ORIGINATION DATE:	8/2/99	**APPROVAL DATE:**	2/27/23		
LAST MODIFICATION DATE:	4/14/21	**EFFECTIVE TERM/YEAR:**	FALL/ 23		
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COURSE ID: **MATH1700**
COURSE TITLE: Trigonometry

	LECTURE	LAB	CLINICAL	TOTAL	OBR MIN	OBR MAX
CREDITS:	3.00	0.00	0.00	3.00	3.00	3.00
CONTACT HOURS:	3.00	0.00	0.00	3.00		

PREREQUISITE:

MATH1650 OR PLACEMENT TEST

COURSE DESCRIPTION:

This course includes the study of trigonometric functions and inverse
trigonometric functions and their graphs; solutions of right and oblique triangles
and their applications; solutions of trigonometric equations; the use of
identities, vectors, and complex numbers; and graphs of polar and parametric
equations. Students will need to supply a graphing utility; the instructor will
provide details.

RATIONALE FOR COURSE:

This course serves as a prerequisite for the Analytical Geometry and Calculus
sequence, as well as a foundation course for Engineering and Science majors.

OUTCOMES:
The course will

1.   Further develop students' ability to use the language of mathematics
      correctly in speaking and writing.

2.   Introduce and develop, in a mathematically rigorous manner, the concepts and
      applications of the trigonometric functions.

3.   Further develop the use of technology as a tool for solving problems.

4.   Further develop students' abilities to solve real-life problems including
      modeling utilizing the trigonometric functions and analyze and solve these
      problems analytically and graphically.

5.   Further strengthen students' ability to critically apply mathematical
      thinking to solve problems and to determine reasonableness of results.

PERFORMANCE INDICATORS:
Upon completion of the course, the student should be able to

1.   Define the six trigonometric functions as circular functions.

2.   Define the six trigonometric functions of angles given a point on the
      terminal side of an angle in standard position.

3. Define the six trigonometric functions for an acute angle within a right triangle.

4. Evaluate the trigonometric functions of angles in radian and degree measure exactly using the unit circle and approximately using a calculator.

5. Graph the six trigonometric functions and determine phase shifts, vertical shifts, period, and amplitude changes, where applicable.

6. Solve right triangles; apply right triangles to real-world problems.

7. Solve oblique triangles using the Law of Sines and Law of Cosines; apply to real-world problems.

8. Use the fundamental trigonometric identities.

9. Graphically and analytically verify identities.

10. Solve and apply trigonometric equations graphically and analytically.

11. Define the inverse trigonometric functions.

12. Graph the inverse trigonometric functions.

13. Convert from Cartesian coordinates to polar coordinates and vice-versa.

14. Graph in polar coordinates.

15. Analyze the path of objects via parametric equations and their graphs.

16. Use vectors to model basic forces.

17. Represent complex numbers in trigonometric form.

COURSE OUTLINE:

I.   Angles
     A. Radian and degree measurement
     B. Positive, negative, and coterminal
     C. Standard position
     D. Applications

II. Circular Functions
     A. Unit circle and definition of 6 trigonometric functions
         1. domain and range
     B. Sine and cosine Functions
         1. function values for cos x and sin x via unit circle
     C. Tangent function
     D. Cosecant, secant, and cotangent functions
     E. Graphs of all 6 trigonometric functions and their characteristics
     F. Periodic functions
         1. model periodic behavior with appropriate function

III. The Inverse Trigonometric Functions
     A. Definitions
         1. domain and range
     B. Notation
     C. Graphs

IV. Triangles
     A. Right triangles
         1. definition of 6 trigonometric functions
         2. solving right triangles

3.   applications
        B.   Oblique triangles
              1.   Law of sines
                    a.   applications
              2.   Law of cosines
                    a.   applications
              3.   area
        C.   Similar triangles

V.   Identities and Equations
        A.   Fundamental identities
              1.   reciprocal identities
              2.   quotient identities
              3.   Pythagorean identities
              4.   negative angle (even / odd) identities
        B.   Sum and difference identities
              1.   sine, cosine, and tangent
        C.   Double angle identities
              1.   sine, cosine, and tangent
        D.   Additional identities
              1.   half-angle
        E.   Verification
              1.   graphical and analytical
        F.   Conditional equations
              1.   solving via graphical and analytical methods

VI.   Vectors
        A.   Definition
        B.   Algebra of vectors
              1.   addition
              2.   subtraction
              3.   scalar multiplication
              4.   dot product
                    a.   angle between vectors
        C.   Applications

VII.   Parametric Equations, Polar Coordinates, and Polar Equations
        A.   Definition
        B.   Analysis via rule of three
        C.   Applications
        D.   Polar coordinates
              1.   convert from Cartesian coordinates to polar coordinates and
                    vice-versa
              2.   graph in polar coordinates
                    a.   lines
                    b.   circles
                    c.   limacons
                    d.   lemniscates
                    e.   roses
                    f.   cardioids
              3.   symmetry of graphs
        E.   Polar/trigonometric form of complex numbers
              1.   products and quotients
              2.   As time permits: powers and roots of complex numbers

INSTRUCTIONAL PROCEDURES THAT MAY BE UTILIZED:

Lecture/discussion
Computer/graphing calculator based activities
Group and/or individual activities
Research projects utilizing real data gathered from the Internet or other sources

GRADING PROCEDURES:

It is recommended that the instructors have at least five evaluative items on which to determine the student's course grade. In general, tests are given covering lecture and homework assignments.

COURSE EVALUATION PROCEDURES:

Student course evaluations
Student success rate in subsequent Math courses

LAKELAND LEARNING OUTCOMES

LEARNS ACTIVELY

	I	R	D
1. Takes responsibility for his/her own learning.			D
2. Uses effective learning strategies.			
3. Reflects on effectiveness of his/her own learning strategies.			

THINKS CRITICALLY

	I	R	D
4. Identifies an issue or idea.			
5. Explores perspectives relevant to an issue or idea.			
6a. Identifies options or positions.			
6b. Critiques options or positions.			
7. Selects an option or position.			D
8a. Implements a selected option or position.			
8b. Reflects on a selected option or position.			

COMMUNICATES CLEARLY

	I	R	D
9a. Uses correct spoken English.			
9b. Uses correct written English.			
10. Conveys a clear purpose.			
11. Presents ideas logically.			D
12a. Comprehends the appropriate form(s) of expression.			D
12b. Uses the appropriate form(s) of expression.			D
13. Engages in an exchange of ideas.			

USES INFORMATION EFFECTIVELY

	I	R	D
14. Develops an effective search strategy.			
15a. Uses technology to access information.			D
15b. Uses technology to manage information.			
16. Uses selection criteria to choose appropriate information.			
17. Uses information responsibly.			

INTERACTS IN DIVERSE ENVIRONMENTS

	I	R	D
18a. Demonstrates knowledge of diverse ideas.			
18b. Demonstrates knowledge of diverse values.			
19. Describes ways in which issues are embedded in relevant contexts.			
20a. Collaborates with others.			
20b. Collaborates with others in a variety of situations.			
21. Acts with respect for others.			

Definitions:

Introduces (I)

Students first learn about key ideas, concepts, or skills related to the performance indicator. This usually happens at a general or very basic level, such as learning one idea or concept related to the broader outcome.

Reinforces (R)

Students are given the opportunity to synthesize key ideas of skills related to the performance indicator at increasingly proficient levels.

Demonstrates (D)

Students should demonstrate mastery of the performance indicator with the level of independence expected of a student attaining an associate's degree.