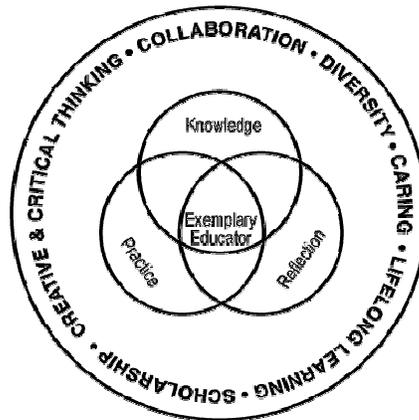


**Department of Mathematical Sciences
Northern Illinois University**

**MATH 412
Methods of Instruction in the
Mathematics Curriculum
For Secondary School**



Course Objectives:

- Learn and practice techniques used to implement NCTM's *Principles and Standards for School Mathematics* (2000) and *The Common Core Standards for Mathematics* (2010) both within the present day middle school and secondary school curriculums.
- Explore how students learn mathematics and what is meant by deep understanding of mathematics. Focus on communication in the mathematics classroom and the need for teachers to create a supportive classroom environment in which students think together, take intellectual risks, debate ideas, and refine their understanding. Teachers learn about the importance and use of cooperative learning strategies through immersion as they engage in logic and reasoning.
- Develop and practice ways of using & adapting different methods of instruction, including cooperative learning and working with instructional approaches to assist students in learning mathematics, such as concrete materials, technology, multiple representations, and the use of contexts to meet the needs of all students in mathematics in both block and traditional schedules.
- Learn how to develop and to adapt unit/daily lesson plans and performance based objectives, questioning and assessment techniques, motivational and classroom management strategies, and ways of incorporating manipulatives, visual aids, technology and multicultural aspects of mathematics into the classroom in accordance with the abilities, learning styles and special needs of students in their classrooms and performance objectives these students are trying to achieve.
- Prepare lessons that reflect a balanced approach to mathematics, including opportunities for students to develop conceptual understanding, procedural fluency, and mathematical reasoning/problem solving skills as well as to communicate precisely.
- Learn valuable teaching techniques, including ways of helping struggling students, by sharing ideas and concerns about clinical experiences (observation/teaching) and by working together in groups on projects and by doing classroom presentations.
- Learn assessment strategies, including formative and summative assessments. Particular assessment practices, including the use of rubrics will be discussed.
- Constructively reflect on the progress toward the above goals and on current issues in education to help you use the results of these reflections to become better math educators.
- Learn about the opportunities for professional growth in mathematics education through membership and active participation in the many professional organizations for mathematics educators so that learning is seen as a life-long process.
- Articulate how NIU's Conceptual Framework and *The Common Core Standards for Mathematics* (2010) provide the "scaffolding" for the mathematics licensure program and how these ideas are implemented in your teaching.

Course Requirements:

- Attendance, Class Participation, and Mathematical Disposition
- Reading Assignments

- Reflective Writing
- Philosophy of Mathematics Education
- In-class Problem Presentation
- Lesson Plan–Group Project
- Analysis of Teacher Interview
- Classroom Management Plan (Expectations/Procedures
- Homework, Grading, and Make-up Policy
- Concept Teaching/Co-Teaching
- Unit Planning Project
- Review of Professional Meeting or Article from a Professional Journal or Lesson/Activity from the Internet
- Professional Portfolio
- Quizzes
- Exams

Course Content

- Mathematics Education: Where Do I Stand?
- NCTM Principles and Standards for School Mathematics
- Encouraging Communication in Mathematics Classrooms
- Logic & Reasoning
- High School Students and How They Learn
- Geometry & Measurement
- Planning for Instruction
- Algebra and Functions
- Lesson Planning
- Data Analysis and Probability
- Assessment of Students' Learning
- Precalculus
- Collaborating with Educational Partners

Text and Required Publications

- Beckmann, C., Thompson, D., & Rubenstein, R. (2010). *Teaching and Learning High School Mathematics*. Wiley. (Required)
- *The Common Core Standards for Mathematics* (June, 2010) <http://www.corestandards.org/the-standards/mathematics>
- National Council of Teachers of Mathematics. (2000). *Principles and Standards for School Mathematics*. Reston, VA. (Note: A 120-day free access to this document is available at nctm.org)

Course Lab Fee

A lab fee charged for enrollment in this course is used to replace and update materials pertaining to instruction of the course and research on instruction of the course.

NIU Students and Conduct

It is expected that all NIU students abide by the NIU student handbook regarding conduct. Academic misconduct will be treated and reported according to the NIU guidelines.

Students with Disabilities

NIU 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 examination accommodation, please contact me early in the semester so that I can provide or facilitate in providing accommodation you may need. If you have not already done so, you will need to register

with the Disability Resource Center (formerly ACCESS Center) on campus. The telephone number of the Disability Resource Center is 815 -753-1303. This center provides services such as administering exams with accommodations for students with disabilities

Changes may be made in the syllabus when judged appropriate by the instructor. Such changes, should they occur, will be announced in class.