed on an exam is your ability to do the problems in the textbook (and other problems that I may ask you to work out).
7. **If you are having trouble (or even if you aren't), see me early – and often**. I have chosen to have office hours everyday so that you can see me frequently if you need extra help. If you feel like you're falling behind, don't wait – come and see me. I can't help you if I don't know you're having trouble. Don't be shy – if nobody comes to see me, I'll probably spend the hour sitting at my computer and aimlessly surfing the web, and I'd much rather be visiting with you and talking about math.

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 Tentative Course Schedule

Date	Sections	Topics
7/14	1.1, 1.2	Coordinate geometry, graphs, and symmetry
7/15	1.3, 1.4	Lines, circles, and their equations
7/16	2.1, 2.2, 2.3	Graphs and properties of functions
7/17	2.4, 2.5	Standard examples of functions, transformations of graphs
7/18	3.1, 3.2	Linear functions and models
7/21	3.3, 3.4	Quadratic functions and models
7/22	4.1	Polynomial functions and models
7/23		EXAM 1 – 1.1 through 4.1
7/24	4.2, 4.3	Rational functions and their graphs
7/25	4.4, 4.6	Rational inequalities, complex roots of polynomials
7/28	5.1, 5.2, A.10	Compositions and inverses of functions, rational exponents
7/29	5.3, 5.4	Exponential and logarithmic functions
7/30	5.5, 5.6	Properties of logarithms, exponential and logarithmic equations
7/31	5.7	Interest
8/1	5.8, 5.9	Exponential and logarithmic models
8/4		EXAM 2 – 4.2 through 5.9
8/5	6.1, 6.2, 6.3	Angles and trigonometric functions
8/6	6.4, 6.5	Graphs of trigonometric functions
8/7	6.6	Phase shift
8/8	7.1, 7.2	Inverse trigonometric functions
8/11	7.3	Trigonometric identities
8/12	7.4, 7.5	Sum of angles, difference of angles, double-angles, half-angles
8/13	7.6	Sum-to-product and product-to-sum identities
8/14	8.1, 8.2, 8.3	Solving triangles using trigonometry
8/15	8.4	Areas of triangles
TBA		EXAM 3 – 6.1 through 8.4

M305G – Precalculus First-Day Questionnaire

Please answer the following questions. Your answers to some of these questions will help me make decisions about how I teach this course, so your input is important! If there is a question you do not wish to answer, you may skip it.

1. What is your name? (If you have a middle name or nickname you prefer, please indicate this.) If anyone has ever mispronounced your name, *ever*, please include a pronunciation guide for me, because I'm likely to mess it up too.
2. Please give me a current e-mail address where I can reach you. (This is important; I frequently use e-mail to communicate with students, and I will hold you responsible for receiving these e-mails.)
3. Why are you taking this course?
4. Have you taken a precalculus course before (either in high school or in college)? If so, please give a brief description of your experience with it.
5. What is your major (or intended major)? Do you plan to take calculus in the future?
6. What do you hope to do after you finish your degree?
7. Tell me something interesting about you that has little or nothing to do with school.

8. If you needed to, could you make it to my office hours from 1 PM to 2 PM (Monday through Friday)?
If not, what would be a better time?
9. I plan to have a review session (which you are not required to attend) the night before each test. Would you be able to attend a review session from 7 PM to 9 PM on each of these nights? (Note that one of these nights would be a Sunday night; I can do afternoon instead that day if that is preferred.)
10. For each of the following statements, please indicate (by circling a number) to what extent you agree or disagree with the statement. 1 = strongly disagree, 2 = disagree, 3 = no opinion, 4 = agree, 5 = strongly agree.
- 1 2 3 4 5 I enjoy doing math.
- 1 2 3 4 5 I find mathematics to be challenging.
- 1 2 3 4 5 I am a visual learner.
- 1 2 3 4 5 I am an auditory learner.
- 1 2 3 4 5 In order to learn a new skill, I need to practice it myself.
- 1 2 3 4 5 I would rather work with others than work by myself.
- 1 2 3 4 5 I would like to have a group of students to study for this class with.
- 1 2 3 4 5 To understand a theorem, I need to know why the theorem is true.
- 1 2 3 4 5 I understand an idea better if it can be expressed with a picture.
- 1 2 3 4 5 I want to know how mathematical ideas are used in real life.
- 1 2 3 4 5 I can do most math homework without a calculator.
- 1 2 3 4 5 I am anxious about taking tests, even if I have prepared for them.