

SU DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE  
 SYLLABUS (Tentative)  
 MATH 230 *Fundamental Concepts II*

**Objectives:** A continuation of MATH 130. To provide students with a thorough understanding of the mathematical concepts covered in grades one through eight, using approaches that support professional (NCTM) standards. To move prospective elementary school teachers through the mathematical content into the ability to explain mathematical ideas and relationships. To develop the ability to (a) explain mathematical concepts in everyday, but correct, language appropriate for the listener; and (b) to demonstrate mathematical ideas using physical models and/or activities. Use of technology is required. Participation in active learning (group work, use of manipulatives, etc.) is expected. Non-routine problem solving is included regularly throughout the semester. (This course **does** satisfy General Education requirements III-B or III-C.)

**Prerequisites:** MATH 130 (with a "C" or better).

**Texts:** "Mathematics for Elementary Teachers: A Conceptual Approach," by Bennett; McGraw Hill, 8th edition, 2010.  
 "Mathematics for Elementary Teachers: An Activity Approach," by Bennett; McGraw Hill, 8th edition, 2010.

| <i>Topic sequence may vary</i>   | <i>Weeks</i>       |
|--|--------------------|
| <p style="text-align: center;"><b><i>Percents, Ratios and Proportions</i></b></p> <p>Basic concepts explored with the use of manipulatives; concrete visualization; applications and analysis of alternate solution techniques</p> <p style="text-align: center;"><b><i>Irrational and Real Numbers</i></b></p> <p>Concepts connected to physical activities; applications (Chapter 6.3, 6.4)</p>  | 2.0                |
| <p style="text-align: center;"><b><i>Geometric Shapes: Polygons and Three-Dimensional Shapes</i></b></p> <p>Characteristics; classification of types; exploration of properties through experimentation; lines, angles and use of algebra blended with geometric relationships; angle measure in regular polygons; development of deductive proof from inductive exploration of interior angles, exterior angles and central angles. Properties of figures in space. (Chapter 9.1, 9.2, 9.3)</p>   | 2.5                |
| <p style="text-align: center;"><b><i>Measurement</i></b></p> <p>Approximate size and equivalence of standard units; conversion of linear, square and cubic units; measures of temperature</p> <p style="text-align: center;"><b><i>Perimeter, Area, and Volume</i></b></p> <p>Basic concept; dimensions and units of measure; basic concepts and relationships; concrete calculation, as opposed to formula approach; applications</p> <p style="text-align: center;"><b><i>Pythagorean Theorem</i></b></p> <p>Connection of the algebra to the concrete relationship; applications; distance formula as an outcome. Properties, constructions, applications (Chapter 10 and supplements)</p> <p>Optional topics as time permits</p> | 5.0                |
| <p style="text-align: center;"><b><i>Functions and Mathematical Models</i></b></p> <p>Basic function concept; notation; representation - table, graph, formula; linear and non-linear functions; creation of graphs from collected data; analysis of properties of different types; creation and use of functions and equations to model situations in areas such as science, economics, social science, environmental studies, etc. (Chapter 1.2, 1.3, 2.2, 7.1 and supplements)</p>  | 3.0                |
| <b><i>Tests</i></b>  | <u>1.5</u><br>14.0 |

**EVALUATION**

|                                 |          |
|---------------------------------|----------|
| Assignments, Quizzes, Classwork | 20 - 30% |
| Tests                           | 40 - 60% |
| Comprehensive Final Examination | 20 - 30% |

*Free tutoring is available for this course in the Spring and Fall semesters.*

**Writing Across the Curriculum:** Writing assignments are a regular part of this course. Students will be expected to carefully explain their reasoning in written English.

**NOTE:** Once a student has received credit, including transfer credit, for a course, credit may not be received for any course with material that is equivalent to it or is a prerequisite for it.