

SYLLABUS

MATH 10772 – Modeling Algebra Plus

(5 Credit Hours)

Catalog Information: Study of algebra in the context of real-world applications, including linear, polynomial, exponential and logarithmic models. Includes a review of factoring and functions. Intended for students not planning to take calculus. No credit earned for this course if student already earned credit for MATH 11010. Students cannot earn credit toward a degree for both this course and MATH 11009. Prerequisites: Minimum 22 ACT mathematics sub score; or minimum 520 SAT mathematics sub score; or minimum ALEKS® math placement assessment score of 35; or a minimum grade of C (2.0) in MATH 00022.

Text: Harshbarger & Yocco (2013). College Algebra in Context with applications for the managerial, life, and social sciences, 4th edition. New York: Addison Wesley.

Review and Extension of Basic Skills (18 days)

- Medium level factoring techniques
 - Grouping
 - Special binomial forms
 - Quadratic from
- Equations and inequalities from function point of view – (Rule of Four- graphing, numerical, verbal, symbolic)
 - Quadratics, including Quadratic Formula and completing the square
- Problem solving

Rational Expressions and Functions (9 days)

- Simplify expressions
- Multiply and divide expressions
- Add and subtract expressions
- Rational equations
- Rational functions
 - Basic graphs
 - Domains
 - Modeling

General Properties of Functions (6 days)

- Real world scenarios focusing on interdependence between two variable quantities
- Increasing/decreasing

(MATH 10772 Syllabus, continued)

- Inputs/outputs; domain/range
- Interpreting and creating graphs
- Function notation
- Operations on functions
 - Addition, subtraction, multiplication
- Graphical, numerical, symbolic

Linear Models (6 days)

- Slope in context: students can recognize in a data set or real world scenario when linear model is appropriate
- Review writing equations for lines – in context
- Piecewise linear functions:
 - Writing models
 - Sketching graphs

Systems of Linear Equations (6 days)

- Systems of two equations in context
 - Writing models
- Review algebraic solution
- Systems of three or four equations

Exponential and Logarithmic Models (15 days)

- Writing exponential models
 - Recognizing exponential vs. linear – in data tables and real world scenarios
 - Arbitrary bases
 - Base e
- Graphs of exponential functions
- Orders of magnitude as introduction to logarithms
- Modeling with logarithms: Richter scale and decibels
- Skills:
 - Evaluate logarithms using the definitions
 - Convert exponential equations to equivalent logarithmic equations and vice versa
 - Properties of logarithms
 - Solve exponential equations using logarithms
 - Solve logarithmic equations
- Graphs of logarithmic functions
- Inverse functions in context
- Composition of functions

(MATH 10772 Syllabus, continued)

Polynomial Models (7 days)

- Quadratic functions in context
 - Review solutions by hand
 - zeroes, maximum, minimum values
- Cubics and quartics
 - Regression equations on a calculator
- Polynomial division, synthetic division, Factor Theorem, finding real zeroes

5 EXAMS, 3 REVIEW DAYS