Course Materials

The university-wide text for MATH 111 and MATH 112 is *Functions Modeling Change: A Preparation for Calculus for the University of Oregon*, by Connally, Hughes-Hallett, Gleason, et al. Our course is based on the content in chapters 7 through 12 (except for chapter 11) in this textbook, but we will not be using it as a reference. Instead, we will be using course notes that will appear on the course website (these notes are free). It is recommended that students purchase the textbook as it is a useful resource for practice problems but no homework exercises will come from it and no reading will be assigned from it. Although the sections in the notes each correspond to the content of a section in the textbook (at least loosely), they are not numbered in the same manner. The first section that we cover, for example, is section 10.3 in the textbook; this will be section 2.1 in the notes. This, unfortunately, is unavoidable.

It will be extremely useful for students to bring a copy of the course notes with them to class. You may print them out if you’d like, but you are also welcome to bring a laptop or tablet to class to view the notes. In fact, the notes are optimized for use on a computer. The document containing the course notes will be in .pdf format so it is possible to view them on most modern cell phones, but, due to the size of the text, a cell phone might not be ideal.

A scientific calculator (or higher) will be required on exams; specifically you will need trigonometric and logarithmic functions on exams. Please be aware, however, that **cell phones, ipods, laptops, and similar devices cannot be used during tests**. The primary function of the device that you use on exams must be a calculator and anything with wireless connectivity is strictly prohibited.

You will need to make frequent reference to the course website located at

http://pages.uoregon.edu/raies/teaching.html.

This is where I will post relevant course materials including the course’s lecture notes, exam reviews, and important dates.

Overall Course Structure

The format of this course is likely much different than any math class you’ve had before. In most classrooms the classroom time is dedicated to lecturing where students learn the concepts and see examples demonstrating the material. Our class will follow an inverted model in which the students attempt to learn the concepts and see examples outside of class and then work on homework during class in small groups and ask questions. It can be difficult to adjust to this type of inquiry based learning at first, but it is a more effective way of learning mathematical content for many students.
The first week will be dedicated to review from MATH 111 and there will be two midterm exams and several review days. Most days, however, will be dedicated to small group discussion. Each day we will be considering a specific section of the notes. The evening before that day, students are expected to read the section of the notes corresponding to that content and to do a couple of rudimentary problems over that content. Then, during class, students will break into small groups and work on a worksheet designed to reinforce the material and on the homework for that section. In the last five minutes of class there will be a short quiz covering the material from that day.

For example, the first section that we cover will be section 2.1 in the notes on Monday, October 7th. On Sunday night (or earlier), students should read section 2.1 in the notes, read the example problems, and work out the Your Turn problems in the section. It is certainly useful to start working on the homework if you’re feeling ambitious. When class starts on Monday students will turn in the Your Turn problems and get together in small groups. I will pass out a worksheet on which students should work until they feel ready to start working on their homework. As we work on the worksheet and on homework I will be walking around and answering any questions, although students should first try to consult their group members and the course notes to help answer questions. Then, with about seven minutes left in the class period, I will break up the groups and we will take a short quiz covering the material from section 2.1.

Grades

Final grades are determined according to the standard scale with pluses and minuses given at my discretion. The graded materials throughout the course are weighted as follows:

- **Your Turn Problems**: 5%
- **Homework**: 15%
- **Quizzes**: 20%
- **Midterm 1**: 15%
- **Midterm 2**: 15%
- **Final Exam**: 30%

Keep in mind that grades are not competitive; one student’s success in no way affects any other student’s grade. I encourage students to work and study together. Grades will be posted throughout the term on Blackboard.

Reading assignments and *Your Turn* Problems

On most days there will be a reading assignment that must be completed before class. Students should not find these assignments unreasonably long; most of them are between 10 and 20 pages. These readings are meant to replace lectures; they contain theory and explanation as well as examples and applications. It is important that students read critically. I recommend re-reading anything that is not clear and writing down any questions that you have. The notes contain several examples and it is important that you read them carefully.

Each section contains several (usually two or three) problems which are labeled *Your Turn* and are found in a green box. (Note that oftentimes these problems will follow a similar example.) As you read through the section, make sure you work out each of these problems on a sheet of paper. At the beginning of class on the day that the reading assignment is due I will collect these problems. I will not grade them for accuracy but I will grade them for completion and I will look at your work and check that you made a reasonable
attempt at the problems. Each section’s worth of Your Turn problems will be weighted equally and they will add up to 5% of your total grade.

Note that on Your Turn problems I want to see all of your work, whereas on homework problems I do not want to see any of your work.

Homework

There will be a homework assignment from each section of the notes that we cover and the assignment will come from the exercises at the end of the notes (though only a portion of them will be assigned). We will cover several sections each week and the homework from those sections will be due the following Monday. The answers to homework assignments should be written on a single sheet of paper and turned in at the beginning of class on the day that they are due. Homework assignments will each be weighted equally and they will add up to 20% of your total grade.

Note that homework assignments will be graded for accuracy only. Unfortunately, due to time constraints and the amount that I have to grade, I am unable to give partial credit on homework assignments. For each problem you will either get full credit for a correct answer or no credit for an incorrect answer. In order to mitigate the completion and accuracy of homework assignments, I will allow students to check their answers with me before they turn them in. You may show me your answers either in person or by email and I will tell you if they are correct or incorrect. There is no limit to the number of times that you can check them but I may not be able to answer emails on the same day that they are due. Also, for obvious reasons, I will not check true/false, yes/no, or any kind of multiple choice question.

Because homework assignments are only graded for accuracy, I would prefer it if you did not include your work on the assignments that you turn in. I know that this is atypical for a math course, but it makes it easier to grade if you copy your answers onto a single page before you turn them in. I will not mark off if you fail to do this, but it will make my life (and my grader’s life) a little easier. Also, be sure that you label each problem clearly with its number.

Homework assignments are intended to be a time where you practice the material and learn the concepts. Hence I encourage students to work together on them and I certainly encourage students to ask me about the problems when they have trouble. In addition to checking your answers with me, you can talk to me during my office hours, you can make an appointment to meet me outside of my office hours, or you can email me with questions about problems. Email is a very valuable resource that students often overlook; I answer emails regularly throughout the day so it is often the quickest and most reliable way to reach me.

Note that on homework problems I do not want to see any of your work, whereas on Your Turn problems I want to see all of your work.

Quizzes

There will be a short quiz most every day at the end of class except on exam days. This quiz will last five minutes and will only consist of one question. The quiz question will be similar to one of the Your Turn problems. This is meant as an incentive to get students to read the assigned sections and to work out (and, ideally, to understand) the Your Turn problems before class. Each quiz will be worth five points (there is partial credit available) and they will add up to 20% of your total grade.

There will be days when you have to miss class or you have to leave early and everyone has a bad day every now and then. To make allowances for such things I will add extra points at the end of the term to everyone’s grade; ten percent of the possible quiz points will be added as bonus quiz points. For example, if we have 20
quizzes at five points each then there will be 100 possible quiz points, so in that case I would add 10 points to everyone’s quiz grade at the end of the term.

Exams

There will be two midterm exams which will are tentatively scheduled for the end of weeks four and eight (although they usually get pushed to weeks five and nine). Our class’ final exam will be Wednesday, December 11th at 3:15pm. Remember to bring a calculator to these exams. There will be three exams throughout the term. In order to pass the course you must pass at least two of the exams. Passing, for this purpose, means getting a D or higher, which means getting at least a 60%.

Missed Tests and Assignments

There will be no make-up quizzes given. Keep in mind that I have allotted extra quiz points, in part, to account for missed quizzes.

I will allow homework assignments to be turned in one day late (on Tuesday) with no questions asked. After that I will not accept any late homework except under extreme circumstances.

I will not allow a student to take an exam late except under extreme circumstances. However, if you would like to take an exam early for any reason then I will be happy to arrange that. I will need three days notice in advance of the day that you wish to take the exam if you’d like to take it early. Keep in mind that if you take an exam early you might not get to see all of the material in class depending on when things are scheduled.

In the event that you find yourself in “extreme circumstances,” please provide documentation. It may seem callous at times, but I will check.

Contacting Me

The best way to contact me is by email. I will check the voicemail in my office as often as I can but you will get a much quicker response from me by email. Again, I encourage you to email me about specific problems but try to ask productive questions. I will be able to be more helpful if you tell me what you’ve already tried and what is giving you problems. Also, if you can’t make my office hours but you’d like to meet with me then let me know so that we can find a time to meet outside of office hours. Also, remember that you can email me to check the answers to your homework problems before the day that they’re due.

Course Content

The course goals and learning outcomes as dictated by the department’s master syllabus are outlined below.

Course Goals: A student successfully completing the course should, in a general sense, have...

- the tools necessary to succeed in a trigonometry-based calculus course or discrete mathematics,
- facility modeling the mathematical topics described among the learning outcomes in words, then solve or simplify the relevant equations and/or expressions, and finally write a summary statement of the
solution. In short, all of the learning outcomes should be incorporated with skill at mathematical modeling.

**Learning Outcomes:** A successful student can...

- identify a function as periodic from its definition,
- describe characteristics of periodic functions such as period, as well as amplitude and midline where applicable,
- describe the sine, cosine, and tangent functions from both unit circle and right triangle perspectives,
- describe the characteristics of the sine, cosine, and tangent as functions,
- calculate all angles and side lengths of both right and oblique triangles, given appropriate information,
- compute using both degrees and radians as measures of angles,
- use identities relating to the period of sine, cosine, tangent as well as identities relating to negative angles and the Pythagorean Identity,
- construct functional models from trigonometric, exponential, polynomial and rational expressions,
- engage in computations of, and conceptual facility with, elementary operations, composition, and inverses of functions at a more sophisticated level than as expected of a college algebra student,
- describe vectors in a mathematical and physical science context,
- add, subtract, and perform scalar multiplication on vectors,
- express n-tuples as 1-by-n vectors,
- find and interpret the dot product of two vectors as a measure of agreement between vectors.

**Student Conduct**

I encourage a laid back and conversational atmosphere in my classroom where students should feel free to participate regularly. That being said, any student that is found to be a consistent distraction will be asked to leave for the sake of the other students. Additionally, I do not mind things like food, laptops, cell phones, or anything else like that as long as it does not distract the other students.

Academic dishonesty is a serious issue and will be treated as such; quizzes and tests will be monitored carefully for cheating. Violations of the student conduct code result in inclusion of the incident on your student conduct record as well as academic sanctions such as failing grades on any coursework related to the violation or simply a failing grade in the course.

Please note that while some professors consider it a violation if students collaborate on graded homework, I do not. In fact, I encourage students to work together outside of class as often as possible on homework and reading assignments and group study sessions are also encouraged.

**Students with Special Circumstances**

If you are registered with Disability Services, if you are a fall-term athlete that will be missing class for games, or if you have any other special circumstances of which I should be aware, please come to me as soon in the term as possible so that proper arrangements can be made.