

AUGSBURG COLLEGE
ESE 330A/ESE 331M 5-12 Mathematics Methods
Course Syllabus

Credits: 1.0 (ESE 330) or .5 (ESE 331)

Pre-requisites:

Admission to Teacher Education Program

Course Description:

ESE 330/331 provides examination and preparation of materials and resources for mathematics at the middle school and high school level.

Required Texts:

Teaching Mathematics for the 21st Century – Huetinck & Munshin, Merrill-Prentice Hall, 2000.
Minnesota K-12 Mathematics Frameworks (can be downloaded as need from the site below)

http://cfl.state.mn.us/ci/learning/math/frameworks_math_1.pdf

Education Department Mission Statement:

The Augsburg College Education Department commits itself to developing future educational leaders who foster student learning and well-being by being knowledgeable in their fields, being capable in pedagogy, being ethical in practice, nurturing self-worth, embracing diversity, thinking reflectively, and collaborating effectively.

Applicable Standards of Effective Practice:

- STANDARD 1 – SUBJECT MATTER: A teacher must understand the central concepts, tools of inquiry, and structures of the discipline taught and be able to create learning experiences that make these aspects of subject matter meaningful for students.
- STANDARD 4 – INSTRUCTIONAL STRATEGIES: A teacher must understand and use a variety of instructional strategies to encourage student development of critical thinking, problem solving, and performance skills.
- STANDARD 5 – LEARNING ENVIRONMENT: A teacher must be able to use an understanding of individual and group motivation and behavior to create learning environments that encourage positive social interaction, active engagement in learning, and self-motivation.
- STANDARD 6 – COMMUNICATION: A teacher must be able to use knowledge of effective verbal, nonverbal, and media communication techniques to foster active inquiry, collaboration, and supportive interaction in the classroom.
- STANDARD 7 – PLANNING IN INSTRUCTION: A teacher must be able to plan and manage instruction based upon knowledge of subject matter, students, community, and curriculum goals.
- STANDARD 8 – ASSESSMENT: A teacher must understand and be able to use formal and informal assessment strategies to evaluate and ensure the continuous intellectual, social, and physical development of the student.
- STANDARD 9 – REFLECTION AND PROFESSIONAL DEVELOPMENT: A teacher must be a reflective practitioner who continually evaluates the effects of choices and actions on others, including students, parents, and other professionals in the learning community, and who actively seeks our opportunities for professional growth.

Course Objectives:

Students in this course will:

- Exhibit the ability to effectively plan, teach, and assess lessons at both the middle school and high school level that draw on student experiences and enable students to think analytically, critically, creatively, and solve in multiple ways mathematical problems. (MSEP 1I, 4E, 4F, 4H, 7B, 7F, 7G, 8E)
- Exhibit knowledge of instructional materials, audio visual aids, and appropriate technology (calculators and computers) that will enable all students in middle school and high school to learn mathematics. (MSEP 1G, 4D, 4L)
- Exhibit knowledge of how to create an environment that supports inquiry-based learning using participation, listening techniques, cooperative groups, individual roles, and group responsibility. (MSEP 5G, 5I, 5P, 6F)
- Exhibit knowledge of the NCTM Curriculum standards and the MN Graduation standards for both the 6-8 and the 9-12 level and their relationship to the evaluation and selection of curriculum materials and the assessment of student learning. (MSEP 1G, 1I, 4A, 4D, 8E, 9D)
- Exhibit the ability to problem solve in the content areas of discrete mathematics, chance and data analysis, algebraic patterns, and the geometry of shape, space and measurement and the knowledge of methods of teaching these concepts at the 6-8 level (K-8 Specialists) and the 9-12 level. (MSEP 1G, 1I, 4A, 4F, 7A)

Assessment Summary:

<u>Assessment Tool</u>	<u>Activities/Documents</u>	<u>Program Standards</u>
Reflective Journal	Weekly reflective journal entries.	<u>MSEP 5G, 5I, 5P, 7A, 9C, 9D</u>
Service Experience	20 hours of service experience in the schools and reflections on those hours.	<u>MSEP 5G, 5I, 6F, 6K, 9C, 9H</u>
Article Summaries	Summary of two articles from math education journals (one article for K-8 math specialists from a middle school journal).	<u>MSEP 4D, 4G, 7B, 7F, 9D</u>
Standards Paper	Explanation of MN State Standards.	<u>MSEP 4A, 4E, 4D</u>
Problem Solving	Multiple solutions to model problems.	<u>MSEP 1G, 1I, 4A, 4F, 7A</u>
Mathematics Teaching	Three lesson plans (one lesson plan for K-8 math specialists) including one calculator lesson Teaching one Lesson Self Critique/Reflection Critique of colleagues	<u>MSEP 1C, 1G, 1I, 4C, 4D, 4H, 4L, 5P, 6F, 7B, 7F, 7G, 9H, 8E</u>

Assessment/Assignment Descriptions:

1. **Problem Solving Journal (25% of the grade):**
 - a) Reflect on how the given class problems have helped you deepen your mathematical understanding.
 - b) Solve any additional problems from the text included in the assignments.
 - c) Look for alternate solutions and/or extensions to the class/assigned problems.
 - d) Reflect on how you might use some of these problems in your classroom.

2. **Reflective Journal (20% of the grade):**
 - a) After each class period write a paragraph(s) answering the following questions:
 - What new insights, if any, did you gain during today's session?
 - How will these insights impact/assist you as a classroom teacher?
 - What questions do you still have?
 - b) During each week write responses to the indicated discussion questions in the text after you have read the material. As you answer the questions be sure to interact with the material.
 - What ideas are most important/helpful to you as you plan your teaching?
 - How can you expand upon or modify these ideas?.

3. **Service Experience in Schools (15% of the grade):**
 - a) Complete 20 hours of service experience in the schools. If you need help in finding placements, contact Merie Benasutti (612-330-1208) for placement in the MPS. If you need a letter of verification, Merrie can also provide that.
 - b) Obtain an evaluation form and then return it completed by your classroom teacher(s).
 - c) Complete reflection forms that document and summarize what you experienced in the schools.

4. **Standards Paper (15% of the grade):**
 - a) Download the MN state standard for mathematics from the MDCFL site (Minnesota Electronic Curriculum Repository). <http://mecr.state.mn.us>. Look under Directories and go to Graduation Standards. Mathematics will also lead you to both the Frameworks and the High Standards.
 - b) Write a 1-2 page paper explaining the MN state standard for Mathematics in terms that parents of your students would be able to understand. (Math K-8 specialists will write on the 6-8 mathematics standards.)
 - c) Review a state sample performance package.
 - d) Write a 1-2 page paper describing how you would adapt a particular task to your course.

5. **Mathematics Teaching (15% of the grade):**
 - a) Write three lesson plans (one lesson plan for Math K-8 Specialists) using the SPOSA model discussed in class. Include on lesson on calculators (5-12 students).
 - b) Prepare to teach one of your lessons to the class.
 - c) Write a written critique of the lesson taught including both positive and negative aspects.
 - d) Critique lessons taught by your classmates.

6. **Article Summaries (10% of the grade):**
 - a) Review two articles (one article on 5-8 mathematics for Math K-8 Specialists) from different journals in mathematics (for example: The Mathematics Teacher, Mathematics Teaching in the Middle School, Journal for Research in Mathematics Education).
 - b) Write a summary of each article.
 - c) Indicate how you believe you can apply the ideas to the teaching of secondary school mathematics.

Grading System/Scale:

Grades will be based on your assignments (journals, lesson plans and teaching, service experience, article summaries, and Standards paper); participation in class; your problem solving journal, and your reflective journal that document your classroom experiences along with your outside of class reading and problem solving. You are required to complete all assignments. Individual assignments will be assessed according to specifically stated criteria as well as the overall quality criteria listed below. Your class work and assignments will be scored as follows:

8 Achieves Highest Standards of Excellence: Work is highly imaginative; demonstrates critical thought; is creative and unique; has substantial application to one’s own teaching experience; goes above and beyond requirements; demonstrates both breadth and depth; shows the individual’s personality; is professional in presentation and appearance; demonstrates considerable effort.

7 Achieves Above Basic Course Standards: Work is well organized and complete; presented effectively and clearly; demonstrates clear understanding; applies what has been learned to classroom situations; shows connections; is detailed, thoughtful, and supported with ideas and/or facts.

6 Meets Basic Standards for the Course: Work meets minimum requirements; includes general information but lacks descriptive detail; has some application to teaching situations; lacks originality; has an unprofessional quality of appearance; shows minimal effort.

5 Below Basic Course Standards: Work is incomplete; is sloppy and poorly written and/or organized; demonstrates surface understanding only; includes no evidence of application to teaching situations; does not follow instructions for the course.

0 No assignment turned in!

Your course grade will be determined by the following:

4.0 – 95 % and up	1.5 – 70%
3.5 – 90%	1.0 – 65%
3.0 – 85%	0.5 – 60%
2.5 – 80%	0.0 – Below 60%
2.0 – 75%	

Course grades falling below 2.0 will not be accepted toward licensure in education.

Course and College Policies:

Attendance:

Attendance is expected at all sessions. Unavoidable absences (illness and family emergency) can be made up with the consent of the instructor. Students must devise a plan for a comparable experience to the one missed, subject to the approval of the instructor. Written documentation must be provided following completion of the experience. Avoidable absences cannot be made up and will impact point values for that portion of the final course grade.

Late Work:

It is expected that students will submit their work on time, according to the course schedule and/or the dates given in class. Late assignments will receive a lowered point value.

Accommodations:

Classroom accommodations will be provided for students with documented disabilities. Students are invited to contact the instructor for accommodations for this course within the first week of the term.

Instructor Information:

Kay Shager

Education Department

Sverdrup Hall 17

Office Hours: Monday's by appointment

Augsburg Education Department phone: 612-330-1130

Macalester phone and voice mail: 651-696-6506 (only available on MWF afternoons, but you may leave a message).

Home Phone: 715-377-0019

email: kayshager@presenter.com

Bibliography:

The course readings, discussions, and assignments are grounded in a research base. Suggestions for further reading in this class include the following references:

Countryman, Joan. (1992). Writing to Learn Mathematics. Portsmouth, NH: Heinemann.

Davidson, Neil (Editor). (1990). Cooperative Learning in Mathematics. Addison-Wesley.

Johnson, David W., & Johnson, Roger T., & Holubec, E. J. (1994). The Nuts and Bolts of Cooperative Learning. Edina, MN: Interaction Book Co.

National Council of Teachers of Mathematics (1989), Curriculum and Evaluation Standards for School Mathematics. Reston, VA: NCTM.

National Council of Teachers of Mathematics (1989), Professional Standards for Teaching Mathematics. Reston, VA: NCTM.

National Council of Teachers of Mathematics (2000). Principles and Standards for School Mathematics. Reston, VA: NCTM.

Stigler, James W. & Hiebert, James. (1999) The Teaching Gap. New York: The Free Press.

Students are also encouraged to review secondary textbooks as resources for lesson plans. In particular it would be most helpful to examine Standards-Based Curricula.