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

MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
MATH 116 – Mathematics for Elementary Teachers II

Created by: Alice Reed

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Canino School of Engineering Technology

Department: Mathematics

Semester/Year: Spring/2019

A. **TITLE**: Mathematics for Elementary Teachers II

B. **COURSE NUMBER:** Math 116

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

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

The study of the development, meaning, and representations of statistics, patterns and functions, concepts of geometry, and measurement of two- and three-dimensional figures. The focus of the course will be on the construction of mathematical representations for K-8 topics via problem solving. The majority of the course will be activity-based (exploration of topics through problem solving activities.)

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

Mathematics for Elementary Teachers I (Math 115) with a grade of C or better, 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*	
Collect, display, and analyze data to interpret and draw inferences from graphs		1	3-Found Skills ISLO ISLO	QTR Subsets Subsets Subsets
Determine the probability of an event occurring		1	3-Found Skills ISLO ISLO	QTR Subsets Subsets Subsets
Use manipulatives to recognize, construct, classify, and understand relationships between basic geometric figures		1	3-Found Skills ISLO ISLO	QTR Subsets Subsets Subsets
Use manipulatives to determine angle measurement, congruence, and identify properties of two and three dimensional figures		1	3-Found Skills ISLO ISLO	QTR Subsets Subsets Subsets
Transform figures to create and understand tessellations and symmetry		1	3-Found Skills ISLO ISLO	QTR Subsets Subsets Subsets
			ISLO ISLO ISLO	Subsets Subsets Subsets Subsets
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			ISLO	Subsets
			ISLO	Subsets
			ISLO	Subsets
				Subsets

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:**

Bassarear, T. (2016). Mathematics for Elementary School Teachers (6th ed.) Boston: Houghton-
       Mifflin Company.
Bassarear, T. (2016). Mathematics for Elementary School Teachers Explorations (6th ed.)
       Boston: Houghton-Mifflin Company.

L. **REFERENCES:**

M. **EQUIPMENT: None** ☒ **Needed:**

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

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

in-class activities/lab work
oral reports
weekly journals about mathematical concepts encountered outside of the classroom
concept maps on the main topics
mini-projects (based on evaluations of K-8 textbooks problems, videos of elementary
       classroom discussions and elementary student work samples)
portfolio
hourly exams

P. **DETAILED COURSE OUTLINE:**

I. Probability and Statistics
1.   Data interpretation and chance in society
2.   Collecting and analyzing data
3.   Measures of Central Tendency
4.   Interpretation of mean
5.   Dispersion, variation, and distributions
6.   Interpreting graphs
7.   Comparing two sets of data
8.   Normal distributions

9. **Different distributions**
10. **Scatter plots**
11. **Inferential statistics**
12. **Probabilities**
13. **Fair games**
14. **Expected value**

II. Patterns and Functions
1. **Functional relationships from tables, graphs, and symbols**
2. **Output values when given input values**
3. **Rules for determining a function from a table or a graph**
4. **Domain and the range of a function**
5. **Properties to solve equations for a variable**
6. **Rate of change of a function from a table, graph, or an equation**

III. Concepts of Geometry
1. **Definitions of terms with necessary and sufficient conditions**
2. **Geometric figures and shapes**
3. **Constructing basic geometric shapes**
4. **Classifying polygons according to their properties**
5. **Determining whether three given segment lengths could be used to form a triangle**
6. **Determining when two figures are congruent**
7. **Determining when two figures are similar**
8. **Properties of figures to find angle measures and/or side lengths**
9. **Determining the measure of the angles in a polygon**
10. **Determining the measure of an angle in a regular polygon**

IV. Measurement
1. **Finding the length, area, perimeter/circumference, surface area, volume of various figures**
2. **Generating rectangles to meet specific criteria**
3. **Finding the length of a side in a right triangle when given the other two sides**
4. **Proving the Pythagorean relationship**
5. **Identifying various parts of two- and three-dimensional figures**
6. **Drawing rectangular prisms from different views**
7. **Translations, rotations, reflections of figures**
8. **Making tessellations**
9. **Identifying vertex arrangements for tessellations**

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