STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK

MASTER SYLLABUS

MATH 100 - BEGINNING ALGEBRA

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CANINO SCHOOL OF ENGINEERING TECHNOLOGY
MATHEMATICS DEPARTMENT
Spring 2019

A. **TITLE**: BEGINNING ALGEBRA

B. **COURSE NUMBER**: MATH 100

C. **CREDIT HOURS**: (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)

 # Credit Hours: 3
 # Lecture Hours: 3 **per week**
 # Lab Hours: 0 **per week**
   Other: 0 **per week**

Course Length: 15 **Weeks**

D. **WRITING INTENSIVE COURSE**: Yes ☐   No ☒

E. **GER CATEGORY**: **None**: ☒   **Yes**:
If course satisfies more than one:

F. **SEMESTER(S) OFFERED**: Fall ☐   Spring ☐   Fall & Spring ☒

G. **COURSE DESCRIPTION**:

This course is designed to prepare the student for Intermediate Algebra (MATH106). It assumes a limited algebra background at the secondary level. Topics include: a review of arithmetic operations, signed numbers, exponents, basic geometry concepts (such as angle measure, area and volume formulas), operations with polynomials, solving linear equations, introduction to graphing, and elementary word problems.

H. **PRE-REQUISITES**: None ☐   Yes ☒ If yes, list below:

For students with no algebra background or for those receiving less than 75 on the New York State Math A or Integrated Algebra Regents or equivalent examination, or permission of instructor.

CO-REQUISITES: None ☒   Yes ☐   If yes, list below:

I. STUDENT LEARNING OUTCOMES: (*see key below*)

By the end of this course, the student will be able to:

Course Student Learning Outcome [SLO]	*Program Student Learning Outcome [PSLO]*	*GER [If Applicable]*	*ISLO & SUBSETS*	
Perform computations applying order of operations to real numbers.			3 Foundational Skills	QTR
Simplify and solve linear equations (conditional) and simple inequalities.			3 Foundational Skills	QTR
Graph linear equations and interpret graphs.			3 Foundational Skills	QTR
Solve literal equations and word problems using algebraic methods.			3 Foundational Skills	QTR
Perform basic operations with exponential expressions and polynomials.			3 Foundational Skills	QTR
Factor polynomials (greatest common factor, difference of squares, and trinomials).			3 Foundational Skills	QTR
Solve quadratic equations and application problems by factoring.			3 Foundational Skills	QTR

KEY	Institutional Student Learning Outcomes [ISLO 1 – 5]
ISLO #	ISLO & Subsets
1	**Communication Skills** Oral [O], Written [W]
2	**Critical Thinking** *Critical Analysis [CA] , Inquiry & Analysis [IA] , Problem Solving [PS]*
3	**Foundational Skills** *Information Management [IM], Quantitative Lit./Reasoning [QTR]*
4	**Social Responsibility** *Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]*
5	**Industry, Professional, Discipline Specific Knowledge and Skills**

*Include program objectives if applicable. Please consult with Program Coordinator

J. **APPLIED LEARNING COMPONENT:**   Yes ☐   No ☒

If YES, select one or more of the following categories:

☐ Classroom/Lab   ☐ Civic Engagement
☐ Internship   ☐ Creative Works/Senior Project
☐ Clinical Placement   ☐ Research
☐ Practicum   ☐ Entrepreneurship
☐ Service Learning   (program, class, project)
☐ Community Service

K. **TEXTS:**

Currently using: ***ELEMENTARY ALGEBRA FOR COLLEGE STUDENTS***
by Angel/Runde, Eighth Edition (2011), Prentice Hall.

L. **REFERENCES:**

Worksheets, software, computer tutorials, and other texts are available on the network, in the Math Lab, and the Library.

M. **EQUIPMENT: None** ☐ **Needed:**

Smart classroom (computer projection and access to the internet). **NOTE:** calculators will **not** be allowed in this course for tests and quizzes.

N. **GRADING METHOD:** A-F

O. **SUGGESTED MEASUREMENT CRITERIA/METHODS:**

- Homework
- Quizzes
- Tests

P. **DETAILED COURSE OUTLINE:**

I. Real Numbers
    A. Fractions, Decimals, and Per Cents
        1. Reducing
        2. Converting – mixed numbers, improper fractions
        3. Operations +, -, x, /
    B. The Real Number System
        1. Sets of numbers – names and structure
        2. Inequalities - relation between two real numbers ($<, >, =$)
    C. Signed Numbers
        1. Absolute Value
        2. Opposites
        3. Operations +, -, x, /

D. Powers and Roots
E. Order of Operations
      1. Evaluate algebraic expressions
F. Properties of the Real Number System
      1. Identity, Inverse
      2. Commutative, Associative
      3. Distributive

II. Linear Equations and Inequalities
    A. ! Simplify Algebraic Expressions
      1. ! Remove Parentheses
      2. ! Combine Like Terms
    B. ! Solving Linear Equations (Using Inverse Operations)
      1. ! Determine whether a number is a solution to an equation
      2. Variable on Only One Side of the Equation
      3. Variable on Both Sides of the Equation
      4. ! Simplification and Equation Solving
    C. ! Ratios and Proportions
      1. ! Write ratios
      2. ! Solve Fractional Equations
    D. ! Solving Linear Inequalities
      1. ! Simple (not compound) – graph the solution on a number line

III. Graphing Linear Equations
    A. ! Reading Graphs
    B. ! The Cartesian Coordinate System
      1. ! Plot points
      2. ! State coordinates and quadrants
    C. ! Graphing Linear Equations
      1. ! Determine whether an ordered pair is a solution to a linear equation
      2. ! Point Plotting Method
      3. ! X- and Y-intercept Method
      4. ! Vertical and Horizontal Lines
    D. ! Slope of a Line
      1. ! Given two points
      2. ! Given a graph
      3. ! Given an equation

IV. Formulas and Applications of Algebra
    A. ! Formulas and Literal Equations
      1. ! Evaluate
      2. ! Solve for a specified variable
      3. ! Geometric: Perimeter, Area, Volume (square, rectangle, triangle, circle, and other figures if given formula)
    B. ! Translating (words to symbols)
      1. ! Write expressions involving percents
    C. ! Applications-Using Algebraic Models to Solve Word Problems
      1. ! Number Relation (consecutive integers)
      2. ! Geometry (perimeter, angles)
      3. ! Distance (Motion)
      4. ! Mixture (Dry) - coin, investment
      5. ! Average

V. Exponents and Polynomials
- A. Laws of Exponents (+, -, 0)
  - 1. Scientific Notation
- B. Types of Polynomials and Degree
- C. Addition and Subtraction of Polynomials
- D. Multiplication of Polynomials
  - 1. Two or More Monomials
  - 2. Distributive Property: (monomial) (polynomial)
  - 3. Two Binomials (F.O.I.L. and special products)
  - 4. Two Polynomials
- E. Division of Polynomials
  - 1. Short Division (divisor is a monomial)

VI. Factoring
- A. Prime Factorization of a Number
- B. Greatest Common Factor (GCF)
- C. Difference of Two Squares $a^2 - b^2$
- D. Trinomials (using reverse of F.O.I.L.)
  - 1. Simple $x^2 + bx + c$
  - 2. General $ax^2 + bx + c$
- E. General Factoring Strategy (Factor Completely)
- F. Solve Quadratic Equations by Factoring
  - 1. Zero Product Rule
  - 2. Application Problems (rectangle-area, consecutive integers - product)

Q. **<u>LABORATORY OUTLINE</u>: None** ☒ **Yes** ☐