

Math 1720 Trigonometry

University of Memphis

Course Description: (3 credit hours.) Circular functions; inverse circular functions, graphs of circular and inverse functions, identities, equations, angles, trigonometric functions, solution of triangles, elementary application of vectors; trigonometric form of complex numbers.

Prerequisites: [Math 1710](#) with a minimum grade of C-, or a minimum score of 61 on the [ALEKS math assessment test](#).

Student population: Lower Division Students. This course will fulfill prerequisite requirements for Calculus I ([Math 1910](#)).

Note: Only one of Math 1720 and [Math 1730](#) may be used to satisfy degree requirements.

Skills to be learnt:

1. Students should know the definition of the six trigonometric functions and use them to solve geometric problems involving right triangles.
2. Students should know the law of sines and law of cosines and use them to solve real life geometry problems.
3. Students should be able to find area of triangles in different situations.
4. Students should know how to extend the definition of trigonometric functions other than acute angles using the unit circle.
5. Students should be able to find values of other trigonometric functions given the value of a trigonometric function using the unit circle.
6. Students should be able to prove identities using the unit circle and basic trigonometric identities.
7. Students should know the domain, range and graph of the basic trigonometric functions.
8. Students should be able to identify amplitude, period, phase shift and vertical shift and use them to graph sinusoidal curves.
9. Students should be able to model real life situation by sinusoidal curves.
10. Students should know the domain, range and graph of the basic inverse trigonometric functions.
11. Students should be able to use inverse trigonometric functions to find angles and be able to compose different inverse trigonometric and trigonometric functions.
12. Students should know the sum and difference angles formulas and how to use them.
13. Students should know the double and half-angle formulas and how and when to use them.
14. Students should know the sum-to-product and product-to-sum formulas.
15. Students should be able to prove trigonometric identities using the above formulas.
16. Students should know basic polar coordinates and how to represent complex numbers using Cartesian and polar coordinates.

Method of Instruction: This course is taught as a guided lecture, which means notes will be given in lecture format while examples will be worked with the help of the students in the class. Questions will be asked and are expected to be answered by the students in the class.

Textbook: *Trigonometry: A Unit Circle Approach*, Tenth Edition with **MyMathLab** by Sullivan ISBN 978-0-321-97860-8 or 0-321-97860-9.

MyMathLab: Registration for the MyMathLab course requires an access code. This comes with your copy of the textbook or can be purchased directly when registering for the MyMathLab course. Visit www.mymathlab.com

Mymathlab plus tech support number: 844.292.7015

Graphing calculator (if required by instructor): TI 83 Plus or TI 84 Plus or Silver Edition for classroom use. Cell phones **cannot** be used as calculators.

Tutoring: Free tutoring is available through the University's Education Support Programs. They offer a drop-in tutoring service in the [Math Learning Center](#) in DH 341 and [online assistance](#).

Disabilities: Any student who anticipates physical or academic barriers based on the impact of a disability should contact [Disability Resources for Students \(DRS\)](#) at 110 Wilder Tower, 901.678.2880 at the earliest opportunity. DRS coordinates access and accommodations for students with disabilities. You must give your instructor a copy of any accommodation memos provided by the DRS **within the first week of class**.

Attendance: Class attendance is important, every student is required to be in class, on time, and stay for the entire class period for each class session. If you miss a class, you are responsible for finding out what topics were covered and for completing any missed work.

Drop / Withdraw: Students who need to drop this class must report to the Office of the Registrar to initiate withdrawal procedures. Check <http://www.memphis.edu/registrar/calendars/> for deadlines.

Email Rules: **All** email correspondence must be made through your [University of Memphis](#) email account. Check your email daily, and make sure that your "inbox" isn't so full that no new messages will get through.

Grading Policy: Grades will be calculated based on homework, quizzes, tests, and final exam. Grading scale is determined by the instructor.

Homework: Homework will be assigned for each section of the text, and must be finished before the due date for you to get credit.

Quizzes & Tests: There will be a number of quizzes/ tests for this course. You must be present in class to take each test.

No Make-ups for a missed homework, quiz, test, or final exam. If you must miss a test because of an official school function you may schedule to take the test at a time prior to the original test date. No other rescheduling will be allowed.

Final Schedule: see <http://www.memphis.edu/registrar/calendars/>

Academic Integrity: I encourage you to work with your classmates on homework or to have study groups for tests; however, letting someone else do all the work while you just sit back and copy will not help you on your tests. Copying the work of others is not going to help you

understand the material or pass the course.

Plagiarism, cheating, and other forms of academic dishonesty are prohibited. Students guilty of academic misconduct, either directly or indirectly, through participation or assistance will receive a zero, in addition to other possible disciplinary sanction which may be imposed through the regular institutional disciplinary procedures.

Classroom Rule: Silence cell phones and remove headphones when in the classroom. No eating or individual breaks will be allowed during the class period.

Course schedule: Any changes of this schedule will be announced in class, and in writing.

1. Graphs and Functions

- 1.1 The Distance and Midpoint Formulas
- 1.2 Graphs of Equations; Circles
- 1.3 Functions and Their Graph
- 1.4 Properties of Functions
- 1.5 Library of Functions; Piecewise-defined Functions
- 1.6 Graphing Techniques: Transformations
- 1.7 One-to-One Functions; Inverse Functions

2. Trigonometric Functions

- 2.1 Angles and Their Measure
- 2.2 Trigonometric Functions: Unit Circle Approach
- 2.3 Properties of the Trigonometric Functions
- 2.4 Graphs of the Sine and Cosine Functions
- 2.5 Graphs of the Tangent, Cotangent, Cosecant, and Secant Functions
- 2.6 Phase Shift; Sinusoidal Curve Fitting

3. Analytic Trigonometry

- 3.1 The Inverse Sine, Cosine, and Tangent Functions
- 3.2 The Inverse Trigonometric Functions (continued)
- 3.3 Trigonometric Equations
- 3.4 Trigonometric Identities
- 3.5 Sum and Difference Formulas
- 3.6 Double-angle and Half-angle Formulas
- 3.7 Product-to-Sum and Sum-to-Product Formulas

4. Applications of Trigonometric Functions

- 4.1 Right Triangle Trigonometry; Applications
- 4.2 Law of Sines
- 4.3 Law of Cosines
- 4.4 Area of a Triangle
- 4.5 Simple Harmonic Motion; Damped Motion; Combining Waves

5. Polar Coordinates; Vectors

- 5.1 Polar Coordinates
- 5.2 Polar Equations and Graphs
- 5.3 The Complex Plane; DeMoivre's Theorem

5.4 Vectors

5.5 The Dot Product

5.6 Vectors in Space

5.7 The Cross Product