

## MAYLAND COMMUNITY COLLEGE

Welcomes You To:

MAT 172A.10 Precalculus Trigonometry Lab

**1 credit hours/2 contact hours**

**Spring 2007**

### Course Description

This course is a laboratory for MAT 172. Emphasis is placed on experiences that enhance the materials presented in the class. Upon completion, students should be able to solve problems, apply critical thinking, work in teams, and communicate effectively. *This course has been approved to satisfy the Comprehensive Articulation Agreement for transferability as a pre-major and/or elective course requirement.*

**Prerequisites:** Mat 171 **Co-requisites:** Mat 172 Precalculus Trigonometry

### Instructor Information

**Instructor:** Larry Shook

**Office Location:** Room P37

**Telephone:** 765-7351, Ext. 229

**E-mail:** lshook@mayland.edu

**Office Hours:** I maintain an open door policy for office hours and, if I am not in class or in a meeting I am available to you. In particular, please avail yourself of any of my posted office hours. Additional office hours are also available by appointment.

### Course Information

**Meeting days and time:** Tuesday/Thursday 9:30 to 10:20 am

**Snow Schedule:** 11:05 to 11:45 am

**Required Text :** Larson, Roland E., Precalculus. Houghton Mifflin Company, Boston New York. Seventh edition, 2006.

**Required Materials:** A TI-83 graphing calculator is required material for this class.

### Course Objectives/Competencies

*This course is a laboratory for Mat 172 Precalculus Trigonometry. Students will:*

1. Use basic algebra skills and trigonometry skills to solve application problems.
2. Reason and communicate mathematical concepts and problems clearly and accurately.
3. Work confidently, collaboratively and independently.
4. Use scientific and graphing calculators accurately and appropriately.
5. Develop the ability to critically analyze a problem and select the most appropriate method of solution.

### Course Content:

1. Transcendental functions, their properties, applications and graphs
2. Right and oblique triangle trigonometry
3. Conic sections and their graphs
4. Vectors
5. Polar coordinates

**This course directly supports the learning outcomes for the General Ed core courses in the Division of Arts and Sciences:**

1. Improve communication in speaking and listening situations needed for college, personal, and work successes
2. Improve communication in writing and reading situations needed for college, personal, and work successes
3. Improve logical, critical, and creative thinking to evaluate evidence and reach a conclusion
4. Increase application of basic computer use skills
5. Increase application of fundamental math skills
6. Increase both independent and collaborative work skills

**Attendance Policy/Tardiness/Make-Up Work**

Roll will be taken and you are expected to be in class each time it meets. Coming in late or leaving class early is counted as an absence. You will be allowed one cut without grade penalty. If you must miss a class you are responsible for obtaining notes, arranging for help on any material that you do not understand and for turning in any work due in a timely manner. No absence is excused beyond the one allowed cut except for personal religious holidays (see me in advance). Any student with 4 or more absences will be penalized 50 grade points for this class.

Additionally, students will automatically receive a grade of **F** for the course if they have 6 or more absences.

**Note:** If a student has not been in contact with the instructor and has not attended class for a consecutive two-week period, an administrative withdrawal will be submitted by the instructor.

**Grading Criteria/Tests/Projects:** The final grade will be determined as follows:

Attendance $\approx$ 1.5 points per class	50 points
Lab activities	100 points
Project(s)	<u>200 points</u>
Total	350 points

**Grading Scale:**

- A = 350 to 315 points (90-100%)
- B = 314 to 280 points (80-89%)
- C = 279 to 245 points (70-79%)
- D = 244 to 210 points (60-69%)
- F = 219 or below (59% or less)

**Inclement Weather Procedures**

Students must use wisdom and discretion in case of inclement weather considering the geographic area in which we live. While this is college and students are expected to attend class, it is not advisable for students to risk bodily harm or property damage to attend. If students must miss classes due to weather or for some other excused reason such as a doctor's appointment or sickness, I will trade documented tutoring time for class time. This must be time with an assigned tutor, the math lab, or me.

It is possible that day classes can be cancelled, but night classes will be held, or vice versa. It is necessary that you either call the school or listen to the radio stations that report school closings to determine whether or not class is being held on any days when the weather is uncertain.

### **Academic Standards/Student Expectations/Ethics**

**Labs:** Labs will be taken from handouts or the text. Labs are designed to be completed as a group and most require assistance from the instructor. Labs are due immediately upon completion, or within one class meeting, if absent.

**Project:** At least one project is required for this class. Some simpler projects will require a second project for full credit. Students may work individually or in a group of no more than two. Project topics are listed below. You may submit your project for review prior to the final submission date and I will be glad to give you suggestions, etc., for correction or improvement. The final project is to be typed and double spaced and **MUST** include a cover sheet (with graphics, if possible). The project will be due no later than Thursday, April 27.

I will not accept any late work for any reason.

**Behavior:** Students are expected to behave appropriately in class. Any excessive talking, profanity, leaving class or other inappropriate behavior will result in the student being asked to leave the class. A conference with student services will be required to return to class. Any one cheating on a test or quiz will be given a zero for the assignment and referred to the Academic Dean for disciplinary action. Cheating is defined as giving or receiving assistance.

**Incompletes:** Incompletes will be granted **ONLY** in extreme circumstances and at my sole discretion. If an incomplete is granted, it is the student's responsibility to see that all aspects of the syllabus are completed prior to August 1 2007. There will be no reminders sent or phone calls made to prompt the student to cure the incomplete. If the incomplete is not cured by the deadline above, the incomplete will automatically convert to an F for the course, and the entire course must be repeated.

**Withdrawal Dates and Course Calendar:** If you wish to audit this course, you must file a drop/add form with the registrar prior to January 12<sup>th</sup>. If you cannot meet the course requirements or you must withdraw from this class, you must file a drop form with the registrar to avoid a failing grade on your transcript. You can withdraw unconditionally without grade penalty prior to February 13<sup>th</sup>. From February 14<sup>th</sup> to March 27<sup>th</sup>, you can withdraw with a grade of WP or WF, to be determined by the instructor. You may not withdraw from any class after March 27<sup>th</sup>. Exceptions to this deadline will be made only in cases of extreme emergency (such as serious illness or family emergency.) This is a school wide Mayland Community College policy.

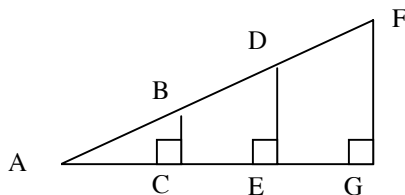
Any student requesting special accommodations for this course due to a disability should apply for services through the SOAR Office or the Counseling Center, which will document the disability. A counselor will then help determine which accommodations, if any, the student needs for success in this course.

## Project topics

**Project 1:** A surveyor in a helicopter is trying to determine the width of an island. See page 350, problem #3 in your text for a diagram.

- What is the shortest distance,  $d$ , the helicopter would have to travel in order to land on the island?
- What is the horizontal distance,  $x$ , that the helicopter would have to travel before it would be directly over the nearer end of the island?
- Find the width,  $w$ , of the island. Explain how you obtained your answer.

\***Project 2:** Use the following figure (include the figure in your project): Also, see page 350, problem #4 in your text.



- Explain why  $\triangle ABC$ ,  $\triangle ADE$ , and  $\triangle AFG$  are similar triangles.
- What does similarity imply about the ratios  $\frac{BC}{AB}$ ,  $\frac{DE}{AD}$ , and  $\frac{FG}{AF}$ ?
- Does the value of  $\sin A$  depend on which triangle from part (a) is used to calculate it? Would the value of  $\sin A$  change if it were found using a different right triangle that was similar to the three given triangles?
- Do your conclusions from part (a) apply to the other five trigonometric functions? Explain.

\***Project 3:** You are seeding a triangular courtyard. One side of the courtyard is 52 feet long and the other side is 46 feet long. The angle opposite the 52-foot side is  $65^\circ$ .

- Draw a diagram that gives a visual representation of the problem.
- How long is the third side of the courtyard?
- One bag of grass seed covers an area of 50 square feet. How many bags of seed will you need to cover the courtyard?

**Project 4:** Verify the following identity used in calculus:

$$\frac{\cos(x+h) - \cos x}{h} = \cos x \left( \frac{\cos h - 1}{h} \right) - \sin x \left( \frac{\sin h}{h} \right)$$

- Project 5:** (a) Write a sum formula for  $\sin(u + v + w)$   
(b) Write a sum formula for  $\tan(u + v + w)$

**Project 6:** Complete the exercise on page 473, problem #10 of your text.

\***Project 7:** A hiking party is lost in a national park. Two ranger stations have received the emergency SOS signal from the party. Station B is 75 miles due east of station A. The bearing from station A to the signal is  $S 60^\circ E$  and the bearing from station B to the signal is  $S 75^\circ W$ .

- Find the distance from each station to the SOS signal.
- A rescue party is in the park 20 miles from station A at a bearing of  $S 80^\circ E$ . Find the distance and the bearing the rescue party must travel to reach the lost hiking party.

**Project 8:** Any other approved project you present to me. See the text at the end of each chapter for other projects.