Note to Instructors: There is a new, updated version of our old textbook. There does not seem to be too many changes, from what I noticed. The most noticeable is adding Learning Objectives to the beginning of each section.

Technology:
If you require a graphing calculator, use it and recommend a TI-84, TI-83 Plus or TI-83. If you do not allow the use of a calculator (like me), be prepared to a) not use one yourself unless necessary (let yet be accused of hypocrisy) and b) write exams so that the simplification of arithmetically complex problems does not overshadow the actual concept they are being tested on.

Course Goals:
A student successfully completing the course should, in general, have a foundation in core algebraic facility as well as conceptual and computation understanding of functions. The student can model 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.

If you’re open to it, free and/or browser-based programs like Wolfram|Alpha or Desmos can be of tremendous use to you and to students.

Learning Outcomes: A successful student can...

- identify, by formula, verbal description, or graph the vertical and horizontal transformations that take a parent function to an indicated function
- 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
- describe vectors in a mathematical and physical science context
- add, subtract, and perform scalar multiplication on vectors
- find and interpret the dot product of two vectors as a measure of agreement between vectors
**Note on a Rough Schedule of Content:** This should be viewed as a tentative schedule for discussing content. With as many as 40 contact hours total for the course, and less than 30 hours of content outlined in the schedule, there should regularly be time to do homework questions, assessments (e.g. quizzes, exams), review and in-class student work.

<table>
<thead>
<tr>
<th>Week</th>
<th>Sections to Cover</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.1 (0.5 hrs), 1.2 (1.5 hrs), 1.3 (1.5 hrs)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1.4 (2 hrs), 1.5 (1 hr)</td>
<td>In 1.4, combinations of horizontal transformations are tricky and often non-intuitive for students; Section 1.5 could be taught anywhere in Chapter 1 (e.g. between 1.3 and 1.4)</td>
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<tr>
<td>3</td>
<td>1.6 (2 hrs), 2.1 (1 hr)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>2.2 (1.5 hrs), 2.3 (1 hr), 2.4 (1.5 hrs)</td>
<td>Section 2.2 introduces sine and cosine from the unit circle definition, but addresses right triangles too; Section 2.4 is graphs of the form $A\sin(\theta) + k$ and $A\cos(\theta) + k$</td>
</tr>
<tr>
<td>5</td>
<td>2.5 (1 hr), 2.6 (2 hrs)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>3.1 (1.5 hrs), 3.2 (2.5 hrs)</td>
<td>Section 3.1 is essentially a treatment of Chapter 2 but revisiting with radians</td>
</tr>
<tr>
<td>7</td>
<td>3.3 (2 hrs), 3.4 (2.5 hrs)</td>
<td>Section 3.4 is a full treatment of transformations on $\sin(\theta)$ and $\cos(\theta)$.</td>
</tr>
<tr>
<td>8</td>
<td>3.5 (0-3 hrs), 4.1 (2 hrs), 4.2 (2 hrs)</td>
<td>Section 3.5 contains optional topics; vectors are defined by direction and magnitude (no components yet).</td>
</tr>
<tr>
<td>9</td>
<td>4.3 (2 hrs), 4.4 (0-2 hrs)</td>
<td>This text uses $\vec{x}i + \vec{y}j$ instead of $(x, y)$ in Section 4.2.</td>
</tr>
<tr>
<td>10</td>
<td>4.5 (0-1 hour), Catch-up, Review</td>
<td>Sections 4.4 and 4.5 are optional but can be covered if time allows</td>
</tr>
<tr>
<td>11</td>
<td>Final Exam</td>
<td>Finals exam week; No classes; Final exam at scheduled time: <a href="https://registrar.uoregon.edu/calendars/examinations">https://registrar.uoregon.edu/calendars/examinations</a></td>
</tr>
</tbody>
</table>

**Additional Notes to Instructors:**

- Like in MATH 111, it is extremely important that the students know that Math 112 is a precalculus course. It is designed for students who have an understanding of college algebra content that is to be built upon in order to prepare them for calculus. Not all students fit this description, but nevertheless it is the assumption.

- The content of this class may be different than you have experienced in a precalculus course (either taking one or if you’ve taught it elsewhere). There are fewer topics than in many other trigonometry curricula, with the goal of the topics being covered in depth and with lots of varying applications. Please keep in mind that probably less than 5% of the students will go on to degrees in mathematics, and the majority need a solid conceptual understanding of the topics in a scientific context.

- Common areas of difficulty: Basic algebra (factoring, simplifying and operations on fractions), completing the square, applications of any sort. Be conscious of these facts when you approach each topic so that you can be ready for the confused looks, frustrated sighs, and eye rolling. Combat them with detailed examples and ample opportunities for practice. Basic algebra review
is most effective when integrated into new concepts, so do it on an as-needed basis. Order in horizontal transformations, solving trigonometric equations and vectors (that are a new concept to many students), always seem confusing to students, hence please take it into the account while covering those topics.

- It is usually beneficial for students to have weekly knowledge assessments (like quizzes), weekly assignments (like homework) and more than one midterm exam.

- Every section in the textbook has two homework assignments. The answers to Homework Assignment B are in the appendix and problems with the same number (between A and B) should be similar.

- You might consider allowing students to use a note card on exams, as it is also a good way of preparation for an exam.

Other Important Dates (https://registrar.uoregon.edu/calendars/academic?):

Saturday of 1st week - Last day to drop without a W (90% tuition refund). After this date, W is recorded for partial and complete withdrawal.
Monday of 2nd week - Last day to add a class via DuckWeb
Sunday after 7th week - Last day to withdraw (drop with a W or change to P/NP)

Course grade:
Course grades\(^1\) are weighted according to the following scheme.

- WebWork 20%
- Quizzes 16%
- 2 midterm exams 17% +17%
- Final exam 30%

Standard grade assignments will be made (e.g. grades in the 80% to 90% range will be B’s, those in the 70% to 80% range are C, etc.) Plus and minus grades will be awarded in the upper and lower 2% of a bracket. (e.g. A grade of B+ is awarded between 88% and 90%; B- between 80% and 82%). I reserve the right to apply a course adjustment to grades at the end of the term.

The standards for each level of work:
Please access the following link for details.

Exams:
- Midterm Exam 1: Wednesday of Week 4
- Midterm Exam 2: Wednesday of Week 7
- Final Exam: Week 11

\(^1\)A student who achieves adjusted grades of D or worse on all of the exams may be eligible for a maximum grade of D+.
Note to Instructors: Please be advised that according to the new Attendance Policy you need to have a statement how you will handle missed exams. Please see an email from the Department Head Prof. Nicholas Proudfoot from Wednesday 9/21/2022. The way I am planning to deal with students who will miss an exam is to use their final exam’s score as a substitute for an exam that they missed. Regarding the final exam: depending on the size of your class and the date of the exam, the two reasonable policies that you might want to consider is to have a single set makeup time, or just to state that anyone who misses the final has to take an incomplete.

Accessibility:
For those of you who are currently registered with Accessible Education Center for a documented disability, please present your paperwork to me during the first week of the term so that we can design a plan for you. Those of you with a disability (or who might) but are not registered with AEC should contact them as soon as possible. It is much more likely that measures can be taken to provide adequate special accommodation if the organization is done through AEC. I have attempted to provide documents that are accessible. Please let me know if you need additional accommodations.

Student Conduct:
I plan to treat every student with respect and, as such, expect my students to show respect for me and for the class as a whole. Violations of the student conduct code result in the incident being included on your student conduct record and can result in a failing grade on any course work related to the violation or a failing grade in the course. The University of Oregon requires all instances of cheating be reported, no matter how small.
Cheating includes, but is not limited to:
-Looking at another student’s exam during a test
-Copying the work of another person (student or otherwise) and submitting it as your own
-Using any materials except those explicitly approved during a test-taking situation
-Resubmitting graded work that was altered after being returned
For a list of other descriptions of cheating, see the Student Conduct Code, dos.uoregon.edu/conduct.
The University Student Conduct Code defines academic misconduct, which includes unauthorized help on assignments and examinations and the use of sources without acknowledgment. Academic misconduct is prohibited at UO. Consequences of a reported misconduct to the Office of Student Conduct and Community Standards can include failure of the course.

Suggestions for Successful Study:
Don’t get behind in your homework, reading, etc.
Participate in class, ask questions, and make use of my office hours.
Make friends with your classmates-you can find out for instance what material was covered when you missed the class or discuss homework problems with them.
Read ahead in the book. Even reading the first few pages of each lesson will help the material sink in quicker during lecture and allow you to ask meaningful questions.
Keep all your old homework assignments, midterms, and quizzes - most probably, you will find them useful when you are studying for future tests.

Community Standards:
The University of Oregon community is dedicated to the advancement of knowledge and the development of integrity. In order to thrive and excel, this community must preserve the freedom of thought and expression of all its members. The University of Oregon has a long and illustrious history in the area of academic freedom and freedom of speech. A culture of respect that honors the rights, safety, dignity and worth of every individual is essential to preserve such freedom. We affirm our respect for the rights and well-being of all members.
Expected Classroom Behavior:
Students are expected to behave respectfully toward each other and toward the instructor during class time. This includes refraining from using cell phones during lectures, unless allowed for instructional purposes by your instructor.

Attendance:
Attendance is not required but it is strongly encouraged, as it gives you a chance to ask questions and clarify any potential confusion.

Note to Instructors: Please be advised on a new Attendance Policy, according to which you need to specify if class attendance is mandatory and how you are going to handle it if it is.

Academic Disruption:
In the event of a campus emergency that disrupts academic activities, course requirements, deadlines, and grading percentages are subject to change. Information about changes in this course will be communicated as soon as possible by email, and on Canvas. If we are not able to meet face-to-face, students should immediately log onto Canvas and read any announcements and/or access alternative assignments. Students are also expected to continue coursework as outlined in this syllabus or other instructions on Canvas.
In the event that the instructor of this course has to quarantine, this course may be taught online during that time.

Staying Safe in Classes:
As the University of Oregon continues in-person instruction, instructors and students play a key role in keeping our community healthy and safe.

Prevention:
The best way to prevent illness is to avoid being exposed to the virus. There are some general precautions the CDC recommends to prevent the spread of respiratory diseases.

- Stay up to date on your COVID-19 vaccines.
- Wear a face covering that covers both your mouth and nose when indoors around others.
- Wash your hands often with soap and water for at least 20 seconds.
- Avoid touching your eyes, nose, and mouth.
- Stay home if you are sick. Do not go to work or class.
- Cover your cough or sneeze with a tissue, then throw the tissue in the trash.
- Clean and disinfect frequently touched objects and surfaces.

Support:
The following resources are available to you as a student.

- University Health Services or call (541) 346-2770
- University Counseling Center or call (541) 346-3277 or (541) 346-3227 (after hrs.)
- MAP Covid-19 Testing
Accommodation for Religious Observances:
The university makes reasonable accommodations, upon request, for students who are unable to attend a class for religious obligations or observance reasons, in accordance with the university discrimination policy which says Any student who, because of religious beliefs, is unable to attend classes on a particular day shall be excused from attendance requirements and from any examination or other assignment on that day. The student shall make up the examination or other assignment missed because of the absence. To request accommodations for this course for religious observance, visit the Office of the Registrar’s website (https://registrar.uoregon.edu/calendars/religious-observances) and complete and submit to the instructor the Student Religious Accommodation Request form prior to the end of the second week of the term.

Basic Needs:
Any student who has difficulty affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live and believes this may affect their performance in the course is urged to contact the Dean of Students Office (346-3216, 164 Oregon Hall) for support.
This UO webpage includes resources for food, housing, healthcare, childcare, transportation, technology, finances, and legal support:
https://blogs.uoregon.edu/basicneeds/food/

Title IX:
I am an assisting employee. For information about my reporting obligations as an employee, please see Employee Reporting Obligations on the Office of Investigations and Civil Rights Compliance (OICRC) website. Students experiencing sex or gender-based discrimination, harassment or violence should call the 24-7 hotline 541-346-SAFE [7244] or visit safe.uoregon.edu for help. Students experiencing all forms of prohibited discrimination or harassment may contact the Dean of Students Office at 5411-346-3216 or the non-confidential Title IX Coordinator/OICRC at 541-346-3123. Additional resources are available at investigations.uoregon.edu/how-get-support.
I am also a mandatory reporter of child abuse. Please find more information at Mandatory Reporting of Child Abuse and Neglect.

Diversity and Inclusion:
The University of Oregon community values diversity and seeks to foster equity and inclusion in a welcoming, safe, and respectful community. In this course, we will uphold these principles by encouraging the exploration, engagement, and expression of distinct perspectives and diverse identities. We will value each class member's experiences and contributions and communicate disagreements respectfully. Please notify me if you feel aspects of the course undermine these principles in any way.

Other information:

- In case of inclement weather, please check Canvas for further instructions. In general, the university does not close for snow, etc. If it is not safe for you to come to campus, please be sure to email me right away.
As the university community adjusts to teaching and learning in the context of the COVID-19 pandemic, course requirements, deadlines, and grading percentages are subject to change, i.e. the syllabus might be changed/updated.

Final Note to Instructors: Please feel free to adjust the schedule and deadlines so that they will work for you; I like to give WebWork due Friday (with possible extensions, if necessary), give exams on Wednesdays and quizzes on Fridays but you might have a different preference. Percentages for different categories based on which a grade is determined can be also altered. Do not hesitate to contact me with course-related questions.