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

MASTER SYLLABUS

MATH 106 - INTERMEDIATE ALGEBRA

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CANINO SCHOOL OF ENGINEERING
TECHNOLOGY !MATHEMATICS DEPARTMENT
Spring 2018

A. TITLE: INTERMEDIATE ALGEBRA

B. COURSE NUMBER: MATH 106

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

 # Credit Hours: 3 !
 # Lecture Hours: 3 **per week** !
 # Lab Hours: 0 **per week** !
Other: plus 1 hour recitation **per week** for supplemental instruction.

Course Length: 15 **Weeks**

D. WRITING INTENSIVE COURSE: Yes ☐ No ☒

E. GER CATEGORY: None: ☐ **Yes:** GER 1 Mathematics
***If course satisfies more than one*:**

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

G. COURSE DESCRIPTION:

This course reviews and builds on the basic, fundamental concepts of algebra, which are required in many other courses and areas of study. Topics include: a review of fundamental concepts, first degree equations and inequalities, graphing and systems of equations, products and factoring, rational expressions, exponents and radicals, quadratic equations.

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

Beginning Algebra (MATH 100) with a grade of C or better, or New York State Math A or Integrated Math Regents or equivalent examination with a grade of 70 or above, 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***	
Solve linear and absolute value equations and inequalities, and compound inequalities and write solutions in interval notation.		1	**3 Foundational Skills**	**QTR**
Write equations of lines using a variety of methods.		1	**3 Foundational Skills**	**QTR**
Evaluate and interpret functions and their graphs.		1	**3 Foundational Skills**	**QTR**
Solve systems of equations by graphing, substitution, and addition (elimination), with rational coefficients.		1	**3 Foundational Skills**	**QTR**
Perform basic operations with polynomials and factor completely (including sums and differences of cubes) and solve quadratic equations using the quadratic formula.		1	**3 Foundational Skills**	**QTR**
Perform basic operations on rational expressions and complex fractions and solve rational equations.		1	**3 Foundational Skills**	**QTR**
Perform basic operations with radical expressions and solve radical equations.		1	**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
- ☐ Internship
- ☐ Clinical Placement
- ☐ Practicum
- ☐ Service Learning
- ☐ Community Service
- ☐ Civic Engagement
- ☐ Creative Works/Senior Project
- ☐ Research
- ☐ Entrepreneurship (program, class, project)

K. TEXTS:

Currently using: ***INTERMEDIATE ALGEBRA FOR COLLEGE STUDENTS***
by Allen R. Angel and Dennis C. 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) and liberal chalkboard/whiteboard space. **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. Linear Equations and Inequalities
   A. Conditional, Contradiction, and Identities
   B. Literal Equations
   C. Linear Inequalities
      1. Graph solutions on a number line and write answers in interval notation
      2. Compound – three part, “and”, “or”
   D. Absolute Value Equations and Inequalities

II. Graphing
- A. Coordinate System
- B. Functions and Relations
  1. Identify domain and range given a set of ordered pairs
  2. Identify functions
     a. Given a set of ordered pairs
     b. Given a graph (use vertical line test)
  3. Functional notation
- C. Graphing Linear Equations
  1. Using intercepts
  2. Using $y = mx + b$
- D. Slope – Intercept Form
  1. Find the slope given two points
  2. Find the slope and y-intercept given a graph or an equation of the line
  3. Write an equation in slope-intercept form
- E. Point – Slope Form
  1. Write the equation of a line given a point and the slope
  2. Write the equation of a line passing through two points
  3. Determine parallel and perpendicular lines
     a. Given two points
     b. Given two equations
  4. Write the equation of a line through a given point and parallel/perpendicular to the graph of a given equation

III. Systems of Linear Equations
- A. Determine if an ordered pair is a solution of a system of linear equations
- B. Determine if a system of linear equations is consistent, dependent, or inconsistent
- C. Solve systems of equations
  1. Graphically
  2. By substitution
  3. By addition method (elimination)
- D. Use systems of linear equations to solve applications

IV. Polynomials
- A. Basic Operations (+, -, x, /)
  1. Use long division to divide polynomials
- B. Factoring
  1. Greatest Common Factor
     a. Factor a common binomial factor
  2. Difference of Two Squares
  3. Sum and Difference of Two Cubes
  4. General Trinomial
  5. Perfect Square Trinomial
  6. Factor by Grouping
- C. Solve Quadratic Equations by Factoring

V. Rational Expressions and Equations
- A. Find the Domain and Note Restricted Values
- B. Reduce Rational Expressions
- C. Basic Operations (+, -, x, /)
- D. Simplify Complex Fractions
- E. Solve Rational Equations (with variable denominators)

VI. Roots and Radicals
   A. Evaluate Radical Expressions
   B. Write a radical expression in exponential form and vice versa
   C. Simplify expressions with rational exponents
   D. Simplify radical expressions
   E. Basic Operations (+, -, x, /)
      1. Rationalize a denominator using the conjugate
   F. Solve Radical Equations with radical on only one side of an equation
   G. Solve Quadratic Equations
      1. Square Root Property
      2. Quadratic Formula

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