COURSE OUTLINE

MATH 116 - MATHEMATICS FOR ELEMENTARY TEACHERS II

Prepared By:  Alice K. Reed
A. **TITLE:** Mathematics for Elementary Teachers I

B. **COURSE NUMBER:** MATH 116

C. **CREDIT HOURS:** 3

D. **WRITING INTENSIVE COURSE:** N/A

E. **COURSE LENGTH:** 15 weeks

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

G. **HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY:** Three hours per week.

H. **CATALOG 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.)

I. **PRE-REQUISITES/CO-COURSES:** Mathematics for Elementary Teachers I (Math 115) with a grade of C or better, or permission of instructor.

J. **GOALS (STUDENT LEARNING OUTCOMES):**  
By the end of this course, the student will be able to:

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<tr>
<th>Course Objective</th>
<th>Institutional SLO</th>
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<tbody>
<tr>
<td>a. Collect, display, and analyze data to interpret and draw inferences from graphs</td>
<td>1. Communication</td>
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<td>2. Critical Thinking</td>
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<td>b. Determine the probability of an event occurring</td>
<td>1. Communication</td>
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<td>2. Critical Thinking</td>
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<td>c. Use manipulatives to recognize, construct, classify, and understand relationships between basic geometric figures</td>
<td>1. Communication</td>
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<td>2. Critical Thinking</td>
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<td>d. Use manipulatives to determine angle measurement, congruence, and identify properties of two and three dimensional figures</td>
<td>1. Communication</td>
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<td>2. Critical Thinking</td>
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<td>e. Transform figures to create and understand tessellations and symmetry</td>
<td>1. Communication</td>
</tr>
<tr>
<td></td>
<td>2. Critical Thinking</td>
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L. **REFERENCES:** None

M. **EQUIPMENT:** Internet connection, VCR, DVD player, manipulatives (pattern blocks, tiles, base five pieces, base ten pieces, fraction bars), calculator for elementary students, and other miscellaneous items.
N. **GRADING METHOD:** A – F

O. **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. **LABORATORY OUTLINE:** N/A