PimaCountyCommunityCollege
West Campus

Course name and number:	Trigonometry, MAT 182
Section code:	23226
Class Meeting Days/Times:	Tuesdays & Thursdays 3:10-4:25pm
Class Location:	West Campus, TORT E105

Instructor:	Anthony Tanbakuchi
Office hours/availability:	After class or by appointment.
Phone/voicemail:	**Office:**(520) 626-4500 **Fax:**(520) 626-3893
Email address:	atanbakuchi@pima.edu
	If you wish to contact me email is the best method and you will get the fastest response.

Class website:	On MyPima: http://mypima.pima.edu

Campus phone number:	206-2200

First day of class:	January 16, 2007
Add date:	January 22, 2007
Drop/Refund/Audit date:	January 29, 2007
Withdrawal deadline:	April 9, 2007
Final exam date:	May 15, 2007
Last day of class:	May 15, 2007

Course Introduction

The primary focus of this course is trigonometry. Along the way we will explore and develop skills in using trigonometric functions and properties, the associated graphs, and applying these skills to solve applications involving trigonometry.

Historically, trigonometry has been a key tool for surveyors, mapmakers, and navigators who used the basic properties of right triangles to solve both simple and complex problems. As you develop skills in trigonometry you will continually see how important trigonometry is for a wide range of real-world applications. Today trigonometry plays a significant role in the modern sciences including quantum physics, relativity, and optics. In fact, trigonometry is extremely broad in its use; it is used to mathematically describe vibrations, rotations, and periodic phenomena such as light, sound and electricity. It is amazing to think that the skills we will develop in this class can be used to everything from the motion of bodies in the universe to the behavior of subatomic particles.

Course Description

Introduction to trigonometric functions. Includes graphs, identities, angle measure, vectors, polar coordinates, and conic sections.

Prerequisite(s): Within the last three years: MAT 151 with a C or better or required score on the mathematics assessment test.

Course Objectives

1. Define, describe, graph, and evaluate the six trigonometric functions.
2. Algebraically solve equations involving trigonometric functions.
3. Use trigonometric identities to simplify expressions and solve equations.
4. Convert between radian and degree measures.
5. Define, describe, graph, and evaluate inverses of the trigonometric functions.
6. Solve application problems.
7. Use the laws of sines and cosines.
8. Name and perform operations on vectors in rectangular form.
9. Graph equations in the polar coordinate system.
10. Perform operations on complex numbers using both standard and polar forms.
11. Use the standard equations of the four conic sections.

Course Outline

The course outline is accessible at:
http://www.pima.edu/aux/course_outlines/mat/mat182.rtf

Course Website

You can access the course website in your courses at the MyPima website. I will post course materials in PDF or other common formats when appropriate.

Required Text Book(s)

Essentials of Trigonometry for Pima Community College by Karl J. Smith.

The textbook may be purchased from the campus bookstore. *This is a custom textbook so you need to purchase the Pima version.

Required Materials

For each class ensure that you bring: (1) the course textbook, (2) a calculator with trig functions (cos, sin, tan) (3) supplies to take notes, and (4) any other materials requested by the instructor. On some assessments, a calculator with trig functions (sin, cos, tan, asin,…) is permitted.

Calculators will be needed for some quizzes and a small portion of homework questions.

ADA Compliance Statement

Pima Community College is an equal opportunity, affirmative action employer and educational institution committed to excellence through diversity. Reasonable accommodations, including materials in an alternative format, will be made for individuals with disabilities when a minimum of five working days advance notice is given. For the general public, please contact the PCC information line at 206-4500 (TTY 206-4530); for PCC students, contact the Northwest Campus Disabled Student Resources Office at 206-6688.

Class Conduct

- Refer to the *Student Code of Conduct* for additional requirements relating to student behavior.
- Because of insurance limitations, non-registered visitors are not allowed at class sessions or on field trips.
- Possession of drugs, alcohol or firearms on college property is illegal.
- Eating, drinking, smoking and soliciting are not allowed in classrooms.
- Pets, telephones, pagers and other electronic devices that distract students are not allowed in classrooms. **Please turn phone ringers and other distracting devices off during class.**

- Students creating disturbances that interfere with the conduct of the class or the learning of others, violations of the *Student Code of Conduct*, will be referred to the Division Dean and/or the Dean of Students.
- Disruptive behavior will not be tolerated and can be cause for being dropped from the class. Disruptive behavior is defined as behavior that is disruptive to the learning process and outside normal behavior parameters. See the *Student Code of Conduct* for particulars, but examples of disruptive behavior are inappropriate talking, arriving late or leaving early, sleeping or doing other class work in class, etc.

How to succeed in this class & other mathematics courses
The following text is reproduced with permission of the original author, Dale Hoffman a professor in the Mathematics Department at Bellevue Community College in Bellevue, WA.

The following comments are based on over twenty years of watching students succeed and fail in mathematics courses at universities, colleges and community colleges and listening to their comments as they went through their study of mathematics. This is the best advice I can give to help you succeed.

Mathematics takes time. Almost no one fails mathematics because they lack sufficient "mental horsepower." Most people who do not succeed are unwilling (or unable) to devote the necessary time to the course. The "necessary time" depends on how smart you are, what grade you want to earn, and on how challenging the mathematics course is. Most mathematics teachers and successful mathematics students agree that 2 to 3 hours every weeknight and 5 or 6 hours each weekend is a good way to begin if you seriously expect to earn an A or B grade. If you are only willing to devote 5 or 10 hours a week to mathematics outside of class, you should consider postponing your study of mathematics.

Do NOT get behind. The brisk pace of many mathematics courses is based on the idea that you are willing to work hard to do well. It is terribly hard to catch up and keep up at the same time. A much safer approach is to work very hard for the first month and then evaluate your situation. If you do get behind, spend a part of your study time catching up, but spend most of it trying to follow and understand what is going on in class.

Go to class, every single class. Most of us (mathematics teachers) try to make every idea crystal clear and make every technique obvious and easy. We try to convey our enthusiasm for mathematics and show that we care about you as a person. Once in a while we might even make you laugh. Even though we're not successful all of the time, you still need to attend class. You need to hear the vocabulary of mathematics spoken and to see how mathematical ideas are strung together to reach conclusions. You need to see how an expert problem solver approaches problems. You need to hear the announcements about homework and tests. And you need to get to know some of the other students in the class. Unfortunately, when students get a bit behind or confused, they are most likely to miss a class or two (or five). That is absolutely the worst time to miss classes. Come to class anyway. Ask where you can get some outside tutoring or counseling. Ask a classmate to help you for an hour after class. If you must miss a class, ask a classmate what material was covered and skim those sections before the next class. Even if you did not read the material, come back to class as soon as possible.

Use the textbook intelligently. There are a number of ways of using a mathematics textbook:

   * to gain an overview of the concepts and techniques,
   * to gain an understanding of the material,
   * to master the techniques, and
   * to review the material and see how it connects with the rest of the course.

The first time you read a section, just try to see what problems are being discussed. Skip around, look at the pictures, and read some of the problems and the definitions. If something looks complicated, skip it. If an example looks interesting, read it and try to follow the

explanation. This is an exploratory phase. Don't highlight or underline at this stage -- you don't know yet what is important and what is just a minor detail.

The next time through the section, proceed in a more organized fashion, reading each introduction, example, explanation, and derivation. This is the beginning of the "mastery" stage. If you don't understand the explanation of an example, put a question mark (in pencil) in the margin and go on. Read and try to understand each step in the derivations and ask yourself why that step is valid. If you don't see what justified moving from one step to another in an argument, pencil in question marks in the margin. This second phase will go more slowly than the first, but if you don't understand some details just keep going. Don't get bogged down yet.

This time worry about the details. Go quickly over the parts you already understand, but slow down and try to figure out the parts marked with question marks. Try to solve the example problems before you refer to the explanations. If you now understand parts that were giving you trouble, erase the question marks. If you still don't understand something, put in another question mark and write down your question so that you can ask your teacher, tutor, or classmate about it.

Finally, it is time to try the problems at the end of the section. Many of them will be similar to examples in the section, but now you need to solve them. Some of the problems will be more complicated than the examples, but they will still require the same basic techniques. Some of the problems will require that you use concepts and facts from earlier in the course, a combination of old and new concepts and techniques. **Working lots of problems is the "secret" of success in mathematics.**

Working the Problems: Usually students read a problem, work it out and check the answer in the back of the book. If their answer is correct, they go on to the next problem. If their answer is wrong, they manipulate (finagle, fudge, massage) their work until their new answer is correct, and then they go on to the next problem. Do not try the next problem yet! Before going on, spend a short time, just half a minute, thinking about what you have just done in solving the problem. Ask yourself, "What was the point of this problem?" , "What big steps did I have to take to solve this problem?" , "What was the process?" Do not simply review every single step of the solution process. Instead, look at the outline of the solution, the process. If your first answer was wrong, ask yourself, "What was it about this problem that should have suggested the right process the first time?" As much learning and retention can take place in the 30 seconds you spend reviewing the process as took place in the 10 minutes you took to solve the problem. A correct answer is important, but a correct process, carefully used, will get you many correct answers.

There is one more step which too many students omit. Go back and quickly look over the section one more time. Don't worry about the details; just try to understand the overall logic and layout of the section. Make sure you understand the definitions, notation, and the statements of the examples and theorems. Ask yourself, "What was I expected to learn in this section?" Typically this last step, a review and overview, goes quickly, but it is very valuable. It can help you see and retain the important ideas and connections.

Work together, sometimes. It is much more fun, and it is very effective for doing well in mathematics. Studies, and my personal observations, show that students who work together in small groups are less likely to drop the course and are more likely to get A's or B's. You need lots of time to work on the material alone, but study groups of 3-5 students, working together 2 or 3 times a week for a couple hours, seem to help everyone in the group. Study groups offer you a way to get and give help on the material, and they can provide an occasional psychological boost ("misery loves company"). They are a place to use the mathematical language of the course, to trade mathematical tips, and to "cram" for the next day's test. Students in study groups are less likely to miss important points in the course, and they get to know some very nice people, their classmates.

Class Preparation and Policies

Study the textbook. <u>You are responsible for all material covered in the book.</u> If we do a derivation or example in class and don't have enough time to go through all the steps then be sure to fill in the gaps when studying.

The course schedule lists the sections we will cover for each class. You need to <u>read over the section before class</u> so you can better absorb what is being presented during class. Due to the limited time we have in class I may expect you to learn the basic material on your own so I can spend time clearly explaining the challenging material.

It is critical that you do the homework assigned for each section prior to the next lecture. Each section builds on the previous and if you have not worked on the homework then you will have a hard time following the new material being presented.

Getting Extra Help

Free tutoring is available in the Tutoring Center. If you are stuck go over and get help. There are people there to help you for free. Don't use the excuse that I was not available to help you. Use the tutoring center; it's a great resource.

Class Attendance

Attend every lecture. There is no substitute for attending lectures. **If you fall behind or get discouraged in class --- it happens to all of us --- don't stop coming!** This will just guarantee getting further behind and more frustrated. However, attending every class is not enough. **You must do the homework, study the book, and ask questions.**

If you are having problems talk to me when class ends, I almost always can stay after to help you.

Exams and quizzes cannot be made up and homework cannot be turned in late. If you know you will be unable to attend a class let me know in advance and coordinate getting your homework in on time.

If you miss a class then talk to a classmate to find out what you missed so you'll be prepared when you return. If you can't get a hold of anyone then email me.

Jury Duty

If you are summoned for jury duty you must notify the instructor a week in advance. It is your responsibility to make arrangements to get your assignments turned in on time.

Academic Integrity

- I take cheating seriously. Students participating in cheating or other unethical behavior will get an F for the course grade.
- Use of calculators capable of symbolic mathematics or graphing on assessments is not permitted. Storing equations or any other material in any electronic device memory for use on an assessment constitutes cheating.
- Students are expected to abide by the *Student Code of Conduct,* ***http://www.pima.edu/studentserv/studentrights/student-conduct/index.shtml*** and the *Code of Academic Integrity*, ***http://www.pima.edu/studentserv/studentrights/code/*** also available at PCC campus libraries.
- Pima Community College considers violations of scholastic ethics, including plagiarism, as serious offenses, which may result in failure of an assignment, the course, or possible expulsion.

- All work done for this class must be your own. For assignments, you may use work from books and other materials if properly cited. Copying from any source without proper reference is considered plagiarism.

Assessment

In order to determine whether this course is meeting its above-stated objectives, a variety of classroom assessment techniques will be used. The purpose of these assessment instruments is to assist your instructor in improving this course. Because this course fulfills a general education requirement, you will be assessed on your ability to communicate both orally and in writing, think critically and demonstrate global awareness.

Assignments

- Homework will be assigned after each new section is covered. Assignments are given at the end of class.
- **Homework is due each Tuesday at the beginning of class.** It must be turned in before you begin working on the Tuesday quiz.
- **No late homework is accepted.**
- **Your homework must be legible and show the steps required to arrive at the answer.**
- The homework grade is based on completeness, clarity, and correctness.
- I will drop your two lowest homework assignment scores.

Quizzes

- **Each Tuesday we will have a short five-minute quiz** containing one or two questions related to the homework that is due. If you have done the homework and understand how to work the problems the quizzes will be reasonable. Quickly reviewing your homework before class will also help. (We may also periodically have a quiz on Thursdays when appropriate.)
- **There are no makeup quizzes.** If you miss the class or arrive after the quiz is over you will receive no credit for the quiz.
- Students who are late for class will not be given additional time to complete the quiz.
- I will drop your two lowest quizzes.

Extra Credit Assignments

No extra credit assignments are planned.

Grading Procedures and Policy

Final Grade Components

Your final grade will be composed of the following components:

	% Final Course Grade	
HW Average:	15	Lowest 2 scores are dropped.
Quiz Average:	15	Lowest 2 scores are dropped.
Exam I:	15	
Exam 2:	15	
Exam 3:	15	
Final Exam:	25	

*If your final exam score is higher than your lowest exam grade then I will make your lowest exam grade equal to your final exam score. Thus, if you struggled initially with a portion of the course and scored poorly on an exam but master the material by the final your grade will increase to reflect your mastery of the material.

Final Grades

Letter grades will be assigned as follows.

Grade	% Final Course Grade
A	90-100
B	80-89.5
C	70-79.5
D	60-69.5
F	<60

Student Withdrawal "W" Grades

Students may withdraw from class without instructor permission and without incurring any grade penalty until the withdrawal date. Students who fail to withdraw themselves by the withdrawal deadline and quit attending class, remain on the active class roster and will receive a grade of "F".

Incomplete "I" Grades

▪ "I" (incomplete) grades will not be given.

"AU" Audit Grades

Auditing a class means to enroll in and attend without working for or receiving credit. Students auditing a class must register by the end of the official refund period and must receive written permission to audit from the instructor, who is not required to grade assignments submitted by students who are auditing the class.

Final Grades

For privacy and security reasons, instructors are advised NOT to give grades over the telephone or via email unless the student signs the exception box on the acknowledgment page of this syllabus. Students who wish to check grades may call MAX 2000 at 206-4880 or may access grades online using Banner Online at: *http://bannerweb.pima.edu*

Class Calendar
Below is the tentative class calendar. Changes may occur and will be announced in class.

	Date		Section	Note
	Date		**Section**	**Note**
T	16-Jan	C	Appendix C: Review of Algebra	
		1	**Right-Triangle Trigonometry**	
R	18-Jan	1.1	Angles and Degree Measure	
		1.2	Similar Triangles	
T	23-Jan	1.3	Trigonometric Ratios	
R	25-Jan	1.4	Right-Triangle Applications	(Jan 29 Drop Deadline)
		1.5	Angles and Arc Length	
		1.6	Chapter 1 Summary and Review	
		2	**Trigonometric Functions**	
T	30-Jan	2.1	Radian Measure	
		2.2	Trigonometric Functions on a Unit Circle	
R	1-Feb	2.3	Fundamental Identities	
T	6-Feb	2.4	Trigonometric Functions of Any Angle	
		2.5	Chapter 2 Summary and Review	
R	8-Feb		Exam 1 Review	
T	**13-Feb**		**Exam 1: Chapters 1 & 2**	
		3	**Graphs of Trigonometric Functions**	
R	15-Feb	3.1	Graphs of the Standard Trigonometric Functions	
T	20-Feb	3.2	General Cosine, Sine, and Tangent Curves	Rodeo Holiday 22-Feb
		3.3	Trigonometric Graphs	
T	27-Feb	3.4	Inverse Trigonometric Functions	
		3.5	Chapter 3 Summary and Review	
			Midterm Review Problems for Chapters 1--3	
		4	**Trigonometric Equations and Identities**	
R	1-Mar	4.1	Trigonometric Equations	(45 Census Day)
T	6-Mar	4.2	Trigonometric Identities	
R	8-Mar	4.3	Addition Laws	Spring Break 13 & 15 Mar
T	20-Mar	4.4	Double-Angle and Half-Angle Identities	
		4.5	Product and Sum Identities	
		4.6	Chapter 4 Summary and Review	
R	22-Mar		Exam 2 Review	
T	**27-Mar**		**Exam 2: Chapters 3 & 4**	
		5	**Oblique Triangles and Vectors**	
R	29-Mar	5.1	Law of Cosines	
T	3-Apr	5.2	Law of Sines	
		5.3	Areas and Volumes	
R	5-Apr	5.4	Vector Triangles	(April 9 Widthdrawl Deadline)
T	10-Apr	5.5	Vector Operations	
		5.6	Chapter 5 Summary and Review	
		6	**Complex Numbers and Polar-Form Graphing**	
R	12-Apr	6.1	The Imaginary Unit and Complex Numbers	
		6.2	De Moivre's Theorem	
T	17-Apr	6.3	Polar Coordinates	
R	19-Apr	6.4	Graphing in Polar Coordinates	
		6.5	Chapter 6 Summary and Review	
			Midterm Review Problems for Chapters 4--6	

		7	**Conic Sections**
T	24-Apr	7.1	Parabolas
R	**26-Apr**		**Exam 3: Chapters 5 & 6**
T	1-May	7.2	Ellipses
R	3-May	7.3	Hyperbolas
T	8-May	7.4	General Conics
R	10-May		Final Exam Review
T	**15-May**		**Final Exam: Cumulative Chapters 1-7**

Caveats

The instructor reserves the right to make changes to the syllabus and will notify students of those changes in class.

Student Information Survey

1. What was the last math class you took?

2. How long ago did you take your last math class? (eg. last semester, last year,…)

3. What grade did you receive in your last math class?

4. Why are you taking this class?

5. What other courses are you taking this semester & what campuses are you taking them at?

6. What is your major or your possible major interests?

7. Are you planning to transfer to another college or university? If so, where?

8. Are you currently working in addition to taking classes? If so, how many hours per week do you typically work?

9. What do you enjoy doing when not in class?

10. Is there anything else I should know?

Acknowledgment of Receipt of Syllabus

Please sign and return the following for **MAT 182, Trigonometry, Section 23226**:

Students: Initial each of the following to which you agree.

_____ I have received my syllabus, which includes the course objectives, policies, requirements and schedule

_____ I have read and understand all of the syllabus policies and requirements.

_____ I will check my MyPima email in a timely manner. I understand that this is the only email address that will be used for communication in this course. You should check it before each class at a minimum along with the course site on MyPima to stay up to date.

_____ I give permission for my instructor to e-mail any grades and materials associated with my student record for this course during this semester to the email address in the MyPima system.

Student information:

Signature: _____

Name: _____
(please print)

Id number: _____

Complete and return the student information survey and this page at the beginning of the next lecture.

Returning this will serve as your first quiz.