



Course Number and Title: MAT 180 College Algebra

Campus Location:

Georgetown, Dover, Stanton, Wilmington

Effective Date:

2021-52

Prerequisite:

SSC 100 or concurrent

Co-Requisites:

None

Course Credits and Hours:

4.00 credits

4.00 lecture hours/week

1.00 lab hours/week

Course Description:

This course includes the algebra of functions, graphs and applications, absolute value equations and inequalities, polynomial, rational, radical, quadratic and piecewise functions, and the application of basic right triangle trigonometry.

Required Text(s):

Obtain current textbook information by viewing the [campus bookstore - https://www.dtcc.edu/bookstores](https://www.dtcc.edu/bookstores) online or visit a campus bookstore. Check your course schedule for the course number and section.

Additional Materials:

Graphing Calculator: TI 83 or TI 84

Schedule Type:

Classroom Course

Disclaimer:

None

Core Course Performance Objectives (CCPOs):

1. Solve triangles using right triangle trigonometry in degrees. (CCC 2, 6)
2. Use functional definitions and the algebra of functions to graph and solve application problems. (CCC 2, 6)
3. Solve problems involving absolute value equations and inequalities and polynomial, rational, and piecewise functions. (CCC 6)
4. Analyze rational functions and their graphs. (CCC 6)
5. Analyze radical functions and their graphs. (CCC 6)
6. Solve application problems using quadratic functions and their graphs. (CCC 2, 6)

See Core Curriculum Competencies and Program Graduate Competencies at the end of the syllabus. CCPOs are linked to every competency they develop.

Measurable Objectives (MPOs):

Upon completion of this course, the student will:

1. Solve triangles using right triangle trigonometry in degrees.
 1. Use properties of special right triangles to solve application problems.
 2. Use sine, cosine, and tangent ratios to solve application problems.
 3. Define the six trigonometric functions in terms of the unit circle, and evaluate trigonometric functions using special angles.
2. Use functional definitions and the algebra of functions to graph and solve application problems.
 1. Apply the definition of a function, and identify graphs and equations that represent functions.
 2. Determine the domain and range of functions.
 3. Evaluate functions algebraically.
 4. Graph functions by plotting points.
 5. Determine if a function is even, odd, or neither.
 6. Sketch the graph of a function by using transformations of parent functions.
 7. Add, subtract, multiply, and divide functions.
 8. Determine compositions of functions.
 9. Decompose a function into smaller functions.
 10. Determine the inverse of a function.
 11. Use compositions to determine if two functions are inverses.
3. Solve problems involving absolute value equations and inequalities and polynomial, rational, and piecewise functions.
 1. Solve absolute value equations and inequalities.
 2. Solve rational equations and inequalities.
 3. Solve equations containing rational exponents.
 4. Solve polynomial equations and inequalities.
 5. Evaluate and graph piecewise functions.
 6. Sketch the graphs of polynomial functions by using end behavior, zeros, intercepts, and the multiplicity of zeros.
 7. Determine the domain and range of polynomial and piecewise functions.
 8. Use the division algorithm, remainder theorem, and factor theorem.
 9. Find all zeros (real and complex) of polynomials.
4. Analyze rational functions and their graphs.
 1. Simplify rational and compound rational expressions.
 2. Add, subtract, multiply, and divide rational expressions.
 3. Determine the domain, range, zeros, and asymptotes of rational functions.
 4. Graph rational functions.
5. Analyze radical functions and their graphs.
 1. Translate radical expressions to complex numbers.
 2. Perform basic operations on complex numbers.
 3. Add, subtract, multiply, and divide radical expressions.
 4. Rationalize numerators or denominators.
 5. Solve radical equations.
 6. Determine the domain and range of radical functions.
 7. Graph radical functions.
6. Solve application problems using quadratic functions and their graphs.
 1. Solve quadratic equations using the zero product property, square root theorem, completing the square, and the quadratic formula.
 2. Determine the vertex, axis of symmetry, and the x- and y-intercepts of a quadratic function.
 3. Graph quadratic functions.
 4. Determine the domain and range of quadratic functions.
 5. Use quadratic functions to solve application problems.

Evaluation Criteria/Policies:

The grade will be determined using the Delaware Tech grading system:

90	–	100	=	A
80	–	89	=	B
70	–	79	=	C
0	–	69	=	F

Students should refer to the [Student Handbook - https://www.dtcc.edu/handbook](https://www.dtcc.edu/handbook) for information on the Academic Standing Policy, the Academic Integrity Policy, Student Rights and Responsibilities, and other policies relevant to their academic progress.

Final Course Grade:

Calculated using the following weighted average

Evaluation Measure	Percentage of Final Grade
6 Tests (summative) (equally weighted)	70%
Labs (formative)	10%
Homework (formative)	10%
Formative Assessments (formative)	10%
TOTAL	100%

Core Curriculum Competencies (CCCs are the competencies every graduate will develop):

1. Apply clear and effective communication skills.
2. Use critical thinking to solve problems.
3. Collaborate to achieve a common goal.
4. Demonstrate professional and ethical conduct.
5. Use information literacy for effective vocational and/or academic research.
6. Apply quantitative reasoning and/or scientific inquiry to solve practical problems.

Program Graduate Competencies (PGCs are the competencies every graduate will develop specific to his or her major):

None

Disabilities Support Statement:

The College is committed to providing reasonable accommodations for students with disabilities. Students are encouraged to schedule an appointment with the campus Disabilities Support Counselor to request an accommodation needed due to a disability. A listing of campus Disabilities Support Counselors and contact information can be found at the [disabilities services - https://www.dtcc.edu/disabilitysupport](https://www.dtcc.edu/disabilitysupport) web page or visit the campus Advising Center.