I. OVERVIEW
The following information will appear in the 2009 - 2010 catalog

MATH-810 Mathematical Skill Modules 0 Unit

Non-credit class designed to improve mathematical skills using computerized modules. Course is repeatable - unlimited completions allowed. Field trips are not required. Course is not applicable to the associate degree.

II. LEARNING CONTEXT
Given the following learning context, the student who satisfactorily completes this course should be able to achieve the goals specified in Section III, Desired Learning:

A. COURSE CONTENT

1. Required Content:

   Note - all lab hours - see Lab Content section

2. Required Lab Content:

   a. Basic Math

      i. Whole Numbers

         a. Expanded form and numeral translation
         b. Addition and subtraction
         c. Multiplication and division
         d. Rounding
         e. Factors and prime number

      ii. Common Fractions and Mixed Numbers

         a. Reducing fractions
         b. Addition and subtraction
         c. Multiplication and division

      iii. Decimals

         a. Decimal place value
         b. Rounding
         c. Addition and subtraction
d. Multiplication and division

e. Conversion between common fractions and decimals

iv. Percent
   a. Conversion between common fractions, decimals, and percent
   b. Application of percents

v. Exponents and Scientific Notation

vi. Geometry
   a. Perimeter of a square, rectangle, triangle, and circumference of a circle
   b. Area of a square, rectangle, triangle, and circle
   c. Volume of a cube, rectangular box, cylinder, and a sphere

b. Prealgebra

i. Whole Numbers
   a. Expanded form, numerical translation
   b. Addition, subtraction
   c. Multiplication, division
   d. Rounding, ordering
   e. Order of operation, arithmetic properties
   f. Factors, prime numbers

ii. Fractions and Proportions
   a. Equivalent fractions
   b. Ordering fractions
   c. Addition, subtraction
   d. Multiplication, division
   e. Mixed numbers
   f. Proportion

iii. Decimals and Percents
   a. Place value, rounding, ordering
   b. Conversion between fractions and decimals
c. Addition, subtraction

d. Multiplication, division

e. Percent

iv. Measurement

v. Variable Expressions and Polynomials
   a. Integers, signed numbers
   b. Variable expressions
   c. Exponents
   d. Polynomials
   e. Square roots

vi. Equations
   a. Additive and multiplicative properties of equality
   b. Solving linear equations
   c. Applications

vii. Geometry
   a. Lines, angles
   b. Triangles
   c. Polygons, quadrilaterals
   d. Circle
   e. Volume, surface area

c. Beginning Algebra
   i. Arithmetic Readiness
      a. Whole numbers
      b. Fractions
      c. Decimals
      d. Percents
      e. Geometry
   
   ii. Real Numbers and Variables
a. Integers and rational numbers
b. Properties of real numbers
c. Variables and algebraic expressions

iii. Linear Equations and Inequalities
   a. Linear equations
   b. Inequalities
   c. Applications

iv. Functions, Lines, Systems of Equations
   a. Sets, relations, functions
   b. Graphing linear equations and inequalities
   c. Properties of lines
   d. Systems of linear equations

v. Integer Exponents and Polynomials
   a. Exponents
   b. Polynomial arithmetic
   c. Factoring

vi. Rational Expressions and Proportions
   a. Simplifying expressions
   b. Solving equations
   c. Applications

vii. Radicals and rational
    a. Square roots
    b. Pythagorean Theorem
    c. Rational exponents

viii. Complex Numbers and Quadratic Equations
      a. Complex numbers
      b. Quadratic equations, functions
      c. Graphing
d. Intermediate Algebra
   i. Real Numbers and Linear Equations
      a. Real numbers
      b. Solving linear equations and inequalities
      c. Applications of linear equations
      d. Absolute value
   ii. Graphs of Linear Functions
      a. Ordered pairs
      b. Graphing lines
      c. Equations of lines
      d. Inequalities in two variables
      e. Sets, relations, and functions
   iii. Systems of Linear Equations
   iv. Solving systems of linear equations
   v. Applications
   vi. Matrices

e. Exponents and Polynomials
   i. Integer and rational exponents
   ii. Manipulating polynomial expressions
   iii. Factoring

f. Rational Expressions and Rational Functions
   i. Simplifying expressions
   ii. Solving equations
   iii. Graphing a rational function
   iv. Applications
   v. Direct and inverse variations

g. Radicals and Quadratic Equations
i. Radicals and rational exponents

ii. Complex numbers

iii. Quadratic equations

iv. Parabolas

h. Functions, Logarithms

i. Functions

ii. Laws of logarithms

iii. Solving logarithmic and exponential equations

iv. Graphing exponential and logarithmic functions

i. Conic Sections, Sequences

i. Conic sections

ii. Sequences and series

• **HOURS AND UNITS**

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<tr>
<th>INST METHOD</th>
<th>TERM HOURS</th>
<th>UNITS</th>
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• **METHODS OF INSTRUCTION (TYPICAL)**

_Instructors of the course might conduct the course using the following method:_

1. Initial orientation meeting

2. Students navigate learning paths based on their level of readiness

3. Periodic meetings to evaluate student's progress

• **ASSIGNMENTS (TYPICAL)**

1. **EVIDENCE OF APPROPRIATE WORKLOAD FOR COURSE UNITS**

_Time spent on coursework in addition to hours of instruction (lecture hours)_

Each module within each category takes approximately 8 - 10 hours to complete.

2. **EVIDENCE OF CRITICAL THINKING**

_Assignments require the appropriate level of critical thinking_
These modules are designed to help students learn to think critically so that they can succeed in for-credit classes.

• TEXTS AND OTHER READINGS (TYPICAL)

1. Other: All work is done in the ALEKS computerized mathematics learning system. ALEKS includes readings, video clips, and mathematical examples.

• DESIRED LEARNING

A. COURSE GOAL
As a result of satisfactory completion of this course, the student should be prepared to:

Achieve greater success in the for-credit math course(s) needed to meet career and/or academic goals.

B. STUDENT LEARNING GOALS
Mastery of the following learning goals will enable the student to achieve the overall course goal.

A. Required Learning Goals
Upon satisfactory completion of this course, the student will be able to:

B. Lab Learning Goals
Upon satisfactory completion of the lab portion of this course, the student will be able to:

a. Basic Math: Add, subtract, multiply, divide, round, and find the prime factorization of whole numbers

b. Basic Math: Add, subtract, multiply, divide, and reduce fractions and mixed numbers

c. Basic Math: Add, subtract, multiply, divide, and round decimals.

d. Basic Math: Convert between decimals, percents, fractions, and mixed numbers.

e. Basic Math: Solve application problems using percents

f. Basic Math: Use the rules of exponents to simplify expressions

g. Basic Math: Use scientific notation to represent large and small quantities.

h. Basic Math: Determine the perimeter, area, or volume of a given simple two or three dimensional figure.

i. Prealgebra: Add, subtract, multiply, divide, round, order, find the prime factorization of, and perform multi-step arithmetic operations on whole numbers

j. Prealgebra: Add, subtract, multiply, divide, order, and solve problems using fractions.

k. Prealgebra: Add, subtract, multiply, divide, order, and round decimals.

l. Prealgebra: Determine the measure of a given figure, either length, area, or volume, using formulas, rulers, or other measuring devices.

m. Prealgebra: State the definition of, and properly use, integers, variables, exponents, square roots, and polynomials.

n. Prealgebra: Solve linear equations using the additive and multiplicative properties of equality, and use these skills to solve application problems.
o. Prealgebra: Define and categorize angles, triangles, polygons, quadrilaterals, and circles.

p. Beginning Algebra: identify and describe the basic properties of real numbers.

q. Beginning Algebra: graph linear equations and inequalities in one variable and use these skills to solve application problems.

r. Beginning algebra: graph linear equations and inequalities in two variables and solve application problems using these skills.

s. Beginning Algebra: add, subtract, multiply, divide, and factor polynomials.

t. Beginning Algebra: Simplify expressions and solve equations involving rational expressions, and use these skills to solve applications.

u. Beginning algebra: Use square roots to solve applications using the Pythagorean Theorem.

v. Beginning Algebra: simplify expressions involving rational exponents.

w. Beginning algebra: state the definition of, add, subtract, and multiply complex numbers.

x. Beginning Algebra: graph simple quadratic equations.

y. Intermediate Algebra: Solve problems involving absolute values.


aa. Intermediate Algebra: manipulate polynomial expressions by exponentiation, factorization, and arithmetic operations.

ab. Intermediate Algebra: Simplify expressions and solve equations involving rational expressions.

ac. Intermediate Algebra: define the difference between direct and inverse variation, and solve problems involving each type.

ad. Intermediate Algebra: Add, subtract, multiply, and divide complex numbers.

ae. Intermediate Algebra: Graph quadratic functions given in standard form or general form by using transformations.


ah. Intermediate Algebra: Graph exponential and logarithmic functions.

ai. Intermediate Algebra: Identify based on its equation and correctly graph each type of conic section: circles, parabolas, ellipses, and hyperbolas.

aj. Intermediate Algebra: State the general term of an arithmetic or geometric sequence, find the sum of an arithmetic or geometric sequence, and determine the first ten terms of a given arithmetic, geometric, or recursive sequence.

• METHODS OF ASSESSMENT (TYPICAL)