**MAC 1114: Trigonometry**
**Section: 074H**
2 Credit Hours
Spring 2024


Instructor: Matt Dallas
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Office Hours: Little Hall 431
**TBD**

Meeting Times:

TR Period 6 (12:50 PM - 1:40 PM) Matherly 0010

**Course Description & Objectives**

This course is the sequel to MAC1140 Precalculus Algebra and serves as an introduction to Trigonometry. Topics include a basic introduction to trigonometric functions, graphing trigonometric functions, inverse trigonometric functions, and analytic trigonometry. Although this course has no official UF course prerequisite, it assumes prior knowledge of intermediate algebra (Algebra 2) from high school. Students should be able to do arithmetic without a calculator.

After completing this course, students will be able to define and analyze trigonometric functions, their inverses, their graphs, and their properties, formulate mathematical models and solve problems using trigonometric functions and their inverses, trigonometric equations, right triangle trigonometry, and various trigonometric formulas (e.g., laws of sine and cosine, sum difference, multiple angles, product-to-sum), and verify trigonometric identities. They will also develop and solve mathematical models of real-world word problems involving trigonometric functions and communicate mathematical solutions clearly and effectively.

**General Education Credit**

This course is a mathematics (M) course in the UF General Education Program. Completing this course with a minimum grade of C will satisfy the student's State Core Mathematics requirement of the UF General Education Program. Courses in mathematics provide instruction in computational strategies in fundamental mathematics including at least one of the following: solving equations and inequalities, logic, statistics, algebra, trigonometry, inductive and deductive reasoning. These courses include reasoning in abstract mathematical systems, formulating mathematical models and arguments, using mathematical models to solve problems and applying mathematical concepts effectively to real-world situations.

**Student Learning Outcomes**

After successful completion of this course students will have demonstrated competency in the following Student Learning Outcomes (SLOs):

- **Content:** Students demonstrate competence in the terminology, concepts, theories, and methodologies used within the discipline. After completing this course students will be able to employ strategies in solving problems involving trigonometric functions and their inverse functions, trigonometric equations, right triangle trigonometry, and various trigonometric formulas (e.g., laws of sine and cosine, sum difference, multiple angles, product-to-sum), and verifying trigonometric identities. (Content for Gen Ed Math, assessed through homework, quizzes, and exams)

- **Communication:** Students communicate knowledge, ideas, and reasoning clearly and effectively in written and oral forms appropriate to the discipline. Throughout this course students will formulate and solve mathematical models using trigonometric functions and their inverses, right triangle trigonometry, trigonometric equations, and trigonometric formulas (laws of sine and cosine, sum difference, multiple angles, product-to-sum) and will communicate mathematical solutions clearly and effectively. (Communication for Gen Ed Math, assessed through homework, lecture and discussion quizzes, and exams)

- **Critical Thinking:** Students analyze information carefully and logically from multiple perspectives, using discipline-specific methods, and develop reasoned solutions to problems. In this course, students will reason in abstract mathematical systems, and they will develop solutions to mathematical models using trigonometric functions and their inverse functions, right triangle trigonometry, the laws of sine and cosine, and various other trigonometric formulas (sum difference, multiple angles, product-to-sum) to solve problems. They will also develop and solve mathematical models of real-world word problems involving trigonometric functions. (Critical Thinking for Gen Ed Math, assessed through homework, quizzes, and exams)

**Required Materials**

There are no required textbooks for this course. We will make use lecture notes, as well as of a free online textbook available at Openstax Precalculus. Both will be provided as supplemental material on our Canvas website. Also, in this course we will use the online platform Xronos which has been developed at UF and is supported by the Office of the Provost and the College of Liberal Arts and Sciences. Xronos is accessible through the Canvas site. More details will be given in class.

**E-Learning Canvas**:

E-learning canvas, a UF course management system, is located at elearning.ufl.edu. Use your Gatorlink username and password to login. All course information including your grade, syllabus, lecture notes, office hours, test locations, mail tool, discussion forum, free help information, etc. can be accessed from this site.

You are responsible for verifying that your grades are accurate. **You have one week after a score has been posted to contact your instructor if you believe there has been a recording error. There is no grade dispute at the end of the semester.**

**E-mail & Canvas Messenger**

All communication between student and instructor and between students should be respectful and professional. All official class communications will be sent only through ufl.edu addresses or Canvas messenger. Students are responsible for acquiring, checking their email accounts and Canvas inbox regularly, and any class information sent to their ufl.edu account. Please be sure to sign your name to your e-mails.

**Lectures**

This class meets twice a week on Tuesday and Thursday, 6th period (12:50-1:40pm) in Matherly 0010.

**Quizzes (5%)**

Each week there will be a take home quiz consisting of 2 to 4 questions based on the material covered that week. The quiz will be available on Canvas Tuesday of that week and is due the following Tuesday in class. The **two** lowest quiz grades will be dropped at the end of the semester. Quizzes will be graded based on accuracy and work shown. **You will earn no points for unsupported answers**.

**Guided Lecture Notes (5%)**

Each week students will complete a set of guided notes consisting of conceptual questions and practice problems corresponding to the lectures that week. These will be made available on Canvas Tuesday of that week, and are due the following Tuesday. Students can print them out and submit them in class, or they can complete them on a tablet or other device and submit on Canvas. Guided notes will be graded based on completion.

**Online Homework (30%)**

**FIREFOX RECOMMENDED FOR XRONOS**. In this course we will be using the online platform Xronos which is free of charge and will be explained during class. Complete Xronos homework by first navigating to our Canvas page. Once in Canvas, go to the assignments section of canvas and complete assignments directly. There is a slight delay in scores being recorded to Xronos. Be patient as your gradebook will update a little bit every so often until you reach 100 percent for the assignment. **Please double-check in the canvas gradebook that your scores are in fact recording**. Reach out to me as soon as possible if any technical difficulties arise.

Online homework assignments will be assigned in groups based on the unit. An assignment group is due just before the date of the relevant exam. Please do not wait until the last minute to start your homework. All assignments are released in advance so you can divvy up your time how you choose. **No assignments can be submitted after the due date**. There will be a total of **three** dropped Xronos homework grades at the end of the semester.

All assignments will have posted due dates and these due dates will not be extended under any circumstance.

Personal computer issues, will NOT be a reason to offer any type of extension.

**Exams (60%)**

We will have three exams throughout the semester, each corresponding to one unit. The exams will be taken in class, and all questions will be free-response.

Exam dates are as follows (see also the schedule at the end of this document):

Exam 1: Thursday, February 8

Exam 2: Thursday, March 7

Exam 3: Tuesday, April 23

Makeup: Saturday, April 27 (5:30 - 6:20pm).

**Class Participation**

Attendance in class is mandatory. Students who come to class prepared and participate are more likely to do well in the course.

Please see https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies for more details on the university's attendance policies.

**Make-up Policy**

All make-up work must be arranged with the instructor.

• **Make-up Exams** If you are participating in a UF sponsored event or religious observance, you may make up an exam only if you make arrangements with the course coordinator during the FIRST TWO WEEKS OF THE COURSE. You must present documentation of a UF sponsored event.
**If illness or other extenuating circumstances cause you to miss an exam, contact the course coordinator (no later than 24 hours after the exam) by email. Then, as soon as possible after you return to campus, provide the appropriate documentation to the instructor. You will be allowed to makeup the exam you missed at the end of the semester.**

Please note that students may not retake an exam. There are, however, opportunities to earn points back on exams 1 and 2. See **Extra Credit** below.

• **Make-up Xronos HW**: There are no make-ups. Xronos Homeworks are released with many weeks to complete the assignments. Please reach out to me with plenty of advance notice if you're having Xronos issues. Technical issues the day before the homework is due is not an excuse.

• **Make-up Quizzes**: There are no quiz make-ups.

• **Make-up Guided Notes**: There are no guided notes make-ups.

**Incomplete**

Students who are currently passing a course but are unable to complete the course because of illness or emergency may be granted an incomplete grade of I which will allow the student to complete the course within the first two weeks of the following semester. See the policy on http://www.math.ufl.edu/fac/incomplete-grades/. If you meet the criteria, you must contact the instructor before finals week to be considered for an I. An I only allows you to make up your incomplete work, not redo your work.

**Grading**

Guided Notes: 5%

Quizzes: 5%

Xronos Homework: 30%

Exams (20% each): 60%

Your final grade will be rounded to the nearest hundredth and a letter grade will be given using the following grading scale:

**Grading Scale**

| | | | |
|---|---|---|---|
| 90.00-100 A | 87.00-89.99 A− | 84.00-86.99 B+ | 80.00-83.99 B |
| 77.00-79.99 B− | 74.00-76.99 C+ | 67.00-73.99 C | 64.00-66.99 C−* |
| 60.00-63.99 D+ | 57.00-59.99 D | 54.00-56.99 D− | 0-53.99 E |

***Note:** A minimum grade of C is required for the General Education Credit. A grade of C− DOES NOT give Gordon Rule or General Education credit!

For a complete explanation of current policies for assigning grade points, refer to the UF undergraduate catalog:

https://catalog.ufl.edu/UGRD/academic-regulations/

**NOTE: We will not review disputed points at the end of the semester. All grade concerns must be settled within one week of the assignment is returned.**

**Extra Credit**

There will be various opportunities for extra credit throughout the semester. In particular,

- Students will be able to earn back half of the points they missed on Exam 1 by making corrections and submitting them to me before Exam 2. These corrections must be written clearly and must be correct to receive the maximmum number of points back.
- On Exam 2, you will be able to correct one question for full credit. The corrections are due before Exam 3. As with the Exam 1 corrections, they must be written clearly and be correct to receive the maximum number of points back.

**Free Help**

In addition to attending lecture each week and visiting me during office hours, the following aids are available.

- The Math Help Center in Little 215 is open for drop-in assistance with homework Monday through Friday from 10:40am to 3:50pm. It is staffed by mathematics graduate students and undergraduate assistants. Please note that this space is not designed for intense one-on-one tutoring, but rather as a resource for quick questions and explanations. You should not expect the staff to help you if you have not at least begun your homework and have specific questions. Moreover, they absolutely will not assist you with quizzes or any other such work.
- The Teaching Center Math Lab, located in Turlington Hall, is a tutorial service staffed by trained math and science students to provide help with your calculus questions and homework. Tutors will be glad to provide guidance on specific problems after you have attempted them on your own. You may want to attend different hours to find tutors with whom you feel most comfortable. You can also request free one-on-one tutoring.
- Private Tutors: If after availing yourself of these aids, you feel you need more help, you may obtain a list of qualified tutors for hire at https://math.ufl.edu. Search "tutors".

**Calculators**

Calculators **without** graphing utilities may be used for the guided lectures notes, quizzes, Xronos homework, and exams. You will only need a calculator in this class if a problem explicitly asks for an approximation. For example, if a problem asks for a decimal approximation of $\sin(\pi/4)$ to three decimal places, you could use your calculator to obtain 0.707. Otherwise, you should leave your answer as $\sin(\pi/4)$. Even though you're allowed a calculator, note that the majority of points for a given problem comes from the supporting work. You will receive very few points if you just write an answer without any supporting work.

**Technical Help**

For technical difficulties with Canvas, please contact the UF Help Desk at:

- Website: https://helpdesk.ufl.edu
- Phone: (352) 392-HELP (4357)
- Walk-in: HUB 132

**Cell Phones**

Cell phones must be turned off (not on vibrate) before coming to class. Use (defined as having one physically in your hand) of a cell phone during a test or quiz will be considered contact with another person and will be viewed as a form of academic dishonesty because I cannot be assured in such a circumstance that you have not taken a picture of the test/quiz or sent a text message to someone. As a result, **all infractions will be reported to the Dean of Students Office.** Wait until after you have left the room and are finished with the test/quiz to use it.

**Other distractions**

While attending lecture, please ensure that your cellphone is on silent and that alarms are turned off. Please be respectful and attentive during lecture. Do not disturb those around you with excessive talking. You will be asked to leave the classroom if you are repeatedly distruptive during class.

**Students with Learning Disabilities**

Students requesting class and exam accommodations must first register with the Dean of Students Office Disability Resource Center (DRC), https://disability.ufl.edu/. That office will provide a documentation letter via email to the instructor. This must be done as early as possible in the semester, **at least one week before the first exam**, so there is adequate time to make proper accommodations.

**COVID Policy**

In response to COVID-19, the following recommendations are in place to maintain your learning environment, to enhance the safety of our in-classroom interactions, and to further the health and safety of ourselves, our neighbors, and our loved ones.

- If you are not vaccinated, get vaccinated. Vaccines are readily available and have been demonstrated to be safe and effective against the COVID-19 virus. Visit one.uf for screening / testing and vaccination opportunities.
- If you are sick, stay home. Please call your primary care provider if you are ill and need immediate care or the UF Student Health Care Center at 352-392-1161 to be evaluated.
- Course materials will be provided to you with an excused absence, and you will be given a reasonable amount of time to make up work.

**Counseling and Wellness Center**

Contact information for the Counseling and Wellness Center: http://www.counseling.ufl.edu/, 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

**Diversity and Inclusion**

The Mathematics Department is committed to diversity and inclusion of all students. We acknowledge, respect, and value the diverse nature, background and perspective of students and believe that it furthers academic achievements It is our intent to present materials and activities that are respectful of diversity: race, color, creed, gender, gender identity, sexual orientation, age, religious status, national origin, ethnicity, disability, socioeconomic status, and any other distinguishing qualities.

**Academic Honesty Guidelines**

All students are required to abide by the Academic Honesty Guidelines which have been accepted by the University. The academic community of students and faculty at the University of Florida strives to develop, sustain and protect an environment of honesty, trust, and respect. Students are expected to pursue knowledge with integrity. Exhibiting honesty in academic pursuits and reporting violations of the Academic Honesty Guidelines will encourage others to act with integrity. Violations of the Academic Honesty Guidelines shall result in judicial action and a student being subject to the sanctions in paragraph XIV of the Student Code of Conduct. The conduct set forth hereinafter constitutes a violation of the Academic Honesty Guidelines (University of Florida Rule 6C1-4.017).

The Mathematics Department expects you to follow the Student Honor Code. We are bound by university policy to report any instance of suspected cheating to the proper authorities. You may find the Student Honor Code and read more about student rights and responsibilities concerning academic honesty at the link https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/.

**In-Class Recording**

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student

**Evaluations** Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

## Important Spring 2024 Academic Dates and Deadlines

| | |
|---|---|
| Classes Begin | Monday, January 8 |
| Drop/Add | Monday, January 8 - Friday, Janurary 12 (11:59 PM) |
| Withdrawal deadline (full refund) | Friday, January 12 (11:59 PM) |
| Withdrawal deadline (25% refund) | Friday, Februrary 2 |
| Drop deadline (no refund) | Friday, April 12 |
| Classes end | Wednesday, April 24 |

## Holidays (no classes)

Spring Break Monday, March 11 - Friday, March 15

Note: Information in this syllabus and schedule below is subject to change. Any changes will be clearly announced in class or through e-mail.

**The schedule begins on the following page.**

# Tentative Schedule Outline

| | | |
|---|---|---|
| **Unit 1** | Week 1: Introduction and Algebra Review | We'll review basic concepts from algebra such as the definition of a function, graphing functions, inverse functions, and exponential and logarithm rules. |
| | Week 2: Angles | We'll learn how to draw angles in standard position, convert from radians to degrees, find coterminal angles, and use linear and angular speed to describe circular motion. |
| | Week 3: Trigonometric Functions | We'll learn how to identify the domain and range of the sine and cosine functions, and we'll compute the values of sine and cosine at $\pi/6$, $\pi/4$, and $\pi/3$ radians. We'll then use reference angles to compute sine and cosine at others angles on the unit circle. These ideas are extended to define the other trigonometric functions secant cosecant, tangent, and cotangent at standard unit circle angles as well as identify their domains and ranges. We'll also learn to use fundamental identities, and how to use properties of even and odd trig functions. |
| | Week 4: Right Triangle Trigonometry | Here we'll extend the definition of the trigonometric functions to any acute angle using right triangles. We'll also use cofunction identities and learn how to solve applied problems. |
| | Week 5: Review and Exam 1 | Covers all of Unit 1 |

| | | |
|---|---|---|
| **Unit 2** | Week 6: Graphs of Trigonometric Functions | We'll learn how to graph variations of $\sin(x)$ and $\cos(x)$. We'll also learn how to graph variations of the other trig functions: $\tan(x)$, $\sec(x)$, $\csc(x)$, and $\cot(x)$. |
| | Week 7: Inverse Trigonometric Functions | We will analyze the inverse sine, cosine, and tangent functions, find the exact value of expressions involving the inverse sine, cosine, and tangent functions, and find exact values of composite functions with inverse trigonometric functions. |
| | Week 8: Solving Trigonometric Equations | We will verify the fundamental trigonometric identities, and simplify trigonometric expressions using algebra and identities. |
| | Week 9: Review and Exam 2 | Covers all of Unit 2 |
| | Week 10: Spring Break | We will enjoy the much deserved break ☺ |
| **Unit 3** | Week 11: Sum and Difference Identities | We will learn the sum and difference formulas for the six trigonometric functions, and apply them to find the exact value of these functions for non-standard unit circle angles. |
| | Week 12: Other Trigonometric Identities | We will learn double angle, power reduction, and half-angle formulas. We'll then see how these can be applied to compute trigonometric functions exactly, verify identities, and simplify expressions. |
| | Week 13: Solving Trigonometric Functions | We will learn how to solve linear and quadratic trigonometric equations. We'll also learn how to solve right triangle problems. |
| | Week 14: Law of Sines and Cosines | We will learn how to use the Law of Sines and the Law of Cosines to solve oblique triangles, and we'll learn how to solve applied problems. |
| | Week 15: Review | We will spend this week reviewing Unit 3 material in preparation for Exam 3. |
| | Week 16: Exam 3 | Covers all of Unit 3. |

# Tentative Weekly Schedule

GN# = Guided Notes #
Q# = Quiz number #

| Week | Monday | Tuesday | Wednesday | Thursday | Friday |
|---|---|---|---|---|---|
| 1 | January 8 | January 9<br>Introduction | January 10 | January 11<br>Algebra Review | January 12 |
| Due | | | | | |
| 2 | January 15<br>Holiday | January 16<br>Module 1: Angles | January 17 | January 18<br>Module 1: Angles | January 19 |
| Due | | | | | |
| 3 | January 22 | January 23<br>Module 3: Trigonometric Functions | January 24 | January 25<br>Module 3: Trigonometric Functions | January 26 |
| Due | | GN1 & Q1 | | | |
| 4 | Janurary 29 | Janurary 30<br>Module 4: Right Angle Trigonometry | Janurary 31 | February 1<br>Module 4: Right Angle Trigonometry | February 2 |
| Due | | GN2 & Q2 | | | |
| 5 | February 5 | February 6<br>Review | February 7 | February 8<br>**Exam 1** | February 9 |
| Due | | GN3 & Q3 | Xronos HW Unit 1 | | |
| 6 | February 12 | February 13<br>Module 5: Graphing $\sin(x)$, $\cos(x)$, and $\tan(x)$ | February 14 | February 15<br>Module 5: Graphing other Trigonometric functions | February 16 |
| Due | | | | | |
| 7 | February 19 | February 20<br>Module 6: Inverse Trigonometric Functions | February 21 | February 22<br>Module 6: Inverse Trigonometric Functions | February 23 |
| Due | | GN4 & Q4 | | | |
| 8 | February 26 | February 27<br>Module 7: Solving Trigonometric Equations | February 28 | February 29<br>Module 7: Solving Trigonometric Equations | March 1 |
| Due | | GN5 & Q5 | | | |

| Week | Monday | Tuesday | Wednesday | Thursday | Friday |
|---|---|---|---|---|---|
| 9 | March 4 | March 5<br>Review | March 6 | March 7<br>**Exam 2** | March 8 |
| Due | | GN6 & Q6 | Xronos HW<br>Unit 2 | | |
| 10 | March 11 | March 12<br>Spring Break | March 13 | March 14<br>Spring Break | March 15 |
| Due | | | | | |
| 11 | March 18 | March 19<br>Module 8: Sum and Difference Formulas | March 20 | April 21<br>Module 8: Sum and Difference Formulas | March 22 |
| Due | | | | | |
| 12 | March 25 | March 26<br>Module 9: Double, power reduction, and half-angle formulas | March 27 | March 28<br>Module 9: Applications of formulas | March 29 |
| Due | | GN7 & Q7 | | | |
| 13 | April 1 | April 2<br>Module 10: Solving Trigonometric Functions | April 3 | April 4<br>Module 10: Solving Trigonometric Functions | April 5 |
| Due | | GN8 & Q8 | | | |
| 14 | April 8 | April 9<br>Module 11: Law of Sines | April 10 | April 11<br>Module 12: Law of Cosines | April 12 |
| Due | | GN9 & Q9 | | | |
| 15 | April 15 | April 16<br>Unit 3 Review | April 17 | April 18<br>Unit 3 Review | April 19 |
| Due | | GN10 & Q10 | Xronos HW<br>Unit 3 | | |
| 16 | April 22 | April 23<br>**Exam 3** | April 24 | April 25 | April 26 |
| Due | | | | | |

**Saturday, April 27 - Makeup Exams (5:30 PM - 6:20 PM)**