Trigonometry
MAT2100

Course Description
Trigonometry is a one-semester course designed to take the student through a detailed study of trigonometric identities. The material will include topics on graphs and functions, the Law of Sines and Law of Cosines, vectors, complex numbers and polar coordinates. The student will take a closer look at conic sections, exponential and logarithmic functions, and inverse trigonometric functions. The subject matter will be presented by video lecture, daily practice, and include sample video solutions, a glossary of terms and other ancillary materials to aid in learning.

Rationale
Trigonometry builds on geometric properties and algebraic principles learned in Geometry and Algebra 2 and takes them to a higher level. By exploring uses of sines and cosines, practical applications involving vectors and matrices can be used to make math a tool for solving problems beyond simple four operation calculations.

Prerequisite
Algebra II and Geometry

Measurable Learning Outcomes
A. The student will explore exponential and radical expressions and factor polynomials with an emphasis on both real and imaginary roots.
B. The student will identify functions based on given properties including transformations, combinations, and inverse functions.
C. The student will work with angles including right angle trigonometric functions and identities.
D. The student will graph trigonometric functions and explore real life applications of trigonometric functions.
E. The student will evaluate trigonometric equations using trigonometric identities and special formulas.
F. The student will use the laws of sines and cosines and solve for roots of complex numbers, vectors and conic sections.
G. The student will explore polar coordinates, solve polar equations and parametric equations with graphing on the polar coordinate plane.
Course Materials

See LUOA's Systems Requirements for computer specifications necessary to operate LUOA curriculum. Also view Digital Literacy Requirements for LUOA's expectation of users’ digital literacy.

This course makes use of third-party digital resources to enhance the learning experience. LUOA staff and faculty have curated these resources. Students can safely access them to complete coursework. Please ensure that internet browser settings, pop-up blockers, and other filtering tools allow for these resources to be accessed. See Technologies and Resources Used in this Course below for a specific list.

- Note: Embedded YouTube videos may be utilized to supplement LUOA curriculum. YouTube videos are the property of the respective content creator, licensed to YouTube for distribution and user access. As a non-profit educational institution, LUOA is able to use YouTube video content under the YouTube Terms of Service. For additional information on copyright, please contact the Jerry Falwell Library.

Technologies and Resources Used in this Course

The following resource(s) are used throughout this course:

- ThinkWell

Course Grading Policies

The student's grades will be determined according to the following grading scale and assignment weights. The final letter grade for the course is determined by a 10-point scale. Assignments are weighted according to a tier system, which can be referenced on the Grades Page in Canvas. Each tier is weighted according to the table below. Items that do not affect the student's grade are found in Tier 0.

<table>
<thead>
<tr>
<th>Grading Scale</th>
<th>Assignment Weights</th>
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<tbody>
<tr>
<td>Tier 0</td>
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<tr>
<td>Tier 1</td>
<td>25%</td>
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<tr>
<td>Tier 2</td>
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<tr>
<td>Tier 3</td>
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<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
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<tr>
<td>B</td>
<td>80-89%</td>
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<tr>
<td>C</td>
<td>70-79%</td>
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<tr>
<td>D</td>
<td>60-69%</td>
</tr>
<tr>
<td>F</td>
<td>0-59%</td>
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</tbody>
</table>

Course Policies

Students are accountable for all information in the Student Handbook. Below are a few policies that have been highlighted from the Student Handbook.

Types of Assessments

To simplify and clearly identify which policies apply to which assessment, each assessment has been categorized into one of four categories: Lesson, Assignment, Quiz, or Test. Each applicable item on the course Modules page has been designated with an identifier chosen from among these categories. Thus, a Quiz on the American Revolution may be designated by the
title, “1.2.W Quiz: The American Revolution.” These identifiers were placed on the Modules page to help students understand which Honor Code and Resubmission policies apply to that assessment (see the Honor Code and Resubmission policies on the pages that follow for further details).

- **Lesson:** Any item on the Modules page designated as a “Lesson”
  These include instructional content and sometimes an assessment of that content. Typically, a Lesson will be the day-to-day work that a student completes.

- **Assignment:** Any item on the Modules page designated as an “Assignment”
  Typical examples of Assignments include, but are not limited to, papers, book reports, projects, labs, and speeches. Assignments are usually something that the student should do his or her best work on the first time.

- **Quiz:** Any item on the Modules page designated as a “Quiz”
  This usually takes the form of a traditional assessment where the student will answer questions to demonstrate knowledge of the subject. Quizzes cover a smaller amount of material than Tests.

- **Test:** Any item on the Modules page designated as a “Test”
  This usually takes the form of a traditional assessment where the student will answer questions to demonstrate knowledge of the subject. Tests cover a larger amount of material than Quizzes.

**Resubmission Policy**

Students are expected to submit their best work on the first submission for every Lesson, Assignment, Quiz, and Test. However, resubmissions may be permitted in the following circumstances:

- **Lesson:** Students are automatically permitted two attempts on a Lesson. The student may freely resubmit for their first two attempts without the need for teacher approval.

- **Assignment:** Students are intended to do their best work the first time on all Assignments. However, any resubmissions must be completed before the student moves more than one module ahead of that Assignment. For example, a student may resubmit an Assignment from Module 3 while in Module 4 but not an Assignment from Modules 1 or 2. High School students may not resubmit an Assignment without expressed written permission from the teacher in a comment.

- **Quiz:** Students may NOT resubmit for an increased grade.

- **Test:** Students may NOT resubmit for an increased grade.

If a student feels that he or she deserves a resubmission on a Lesson, Assignment, Quiz, or Test due to a technical issue such as a computer malfunction, the student should message his or her teacher to make the request, and that request will need to be approved by a Department Chair.

**Consequences for Violations to the Honor Code**

Every time a student violates the Honor Code, the teacher will submit an Honor Code Incident Report. The Student Support Coordinator will review the incident and allocate the appropriate
Consequences, which are determined by the number of student offenses, are outlined below:

- **Warning**: This ONLY applies to high school Lessons and elementary/middle school Assignments and Lessons. Students should view these actions as learning opportunities.
  - **Lessons**: A zero will be assigned for the question only.
  - **Elementary/Middle School Assignment**: The student must redo his or her work; however, the student may retain his or her original grade.

- **1st Offense**:
  - **Lesson, Quiz, or Test**: The student will receive a 0% on the entire assessment.
  - **Assignment**: The student will either:
    - Receive a 0% on the original assignment
    - Complete the Plagiarism Workshop
    - Retry the assignment for a maximum grade of 80%

- **2nd Offense**: The student will receive a 0% and be placed on academic probation.

- **3rd Offense**: The student will receive a 0% and the Faculty Chair will determine the consequences that should follow, possibly including withdrawal from the course or expulsion from the academy.
Scope and Sequence
Trigonometry

Module 1: Polynomials, Rational Expressions, and Equations
Week 1: Exponents and Roots
Week 2: Polynomials and Factoring
Week 3: Rational Expressions and Solving Equations
Week 4: Coordinates and Graphing Equations

Module 2: Functions and Angles
Week 5: Functions
Week 6: Transformations, Combining Functions, and Inverse Functions
Week 7: Angles and Their Measure
Week 8: Right Angle Trigonometry

Module 3: Graphing Functions, Fundamental Identities, and Formulas
Week 9: Unit Circle Trigonometry and Graphing Sine and Cosine Functions
Week 10: Graphing Other Trigonometric Functions
Week 11: Fundamental Trigonometric Identities
Week 12: The Sum, Difference, Double-Angle, Half-Angle, and Power-Reducing Formulas

Module 4: Laws of Sines and Cosines, Vectors and Conics
Week 14: Vectors
Week 15: Complex Zeros and Trigonometric Form of Complex Numbers
Week 16: Conics

Module 5: Polar Coordinates and Equations, Parametric Equations and the Semester Exam
Week 17: Polar Coordinates, Polar Equations, & Parametric Equations
Week 18: Semester Review and Exam