

MATH 1317 (Plane Trigonometry)

Instructor

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Course Description

A course covering trigonometric functions, right triangles, radian measure, graphs of trigonometric functions, trigonometric identities, including multiple and half-angle identities, inverse trigonometric functions, trigonometric equations, oblique triangles, and complex numbers. Prerequisite: MATH 1315 with a grade of C or higher, Accuplacer College Mathematics score of 86 or more, Compass College Algebra score of 46 or more.

Scope & Nature of the Course

This course is designed to give a thorough and rigorous introduction to plane trigonometry. The range of applications of plane trigonometry is wide and various, and the course attempts to give you some knowledge of application areas: modeling of waves or springs, measuring land, navigating, surveying, etc. The following topics form the scope of the course

1. The six trigonometric functions
2. Right angle trigonometry
3. Radian measure
4. Graphing and inverse functions
5. Identities and formulas
6. Trigonometric equations
7. Triangles
8. Complex numbers and polar coordinates

This course consists of eight lessons. The first lesson begins by reviewing a few facts about the unit circle and then continues by defining the six trigonometric functions, based on these facts. The second lesson investigates an alternate way of defining these six functions that allows you to use special facts about right triangles to help you deepen your understanding of these functions. Both ways of defining the trigonometric functions give insights into what these functions may be useful for. The third lesson introduces a unit of measurement of angles; while not as familiar as degrees, the use of radian measure is important for applying the trigonometric functions within calculus, because of its direct relation to length of a circular arc and, hence, to area of a circular sector. The fourth lesson introduces the six inverse trigonometric functions and various techniques for graphing them. In Lesson 5, you will begin to develop a catalog of useful relationships among the six trigonometric functions. These are known as trigonometric identities. Lesson 6 introduces methods to solve equations in which the unknown depends on a trigonometric function. This lesson also introduces graphing of parametric equations. In Lesson 7, you will learn how to determine the measure of all three angles and all three sides of any triangle, when given any three of these six measures. Finally, Lesson 8 guides you to apply trigonometry to complex numbers and to polar coordinates. Any polynomial equation has roots, as long as we allow complex numbers as roots. For certain of these equations, trigonometric functions provide a very concise way for us to describe those roots.

Required Materials

Two texts and an online homework system are required for this course:

- McKeague and Turner. *Trigonometry*. 7th ed., including access code for Enhanced Web Assign online. Belmont, CA: Brooks/Cole, 2013. ISBN 978-1-111-82685-7.

- McKeague, Barclay, and Turner. *Student Solutions Manual for McKeague/Turner's Trigonometry*. 7th ed. Belmont, CA: Brooks/Cole, 2013. ISBN 978-1-111-98976-7.
- **The [WebAssign access code](#) for this course is: txstate 6749 3828.** The access code offers access to a multitude of problems that will help you practice the concepts in this course and will likely increase your final grade. The link will carry you to the WebAssign website page that will allow you to enter this key. You have a 14 day grace period in which to use the course site for free. You will need to pay.

I strongly suggest that you use the following two features from the textbook's companion website: the online videos and the Tutorial Quiz for each textbook chapter (available [here](#)). Refer to the section below for more information on the textbook's companion website. Please consult these resources before e-mailing me.

The course covers chapters 1 through 8 of the first text. You are also **required** to buy the *Student Solutions Manual* with the text. Solutions manuals sometimes have errors, so if you are unsure, e-mail me for advice.

A graphing calculator can be very useful when doing the assigned exercises. The book has several exercises that are designed specifically for using such a calculator. Nonetheless, for most exercises, such a calculator is not necessary, though it may be handy to double-check your answers. I **strongly** suggest doing the exercises first without a graphing calculator, so as to prepare for the exams.

During exams, you are allowed to use a **scientific calculator from the TI-30 series of calculators only**. **You may not use any other scientific or graphing calculator on exams.**

The Textbook's Companion Website

As mentioned above, the textbook publisher provides two companion websites for the textbook. The [first companion website](#) is free and offers instructional videos. The second companion website contains practice problems and is only available by entering the [Web Assign access code](#): **txstate 6749 3828**.

- The online videos include 8 to 12 minutes of instruction on each section from your textbook. In your textbook, the red arrow icon next to an exercise means that video instruction for that exercise is available online.
- The online Tutorial Quiz for each section and chapter of your textbook gives you the chance to test yourself. If you wish, you can also choose to have the results e-mailed to me (ds08@txstate.edu).

Course Goals

The main goal of this course is to provide you with a solid foundation in plane trigonometry. You should also develop careful, critical thinking skills and broaden your abilities to think mathematically. I hope that the course will also awaken in you a feeling of awe for the beauty yet practicality of trigonometry, and for its central importance to the technological and intellectual development of humanity.

If you go on to precalculus and calculus classes, this course will ensure that you will have the prerequisite trigonometrical knowledge for those courses. Trigonometry is fundamental for studying any of the physical or engineering sciences. If you do not plan to take calculus, I hope that this course will give you skills and insights useful in either your trade or hobby.

Course Procedure

Each of the eight lessons consists of a reading assignment, a self-assessment that includes an online Tutorial Quiz, an online homework assignment, and a written assignment, which is to be submitted for evaluation. Learning objectives are stated for each lesson. Reading the assigned text carefully and working through the examples yourself should lead to your accomplishment of these goals. After working all the assigned exercises, work as many other exercises from the text as you can; doing so is the only way to strengthen and gauge your grasp of the subject matter. The assignments are designed to give you relevant

feedback on your understanding of the lessons and further help you reach lesson objectives. The exams help me determine how well you have attained those objectives.

Each reading assignment consists of an entire chapter from the text. I strongly suggest that you read the chapters one section at a time, being sure to work through all the examples, self-assessment questions, and assignment questions for that section *before* proceeding to the next section.

Online Assignments

This course includes eight online assignments (at web collectively worth 15% of the final grade. The purpose of these assignments (as opposed to the online assignments) is for you to focus first on learning to compute the answers correctly. The site provides various types of support to help you succeed in these assignments. Each assignment has 100 questions. You should expect about 6-8 hours of time spent on each online assignment (you may need more or less time depending on your mathematical abilities).

Written Assignments

This course includes eight written assignments collectively worth 15% of the final grade. The purpose of these assignments (as opposed to the online assignments) is for you to not just do the calculations correctly but to practice presenting and communicating your mathematical work, in preparation for the exams. *For this reason, it is important that you first do (most of) the corresponding online assignment before doing the written assignment.* There are basically three types of exercises that you will turn in for a written assignment (though in some assignments, only one type might appear):

- Computational exercises ask you to manipulate equations, solve equations, or find unknowns. Show your work! Show me how you arrive at your answer.
- In graphical exercises, you have to draw a picture to indicate how you arrive at your result(s) or just to graph a function. Depending on the exercise, you may be required to explain and/or justify what the graph signifies and how you arrive at it.
- Expository exercises require a written response in addition to any computations or pictures you may use. You will be required to explain, justify, or prove your answer.

All assignments are submitted via the Assignments tool in the left-hand navigation menu. It is very important that students adhere to the following assignment submission instructions:

- Assignments must be written on lined notebook paper.
- You must number your pages.
- Your submissions should be neat, legible, and organized; you should, in general, use scratch paper to get your solutions, and then write them up neatly so that your solutions are easy to follow. Remember: I'm also grading your ability to communicate your understanding of how to solve these exercises.
- Don't just give an answer; restate questions briefly to ensure you understand the question and put your polished solution underneath.
- Leave room for comments from the instructor.

Only scanned, handwritten submissions will be accepted. That is, students should complete the assigned problems by hand, then scan those pages for submission. Your time is better spent thinking about the exercises and concepts involved than in working to provide solutions in typed form.

If you do not have a scanner, you can a) check with your public library to see if they have one available for use, b) utilize one of the scanners available at computer labs on the Texas State campus, or c) utilize the scanning services of commercial copy centers such as Staples or FedEx Office. *All scans must be submitted as .pdf files, and students are responsible for ensuring that the .pdf is of sufficient quality for clear printing.*

Exams

There will be four exams. Each of the first three exams will cover two chapters from the text, and the final exam will cover chapters 1 through 8. The first exam will follow Lesson 2; you may take this exam after submitting the first two written and online assignments, and you must take the first exam before submitting Assignment 3. The second exam will follow Lesson 4; you may take this exam after submitting the third and fourth written and online assignments, and you must take the second exam before submitting Assignment 5.

The third exam will follow Lesson 6; you may take this exam after submitting the fifth and sixth written and online assignments, and you must take the third exam before submitting Assignment 7. You may take the final exam after you submit all written and online assignments. The final exam will have one section like the previous exams that covers only chapters 7 and 8, but it will also have an extra section that reviews material from the first six chapters.

The practice exams in the text are a good way to train for the exams. An outline of the format, general content, and length of each exam, along with suggestions for your review, is given in the Prep for Exam sections in Lessons 2, 4, 6, and 8.

All exams must be proctored. For additional information on arranging for a proctor, view the [Correspondence Course Information \(.pdf\)](#) page.

You must submit all assignments and pass the final exam with a score of 61% or higher to pass the course.

Again, **the only calculator you are allowed to use for exams is a scientific calculator from the TI-30 series.**

Grading Criteria

Your grade for the semester will be determined as follows:

Online Assignments: 15%
Written Assignments: 15%
Exam 1: 15.75%
Exam 2: 15.75%
Exam 3: 15.75%
Comprehensive Final Exam: 22.75%

Final grades will be determined as follows:

A - Excellent: 90-100%
B - Good: 80-89%
C - Average: 70-79%
D - Poor: 61-69%
F - Failure: 60% and below

No pluses or minuses will be added to the final, reported grade.

Again, **to pass the course and receive credit, you must submit all assignments and receive a score of 61% or higher on the final exam.**

Your lowest score of the first three exams will be replaced by your score on the comprehensive final exam if the latter score is higher.

Free Tutoring Resources

A variety of free tutoring resources are available for students enrolled in correspondence courses. All correspondence students have access to several hours of free online tutoring from Smarthinking for subjects ranging from grammar and writing to mathematics and Spanish. Free online tutoring for writing-related assignments is also available from the Texas State Writing Center. For information on accessing these resources, please visit the Office of Distance and Extended Learning's [Free Tutoring](#) page. Currently-enrolled, degree-seeking students able to visit the Texas State campus are eligible for free in-person tutoring from the [Student Learning Assistance Center \(SLAC\)](#) on the fourth floor of Alkek Library and from the [Math Lab](#) in Derrick 233.

Scheduling Your Time

To some extent you can set your own pace in a correspondence course, but it is important that you schedule your time effectively. You should be able to complete each lesson, along with the assignment for each

lesson, in two weeks, so completing the course in four to five months is quite possible if you carefully budget your time. Remember, you have a maximum of nine months to complete this course. Use the [Course Study Schedule \(.pdf\)](#) to help you proceed through the course effectively.

Faculty-Student Contact

According to “Seven Principles for Good Practice in Undergraduate Education,” faculty-student contact is very important. Even though this is a correspondence course, I encourage you to contact me personally if you have any concerns, questions, or problems. You are welcome to e-mail me by using the Mail tool in the left menu bar. (It is important to keep all mail related to this course contained within this TRACS site.) My policy is that during non-holiday breaks or announced away times, any email I receive between Monday morning and Friday at noon will receive a reply within 48 hours. Emails received between Friday at noon and Sunday night will receive a reply on the next business day.

TRACS Technical Support

Texas State’s Information Technology Assistance Center (ITAC) provides phone and LiveChat technical support for TRACS 24 hours a day, seven days a week, 365 days a year. To take advantage of these services, visit [ITAC online](#) or call 512.245.ITAC (4822). Note also that a number of online TRACS tutorials are available from [TRACS Facts](#).

Before beginning this online course, it is recommended that you review the minimum hardware and software requirements and other important information available on the ITS [Course Information page](#).

Correspondence Course Information

As a correspondence studies student, it is your responsibility to be familiar with correspondence-related policies and services. To this end, I encourage you to review the [Correspondence Course Information \(.pdf\)](#) page as well as the [Correspondence Studies Student Handbook](#).

Students with Special Needs

The Office of Distance and Extended Learning is committed to helping students with disabilities achieve their educational goals. A disability is not a barrier to correspondence study, and we strive to provide reasonable accommodations to individuals in coursework and test taking. Students who require special accommodations need to provide verification of their disability to the [Office of Disability Services](#), Suite 5-5.1 LBJ Student Center, 512.245.3451 (voice/TTY). Students should then notify the [Office of Distance and Extended Learning](#) of any disability-related accommodation needs as soon as possible to avoid a delay in accommodations.

Academic Honor Code

The [Texas State Academic Honor Code](#) applies to all Texas State students, including correspondence students. The Honor Code serves as an affirmation that the University demands the highest standard of integrity in all actions related to the academic community.

Final Comments

The text has good problems and, for a mathematics text, is quite readable. The text also gives the location of resources on the Internet. The solutions manual provides extra assistance. E-mail me via the Mail tool in the menu bar at left if you need further resources. Be disciplined with your time and efforts, do all the exercises and practice exams, and succeed!

I would also appreciate any suggestions or comments you have about this course!