

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



MASTER SYLLABUS

**COURSE NUMBER – COURSE NAME
MATH 123 - Precalculus**

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Updated by: Linda Law

Canino School of Engineering Technology

Department: Mathematics

Semester/Year: Fall 2018

- A. **TITLE:** Precalculus
- B. **COURSE NUMBER:** Math 123
- C. **CREDIT HOURS:** (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)

Credit Hours: 4
Lecture Hours: 4 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: GER 1 Mathematics
If course satisfies more than one: GER
- F. **SEMESTER(S) OFFERED:** Fall Spring Fall & Spring

G. **COURSE DESCRIPTION:**

This course provides an intense study of topics which are fundamental to the study of Calculus. Emphasis is placed on functions and their graphs with special attention to polynomial, rational, exponential, logarithmic and trigonometric functions, and analytic trigonometry. Additional topics include complex numbers; systems of equations and inequalities; trigonometric identities; and trigonometric applications.

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

Intermediate Algebra (MATH 106) with a grade of C or better, or 2 high school regents math courses with a grade of 75 or above on the second New York State Regents mathematics examinations, or permission of instructor. Cannot be taken for credit by students with credit in College Algebra and Trigonometry (MATH 121).

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:

<u>Course Student Learning Outcome</u> <u>[SLO]</u>	<u>Program Student Learning Outcome</u> <u>[PSLO]</u>	<u>GER</u> <i>[If Applicable]</i>	<u>ISLO & SUBSETS</u>	
Solve linear, polynomial, and rational equations/inequalities as well as absolute value, radical, exponential, and logarithmic equations	N/A	1	3-Found Skills ISLO ISLO	QTR Subsets Subsets Subsets
Graph functions and find zeros, domains, ranges, inverses, and perform algebraic operations and composition of functions	N/A	1	3-Found Skills ISLO ISLO	QTR Subsets Subsets Subsets
Find trigonometric function values and convert between angle measures	N/A	1	3-Found Skills ISLO ISLO	QTR Subsets Subsets Subsets
. Solve right and oblique triangles	N/A	1	3-Found Skills ISLO ISLO	QTR Subsets Subsets Subsets
Use Pythagorean, sum, difference, half angle, and double angle identities to simplify or evaluate trigonometric expressions and prove identities	N/A	1	3-Found Skills ISLO ISLO	QTR Subsets Subsets Subsets
Analyze graphs of transformed sine and cosine functions	N/A	1	3-Found Skills ISLO ISLO	QTR Subsets Subsets Subsets
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			ISLO ISLO ISLO	Subsets Subsets Subsets Subsets

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

- | | |
|---|--|
| <input type="checkbox"/> Classroom/Lab | <input type="checkbox"/> Civic Engagement |
| <input type="checkbox"/> Internship | <input type="checkbox"/> Creative Works/Senior Project |
| <input type="checkbox"/> Clinical Placement | <input type="checkbox"/> Research |
| <input type="checkbox"/> Practicum | <input type="checkbox"/> Entrepreneurship |
| <input type="checkbox"/> Service Learning | (program, class, project) |
| <input type="checkbox"/> Community Service | |

K. **TEXTS:**

Algebra and Trigonometry (Third Edition) by Beecher, Penna, and Bittenger, Pearson/Addison Wesley 2008, ISBN 13: 978-0-321-46620

L. **REFERENCES:**

L. Many materials in the Math Lab and online will aid the students with mastery of this subject

M. **EQUIPMENT:** None Needed: L. Technology enhanced classroom

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

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

- Homework
- Quizzes
- Exams
- Projects

P. **DETAILED COURSE OUTLINE:**

I. Graphs Functions and Models

1. Functions and graphs
2. Slope of a line segment and equations of lines
3. Special cases: vertical and horizontal lines
4. The algebra of functions
5. Symmetry and transformations of functions

II. Functions, Equations, and Inequalities

1. Linear equations
2. Complex numbers
3. Quadratic functions and equations
4. Analyzing graphs of quadratic functions

5. Rational equations and equations involving absolute value
6. Linear inequalities

III. Polynomial Functions and their Graphs

1. Introduction to polynomial functions
2. Graphs of polynomials
3. Polynomial division
4. Fundamental Theorem of Algebra and Rational Root Theorem
5. Polynomial Inequalities
6. Rational Inequalities

IV. Exponential and Logarithmic Functions

1. Inverse functions
2. General exponential functions and the number e
3. Logarithmic functions
4. Properties of logarithmic functions.
5. Exponential and logarithmic equations
6. Exponential models for growth and decay

V. Trigonometric Functions

1. Trigonometric functions of acute angles
2. Solving right triangles
3. Trigonometric functions of any angle
4. Radians and arc length
5. Graphs of trigonometric functions
6. Graphs of transformed sine and cosine functions

VI. Trigonometric Identities

1. Pythagorean, sum and difference identities
2. Co-function, double angle and half angle identities
3. Proving identities

VII. Applications of Trigonometry

1. Law of Sines
2. Law of Cosines

Q. LABORATORY OUTLINE: None Yes