UW COLLEGES
DEPARTMENT OF MATHEMATICS

COURSE GUIDELINES

Course Title: Mathematics for Elementary Teachers
Course No. MAT 130  No. of Credits 4
Associate Degree Designation: MS

Contact hrs/wk: Lecture 4 or (3)  Lecture/Discussion Lab 0 or (2)

Course Prerequisites: A Grade of C or better in MAT 105 or MAT 108, or two years of high school algebra and one year of high school geometry, or Consent of Instructor.

Catalog description:
A mathematics content course for prospective elementary teachers. Emphasis is on the development of properties of arithmetic. Topics also may include elementary concepts of algebra, probability and statistics. Four hours of lecture (no lab) or three hours lecture and two hours laboratory per week.

Course content (list of topics normally covered):
Exposure to and Discussion of NCTM curriculum and evaluation standards.

1. Problem solving techniques
   Inductive reasoning
   Deductive reasoning
   Numerical and geometric patterns

2. Sets, relations, functions, graphs, and logic

3. Number Systems
   From whole numbers to real number systems
   Other numeration systems from antiquity and from other cultures
   Bases – 10 and others
   Algorithms from antiquity and from other cultures for addition, subtraction, multiplication and division
   Models for these algorithms -
      Uses of manipulatives
      Common error patterns
   Decimals

4. Basic Number Theory
   Primes
   Divisibility tests
   Greatest common factor and Least common multiple
   Proofs, proof by contradiction

5. Optional Topics –
   Further number theory (modular arithmetic, finite fields), probability, statistics, further geometry (beyond that used in the problems solving techniques).

Content-based department proficiencies:

1)…to be able to do basic arithmetic with all the number systems.
2)…to be able to understand the basic principles and logic behind standard and non standard algorithms for the four operations (addition, subtraction, multiplication, and division).
3)…to be able to understand different representation of fractions.
4)…to develop a number sense and be able to do mental arithmetic.
5)…to develop problem solving skills

Colleges-wide proficiencies assigned to course:

Students should be able to demonstrate the following:

A. Analytical skills Performance Indicators: Students should be able to:
1. Interpret and synthesize information and ideas.
4. Select and apply scientific and other appropriate methodologies.

B. Quantitative skills Performance Indicators: Students should be able to:
1. Solve quantitative and mathematical problems.
2. Interpret graphs, tables, and diagrams.

Representative textbooks used for the courses:
Mathematics for Elementary Teachers, Volume 1, Numbers and Operations by Sybilla Beckmann
Mathematics for Elementary Teachers, by Musser, Burger and Peterson
Mathematics for Elementary Teachers, by Sonnabend, Saunders

Approved April 22, 2006