Number: MATH G040  TITLE: Accelerated Elementary and Intermediate Algebra

ORIGINATOR: Erin Craig  EFF TERM: Fall 2017
FORMERLY KNOWN AS:
DATE OF OUTLINE/REVIEW: 04-04-2017
CROSS LISTED COURSE:  TOP NO: 1701.00

SEMESTER UNITS: 5.0
HRS LEC: 90.0  HRS LAB: 18.0  HRS OTHER: 0.0
CONTACT HRS TOTAL: 108.0
STUDY NON-CONTACT HRS RECOMMENDED: 180.0

CATALOG DESCRIPTION:
Equivalent to a first and second year high school algebra course accelerated into one semester. Taught in a combined large lecture and laboratory format. Software used requires access to a computer. It is taught using group lectures in conjunction with computer assignments and laboratory work.

Topics include: properties of real numbers; simplifying polynomial, rational, and radical expressions; solving linear, quadratic, rational, and radical equations in one variable; graphing and solving systems of linear equations in two variables, absolute value, rational exponents, quadratic equations and inequalities, linear and quadratic functions, conic sections, exponential and logarithmic functions, sequences, and series. A scientific calculator will be required.

JUSTIFICATION FOR COURSE:

PREREQUISITES:

COREQUISITES:

ADVISORIES:

ASSIGNED DISCIPLINES:
Mathematics

MATERIAL FEE: Yes [ ] No [X] Amount: $0.00

CREDIT STATUS: Noncredit [ ] Credit - Degree Applicable [X] Credit - Not Degree Applicable [ ]

GRADING POLICY: Pass/No Pass [ ] Standard Letter [X] Not Graded [ ] Satisfactory Progress [ ]

OPEN ENTRY/OPEN EXIT: Yes [ ] No [X]

TRANSFER STATUS: CSU Transferable[ ] UC/CSU Transferable[ ] Not Transferable[X]

BASIC SKILLS STATUS: Yes [ ] No [X] LEVELS BELOW TRANSFER: 1 level below transfer level

CALIFORNIA CLASSIFICATION CODES: Y - Not Applicable

NON CREDIT COURSE CATEGORY: Y - Not applicable, Credit Course

OCCUPATIONAL (SAM) CODE: E

REPEATABLE ACCORDING TO STATE GUIDELINES: No [X] Yes [ ] NUMBER REPEATS:

REQUIRED FOR DEGREE OR CERTIFICATE: No [ ] Yes [X]

GE AND TRANSFER REQUIREMENTS MET:
GWC AA - Area B Physical Universe and Its Life Forms
Group 2 Mathematic Competency
COURSE LEVEL STUDENT LEARNING OUTCOME(S) Supported by this course:

1. Solve equations containing rational or radical expressions.
2. Solve a system of linear equations in two variables using the addition method.
3. Determine the equation of a line given its slope and y-intercept, its slope and a point on the line, or two points on the line.
4. Solve quadratic equations in one variable using the quadratic formula.
5. Graph a parabola and determine its vertex and axis of symmetry.

COURSE OBJECTIVES:
1. Identify the set of real numbers with the real number line and perform operations with real numbers.
2. Recognize and solve linear equations and quadratic equations in one variable.
3. Recognize and graph the solution set of linear equations in two variables and inequalities in one or two variables.
4. Recognize and solve a system of linear equations in two variables using the methods of graphing, substitution, and addition.
5. Perform operations on polynomials, including factoring and evaluating polynomials.
6. Perform operations on rational expressions and solve equations containing rational expressions.
7. Perform operations on radical expressions and solve equations containing radical expressions.
8. Translate, solve, and analyze application problems.
9. Apply the algebraic rules associated with various operations and functions.
10. Solve various equations and systems of equations.
11. Analyze, interpret, and generate graphs involving various functions.
12. Perform operations on logarithmic expressions and solve logarithmic equations.
13. Solve a variety of application problems.
14. Understand and find characteristics of conics.

COURSE CONTENT:

LECTURE CONTENT:

A. Real Numbers
   1. Real Number Line
   2. Opposites
   3. Absolute Value

B. Operations on Real Numbers
   1. Addition
   2. Subtraction
   3. Multiplication
   4. Division
   5. Order of Operations

C. Properties of Real Numbers
   1. Properties of Addition
a. Commutative Property
b. Associative Property
c. Additive Identity
d. Additive Inverse Property

2. Properties of Multiplication
   a. Commutative Property
   b. Associative Property
c. Multiplicative Identity
d. Multiplicative Inverse Property

3. Distributive Property of Multiplication over Addition

4. Multiplication and Division with Zero and One

D. Linear Equations in One Variable
   1. Properties of Equality
      a. Addition Property of Equality
      b. Multiplication Property of Equality

   2. Solving Linear Equations in One Variable

   3. Applications of Linear Equations in One Variable

E. Linear Inequalities in One Variable
   1. Properties of Inequalities
      a. Addition Property of Inequality
      b. Multiplication Property of Inequality

   2. Solving linear inequalities in one variable

   3. Solving absolute value inequalities

   4. Solving and Graphing Linear Inequalities and Compound Inequalities in One Variable

F. Linear Equations in Two Variables
   1. Rectangular Coordinate System
      a. Axes and Quadrants
      b. Graphing Ordered Pairs

   2. Solution Set of a Linear Equation in Two Variables

   3. Graphing Linear Equations in Two Variables

   4. Writing a Linear Equation in Two Variables

   5. Solving linear inequalities in two variables

G. Linear Inequalities in Two Variables
   1. Solution Set of a Linear Inequality in Two Variables
2. Graphing Linear Inequalities in Two Variables

H. Systems of Linear Equations in Two and Three Variables
   1. Solution Set of a System of Linear Equations in Two Variables
   2. Solving Systems of Linear Equations in Two Variables
   3. Application of Systems of Linear Equations in Two Variables

I. Introduction to Functions
   1. Definition of function
   2. Function notation
   3. Composition of functions
   4. Variation
   5. Inverse of a function

J. Polynomials
   1. Properties of Exponents
   2. Operations on Polynomials
      a. Addition
      b. Subtraction
   3. Multiplication
   4. Division
   5. Factoring
   6. Evaluating a Polynomial

K. Quadratic Equations in One Variable
   1. Complex Numbers
      a. Algebraic properties of complex numbers
   2. Solving Quadratic Equations in One Variable with real and complex solutions
      a. Factoring and zero-product rule
      b. Square root property
      c. Completing the square
      d. Quadratic formula
      e. Solving equations quadratic in form
   3. Applications of Quadratic Equations in One Variable
   4. Solving formulas for specified variables
   5. Solving absolute value equations

L. Rational Expressions
   1. Reducing Rational Expressions
2. Operations on Rational Expressions
   a. Addition
   b. Subtraction
   c. Multiplication
   d. Division
3. Simplifying compound fractions
4. Solving Equations Containing Rational Expressions
5. Applications of Rational Equations in One Variable
   a. Proportions
   b. Variation

M. Radical Expressions
1. Simplifying Radical Expressions
   a. Square Roots
   b. Cube Roots
2. Operations on Radical Expressions
   a. Addition
   b. Subtraction
   c. Multiplication
   d. Division
   e. Rationalizing Denominators
3. Solving Equations Containing Radical Expressions

N. Exponential and Logarithmic Functions
1. Algebraic properties of exponential and logarithmic functions
2. Graphing exponential and logarithmic functions
3. Solving exponential and logarithmic equations
4. Applications of exponential and logarithmic functions

O. Conic Sections
1. Distance formula
2. Circles
   a. Standard equation of a circle
   b. Finding the center and radius of a circle
   c. Graphing a circle
3. Parabolas
a. Standard equation of a parabola
b. Finding the vertex of a parabola
c. Graphing a parabola

4. Ellipses
   a. Standard equation of an ellipse
   b. Finding the center and radius of a ellipse
   c. Graphing of an ellipse

5. Hyperbolas
   a. Standard equation of a hyperbola
   b. Graphing a hyperbola

P. Sequences and Series
   1. Sequences and series
   2. Arithmetic sequence and series
   3. Geometric sequence and series
   3. Binomial theorem

LABORATORY CONTENT:

Through weekly quizzes, collaborative activities, formative and summative error analysis, ALEKS learning path completion, and individual math content goal setting and action planning, students will learn the following content: properties of real numbers; simplifying polynomial, rational, and radical expressions; solving linear, quadratic, rational, and radical equations in one variable; graphing and solving systems of linear equations in two variables, absolute value, rational exponents, quadratic equations and inequalities, linear and quadratic functions, conic sections, exponential and logarithmic functions, sequences, and series. A scientific calculator will be required.

METHODS OF INSTRUCTION:

A. Lecture:
B. Lab:

INSTRUCTIONAL TECHNIQUES:

Lecture and/or Instruction
Laboratory assessment

COURSE ASSIGNMENTS:

Out-of-class Assignments
   Individual study that can be completed online through the online component of the course

Writing Assignments
   Homework
   Quizzes
   Activities in class
   Presentations
Reading Assignments

Written computation processes for mathematical problems in the homework assignments and quizzes on computers or chromebooks.

METHODS OF STUDENT EVALUATION:
Midterm Exam
Final Exam
Short Quizzes
Written Assignments
Projects (ind/group)
Problem Solving Exercises

Demonstration of Critical Thinking:
Analysis and application of mathematical techniques presented in the course
Mathematical modeling and computational methods
Understanding and application of algebraic, numerical, and graphical interpretations of high school algebra concepts

Required Writing, Problem Solving, Skills Demonstration:
Homework, quizzes, class activities, projects, and examinations covering topics presented in the course.

TEXTS, READINGS, AND RESOURCES:

TextBooks:

Software:

LIBRARY:
Adequate library resources include: Non-Print Materials
Online Materials
Services

Comments:

Attachments:
Attached Files