> "When a truth is necessary, the reason for it can be found by analysis, that is, by resolving it into simpler ideas and truths until the primary ones are reached."
>
> -Gottfried Leibniz

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Office Hours: M 1-2, Th 2-3, F 1-2; Also by appt.
Class Location: 101 Peterson
Time: TTh 6-7:50pm

Course Description: This course will cover the elementary functions and applications required for calculus or discrete mathematics; with focus on trigonometric functions and vector operations. Emphasis will be placed on mathematical modeling and developing mathematical writing skills.

Required Text: *Functions, Trigonometry, and their Applications*, by Dan Raies. Reading assignments and problem sets will be given on a frequent basis, so daily access to this textbook is necessary.

Technology: A scientific or graphing calculator or access to computation software (like Wolfram|Alpha or Excel) is **required** for completing some homework problems in this course. Calculators may be checked out from the Math Office in Fenton Hall and the UO Library system.

Communication: If you would like to contact me, I can most easily be reached by email (wells6@uoregon.edu) weekdays between 10am and 6pm. While I will try to answer email as soon as is possible, in some cases, I may not be able to respond until the following school day. You are also welcome to stop by my office outside of office hours—I usually have at least a few free minutes to help.

Course Outcomes

By the end of the course, a student should be able to:

1. Identify, by formula, verbal description, or graph, the vertical and horizontal transformations that take a parent function to an indicated function;
2. Determine whether a function is periodic from its definition;
3. Describe characteristics of periodic functions (period, amplitude, midline);
4. Define the sine, cosine, and tangent functions from both the unit circle and right triangle perspective;
5. Describe characteristics of the trigonometric functions (sine, cosine, tangent);
6. Calculate all angles and side lengths of both right and oblique triangles, given appropriate information;
7. Compute values of trig functions using both degree and radian measure of angles;
8. Use identities relating period of sine, cosine, and tangent, as well as negative angle and Pythagorean identities;
9. Construct functional models from trigonometric, exponential, polynomial, and rational expressions;
10. Describe vectors in a mathematical and physical science context;
11. Perform addition, subtraction and scalar multiplication on vectors;
12. Find and interpret the dot product of two vectors as a measure of angle between two vectors.

Grading Criteria

Grading Scale: A = 90-100%; B = 80-89%; C = 70 – 79%; D = 60-69%, with the upper and lower 2.5% of each division corresponding to +/- respectively. However, a grade of A+ is awarded only when a student has demonstrated mastery of the material far above the retirements of the course.

Your grade in the class will be based on the following rubric:

1	WebWork Homework	15%
2	Projects	10%
3	Daily Reading / Participation	7.5%
4	Weekly Quizzes	12.5%
5	Midterm Exams	20%
6	Final Exam	35%

1 WebWork Homework

The best way to improve mathematical skills is through regular practice. Homework will be assigned daily and due weekly on Monday at 11:59pm. Homework assignments will be completed electronically through the WebWork portal. More information about WebWork can be found below.

2 Projects

Solving mathematical problems is important; clearly communicating these solutions is even more so. There will be five group projects assigned over the course of the term. For each project, groups will collectively complete one or two more challenging problems, then draft and revise an answer. Final solutions to each problem must be written in complete sentences, and should include a description of the method used. Example solutions will be posted on Canvas. More details about these assignments will be given at a later date.

3 Daily Reading / Participation

Mathematical knowledge takes time to develop, and understanding deepens upon revisiting a concept a 2^{nd}, 3^{rd}, or n^{th} time. Studying basic terminology and elementary examples in the textbook before class means that lectures can be spent clarifying and expanding ideas, rather than introducing them. Daily reading assignments will be posted under the "Assignments" tab of Canvas (usually in week-long segments). These assignments will list the specific section(s) to read for each day, along with several basic questions to check comprehension. Answers to these questions are due by 5pm each day, and can be submitted by following the same link on Canvas where the assignment was found and then either a) uploading a Word / .pdf file, or b) by clicking the "Text Entry" button and typing directly into the textbox (**Be aware that there is also a "comments" box under the file upload link. Do not use this unless you want to make a comment about the assignment)**. Each assignment will be graded out of 5 points, according to the following rubric: 5 points for complete, correct answers; 3 points for incorrect answers that show earnest effort; 0 points for sparse or missing solutions. Any student who earned less than 5 points may resubmit a revised assignment within 24 hours to earn up to 2 points back.

4 Weekly Quizzes

Each Tuesday, a short quiz will be given covering the material from the previous week. Not only do these quizzes give both you and I assessment of your current understanding, but they also provide you with feedback on your thought processes and solution methods (feedback that, unfortunately, WebWork doesn't provide). **Except in extreme circumstances, make-up quizzes will not be given. However, at the end of the term, your lowest quiz score will be dropped.**

5 **Midterm Exam**

A 110-minute midterm exam will be given approximately halfway through the term: tentatively, the midterm is scheduled for Thursday, February 11th (Week 6). Make-up midterms may be given at the instructor's discretion (but only if at least 1 week notice is given).

6 **Final Exam**

A cumulative, final exam will be given on Tuesday, March 15th (Week 11) from 7:15–9:15pm. The location will be given in our usual classroom, Peterson 101.**The final exam cannot be taken at any other time, except in extreme circumstances where there is a documented conflict with the time of another exam**.

A few notes on late assignments: Up to twice throughout the term, you may request a 2 day extension on your WebWork, but requests must be made prior to an assignment's deadline. No extension will be given on reading assignments, but at the end of the term, three missed reading assignments will be dropped.

Accessibility

Any student with a disability for whom special accommodations would be helpful is encouraged to discuss this with the instructor as soon as possible. If you are currently registered with the Accessible Education Center, please present your paperwork to me during the first week so that we can design a plan for you.

Academic Integrity

Students are allowed, and in fact, encouraged, to collaborate on homework assignments. However, the work that you turn in must be your own. Exams will be closed book, closed notes, closed calculator, and closed colleague, unless otherwise specified. All written work that references material outside of the textbook should be accompanied by an appropriate citation (APA or AMS format is preferred). The University of Oregon requires that all instances of academic dishonesty be reported, no matter the scope.

Important Dates

Monday, January 11th	Last day to drop class without "W"
Wednesday, January 13th	Last day to add a class
Sunday, February 21st	Last day to withdraw with "W" or to change to P/N

Approximate Schedule

Week 1	1.1 -1.3	Week 6	4.2
Week 2	1.4, 1.5, 2.4	Week 7	4.3, 4.4, 4.5
Week 3	3.1, 3.2	Week 8	5.1, 5.2, 5.3
Week 4	3.3, 3.4	Week 9	5.4, 5.5
Week 5	3.5, 3.6, 4.1	Week 10	Review, Catch-up

Working with WebWork

Webwork is a free online homework system that allows for instant feedback on each question, and allows for timely corrections to be made. However, since the assignments are graded automatically and electronically, it also requires careful attention to detail and precise use of correct mathematical syntax. You may log in to WebWork by clicking on the link on the weekly assignment under the "Assignments" tab on Canvas, or by using the following address:

https://webwork1.uoregon.edu/webwork2/Math112-23674/

Your username is your DuckID and your password is your UO email password.

When working on your assignment, you should have scratch paper available, and neatly write out your thought process in solving the problem. While WebWork does not grade you on this process, writing it out carefully will allow you to more easily return to the question at a later time, to track down any mistakes in your work, and to train you in the skills you will need to demonstrate on quizzes and exams.

If you have questions about a homework problem, one excellent resource is the "Email Instructor" button at the bottom of the WebWork screen. This button will send me a link to the problem you are currently on, as well a list of your current and past answers. It is **essential** that you include a short message describing what steps you've already taken to solve the problem (along with all calculations you've made) in order to help me diagnose the issue. On most homework problems, it is impossible for me to figure out what you've done incorrectly, if I only see the answers you've given.