Course Name: Elementary Functions				
Term: Semester 2, 2021-22	Class Days: Monday-Thursday, select Fridays	Class Time: 9:05-10:02 AM	Class Location: Room 804	Credit Hours: 4
Teacher: AJ Rise		Phone: 503-747-8835	Email: aj.rise@centrallinnk.12.or.us	

OFFICE HOURS

My prep. is 7th period this semester, so that time is best for coming in and getting work done. You MUST have permission from your 7th period teacher before doing so. But please feel free to stop by any time!

COURSE DESCRIPTION

Math 112 Elementary Functions:

Triangle trigonometry, trigonometric equations and identities, circular functions and graphs, complex numbers, polar coordinates.

COURSE STANDARDS

Standard 1	Objectives	
Angles	1.1	Know the different types of angles
	1.2	Find coterminal angles
	1.3	Find supplementary and complimentary angles
	1.4	Convert a decimal degree to degree, minutes, seconds and vice versa
	1.5	Convert degrees to radians and vice versa
	1.6	Find reference angles

Standard 2	Objectives	
Arc Length, Sector Areas, and Area Formulas	2.1	Find the arc length
	2.2	Find the area of a sector

	2.3	Solve applications involving area formulas and Heron's formula

Standard 3	Objectives	
Right Triangle Trigonometry	3.1	Use the Pythagorean Theorem
	3.2	Evaluate all six trig functions using a right triangle
	3.3	Know and use facts about special triangles
	3.4	Solve for trig functions knowing specific information and using right triangles
	3.5	Solve right triangles
	3.6	Use cofunctions/cofunction formulas

Standard 4	Objectives	
The Unit Circle	4.1	Know and use the Unit Circle
	4.2	Find sine and cosine for any point in the plane
	4.3	Find sine and cosine using a point on a circle (not necessarily the UnitCircle)
	4.4	Know, use, and understand the relationship between sine and cosine andthe Unit Circle
	4.5	Find all six trig functions for an point in the plane
	4.6	Find all six trig functions using a point on a circle (not necessarily the UnitCircle)

Standard 5	Objectives	
Properties and Graphs of Trigonometric Functions	5.1	Know and use the graphs of all six trig functions
	5.2	Know and use the domain, range, and period of all six trig functions
	5.3	Approximate all six trig functions for angles in degrees and radians
	5.4	Perform graph transformations on all six trig functions
	5.5	Identify the amplitude, period, vertical shift, and phase shift algebraically and graphically
	5.6	Know the relationship between the signs of trig functions and the Quadrant containing the angle
	5.7	Find exact values of trig functions given specific conditions

Standard 6	Objectives	
Inverse Trigonometric Functions	6.1	Understand how inverse trig functions work
	6.2	Understand and use the relationship between a trig function and its inverse
	6.3	Find and understand the domain and range of inverse trig functions
	6.4	Evaluate inverse trig functions
	6.5	Graph inverse trig functions
	6.6	Compose and simplify trig functions with inverse trig functions and vice versa

Standard 7	Objectives	
Identities	7.1	Know and use the Reciprocal, Quotient Identities, Pythagorean, and Negative Angle Identities
	7.2	Simplify trig expressions
	7.3	Write trig functions in terms of other trig functions
	7.4	Find exact values involving trig functions using identities
	7.5	Apply algebraic techniques to expressions involving trig functions
	7.6	Verify identities algebraically and graphically
	7.7	Know and use the Cofunction, Sum, Difference, Double Angle, Half Angle,and Power Reducing Identities
	7.8	Derive identities
	7.9	Use substitution to apply identities

Standard 8	Objectives	
Trigonometric Equations	8.1	Understand and use the relationship between trig functions evaluated at an angle and its reference angle
	8.2	Solve trig equations using algebraic techniques
	8.3	Solve trig equations using inverses
	8.4	Use reference angles to help find solutions to trig equations
	8.5	Illustrate solutions to trig equations
	8.6	Find all solutions to a trig equation
	8.7	Find exact and approximate solutions to trig equations

Standard 9	Objectives	
Solving Triangles, Law of Sines, Law of Cosines	9.1	Understand the different cases when solving a triangle
	9.2	Use Law of Sines
	9.3	Use Law of Cosines
	9.4	Solve triangles
	9.5	Identify and solve ambiguous case triangles
	9.6	Determine the existence of triangles satisfying certain conditions
	9.7	Understand the strengths and weaknesses of Law of Cosines and Sines
	9.8	Understand and use the relationship between domain and range of trig functions and the Law of Cosines and Sines

Standard 10	Objectives	
Vectors	10.1	Understand the difference between scalars and vectors
	10.2	Represent vectors on a coordinate system
	10.3	Represent vectors in magnitude/direction form as well as component form
	10.4	Go back and forth between component and magnitude/direction form
	10.5	Perform operations on vectors
	10.6	Illustrate vector operations (except the dot product)
	10.7	Rewrite vectors as linear combinations of i and j
	10.8	Find the angle between two vectors

Standard 11	Objectives	
Parametric Equations	11.1	Understand the relationship between the parameter and the coordinates
	11.2	Identify parametric equations vs. rectangular
	11.3	Graph parametric equations
	11.4	Understand the relationship between the parameter and the direction of the graph
	11.5	Go back and forth between parametric and rectangular form

Standard 12	Objectives	
Polar Coordinates	12.1	Plot points in polar form
	12.2	Understand the relationship between vectors and polar coordinates
	12.3	Go back and forth between rectangular form and polar form
	12.4	Understand the different representations of the same point in polar form
	12.5	Graph polar equations
	12.6	Apply a direction to polar equations when appropriate

Standard 13	Objectives	
Modeling and applications: Right Triangle Trigonometry and Angles	13.1	Solve applications involving arc length and area of a sector
	13.2	Find the angular speed and linear speed
	13.3	Solve applications involving angular speed and linear speed
	13.4	Solve applications involving trig functions and right triangles
	13.5	Solve applications involving angles of elevation or depression

Standard 14	Objectives	
Modeling and applications: Trigonometric Functions	14.1	Solve applications involving sine and cosine
	14.2	Solve applications involving any of the six trig functions
	14.3	Solve applications and interpret results involving Simple Harmonic Motions
	14.4	Solve applications that involve transformed trig functions
	14.5	Solve applications involving inverse trig functions
	14.6	Solve applications involving trig equations
	14.7	Solve applications using the relationship between tangent and the slopes of lines
	14.8	Solve applications involving identities
	14.9	Solve applications involving triangles

Standard 15	Objectives	
Modeling and Applications: Vectors and Parametric Equations	15.1	Solve work problems
	15.2	Solve applications involving vectors
	15.3	Use parametric equations to solve projectile motion problems

REQUIRED TEXTS
College Algebra and Trigonometry, 7th edition, Aufmann, Barker, and Nation, 2011
- The same book you checked out from the CLHS library at the start of the year. Remember, you are responsible to keep the book in good condition. Generally, you do not need to bring the book to class.

CLASSROOM POLICIES
ASSESSMENT BASED-LEARNING
Willamette Promise Math courses are Assessment-Based Learning credit, which means that students will receive college credit if their instructor and the Western Oregon University faculty determine that their work meets the standards set by the program. Students will not receive credit if their work does not meet standards, or if they choose to not transcribe the grade they received.

COLLEGE-LEVEL CONTENT
Curriculum for this course is determined by the Western Oregon college faculty that oversees this Willamette Promise course. In college, students are expected to have mastered the prerequisite material. As such, assessment questions are written with the assumption that prerequisites have been satisfied. If you are struggling with prerequisite material, please reach out to your teacher for help.

GRADING POLICY:
High School Grade

- (30%) **Homework quizzes.** We will have homework assignments corresponding to nearly every lesson. You will not be responsible to turn in these assignments - however, we will have a weekly timed quiz on the content of those assignments. The expectation is that you make use of the homework assignments as you need to be prepared for the quizzes, which will, in turn, prepare you for the college assessments. *There are no notes allowed on homework quizzes. You may re-take homework quizzes throughout the unit - however, you MUST pass each homework quiz for the unit to take the college test.*
- (30%) **Labs.** These are activities that we will do mostly in class (that you will possibly finish up at home). Typically, problems will be graded on effort, and one problem may be chosen at random to be graded on accuracy. The purpose of labs is to go in-depth on particular concepts, and give you a chance to explore this rich area of mathematics. *Labs must be turned in by the prescribed due date. I will not accept any late assignments in this course.* Feel free to talk to me if you need an extension - which I can give on a limited basis for legitimate reasons.
- (40%) **Tests.** These are the same assessments that will determine your college grade (see below). They will consist of a series of **unit tests** and a **final exam** given at the end of the semester. Per university policy, retakes are not an option on these tests for college credit. You will also not have

access to any notes. It is therefore your responsibility to be prepared to exceed expectations on these assessments on the day they are given. The primary purpose of the homework quizzes and labs is to ensure such preparedness.

College Grade

College Grade is determined by the 30 assessment questions only - these are the same assessment questions as your unit tests in the "High School Grade" category.
- **There will be no exam retakes for college credit.**

- Percent Scores for each question are as follows:
  4 ↔ 100%, 3 ↔ 85%, 2 ↔ 60%, 1 ↔ 10%, 0 ↔ 0%

- Letter grades are assigned as follows:

Mean of Percent Scores for 30 Question Assessment	WOU Grade
(93, 100)	A
[90, 93)	A-
[86, 90)	B+
[83, 86)	B
[80, 83)	B-
[76, 80)	C+
[73, 76)	C
[70, 73)	C-
[66, 70)	D+
[63, 66)	D
[60, 63)	D-
[0, 60)	F

ATTENDANCE AND OTHER POLICIES

The best part of college is your freedom. You can eat whatever you'd like, study as much as you want, pay as much attention in class as you'd like, etc. The hardest part of college is also your freedom, because you still have to make all the right decisions. In this class, you will make good choices, because you will not succeed if you do not. Therefore, the following guidelines are the expectations that I expect you to adhere to in this class:

- Act with the utmost decency, respect, and kindness towards *yourself*, your classmates, and me, at all times, in and out of class. I expect myself to follow the same standard - if you see me deviate from this, please talk to me about it.
- Follow all existing COVID-19 safety guidelines.

- Turn in any assignments and assessments on time. I will not accept late work in this course.

Everything else is your decision and responsibility.

WOU POLICIES

DISABILITY ACCOMMODATIONS:
WOU values diversity and inclusion; we are committed to fostering full participation for all students. Please notify your instructor if there are aspects of the instruction or design resulting in barriers to your participation. Disability related accommodations are determined through the Office of Disability Services (ODS).

Students with disabilities are encouraged to contact both your instructor and the Office of Disability Services, APSC 405, or at 503-838-8250. Please keep in mind that accommodations are not retroactive and should be discussed as early as possible in the term. For more information, please contact: Casie Moreland, Willamette Promise Manager at 503-540-4420 or Casie.Moreland@wesd.org.

VETERANS' ACCOMMODATIONS
Western Oregon University recognizes that those who are actively serving in the Reserves or National Guard of the United States are required by their military contract to attend mandatory training. If you will be absent due to military orders, I strongly encourage you to communicate that with me as soon as possible so we may discuss alternative arrangements.

ACADEMIC INTEGRITY:
Students must adhere to WOU's Code of Student Responsibility. Academic dishonesty will not be tolerated in this course. Any student who violates the policy will receive 0 points on the assignment, and MAY also be given a failing grade for the course. Examples of inappropriate behavior include doing assigned work for another student, sharing answers on work assigned to be done individually, copying answers during an exam, sharing exam questions or answers, or portraying another person's writing as your own. If you have questions about what might be considered inappropriate, please contact Casie Moreland, Willamette Promise Manager at 503-540-4420 or Casie.Moreland@wesd.org.

TENTATIVE SCHEDULE
This course is on a 17-week schedule. It is subject to change as the course progresses. Due to pressing time constraints, the pace will be brisk. You can expect a college test roughly every 1.5 weeks.

Week 1 (Feb. 7th - Feb. 10th)
- Introduction
- Angles and their measures, sectors, area formulas

Week 2 (Feb. 14th - Feb. 18th)
- Right angle trigonometry
- *College test 1*

Week 3 (Feb. 22nd - Feb. 25th)
- Solving triangles, law of sines, law of cosines
- *College test 2*

Week 4 (Feb. 28th - Mar. 4th)
- Properties of trigonometric functions and graphs

Week 5 (Mar. 7th - Mar. 10th)
- Properties of trigonometric functions and graphs
- The unit circle

Week 6 (Mar. 14th - Mar. 17th)
- Properties of trigonometric functions and graphs
- The unit circle
- *College test 3*

SPRING BREAK

Week 7 (Mar. 28th - Mar. 31st)
- Inverse trigonometric functions

Week 8 (Apr. 4th - Apr. 7th)
- Inverse trigonometric functions
- *College test 4*

Week 9 (Apr. 11th - Apr. 14th)
- Solving trigonometric equations

Week 10 (Apr. 18th - Apr. 22nd)
- Solving trigonometric equations
- *College test 5*

Week 11 (Apr. 25th - Apr. 28th)
- Trigonometric identities

Week 12 (May 2nd - May 5th)
- Trigonometric identities
- *College test 6*

Week 13 (May 9th - May 12th)
- Parametric Equations

Week 14 (May 16th - May 19th)
- Parametric equations and polar coordinates

Week 15 (May 23rd - May 26th)
- Polar coordinates, vectors

Week 16 (May 31st - June 3rd)
- Finish vectors
- *College Test 7*

Week 17 (June 6th - June 9th)
- Review and Final Exam *(College test 8)*