

NORTHWESTERN CONNECTICUT COMMUNITY COLLEGE
Course Syllabus

Course Title: Intermediate Algebra, Precalculus Prep **Course #** MAT* 137P

Course Description: 4 credits

This course is a further study of algebra and mathematical modeling of functions and relations represented by tables, graphs, words, and symbols. Polynomial functions and expressions with special attention to linear, quadratic, exponential, rational, and radical functions are studied. There is an emphasis on modeling and applications for all topics. This course meets for an hour longer each week than MAT*137 to allow for more time to cover topics that are useful in MAT* 186. *This course fulfills graduation requirements in many degree programs at NCCC. Check with your Academic Advisor if you intend to transfer to a 4-year college or university and wish to complete your math requirements while at Northwestern. MAT* 137P typically transfers as a general elective, not as a math course.*

Prerequisite:

A grade of C or better in MAT 085, 095, or 094, or satisfactory scores on the math placement test, SAT, or ACT.

Goals:

Students will:

1. Exhibit perseverance, ability, and confidence to use mathematics to make sense of and solve problems
2. Perform mental arithmetic and use proportional reasoning.
3. Analyze problem situations through numerical, graphical, symbolic and/or verbal approaches and modeling.
4. Use appropriate tools strategically in solving problems.
5. Recognize patterns, draw inferences
6. Communicate and interpret results
7. Demonstrate an understanding and appreciation of the usefulness of mathematics in everyday life

Outcomes:

At the completion of MAT*137P, the student will be able to do the following:

Linear Functions

- 1) Provide multiple representations (e.g., words, symbols, graphs, tables) of linear functions by hand and/or using technology
- 2) Determine identifying characteristics of linear functions
- 3) Model and solve real world applications with linear functions (e.g., car depreciation) and systems of linear equations
- 4) Solve linear inequalities and absolute value equations and inequalities

Quadratic Functions and/or Expressions

- 1) Provide multiple representations of quadratic functions or expressions by hand and/or using technology
- 2) Determine identifying characteristics of quadratic functions or expressions (e.g., factors)
- 3) Evaluate, simplify, and perform operations on quadratic functions or expressions
- 4) Solve quadratic equations algebraically (e.g., factoring, completing the square, and quadratic formula with rational solutions) and/or graphically
- 5) Solve real world applications involving quadratic equations and functions

Exponential Functions and/or Expressions

- 1) Provide multiple representations (e.g., tables, graphs, symbols) of exponential functions or expressions by hand and/or using technology
- 2) Determine identifying characteristics of exponential functions or expressions
- 3) Evaluate, simplify, and perform operations on exponential functions or expressions
- 4) Identify exponential functions within real world applications
- 5) *Solve simple exponential equations using the properties of exponentials*

Rational Functions and/or Expressions

- 1) Provide multiple representations of simple rational functions or expressions by hand and/or using technology
- 2) Determine identifying characteristics of rational functions or expressions
- 3) Evaluate, simplify, and perform operations on simple rational functions or expressions
- 4) Solve rational equations algebraically and/or graphically
- 5) Solve real world applications involving rational functions

Radical Functions and/or Expressions

- 1) Provide multiple representations of simple radical functions or expressions by hand and/or using technology, with primary emphasis on square root
- 2) Determine identifying characteristics of radical functions or expressions
- 3) Evaluate, simplify, and perform operations on simple radical functions or expressions
- 4) Solve radical equations algebraically and/or graphically
- 5) Solve real world applications involving radical functions
- 6) Identify imaginary numbers

Basic Geometry and Trigonometry

- 1) *Calculate lengths of sides, interior angles, and exterior angles of polygons*
- 2) *Apply circle properties to solving problems*
- 3) *Evaluate sine, cosine, and tangent using the unit circle*
- 4) *Write sine, cosine, and tangent ratios for any angle*
- 5) *Solve right triangles using trigonometric ratios and the Pythagorean Theorem*
- 6) *Identify similar triangles & compute unknown angles and sides using proportions*