

Southeast Missouri State University

Department of Mathematics
Title of Course: Plane Trigonometry

Course No. MA 133
Revision: Fall 2008

I. Catalog Description and Credit Hours of Course:

Trigonometric functions, graphing trigonometric functions, right and oblique triangles, trigonometric identities and equations, inverse trigonometric functions, vectors, complex numbers, polar coordinates, and applications. (3)

II. Prerequisites:

MA102 with a grade of 'CR' or MA095 with a grade of 'C' or higher, or ACT Math subscore of 18-20 with MA 095 placement score of 14 or higher, or ACT Math subscore of 21 or higher.

III. Purposes and Objectives of the Course:

The course is intended to provide basic knowledge of the six trigonometric functions and their relationships and to show applications of trigonometry to various problems including solutions of triangles.

IV. Expectations of Students:

Students are expected to attend class, participate in class activities, do homework, and pass quizzes and exams. They are required to follow the rules regarding Academic Honesty as provided in the Handbook.

Upon completion of the class, students should

- A. be able to use knowledge of trigonometry in solving triangles and other simple applications.
- B. be familiar with and be able to use the basic relationships and identities involving trigonometric functions.
- C. be able to use a graphing calculator as an aid in solving problems in trigonometry.

V. Textbook:

Cynthia Y. Young. Trigonometry, John Wiley & Sons, Inc, 2007.

VI. Course Outline:

Chapter	Sections	Topics	Class Hours
1	1.1-1.5	Right Triangle Trigonometry: Angles, Degrees and Triangles. Similar Triangles. Definition 1 of Trigonometric Functions: Right Triangle Ratios, Evaluating Trigonometric Functions. Solving Right Triangles.	6
2	2.1-2.4	Trigonometric Functions: Angles in the Cartesian Plane. Definition 2 of Trigonometric Functions: Cartesian Plane. Evaluating Trigonometric Functions for Any Angle. Basic Trigonometric Identities.	4
3	3.1-3.4 3.5 optional	Radian Measure and the Unit Circle Approach: Radian Measure. Arc Length and Area of a Circular Sector. Linear and Angular Speeds. Definition 3 of Trigonometric Functions: Unit Circle Approach.	4
4	4.1-4.3	Graphing Trigonometric Functions: Basic Graphs of Sine and Cosine Functions: Amplitude and Period. Translations of Sine and Cosine Functions: Phase Shift. Graphs of Tangent, Cotangent, Secant, and Cosecant Functions.	4
5	5.1-5.5	Trigonometric Identities: Verifying Trigonometric Identities. Sum and Difference Identities. Double-Angle Identities. Half-Angle Identities. Product-to-Sum and Sum-to-Product Identities.	5

6	6.1-6.3	Solving Trigonometric Equations: Inverse Trigonometric Functions. Solving Trigonometric Equations that Involve Only One Trigonometric Function. Solving Trigonometric Equations that Involve Multiple Trigonometric Functions.	3
7	7.1-7.5	Applications of Trigonometry: Triangles: Oblique Triangles and The Law of Sines. The Law of Cosines. Area of a Triangle. Vectors. Dot Product.	5
8	8.1 - 8.5	Complex Number, Polar Coordinates and Parametric Equations: Complex Numbers. Polar(Trigonometric) Form of Complex Numbers. Polar Equations and Graphs.	5
		Reviews	3
		Exams	3
		Review for Finals	1
		Final Exam	1
		Total Days	44

VII. Basis of Student Evaluation:

- A. Hourly examinations
- B. Quizzes, homework, class participation
- C. Final examination

Approximate

- 60%
- 20%
- 20%

VIII. Proposed syllabus for use with Cynthia Y. Young, Trigonometry:

Day(s)	Section(s)
1, 2	1.1
3	1.2
4	1.3
5	1.4
6	1.5
7	2.1
8	2.2
9	2.3
10	2.4
11	Review.
12	Test 1: Ch. 1 & 2
13	3.1
14	3.2
15	3.3
16	3.4
17	4.1
18, 19	4.2
20	4.3
21	5.1
22	5.2
23	5.3
24	5.4

Day	Section(s)
25	5.5
26	Review
27	Test 2: Ch. 3, 4 & 5
28	6.1
29	6.2
30	6.3
31	7.1
32	7.2
33	7.3
34	7.4
35	7.5
36	Review..
37	Test 3: Ch. 6 & 7
38	8.1
39	8.2
40	8.3
41	8.4
42	8.5
43	Final Review
44	Final Exam

IX. Notes on Graphing Calculators:

Every student in MA 133 is required to have a graphing calculator. Students should bring their calculators to class and use them in class activities.

Graphs of the six basic trigonometric functions are sketched by analyzing the behavior of the functions, using relationships between the functions, and plotting only a few points. These basic graphs, along with more complicated graphs, can also be rapidly sketched with proper use of a graphing calculator. Graphing techniques, including the appropriate use of a graphing calculator, should be incorporated throughout the semester in class lectures and on exams.