

Washtenaw Community College Comprehensive Report

MTH 178 General Trigonometry Effective Term: Winter 2025

Course Cover

College: Math, Science and Engineering Tech

Division: Math, Science and Engineering Tech

Department: Math & Engineering Studies

Discipline: Mathematics

Course Number: 178

Org Number: 12200

Full Course Title: General Trigonometry

Transcript Title: General Trigonometry

Is Consultation with other department(s) required: No

Publish in the Following: College Catalog , Time Schedule , Web Page

Reason for Submission: Three Year Review / Assessment Report

Change Information:

Consultation with all departments affected by this course is required.

Rationale: Three-year syllabus review based on course assessment; no changes needed at this time.

Proposed Start Semester: Winter 2024

Course Description: In this course, students receive a rigorous background in trigonometry. Topics include trigonometric functions, inverse trigonometric functions, radian measure, trigonometric graph, identities, solutions of trigonometric equations, solution of triangles, rotation and vector triangles. A graphing calculator is required for this course. See the time schedule for the current brand and model.

Course Credit Hours

Variable hours: No

Credits: 3

Lecture Hours: Instructor: 45 **Student:** 45

Lab: Instructor: 0 **Student:** 0

Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 45 **Student:** 45

Repeatable for Credit: NO

Grading Methods: Letter Grades

Audit

Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

Level 5

Requisites

Prerequisite

Math Level 5

or

Prerequisite

MTH 176 minimum grade "C"; may enroll concurrently

General Education**Degree Attributes**

Assoc in Applied Sci - Area 3

Assoc in Science - Area 3

Assoc in Arts - Area 3

MACRAO Science & Math

Michigan Transfer Agreement - MTA

MTA Mathematics

Request Course Transfer**Proposed For:****Student Learning Outcomes**

1. Solve triangles.

Assessment 1

Assessment Tool: Outcome-related exam questions

Assessment Date: Spring/Summer 2026

Assessment Cycle: Every Three Years

Course section(s)/other population: All sections

Number students to be assessed: All students or a random sample with a maximum of 40 students

How the assessment will be scored: Departmentally-developed rubric

Standard of success to be used for this assessment: 70% of the students will score 75% or better.

Who will score and analyze the data: Departmental faculty

2. Interpret trigonometric graphs and graph trigonometric functions.

Assessment 1

Assessment Tool: Outcome-related exam questions

Assessment Date: Spring/Summer 2026

Assessment Cycle: Every Three Years

Course section(s)/other population: All sections

Number students to be assessed: All students or a random sample with a maximum of 40 students

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3. Prove trigonometric identities.

Assessment 1

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Course section(s)/other population: All sections

Number students to be assessed: All students or a random sample with a maximum of 40 students

How the assessment will be scored: Departmentally-developed rubric

Standard of success to be used for this assessment: 70% of the students will score 75% or better.

Who will score and analyze the data: Departmental faculty

4. Solve trigonometric equations.

Assessment 1

Assessment Tool: Outcome-related exam questions

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Course section(s)/other population: All sections

Number students to be assessed: All students or a random sample with a maximum of 40 students

How the assessment will be scored: Departmentally-developed rubric

Standard of success to be used for this assessment: 70% of the students will score 75% or better.

Who will score and analyze the data: Departmental faculty

5. Solve problems involving radian measure.

Assessment 1

Assessment Tool: Outcome-related exam questions

Assessment Date: Spring/Summer 2026

Assessment Cycle: Every Three Years

Course section(s)/other population: All sections

Number students to be assessed: All students or a random sample with a maximum of 40 students

How the assessment will be scored: Departmentally-developed rubric

Standard of success to be used for this assessment: 70% of the students will score 75% or better.

Who will score and analyze the data: Departmental faculty

Course Objectives

1. Describe angles.
2. Convert between radians and degrees measure.
3. Find the radian measure of a central angle given the radius and arc length.
4. Graph and solve problems involving radians and degrees measure.
5. Evaluate the trigonometric functions of any angle.
6. Evaluate trigonometric functions using the unit.
7. Evaluate trigonometric functions of acute angles, and use a calculator to evaluate trigonometric functions.
8. Use reference angles to evaluate trigonometric functions.
9. Solve a right triangle using trigonometric functions.
10. Find the horizontal and vertical components of a vector and its magnitude.
11. Find the direction angles of vectors.
12. Perform basic vector operations.
13. Solve real-life problems involving right triangle trigonometry.
14. Solve real-life problems involving directional bearing and right triangle trigonometry.
15. Solve real-life problems using vectors.
16. Use the law of sines and the law of cosines to solve oblique triangle problems.
17. Find the areas of oblique triangles.
18. Recognize and write the fundamental trigonometric identities.
19. Use the fundamental trigonometric identities to evaluate, simplify and rewrite trigonometric expressions.
20. Verify trigonometric identities.
21. Sketch the graphs of basic sine and cosine functions.
22. Use the amplitude and the period to sketch the graphs of the sine and the cosine functions.
23. Sketch the rigid and non-rigid translations and the reflections of the sine and the cosine functions.
24. Sketch the graph of the tangent and the cotangent functions.
25. Sketch the graph of the secant and the cosecant functions.
26. Find the equation of a function from a given graph.
27. Evaluate the graph of inverse sine, cosine and tangent functions.
28. Use standard algebraic techniques to solve trigonometric equations.
29. Solve trigonometric equations of quadratic type.

30. Solve trigonometric equations involving half angles and multiple angles.
31. Use inverse trigonometric functions to solve trigonometric equations.
32. Use the sum and difference formulas to evaluate trigonometric functions, verify trigonometric identities, and solve trigonometric equations.
33. Use the multiple-angle formulas to evaluate trigonometric functions, verify trigonometric identities, and solve trigonometric equations.
34. Use the half-angle formulas to evaluate trigonometric functions, verify trigonometric identities, and solve trigonometric equations.
35. Identify the power-reducing formulas, the product-to sum formulas and the sum-to-product formulas.

New Resources for Course

TI-83, TI-83 Plus, or TI-84 graphing calculator required.

Course Textbooks/Resources

Textbooks
Manuals
Periodicals
Software

Equipment/Facilities

Level III classroom

<u>Reviewer</u>	<u>Action</u>	<u>Date</u>
Faculty Preparer: <i>Hanan Wahab</i>	<i>Faculty Preparer</i>	<i>Sep 26, 2023</i>
Department Chair/Area Director: <i>Nichole Klemmer</i>	<i>Recommend Approval</i>	<i>Sep 28, 2023</i>
Dean: <i>Tracy Schwab</i>	<i>Recommend Approval</i>	<i>Oct 27, 2023</i>
Curriculum Committee Chair: <i>Randy Van Wagnen</i>	<i>Recommend Approval</i>	<i>Jul 30, 2024</i>
Assessment Committee Chair: <i>Jessica Hale</i>	<i>Recommend Approval</i>	<i>Jul 30, 2024</i>
Vice President for Instruction: <i>Brandon Tucker</i>	<i>Approve</i>	<i>Jul 31, 2024</i>

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Is Consultation with other department(s) required: No

Publish in the Following: College Catalog , Time Schedule , Web Page

Reason for Submission: Three Year Review / Assessment Report

Change Information:

Consultation with all departments affected by this course is required.

Outcomes/Assessment

Rationale: Syllabus update based on assessment report

Proposed Start Semester: Fall 2021

Course Description: In this course, students receive a rigorous background in trigonometry. Topics include trigonometric functions, inverse trigonometric functions, radian measure, trigonometric graph, identities, solutions of trigonometric equations, solution of triangles, rotation and vector triangles. A graphing calculator is required for this course. See the time schedule for the current brand and model.

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Number students to be assessed: All students or a random sample with a maximum of 40 students

How the assessment will be scored: Departmental rubric

Standard of success to be used for this assessment: 70% of the students will score 75% or better.

Who will score and analyze the data: Lead instructor

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4. Solve trigonometric equations.

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<u>Reviewer</u>	<u>Action</u>	<u>Date</u>
Faculty Preparer: <i>Hanan Wahab</i>	<i>Faculty Preparer</i>	<i>Jul 21, 2021</i>
Department Chair/Area Director: <i>Lawrence David</i>	<i>Recommend Approval</i>	<i>Aug 04, 2021</i>
Dean: <i>Victor Vega</i>	<i>Recommend Approval</i>	<i>Aug 10, 2021</i>
Curriculum Committee Chair: <i>Randy Van Wagnen</i>	<i>Recommend Approval</i>	<i>Nov 29, 2021</i>
Assessment Committee Chair: <i>Shawn Deron</i>	<i>Recommend Approval</i>	<i>Nov 30, 2021</i>
Vice President for Instruction: <i>Kimberly Hurns</i>	<i>Approve</i>	<i>Nov 30, 2021</i>