

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



MASTER SYLLABUS

MATH 111 – SURVEY OF MATHEMATICS

Created by: Alice K. Reed

Updated by: Claire Medve

**CANINO SCHOOL OF ENGINEERING TECHNOLOGY
MATHEMATICS DEPARTMENT
Spring 2018**

A. **TITLE:** Survey of Mathematics

B. **COURSE NUMBER:** MATH 111

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: GER 1 Mathematics
If course satisfies more than one:

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

G. **COURSE DESCRIPTION:**

A study of various mathematical topics including an introduction to quantitative reasoning skills, truth table logic, sets, probability, and geometry. This course is designed for non-technical oriented students. It is appropriate for students in liberal arts.

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

Intermediate Algebra (MATH 106) with a grade of C or better, or 2 NYS 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.

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> <i>[SLO]</i>	<u>Program Student Learning Outcome</u> <i>[PSLO]</i>	<u>GER</u> <i>[If Applicable]</i>	<u>ISLO & SUBSETS</u>	
Use inductive and deductive reasoning to predict patterns or sequences and prove conjectures.		1	3 Foundational Skills	QTR
Solve real life applications using set operations and Venn diagrams.		1	3 Foundational Skills	QTR
Determine the validity of symbolic and syllogistic arguments.		1	3 Foundational Skills	QTR
Find expected value in real life applications.		1	3 Foundational Skills	QTR
Use permutations, combinations, and compound, conditional, and binomial probabilities to solve real life applications.		1	3 Foundational Skills	QTR
Find angle measurement to solve real life applications.		1	3 Foundational Skills	QTR
Solve applications using area, volume, and the Pythagorean Theorem.		1	3 Foundational Skills	QTR
Construct and analyze transformations of objects in two dimensional space.		1	3 Foundational Skills	QTR
Use basic graph theory to determine if a network is traversable.		1	3 Foundational Skills	QTR

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:**

Currently using: *A Survey of Mathematics with Applications*
by Angel, Abbott, and Runde, 9th edition (2013), Pearson.

L. **REFERENCES:** None

M. **EQUIPMENT:** None Needed:

Smart classroom (computer projection and access to the internet).
A scientific calculator is required for this course.

N. **GRADING METHOD:** A – F

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

- Homework
- Quizzes
- Exams

P. **DETAILED COURSE OUTLINE:**

I. Quantitative Reasoning Skills

1. Inductive Reasoning
2. Deductive Reasoning
3. Estimation

II. Elementary Set Operations

1. Set Notation
2. Finite and Infinite Sets
3. Equal and Equivalent Sets
4. Cardinality
5. Empty and Universal Set
6. Subsets and Proper subsets
7. Complements, Intersection, and Union of Sets
8. Venn Diagrams

III. Elementary Truth Table Logic

1. Symbolic Form
2. Statements and Logical Connectives
3. Quantifiers
4. Constructing Negation, Conjunction, Disjunction, Conditional and Biconditional Truth Tables
5. Tautologies
6. Logically equivalent statements
7. Converse, Inverse, and Contrapositive
8. Symbolic arguments using Laws of Inference and Proof
9. Syllogistic arguments using Euler Diagrams

IV. Basic Counting and Probability

1. Empirical and Theoretical Probability
1. Odds and Probability
3. Expected Value (Expectation)
4. Tree Diagrams
5. Basic Counting Principle
6. Compound Probability (And/Or) With and without replacement
7. Mutually exclusive, Independent and Dependent Events
8. Conditional Probability
9. ! Permutations
10. Combinations
11. Binomial Probability

V. Geometry

1. Points, Lines, Planes, and Angles
2. Polygons
3. ! Perimeter and Area
4. ! Volume and Surface Area
5. Transformational Geometry, Symmetry, and Tessellations
6. Mobius Strip
7. ! Jordan Curve
8. Topological Equivalence
9. Graphs, Paths, and Circuits

Q. **LABORATORY OUTLINE:** None Yes