Course Syllabus

Department: Mathematics

Date: January 25, 2012

I. Course Prefix and Number: MAT 280

Course Name: Mathematics for Elementary School Teachers II

Credit Hours and Contact Hours: 3 Credit Hours, 3 Contact Hours

Catalog Description including pre- and co-requisites:
This course is the second of a two-semester sequence designed for prospective elementary education teachers. The course presentation and material will conform to the NCTM Standards and therefore will present mathematics in the context of problem solving, communication (both oral and written), reasoning, including direct and indirect proofs, and mathematical connections. Students will explore mathematical concepts and theories underlying the topics including: proportional reasoning, statistics, probability, and geometry in terms of shape, transformations, and measurement.

Prerequisite: MAT 180 Mathematics for Elementary School Teachers I

II. Course Outcomes and Objectives

Student Learning Outcomes:
Upon completion of the course the participant will be able to:
1. Demonstrate competence in the basic mathematical structures and topics in the N-9 curriculum.
2. Communicate mathematical ideas both verbally and in writing.
3. Explain the reasoning behind mathematical ideas and their connection to algorithms.
5. Demonstrate critical thinking.
6. Demonstrate the use of both direct and indirect reasoning.
7. Model a positive attitude towards mathematics
8. Evaluate their results for reasonableness.

Relationship to Academic Programs and Curriculum:

This course is an introductory college level course that fulfills elective mathematics/science course requirements for all A.A., A.S. and A.A.S. degree programs. A student should verify the appropriateness of this course for his program with his advisor.

College Learning Outcomes Addressed by the Course:

☐ writing ☐ computer literacy
☐ oral communications ☐ ethics/values
☒ reading ☐ citizenship
☒ mathematics ☐ global concerns
☒ critical thinking ☐ information resources
III. Instructional Materials and Methods

Types of Course Materials:
1. Textbook: Selected by department.
2. Scientific calculator

Methods of Instruction (e.g. Lecture, Lab, Seminar …):
1. Lectures
2. Discussions
3. Demonstrations
4. Group activities
5. Experiments
6. Use of computers
7. Collaborative activities.

IV. Assessment Measures (Summarize how the college and student learning outcomes will be assessed):

Student Learning Outcomes will be assessed through a variety of activities. The Mathematics department believes that each instructor should determine the grading system and evaluation methods that will be used in their sections of the course. Any grading system used in the course must be consistent with the College Catalog. These methods must be communicated to students the first week of the semester in writing. Possible evaluation methods include quizzes, tests, portfolios, collected assignments, group activities, et. al. Such evaluations and related assignments will develop a student’s ability to read problems carefully, perform mathematics and use critical thinking techniques. Course policies with respect to attendance, late work, plagiarism, etc. must be communicated to the student.

V. General Outline of Topics Covered:

1) Rational Numbers
   a) Conversions between decimals and fractions
   b) Operations with rational numbers

2) Proportional reasoning
   a) Ratio and Proportion
   b) Percents

3) Real Numbers
   a) Introduction to irrational numbers
      i) $\pi$
      ii) $\sqrt{2}$
   b) Properties of real numbers
   c) Pythagorean Theorem

4) Uncertainty: Data and Chance
   a) Representing and Interpreting Data
   b) Distributions: Centers and Spreads
   c) Concepts Related to Chance
d) Counting and Chance

5) Geometry as Shape
   a) Basic Concepts of Geometry
   b) Two-Dimensional Figures
   c) Three-Dimensional Figures

6) Geometry as Transforming Shapes
   a) Congruence Transformations
   b) Symmetry and Tessellations
   c) Similarity

7) Geometry as Measurement
   a) Systems of Measurement
   b) Perimeter and Area
   c) Surface Area and Volume