Montgomery County Community College
MAT 170
College Algebra and Trigonometry
4-4-0

COURSE DESCRIPTION:
A course to precede the calculus sequence. The topics include polynomial, trigonometric, and logarithmic functions, the binomial theorem, complex numbers, polar graphing. A graphing calculator is required for class, homework, and testing. Classroom instruction and programs will be presented using a graphing calculator.

REQUISITES:
Previous Course Requirements
None

Concurrent Course Requirements
None

COURSE COMMENT
- MAT 170 is a very fast paced course that should only be taken as a review by students who have a strong high school background in both algebra and trigonometry. This course should not be taken by students who have had MAT 161 and 162 which together form its equivalent. In addition, students who have just completed MAT100 should not take this course
- Elementary Algebra Accuplacer Test Score of 67 to 85 or a College Level Math Accuplacer Test Score of 53 to 85

LEARNING OUTCOMES Upon successful completion of this course, the student will be able to:	LEARNING ACTIVITIES	EVALUATION METHODS
1. Graph linear, quadratic, and other algebraic functions with and without the use of a graphics calculator.	Lectures Small Group Discussions and/or Projects The Use a Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects
2. Use rigid and nonrigid transformations to graph functions.	Lectures Small Group Discussions and/or Projects The Use a Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects

LEARNING OUTCOMES	LEARNING ACTIVITIES	EVALUATION METHODS
3. Calculate combinations and compositions of functions.	Lectures Small Group Discussions and/or Projects The Use a Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects
4. Determine when an inverse function exists and how to find the equation of the inverse function.	Lectures Small Group Discussions and/or Projects The Use a Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects
5. Solve a variety of equations, both algebraically and graphically.	Lectures Small Group Discussions and/or Projects The Use a Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects
6. Generate of complex numbers and their role in the search for zeros of a polynomial.	Lectures Small Group Discussions and/or Projects The Use a Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects
7. Recognize, graph and apply the basic conic sections.	Lectures Small Group Discussions and/or Projects The Use a Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects
8. Write efficiently in summation notation and be able to interpret statements in summation notation.	Lectures Small Group Discussions and/or Projects The Use a Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects

LEARNING OUTCOMES	LEARNING ACTIVITIES	EVALUATION METHODS
9. Expand Binomials via the Binomial Theorem.	Lectures Small Group Discussions and/or Projects The Use a Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects
10. Solve systems of equations with two or three variables and apply this skill to a variety of real-world problems.	Lectures Small Group Discussions and/or Projects The Use a Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects
11. Solve problems using trigonometric definitions involving angles, circular functions, and right triangles	Lectures Small Group Discussions and/or Projects The Use a Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects
12. Graph the six trigonometric functions and their inverses.	Lectures Small Group Discussions and/or Projects The Use a Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects
13. Solve trigonometric identities and equations.	Lectures Small Group Discussions and/or Projects The Use a Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects

LEARNING OUTCOMES	LEARNING ACTIVITIES	EVALUATION METHODS
14. Use the law of sines and law of cosines to solve trigonometric applications.	Lectures Small Group Discussions and/or Projects The Use a Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects
15. Extend the complex number system into concepts involving DeMoivre's Theorem, polar coordinates, and parametric equations.	Lectures Small Group Discussions and/or Projects The Use a Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects
16. Solve problems using logarithmic and exponential definitions and properties and use these properties them in relevant applications.	Lectures Small Group Discussions and/or Projects The Use a Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects
17. Use the TI-84+ graphing calculator in relevant concepts.	Lectures Small Group Discussions and/or Projects The Use a Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects

At the conclusion of each semester/session, assessment of the learning outcomes will be completed by course faculty using the listed evaluation method(s). Aggregated results will be submitted to the Associate Vice President of Academic Affairs. The benchmark for each learning outcome is that *70% of students will meet or exceed outcome criteria*.

SEQUENCE OF TOPICS:

1. Real Numbers, Exponents and Radicals
2. Polynomials and Factoring
3. Fractional Expressions
4. Graphical Representation of Data
5. Graphs and Graphing Utilities
6. Lines in the Plane
7. Functions; Graphs of Functions

8. Shifting Graphs
9. Reflecting, and Stretching Graphs
10. Combinations of Functions
11. Inverse Functions
12. Linear Equations and Modeling
13. Solving Equations Graphically
14. Complex Numbers
15. Solving Equations Algebraically
16. Solving Inequalities Algebraically and Graphically
17. Quadratic Functions
18. Polynomial Functions of Higher Degree
19. Real Zeros of Polynomial Functions
20. The Fundamental Theorem of Algebra
21. Rational Functions and Asymptotes
22. Graphs of Rational Functions
23. Conics
24. Translation of Conics
25. Exponential Functions and Graphs;
26. Inverse Functions
27. Logarithmic Functions and Graphs
28. Properties
29. Solving Equations; Exponential
30. Log Models
31. Angles and Their Measures
32. Right Triangle Trig
33. Trigonometric Functions of Any Angle
34. Graphs of Sine and Cosine
35. Graphs of Other Trig Functions
36. Inverse Trig Functions
37. Applications
38. Using Fundamental Trig Identities
39. Solving Trig Equations
40. Sum, Difference, Multiple Angles, Product-Sum Formulas
41. Law of Sines
42. Law of Cosines
43. Trig Form of a Complex Number
44. Parametric Equations
45. Polar Coordinates
46. Polar Graphs

LEARNING MATERIALS:

Textbook:

Larson. (2016). *Algebra and Trigonometry: Real Mathematics, Real People (*7th ed.). Cengage.

Required Materials:

TI-84+ Graphing Calculator. If a student has a TI-83+, they do not need to buy a TI-84+.

Other learning materials may be required and made available directly to the student and/or via the College's Libraries and/or course management system.

COURSE APPROVAL:

Prepared by:	Walter R. Hunter	Date: 9/1994
Revised by:	Aileen Conway	Date: 5/1998
Revised by:	Walter R. Hunter	Date: 9/2004
Revised by:	Walter R. Hunter	Date: 5/2005
Revised by:	Mark McFadden	Date: 2/25/2013
VPAA/Provost or designee Compliance Verification:		
	Victoria L. Bastecki-Perez, Ed.D.	Date: 5/23/2013
Revised by:	Marion Graziano/James Muscatell	Date: 8/31/2017
VPAA/Provost or designee Compliance Verification:		Date: 11/13/2017

This course is consistent with Montgomery County Community College's mission. It was developed, approved and will be delivered in full compliance with the policies and procedures established by the College.