Washtenaw Community College Comprehensive Report

MTH 178 General Trigonometry
Effective Term: Spring/Summer 2020

Course Cover

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: Update based on the assessment results.
Proposed Start Semester: Fall 2019
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 questions on the common exam
   Assessment Date: Winter 2022
   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: Departmental rubric
   Standard of success to be used for this assessment: 70% of the students will score 70% or better.
   Who will score and analyze the data: Lead instructor

2. Interpret trigonometric graphs and graph trigonometric functions.
   Assessment 1
   Assessment Tool: Outcome-related questions on the common exam
   Assessment Date: Winter 2022
   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: Departmental rubric
   Standard of success to be used for this assessment: 70% of the students will score 70% or better.
   Who will score and analyze the data: Lead instructor

3. Prove trigonometric identities.
   Assessment 1
   Assessment Tool: Outcome-related questions on the common exam
   Assessment Date: Winter 2022
   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: Departmental rubric
   Standard of success to be used for this assessment: 70% of the students will score 70% or better.
   Who will score and analyze the data: Lead instructor

4. Solve trigonometric equations.
   Assessment 1
   Assessment Tool: Outcome-related questions on the common exam

Assessment Date: Winter 2022
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: Departmental rubric
Standard of success to be used for this assessment: 70% of the students will score 70% or better.
Who will score and analyze the data: Lead instructor

5. Solve problems involving radian measure.
   Assessment 1
   Assessment Tool: Outcome-related questions on the common exam
   Assessment Date: Winter 2022
   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: Departmental rubric
   Standard of success to be used for this assessment: 70% of the students will score 70% or better.
   Who will score and analyze the data: Lead instructor

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 the 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

Reviewer	Action	Date
Faculty Preparer:		
Hanan Wahab	*Faculty Preparer*	*Sep 26, 2019*
Department Chair/Area Director:		
Lisa Manoukian	*Recommend Approval*	*Sep 26, 2019*
Dean:		
Victor Vega	*Recommend Approval*	*Sep 26, 2019*
Curriculum Committee Chair:		
Lisa Veasey	*Recommend Approval*	*Dec 04, 2019*
Assessment Committee Chair:		
Shawn Deron	*Recommend Approval*	*Dec 17, 2019*
Vice President for Instruction:		
Kimberly Hurns	*Approve*	*Dec 18, 2019*

Washtenaw Community College Comprehensive Report

MTH 178 General Trigonometry
Effective Term: Fall 2017

Course Cover

Division: Math, Science and Engineering Tech
Department: Mathematics
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.
Outcomes/Assessment
Objectives/Evaluation
Rationale: Syllabus need to up dated
Proposed Start Semester: Fall 2017
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
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: Common Exam Questions
   Assessment Date: Fall 2017
   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: Departmental rubric
   Standard of success to be used for this assessment: 70% of the students will score 70% or better.
   Who will score and analyze the data: Course Mentor

2. Interpret trigonometric graphs and graph trigonometric functions.

   Assessment 1

   Assessment Tool: Common Exam Questions
   Assessment Date: Fall 2017
   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: Departmental rubric
   Standard of success to be used for this assessment: 70% of the students will score 70% or better.
   Who will score and analyze the data: Course Mentor

3. Prove trigonometric identities.

   Assessment 1

   Assessment Tool: Common Exam Questions

Assessment Date: Fall 2017
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: Departmental rubric
Standard of success to be used for this assessment: 70% of the students will score 70% or better.
Who will score and analyze the data: Course Mentor

4. Solve trigonometric equations.
   Assessment 1
   Assessment Tool: Common Exam Questions
   Assessment Date: Fall 2017
   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: Departmental rubric
   Standard of success to be used for this assessment: 70% of the students will score 70% or better.
   Who will score and analyze the data: Course Mentor

5. Solve problems involving radian measure.
   Assessment 1
   Assessment Tool: Common Exam Questions
   Assessment Date: Fall 2017
   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: Departmental rubric
   Standard of success to be used for this assessment: 70% of the students will score 70% or better.
   Who will score and analyze the data: Course Mentor

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 the 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

Reviewer	Action	Date
Faculty Preparer:		
Hanan Wahab	*Faculty Preparer*	*Jan 04, 2017*
Department Chair/Area Director:		
Lisa Rombes	*Recommend Approval*	*Jan 09, 2017*
Dean:		
Kristin Good	*Recommend Approval*	*Jan 10, 2017*
Curriculum Committee Chair:		
David Wooten	*Recommend Approval*	*Feb 14, 2017*
Assessment Committee Chair:		
Ruth Walsh	*Recommend Approval*	*Feb 15, 2017*
Vice President for Instruction:		
Bill Abernethy	*Approve*	*Feb 15, 2017*