Course Outline

Department of Mathematics and Statistics

Minnesota State University, Mankato

Math 485 Teaching Secondary School Mathematics (3 semester hours)

Course Description:
Learning theories, teaching strategies, assessments and planning, teaching and reflecting on secondary (grades 9-12) school mathematics. Field experiences in grades 9-12 mathematics classroom required.

Prerequisites: MATH 290 with “C” (2.0) or better or consent

Learning Outcomes:
Student will be able to

1. Demonstrate an awareness of current developments in the school mathematics curriculum
2. Demonstrate recognition of the importance of communication and connectedness in mathematics teaching.
3. Demonstrate effective classroom management skills for grades 7-12.
4. Use appropriate instructional strategies and materials, including physical models and technology, in teaching 7-12 mathematics.
5. Demonstrate ways of evaluating students' mathematics achievement
6. Demonstrate familiarity with the functions of professional mathematics and mathematics education organizations at the national, state and local level
7. Synthesize their perceptions and values of mathematics and effective mathematics teaching and analyze whether that synthesis incorporates mathematics by and for a diversity of cultures, ability levels and learning styles.

Content Outline:

3. Teaching strategies and physical models for:
   a. Mathematical concepts
   b. Mathematical generalizations
   c. Mathematical skills
   d. Mathematical problem solving
   e. Mathematical applications through laboratory activities
4. Examination of selected mathematical topics
5. Multicultural mathematics and multicultural math classroom
6. Management of a successful mathematics classroom
7. Micro-teaching experiences
   a. in the class, peer-teaching
   b. in a local junior high/high school
8. Developing tests and using instruments for assessing students' achievement
Textbook/Related Readings/Materials:

Minnesota Academic Standards: Mathematics
http://education.state.mn.us/MDE/Academic_Excellence/Academic_Standards/Mathematics/index.html
APA Formatting and Style Guide
http://owl.english.purdue.edu/owl/resource/560/01/
MTLE: Minnesota Teacher Licensure Exam
http://www.mtle.nesinc.com/Home.aspx
TPA: Teacher Performance Assessment
http://tpafielddtest.nesinc.com/Home.aspx
Cofman, Judith, What to Solve? Problems and Suggestions for Young Mathematicians
Cooney, T., Davis, E. and Henderson, K, Dynamics of Teaching Secondary Mathematics
Crouse, R., and Sloyer, C. Mathematical Questions From the Classroom
Henderson, K., What Research Says to the Teachers
Johnson, D., Making Minutes Count Even More. A Sequel to Every Minute Counts
Johnson, D., Every Minute Counts: Making your math class work
NCTM, Arithmetic Teacher
NCTM, Mathematics Teacher
NCTM, Professional Standards for Teaching Mathematics
NCTM, Results from the Fourth Mathematics Assessment
NCTM, Research Agenda for Mathematics Education (Volumes 1-5)
NCTM, Yearbooks
National Research Council, Everybody Counts
Postamentier, A. and Stepelman, J. Teaching Secondary School Mathematics
Reys, R.Z., The Mathematics Laboratory, Theory to Practice
School Science and Mathematics Association, School Science and Mathematics
Skemp, P. The Psychology of learning Mathematics
Tobias, S., They're Not Dumb, They're Different
Van Hiele, P., Structure and Insight
Zaslavsky, C., The Multicultural Math Classroom, Bringing in the World
Materials: Manipulatives including ones for algebra, geometry and other secondary content technology
Technology: Geometer's Sketchpad, G.G. and Graphing Equations, Graphing Calculators