Math 112 / Trigonometry / 40554 /TR/ 8:00 -10:00 / HCC 190 / F '17

Instructor: Liz Coleman **Office:** GRV 214 **Office hours**: Mon: 11:00 - 12:30 in GRV 234;
Phone: 541-383-7414 TuTh: 12:15 - 1:00 pm in HCC 190; Wed: 10:30 - 11:30 in GRV 214
Email: ecoleman@cocc.edu **Web Site:** http://www.cocc.edu/ecoleman/

Prerequisite: Math 111, College Algebra, with a grade of B- or better.

Textbook: From the COCC bookstore: $112.25, *Algebra and Trigonometry* 4th ed., loose-leaf packaged with WebAssign* software, by James Stewart, ISBN: 9781305719781, published by Cengage Learning. You should purchase a three-ring binder to keep your loose-leaf "book" intact. Alternatively, for $100.75, and no loose-leaf book you can get just the WebAssign access, ISBN: 9781285858333. In both cases, you will have access to a full copy of the book electronically through the WebAssign website.

Calculators: A graphing calculator is required, the TI83 or 84 is recommended.

Attendance: Attendance is mandatory the first week and necessary thereafter if you plan on succeeding in this course. ***You will be dropped if you miss a class the first week***

WebAssign (I do not use Black Board):

You must have a WebAssign account linked to this class to continue to be enrolled in this class. To sign up for a WebAssign account for this class go to http://www.webassign.net/ and click on I Have a Class Key (far right side under LOG IN). The institution is: cocc.

For our section **40554** the class key is: **cocc 8589 8905**

If you already have an account from Math 111, or are retaking 112 and created an account prior to this term, please check "I already have a Web Assign account". *If you've never signed up for Web Assign click on*: "I need to create a Web Assign account".

Check out the WA Quick Start guide: http://www.webassign.net/manual/WA_Student_Quick_Start.pdf

Be sure to use a username (COCC preferred) and password that you can remember!

Please *do not* use your cell phone or lap top during class. Have the ringer turned off, and do not use it for text messaging -- it's too distracting.

IF YOU STOP COMING TO CLASS PLEASE REMEMBER TO OFFICIALLY DROP THE CLASS OTHERWISE, YOU WILL RECEIVE AN "F" FOR YOUR GRADE.

NOTE: You will only learn by doing; math is not a spectator subject. You should plan on **reading the text prior to class and take notes during class**. I encourage you to ask questions during lectures pertinent to the topic being discussed. Get to know some of the other students in the class and get some "study buddies"!

Instructional Methods: Lecture, small group work, and discussion. *It is highly recommended that you read the assigned section(s) before class.* Homework is submitted through an on-line, web-based component called WebAssign (see: www.webassign.net).

NOTE: You will only learn by doing; math is not a spectator subject. You should plan on **reading the text prior to class, take notes during class, and having 10-12 hrs of study time outside of class**. I encourage you to ask questions during lectures pertinent to the topic being discussed.

Dropping a Class/Audits: The end of the 7th week of the term is the last day to change from a grade to an audit, or vice versa. This date is also the last day to drop a course without receiving a W on your transcript. After the 7th week and by the end of the Wednesday prior to finals week, you may drop a course and receive a W on your transcript only with permission from your instructor

ADA statement: "Students with documented disabilities who may need accommodations, who have any emergency medical information the instructor should know of, or who need special arrangements in the event of evacuation, should make an appointment with the instructor as soon as possible, no later than the first week of the term. Students may also wish to contact the COCC Disability Office in BEC, (541) 383-7583."

Classroom behavior: We are here to work and to learn. I expect you to be respectful of the classroom environment and your fellow students. I expect you to be on time for class, and to stay until the end, unless you have checked in with me beforehand. Specifically, I expect you to abide by the guidelines explained in the COCC Student Rights and Responsibilities Handbook. The most up-to-date version of this handbook can be found at:
Students Rights and Responsibilities available online (http://www.cocc.edu/Student-Life/Rights_and_Responsibilities/). Any violations of COCC's student rights and responsibilities policies will be reported to Office of Student Life.

COCC Non-Discrimination Policy: Central Oregon Community College is an affirmative action, equal opportunity institution. It is the policy of the Central Oregon Community College Board of Directors that there will be no discrimination or harassment on the basis of age, disability, gender, marital status, national origin, race, religion, sexual orientation, or veteran status in any educational programs, activities or employment. Persons having questions about equal opportunity and non-discrimination, please contact Human Resources for referral to the appropriate personnel, 541-383-7236.

Grading:	**Weight**
Homework (on WebAssign)	5%
Quizzes, Projects, Group Work	30%
Two tests@ 20% each	40%
Final	25%
Total	100%

Approximate grading scale:

A⁻, A: 90%-100%
B⁻,B⁺: 80%-89.9%
C,C⁺: 70%-79.9%
D: 60%-69.9%
F: <59.9%

Exams: There will be 2 tests and one final given throughout the quarter. *Tentative* dates for the tests and material covered are as follows:

Test 1: Week 5 - Covers: HW's 1-6, Quizzes A-C, and Projects 1-3;
Test 2: Week 8 - Covers: HW's 7-14 and some previous material;

All tests and quizzes are closed book and no notes.

MAKE-UP TESTS ARE GIVEN WITH PRIOR ARRANGEMENT ONLY.

Final exam: Tuesday, Dec. 12, 8:00-10:00. The final is comprehensive, from all material covered this term.

Homework, Quizzes, Group Work and Projects:

Homework (HW) will be handled electronically on WebAssign, (WA) and due dates will be posted on WA. Bonus points (20% of your correct work points added back!) will be awarded for HW submitted by midnight of the bonus "due" dates. The absolute deadline for HW is the night prior to the day in which the test for the material will be held. No late HW will be accepted after the deadline. The homework is only available on WebAssign.

Quizzes will be given occasionally throughout the term and announced in class for their scheduled time. If you miss a quiz, you may make it up during my office hours **within a week** of the originally scheduled date.

Group Work & Projects will be handed out one or two times a week and due dates for each will be announced in class and on WA. We will often have in-class time to work on these and I expect you to stay in class to use the time to get questions answered and work with your fellow students. Written work needs to be turned in on time if you want it graded and back to you in a timely manner. **Late work is accepted up to one week late only and will be reduced by 25%.**

Any work handed MUST be presented:

- neat and in PENCIL ONLY (points will be deducted for pen).
- your name -first and last, and class meeting time in the *upper-most right-hand corner of the page.*
- **no frilly edges.**
- Points will be deducted for incorrect notation, wrong answers, and infractions to presentation.
- **Always show any and all necessary work for full credit. Leave space between each problem.**
- Staple more than one paper together; please do not fold the corners together or paper-clip papers together. Use both sides of the paper.

Disclaimer: *The contents of this syllabus are subject to revision at the discretion of the instructor.*

Course Description: Mth 112 is a course designed to examine in detail the applied, real–world, and theoretical mathematical implications of the trigonometric functions. The symbolic, numerical, and graphical representations of these functions and their applications form the core of the course. Emphasis will be on solving problems symbolically, numerically and graphically and understanding the connections among these methods in interpreting and analyzing results.

Mth 112 has the competencies from Mth 111: Precalculus as prerequisites; the course is college-transferable. Mth 112 is a 4 credit hour (quarter system) course.

Performance Based Outcomes in Mathematics:
Students who successfully complete any mathematics course at Central Oregon Community College will be able to:

1. *Work independently to explore mathematical applications and models, and to develop algebraic/symbolic, graphical, numerical, and narrative skills in solving mathematics problems.*

2. *Work as a member of a group/team on projects or activities that are designed to explore mathematical applications and models.*

3. *Use both written and oral skills to communicate about mathematical concepts, processes, complete mathematical solutions and their implications.*

4. *Use a variety of problem solving tools including symbolic/algebraic notation, graphs, tables, and narratives to identify, analyze, and solve mathematical problems.*

5. *Develop mathematical conjectures and use examples and counterexamples to examine the validity and reasonableness of those conjectures.*

6. *Create and analyze mathematical models of real world and theoretical situations, including the implications and limitations of those models.*

7. *Use appropriate technologies to analyze and solve mathematics problems, and verify the appropriateness and reasonableness of the solution(s).*

Specifically, students who complete Math 112: Trigonometry will be able to:

- model and solve applied, real–world, and theoretical mathematical problems involving right–triangle and oblique–triangle trigonometry. 1, 2, 4, 5, 6

- model and solve problems using symbolic, graphic and numeric strategies and translate among written descriptions, symbolic, graphic and numeric representations of trigonometric functions.

- use a graphing calculator to create trigonometric graphs that represent mathematical models, determine appropriate viewing windows and accurately interpret and draw inferences regarding the meaning and limitations of the graphs. 4, 5, 6, , 7

- understand, apply, and interpret the meaning of trigonometric identities to solve trigonometric equations.

- model and solve problems involving vectors in two dimensions both algebraically and graphically and understand the relationship between the methods and solutions.

WEEK	***Tentative* weekly schedule for Math 112 Fall 2017 and other important dates:**	
#1- (Mon. dates) **Sept 25**	Syllabus handed out (also on Directory Page). This week we'll be covering the concepts of angles, angle measure in degrees & radians, **the "standard" angles,** coterminal angles, arc length, and area of a sector. Trigonometric functions and the unit circle will be introduced and defined. Read sections 5.1 & 5.3 for HW's #1 - #3. HW due dates will be posted on WebAssign (WA). Make sure you are signed up on WA before the end of the week. **Hand out "Cone" project & First week activity**	
#2- Oct. 2 (10-6 Tuition due & end of refund period)	**Project 1 – Graphs of Sine & Cosine**. Read 5.3&6.2 for HW#4. Some key concepts for graphing are *amplitude*, *period*, and *phase shift*. **QUIZ A: The "standard" angles in degrees and radians.** **QUIZ B: Trig functions of the "standard" angles.** **Group Work 1 (GW1-Standard Angles and Translated Graphs of Trig. Functions)**	
#3- Oct. 9	More on graphing the trig functions, **Proj 2 - Graphs of Sine, Cosine & Tangent**. Read 6.3 for HW's #5&6 and get handouts that go along with HW's #5&6. **Group Work 2 – Graph Reading/Build Trig. Functions**	
#4- Oct. 16	**Project 3 – Fitting a cosine curve to a data set** and more on graphing. **QUIZ C: Graph Sine, Cosine and Tangent.** **GW3-Arc length and Area of Sector & GW4-Geometric Representations**	
#5- Oct. 23	**<u>First Test is scheduled for this week</u> over** **HW's 1-6, quizzes A-C, proj's 1-3, and GW's 1-4.** Introduce Right triangle trigonometry. Hand out and group work. Read 5.2. **Project 4, all 6 trig functions and their graphs**.	
#6- Oct. 30	Right triangle trig, applications, and the reciprocal trig functions. Read 5.2 and 5.4 for HW's #7-#10. **Climber Project & GW5-Solving Right Triangles**	
#7- Nov. 6	**Law of Sines and Law of Cosines**. Read 5.5 and 5.6 for HW's #11&12. Intro to simplifying trig expressions. Read 7.1 for HW's #13&14. Hand out, GW's 6&7 **Nov. 9, 5pm, Last day to drop class with no grade on transcript**	
#8- Nov. 13	Wrap up Law of Sines and Cosines. Sum and Difference formulas. Read 7.2-7.4 for HW's #15&16. **Non-right triangle "protractor" GW8. Proving trig identities GW9.** **<u>The 2nd test is scheduled for this week</u>; HW's #7-12 and some previous material.**	
#9- Nov. 20	Sum and Difference formulas. Double angle formulas. Solving basic trig equations. Read 7.4 for HW#17 and 5.4&6.5 for HW#18. **QUIZ D (if time).**	Thanksgiving Holiday, college is closed, Nov. 23 & 24
#10- Nov. 27	More on solving trig equations and inverse trig functions. Introduction to Vectors, notation, applications, algebra and graphing.	
#11- Dec. 4	Wrap up Vector introduction and REVIEW for the final! **Dec. 6, Last day to withdraw**, receive a "W" grade (need instructor's signature)	
Final	**Final exam:** HCC 190, <u>Tuesday, Dec. 12, 8:00-10:00.</u>	

Assignment Check Off/Coleman/Math 112: below is a list of the Quizzes, Projects, and Group Work you can expect throughout the term. There may be slight changes.

Assignment	Due	Worth	Your Score
First week activity: Naming the Standard Angles & Trig Func's		20pts	
Quiz A (Id. all standard angles degrees/radians)		32pts	
Quiz B (Id. the val's of trig functions at the st. angles)		45	
Quiz C (Graphs of the Sine, Cosine & Tangent functions)		30	
Quiz D (if time)		30	
Homework 5 additional graphing handout		12	
Homework 6 additional graphing handout		10	
Cone Project		30	
Project 1 (Graphs of Sine and Cosine)		36	
Project 2 (Graphs of Sine, Cosine and Tangent)		40	
Project 3 (Curve fitting)		32	
Project 4 (Graphs of all 6 trig functions)		60	
Project 5 (Solving triangles, applications, with bonus!)		50	
Climber Project (Bonus)		20	
Group Work (1) - Fill-in-the-blank and Graphing sines & cos's		48	
Group Work (2) - Graph Reading (Create eqn's for the graph)		45	
Group Work (3) – Arc Length Handout		20	
Group Work (4) - Geometric Rep's for the Trig Functions		24	
Group Work (5) - Right Triangle Trig. Handout		18	
Group Work (6) - Non-right triangles– Law of Sines		24	
Group Work (7) - Non-right triangles– L.o.S. & Law of Cos's.		30	
Group Work (8) - Ambiguous case protractor project		30	
Group Work (9) – Verifying Identities		20	
Fraction Practice (Review #1)		34	
Solving Equations (Review #2)		30	
Functions (Review #3)		50	
Logarithm (Review #4)		50	
Test 1		100	
Test 2		100	

Be able to define and understand the following:

- Angle
- Initial side
- Terminal side
- Angle in Standard Position
- Coterminal Angles
- Radians and Degrees
- Unit Circle
- List of Standard Angles
- Arc Length
- Area of a Sector
- Reference Angle
- Reference Triangle
- Understand how to define the trigonometric functions, their values at the standard angles, and what their graphs look like.
- Sine
- Cosine
- Tangent
- Amplitude
- Period
- Phase Shift
- Reciprocal trig functions: Cosecant, Secant, Cotangent (and their graphs)
- Right triangle trig: the relationship of the ratio of the sides to the angles
- SohCahToa
- Complimentary angles
- Supplementary Angles
- Types of triangles: Right, Non-right, Isosceles, Equilateral, Scalene, Obtuse, Acute
- Law of Sines
- Law of Cosines
- Trig Identities
- Sum and Difference formulas for Sine, Cosine, and Tangent
- Double Angle Formulas
- Solving Trig Equations
- Inverse Trig Functions
- Vectors, notation, components, magnitude, direction, addition and subtraction
- Vector multiplication by a scalar and the dot product
- Graphical and algebraic forms of vector addition, applications.