



Precalculus
MATH 0132
4 credits

Description: The topics include intermediate algebra, functions and graphs, polynomial functions, rational functions, inverse functions, logarithmic and exponential functions, and trigonometry.

Prerequisite: MATH 0097 or Introductory Algebra

Textbook: The recommended text for the course is *Precalculus: Functions & Graphs*, 12th Edition. Swokowski, E.W., Cole, J.A.

Other textbooks will be considered by the faculty liaison on case-by-case basis.

The following topics should be covered in this course:

1. Intermediate algebra
2. Functions and graphs
3. Polynomial, rational, inverse, logarithmic and exponential functions
4. Trigonometry

Course objectives: Students will be able to:

Functions (2.1-2.5, 2.7)

1. Find the distance between two points in the coordinate plane.
2. Find the midpoint of a line segment.
3. Sketch the graph of an equation.
4. Find the equation of a circle given its center and radius.
5. Find the center and radius of a circle.
6. Find the slope and the equation of a line.
7. Sketch the graph of a line.
8. Identify functions.
9. Explain why a given relation is not a function.
10. Evaluate functions for given values of the independent variable.
11. Sketch the graph of each of the following basic functions-identity, square, cubic, square root, reciprocal, absolute value.
12. Graph any given function using transformation and other graphing techniques.
13. Operate on functions-add, subtract, multiply, divide, and compose.

Quadratic Functions (2.6)

1. Find the equation of a parabola-either standard or general form.

2. Sketch the graph of a quadratic function/parabola using transformation techniques.
3. Solve quadratic equations/functions either graphically-with the aid of the TI-83- or algebraically.
4. Solve story problems involving quadratic equations.

Polynomial Functions (3.1-3.4)

1. Sketch the graph of a polynomial function of degree greater than 2.
2. Identify intervals of the real line where a given polynomial function is greater than or less than zero.
3. Divide polynomials using long division or synthetic division.
4. Find the real, complex, and rational zeros of polynomial functions.

Rational Functions (3.5)

1. Identify the vertical, horizontal, or oblique asymptote of rational functions.
2. Sketch the graph of a rational function.

Exponential Functions (4.1-4.3)

1. Determine if a function is one-to-one and invertible.
2. Find the inverse of a function.
3. Sketch the graph of an inverse function.
4. Find the domain and range of a function and its inverse.
5. Prove/disprove that two functions are/are not inverses of each other.
6. Sketch the graph of exponential functions.
7. Solve problems involving exponential equations.

Logarithmic Functions (4.4-4.6)

1. Sketch the graph of logarithmic functions.
2. Solve problems involving logarithmic equations.

Solving Systems of Equations (8.1-8.3)

1. Solve systems of two equations in two variables using the substitution method or the method of elimination.
2. Solve systems of inequalities.

Trigonometric Functions (5.1-5.6)

1. Convert degrees to radians and radians to degrees.
2. Sketch the graph of trigonometric functions-sine, cosine, tangent, cosecant, secant, and cotangent.
3. Identify the amplitude (where applicable), period, and phase shift of trigonometric functions.
4. Solve problems using the definition of trigonometric functions of an angle of a Right Triangle.

Analytic Trigonometry (6.1-6.4, 6.6, 7.1)

1. Verify trigonometric identities using the fundamental identities-Pythagorean, reciprocal, tangent, and cotangent, addition and subtraction formulas for sine, cosine, and tangent, double angle and half-angle formulas.
2. Solve trigonometric equations.
3. Sketch the graph of the inverse sine, cosine, and tangent functions.
4. Law of Sines.

Grading: The final grade will be determined using a variety of assessment methods including quizzes and exams.

Pitt Grading System:

All courses required to satisfy associate and baccalaureate degree requirements-including all courses required for a major, a minor, or general education-must be taken for letter grades, with the exception of those courses designated as graded S and NC only. Pitt-Bradford uses 13 earned letter grades. They are listed below with their equivalent quality point values.

A+	4.00
A	4.00 superior achievement
A-	3.75
B+	3.25
B	3.00 meritorious achievement
B-	2.75
C+	2.25
C	2.00 adequate achievement
C-	1.75
D+	1.25
D	1.00 minimal achievement
F	0.00 failure

Academic Integrity and Plagiarism: Members of a university community, both faculty and students, bear a serious responsibility to uphold personal and professional integrity and to maintain complete honesty in all academic work. Violations of the code of academic integrity are not tolerated. Students who cheat or plagiarize or who otherwise take improper advantage of the work of others face harsh penalties, including permanent dismissal. The academic integrity guidelines set forth student and faculty obligations and the means of enforcing regulations and addressing grievances.

Grades: Grade criteria in the high school course may be different from the University standards. A CHS student could receive two course grades, one for high school and one for the University transcript. In most cases, the grades are the same. Grading standards should be explained at the beginning of the course.

Transfer Credits: Grades earned in CHS courses appear on an official University of Pittsburgh transcript and the course credits may be eligible for transfer to other colleges and universities. Students should contact potential colleges and universities in advance to be sure their CHS credits will be accepted. If students will attend any University of Pittsburgh campus, grade earned in the course will count toward the student grade point average at the University. At the University of Pittsburgh, the CHS course supersedes any equivalent AP credit.

Drops and Withdrawals: Students should monitor their progress in a course. A CHS teacher can contact the program administrators to request a drop or withdrawal. Dropping or withdrawing from the CHS course has no effect on enrollment in the high school credits.