

Syllabus for  
**MAT 106—Trigonometry**  
3 Credit Hours  
Spring 2016

I. COURSE DESCRIPTION

A continuation of MAT 105. The concepts developed in the first course are expanded and considered in relationship to rational functions, trigonometric functions, and conic sections. (This is the second course in a two-semester sequence preparing students for calculus. Does not count toward a major or minor in mathematics.)

Prerequisite: MAT 105; or an appropriate score on the ORU calculus placement exam.

II. COURSE GOALS

The purpose of this course is to enable the student to be able to do the following: Develop the background required for the science or mathematical courses required in his or her chosen field, such as pre-medicine, computer science, and pre-engineering (as well as other scientific disciplines). This course is the second of a two-course series in trigonometry that provides the prerequisites for the study of calculus.

III. STUDENT LEARNING OUTCOMES FOR THIS COURSE

A. Objectives

As a result of successfully completing this course, the student will be able to do the following:

1. Define the sine and cosine functions in terms of the unit circle.
2. Define other trigonometric functions in terms of sine and cosine.
3. List and apply the fundamental identities for circular functions.
4. Prove trigonometric identities by use of the fundamental identities.
5. State and use the sum-difference, reduction, and multiple value formulas of the trigonometric identities.
6. Solve trigonometric equations.
7. Graph the six trigonometric functions and other sinusoids with respect to amplitude, period, phase shift, etc.
8. Define and identify uses of the inverse trigonometric functions.
9. Solve trigonometric problems involving triangles using the law of sines, cosines, and other special cases.
10. Convert measurement from degrees to radians and conversely.
11. List the characteristics of the graph of an ellipse, parabola, and hyperbola.

B. Objectives for Students in Teacher Preparation Programs

The course goals for the Teacher Preparation Program now meet the “competency-based” requirements established by the Oklahoma Commission on Teacher Preparation. This course meets Subject Competencies 5, 6, 7, 8, and 9.

- SC5: Has a broad and deep knowledge of the concepts, principles, techniques, and reasoning methods of mathematics that are used to set curricular goals and shape teaching.
- SC6: Understands significant connections among mathematical ideas and the applications of these ideas to problem solving in mathematics, in other MAT disciplines, and in the world outside of school.
- SC7: Has experiences with practical applications of mathematical ideas and is able to incorporate these in curricular and instructional decisions.
- SC8: Is proficient in, at least, the mathematics content needed to teach the mathematics skills described in Oklahoma's core curriculum, from multiple perspectives. This includes, but is not limited to, a concrete and abstract understanding of number systems and number theory, geometry and measurement, statistics and probability, functions, algebra, discrete mathematics, and calculus necessary to effectively teach the mathematics skills addressed in the sixth through twelfth grade in the Oklahoma core curriculum. (The depth and breadth of knowledge should be much greater than for the Intermediate Mathematics certification.)
- SC9: Is proficient in the use of a variety of instructional strategies to include, but is not limited to, cooperative learning, use of concrete materials, use of technology (i.e., calculators and computers), and writing strategies to stimulate and facilitate student learning.

#### IV. TEXTBOOKS AND OTHER LEARNING RESOURCES

##### A. Required Materials

1. Textbooks - **Check with your instructor for textbook requirements.**  
Lial, Margaret, John Hornsby, David Schneider, and Callie Daniels. (2012).  
*Precalculus*. 5th ed. An electronic version of the textbook is included/packaged with the *MyMathLab* software.  
ISBN-10: 0321783808 or ISBN-13: 9780321783806
2. Other – **Check with your instructor for software requirements.**  
*MyMathLab* is an online software product that allows the student to do homework math problems accompanied with immediate feedback, context sensitive help, examples, multiple tries for each problem, and pages to read from the textbook. The software also contains grade book and testing features. The Internet site for the course is <http://www.coursecompass.com/> (the CourseCompass course name is MAT 106 —Trigonometry). Each student will purchase a MyMathLab access key code, go to the Internet site listed above, and join the class that has the class code that will be given out in class. If the bookstore is out of student access kits, a credit card or PayPal can be used for the purchase at the Internet site.

A graphing calculator is required. The instructor will be using the TI-84 Plus Silver Edition throughout the course.

##### B. Optional Materials

1. Textbooks  
None

2. Other  
Graphing calculator, such as the TI-84

## V. POLICIES AND PROCEDURES

### A. University Policies and Procedures

1. Attendance at each class or laboratory is mandatory at Oral Roberts University. Excessive absences can reduce a student's grade or deny credit for the course.
2. Students taking a late exam because of an unauthorized absence are charged a (\$15) late exam fee.
3. Students and faculty at Oral Roberts University must adhere to all laws addressing the ethical use of others' materials, whether it is in the form of print, electronic, video, multimedia, or computer software. Plagiarism and other forms of cheating involve both lying and stealing and are violations of ORU's Honor Code: "I will not cheat or plagiarize; I will do my own academic work and will not inappropriately collaborate with other students on assignments." Plagiarism is usually defined as copying someone else's ideas, words, or sentence structure and submitting them as one's own. Other forms of academic dishonesty include (but are not limited to) the following:
  - a. Submitting another's work as one's own or colluding with someone else and submitting that work as though it were his or hers;
  - b. Failing to meet group assignment or project requirements while claiming to have done so;
  - c. Failing to cite sources used in a paper;
  - d. Creating results for experiments, observations, interviews, or projects that were not done;
  - e. Receiving or giving unauthorized help on assignments.By submitting an assignment in any form, the student gives permission for the assignment to be checked for plagiarism, either by submitting the work for electronic verification or by other means. Penalties for any of the above infractions may result in disciplinary action including failing the assignment or failing the course or expulsion from the University, as determined by department and University guidelines.
4. Final exams cannot be given before their scheduled times. Students need to check the final exam schedule before planning return flights or other event at the end of the semester.
5. Students are to be in compliance with University, school and departmental policies regarding Whole Person Assessment (WPA) requirements. Students should consult the WPA handbooks for requirements regarding general education and the students' majors.
  - a. The penalty for not submitting electronically or for incorrectly submitting an artifact is a zero for that assignment.

- b. By submitting an assignment, the student gives permission for the assignment to be assessed electronically.

B. Department Policies and Procedures

1. Computer Resources - Each Student who uses the computer is given access to the appropriate computer resources. These limited resources and privileges are given to allow students to perform course assignments. Abuse of these privileges will result in their curtailment. Students should note that the contents of computer directories are subject to review by instructors and the computer administrative staff.
2. Late Exams - Each instructor has his or her own late-exam policy, so an instructor may decide that an exam missed because of an unexcused absence cannot be made up.
3. Unexcused Absences - Any student whose unexcused absences total 33% or more of the total number of class sessions will receive an F for the course grade.
4. Incompletes – As stated in the University catalog, incompletes are granted only for “good cause,” such as extended hospitalization, long-term illness, or a death in the family. Students must petition for an incomplete using the form available in the Computing and Mathematics Department. Very few incompletes are granted.

C. Course Policies and Procedures

1. Evaluation Procedures may vary according to software available and instructor preferences:
  - a. One-period examinations (4 in number) count 100 points each.
  - b. Quizzes (if given) and homework together are worth up to a total of 245 points.
  - c. Grade Categories and Weights
    - i. The final exam is comprehensive and is worth 200 points.
    - ii. The course grade will be determined by the percentage of total points accumulated as shown on the grading and points scales:  
A=90%  
B=80%  
C=70%  
D=60%  
F=59% and below
    - iii. The **approximate** grade calculations for the class are as follows. The percentages and categories may vary somewhat depending on your instructor, the capabilities of the software, and grade book used.

Chapter Exams are worth 100 points each (4)	400
Chapter Practice Tests are worth 25 points each (4)	100
Practice Final Test is worth 50 points (1)	50
Final Exam is worth 200 points (1)	200

Homework assignments are 10 points each (23)	230
Discussions are worth 10 points each (7)	70
Quizzes are worth 5 points each (up to 3)	15
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Total points possible:	1065

2. Whole Person Assessment Requirements
 

No WPA artifact is required for Advantage courses.
3. Other Policies and/or Procedures
  - a. Excessive absenteeism or discipline problems may cause a deduction in the course grade.
  - b. Any assignment turned in late may have points deducted. All homework problems completed after the due date will have a 20% penalty assessed. Everything completed correctly before the due date will have no penalty. The homework assignments do close on Saturday at 11:59 p.m. each week, so don't wait until Friday night to start your assignments. **Practice tests and chapter exams are not available after the due date.**
  - c. Completing the homework is essential. Because mathematics builds upon previously developed concepts, the student's progress in the learning process depends on proper pacing. The best way to ensure maximum learning is for each student to give immediate attention to each assignment presented. Specific homework assignments are given in *MyMathLab* and a tentative schedule is listed in Part VI of the syllabus.
  - d. All math problems will be done online with *MyMathLab*. Discussions will be required and part of your grade.
  - e. Credit by examination. All ORU students are expected to take one college-level mathematics course. If the material in this course and MAT 105 were studied in high school, the student is expected to take Calculus I (MAT 201). Consequently, credit for this course by examination is not permitted.
  - f. If a syllabus revision is necessary for any reason, the instructor will notify the students on D2L and by email.
  - g. There is a practice before each exam that a student may take as many times as liked to obtain the best possible score. I will enter the highest score in the gradebook on D2L. PLEASE NOTE: Students **must score 70% or greater on the practice test to take the chapter exam.**
  - h. Do not wait until the last minute to do any assignments – computer glitches happen, internet services occasionally go out, websites can go down... Working early helps keep these kind of issues from affecting your grade negatively

- i. Homework assignments must be completed with a score of 80% or better to go on to the next assignment. It will snowball on you, so don't let yourself fall behind.

## VI. TENTATIVE COURSE CALENDAR FOR MYMATHLAB WORK

The assignments may vary due to the availability of problems in MyMathLab.

### Chapter 5: Trigonometric Functions (Weeks 1-3)

Weeks:	Section(s):	Topic:	HW #
1	0	MyMathLab Orientation	1
1	5.1	Angles	2
1,2	5.2	Trigonometric Functions	3
2	5.3	Evaluating Trigonometric Functions	4
2,3	5.4	Solving Right Triangles	5
3		Practice Test 1 due	
3		Test 1 – Chapter 5	

### Chapter 6: The Circular Functions and Their Graphs (Weeks 4-6)

4	6.1	Radian Measure	6
4	6.2	The Unit Circle and Circular Functions	7
5	6.3	Graphs of the Sine and Cosine Functions	8
5	6.4	Translations of the Graphs of Sine and Cosine Functions	9
5, 6	6.5	Graphs of Other Equations	10
6		Practice Test 2	
6		Chapter 6 Exam	

### Chapter 7: Identities

(Weeks 7-9)

7	7.1	Fundamental Identities	11
7	7.2	Verifying Trigonometric Identities	12
7	7.3	Sum and Difference Identities	13
8	7.4	Double-Angle and Half-Angle Identities	14
8	7.5	Inverse Circular Functions	15
8	7.6	Trigonometric Equations	16
8	7.7	Equations Involving Inverse Trigonometric Functions	17
9		Practice Test 3	
9		Chapter 7 Exam	

**Spring Break!**

**Woo Hoo!!!!**

### Chapter 8: Applications of Trigonometry (Weeks 10-11)

10	8.1	The Law of Sines	18
10	8.2	The Law of Cosines	19
11	8.8	Parametric Equations, Graphs, and Applications	20

### Chapter 10: Analytic Geometry (Weeks 11-13)

11	10.1	Parabolas	21
12	10.2	Ellipses	22

12	10.3	Hyperbolas	23
13		Practice Test 4	
13		Chapters 8 & 10 Exam	
13, 14		Review For Final Examination	
14		FINAL EXAM	

**Course Inventory for ORU's Student Learning Outcomes**  
**MAT 106—Trigonometry**  
**Spring 2016**

This course contributes to the ORU student learning outcomes as indicated below:

**Significant Contribution** – Addresses the outcome directly and includes targeted assessment.

**Moderate Contribution** – Addresses the outcome directly or indirectly and includes some assessment.

**Minimal Contribution** – Addresses the outcome indirectly and includes little or no assessment.

**No Contribution** – Does not address the outcome.

The Student Learning Glossary at <http://ir.oru.edu/doc/glossary.pdf> defines each outcome and each of the proficiencies/capacities.

<b>OUTCOMES &amp; Proficiencies/Capacities</b>		Significant Contribution	Moderate Contribution	Minimal Contribution	No Contribution
<b>1</b>	<b>Outcome #1 – Spiritually Alive</b> Proficiencies/Capacities				
1A	Biblical knowledge			X	
1B	Sensitivity to the Holy Spirit			X	
1C	Evangelistic capability				X
1D	Ethical behavior			X	
<b>2</b>	<b>Outcome #2 – Intellectually Alert</b> Proficiencies/Capacities				
2A	Critical thinking	X			
2B	Information literacy			X	
2C	Global & historical perspective				X
2D	Aesthetic appreciation				X
2E	Intellectual creativity			X	
<b>3</b>	<b>Outcome #3 – Physically Disciplined</b> Proficiencies/Capacities				
3A	Healthy lifestyle				X
3B	Physically disciplined lifestyle				X
<b>4</b>	<b>Outcome #4 – Socially Adept</b> Proficiencies/Capacities				
4A	Communication skills				X
4B	Interpersonal skills				X
4C	Appreciation of cultural & linguistic differences				X
4D	Responsible citizenship			X	
4E	Leadership capacity				X