

**Department of Mathematical Sciences
Northern Illinois University**

**MATH 201
Foundations of Elementary School Mathematics**

This course aligns with the mathematical content and mathematical practices recommended in *The Mathematical Education of Teachers* (Conference Board of the Mathematical Sciences, 2001), *Undergraduate Programs and Courses in the Mathematical Sciences* (Mathematical Association of America–Committee on the Undergraduate Program in Mathematics, 2004), the *Principles and Standards for School Mathematics* (National Council of Teachers of Mathematics, 2000), and the *Common Core State Standards-Mathematics* (National Governors Association Center for Best Practices, Council of Chief State School Officers, 2010).

Course Objectives:

- To develop an appreciation of and an interest in mathematics and applications of mathematics;
- To develop an understanding of the concepts, processes, algorithms, and applications found in elementary school mathematics;
- To develop quantitative and spatial reasoning through mathematical and real-world contexts;
- To become confident in abilities to use mathematical knowledge;
- To reflect on mathematical experiences and present mathematical ideas using representations and symbols;
- To further develop positive dispositions toward mathematics.

Note: This is a mathematics course for teachers. It is not intended to be a course in methods for teaching mathematics.

Note: This course is open for credit *only* to majors in elementary education, special education, and early childhood education. It does *not* count for credit toward a major or minor in mathematical sciences.
PRQ: One year of high school algebra and one year of high school geometry.

Course Requirements

- Attendance, Participation, and Mathematical Disposition
- Computational Assessment
- Quizzes
- Exams
- Final Exam

Course Content

- Numerical Patterns and Algebra
- Functions and Algebra; Slope; Interpreting Graphs
- Review of Polygon Vocabulary; Organizing Shapes; Triangles and Quadrilaterals
- Faces and Nets; Introduction to Polyhedra
- Key Ideas of Measurement; Length and Angle Size; Area and Surface Area; Volume; Circumference, Area, and Surface Area Formulas; Volume Formulas; Pythagorean Theorem
- Expressing Values of Quantities
- Bases Other Than Ten; Operations in Different Bases
- Thinking about Addition, Subtraction, Multiplication; Division
- Operating on Whole Numbers and Decimals
- Understanding the Meaning of a/b
- Equivalent Fractions
- Relating Fractions, Decimals and Percents
- Estimating Fractional Values
- Addition, Subtraction, Multiplication; Division of Fractions
- Comparing Ratios
- Percents in Comparisons and Changes
- Models for Integers; Addition, Subtraction, Multiplication and Division of Integers

- What Are Statistics; Representing Categorical Data; Examining the Spread of Data; Measures of Center
- Assigning Probabilities; Simulating Probabilistic Situations; Tree diagrams and Lists for Multistep Experiments

Course Textbook:

MATH 201 Course Materials: Sowder, J., Sowder, L., & Nickerson, S. (2014). *Reconceptualizing Mathematics for Elementary School Teachers (Second Edition)*. New York: W. H. Freeman and Company.

Note: Changes and adjustments may be made to this syllabus when judged appropriate by the instructor. Such changes, should they occur, will be announced in class.

Academic Conduct:

Academic honesty and mutual respect (student with student and instructor with student) are expected in this course. Academic misconduct, as defined by the Student Judicial Code, will not be tolerated.

Qualified Students with Disabilities:

Northern Illinois University abides by Section 504 of the Rehabilitation Act of 1973, which mandates reasonable accommodations be provided for qualified students with disabilities. If you have a disability and may require some type of instructional and/or exam accommodation, please contact your instructor early in the semester so that the instructor can provide or facilitate in providing accommodations you may need. If you have not already done so, you will need to register with the Disability Resource Center (DRC), the designated office on campus to provide service and administer exams with accommodations for students with disabilities. The DRC is located on the 4th floor of the NIU Health Services building (815-753-1303).