SYLLABUS
Modeling Algebra Plus
(5 Credit Hours)
Proposed Curriculum for Fall 2014 (Spring 2015 on Kent Campus)

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
- 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
    - relation between exponential and logarithmic functions
- Composition of functions

Polynomial Models (7 days)
- Quadratic functions in context
    - Review solutions by hand
        - zeros, maximum, minimum values
- Cubics and quartics
    - Regression equations on a calculator
- Polynomial division, synthetic division, Factor Theorem, finding real zeros

5 EXAMS   3 REVIEW DAYS