MATH 1112

Trigonometry (3 hrs.)

Mathematics Department

Valdosta State University

Course Description

A thorough study of the six trigonometric functions and their inverses, using both the unit circle and right triangles. Topics include analysis of graphs, solving triangles, trigonometric identities, solving trigonometric equations and operations with complex numbers.

Required materials

Textbook. Trigonometry: A Unit Circle Approach (11th edition) by Michael Sullivan, Pearson. Available online on Blazeview through the Day1 program. Do not opt-out of the Day 1 program.

Scientific calculator. It is recommended to use a TI-83, TI-84, TI-83 plus, or a TI-84 plus graphing calculator.

Student learning outcomes

After successful completion of the course, you will be able to:

1. Identify the major arc measures and angle measures around the unit circle.
2. Evaluate the six trigonometric functions according to the points on the unit circle.
3. Solve right triangles and their applications using right triangle definitions and inverse trigonometric functions.
4. Graph the trigonometric functions and identify the domain, range, period, amplitude and phase shifts.
5. Solve non-right triangles using Law of Sines and Cosines and inverse trigonometric functions.
6. Simplify expressions and verify identities using given trigonometric identities.
7. Solve problems, simplify expressions, prove identities using the sum, difference, double angle and half angle identities.
8. Solve conditional and multi-angle equations using algebra and inverse circular functions.
9. Convert complex numbers to trigonometric form or polar form.

VSU general education outcomes:

AREA A2:

Students will demonstrate mathematical proficiency by analyzing a variety of functions and solving various equations.

AREA D:

Students will demonstrate understanding of the physical universe and the nature of science, and they will use scientific methods and/or mathematical reasoning and concepts to solve problems.

(Critical Thinking)

Students will identify, evaluate, and apply appropriate models, concepts, or principles to issues, and they will produce viable solutions or make relevant inferences.

Course outline:

Based on 23 sections, 3 days per week

Chapter/Section	Topic(s)	Suggested days
A.3 (Optional)	Factoring polynomials; completing the square	8-9
A.4 (Optional)	Solving equations	
2.1	Angles, arclength and circular motion	
2.2	Trigonometric functions: Unit circle approach	
2.3	Properties of the trigonometric functions	
2.4	Graphs of the sine and cosine function	
2.5	Graphs of the tangent, cotangent, cosecant, and secant functions	
2.6	Phase shift; Sinusoidal curve fitting	
3.1	The inverse sine, cosine, and tangent functions	9-10
3.2	The inverse trigonometric functions	
3.3	Trigonometric equations	
3.4	Trigonometric identities	
3.5	Sum and Difference formulas	
3.6	Double-angle and half-angle formulas	8-9
3.7	Product-to-sum and sum-to-product formulas	
4.1	Right triangle trigonometry; Applications	
4.2	The Law of sines	
4.3	The Law of cosines	
4.4	Area of a triangle	
4.5	Simple harmonic motion; damped motion; combining waves	7-8
5.1	Polar coordinates	
5.2 (Optional)	Polar equations and graphs	
5.3 (Optional)	The complex plane; De Moivre's Theorem	