

Norfolk State University
School of Education
Secondary Education and School Leadership
"Preparing Competent, Compassionate, Cooperative and Committed Leaders."
SED 384 Teaching Math and Science in the Secondary School
Spring 2007
Class Meetings: Saturday 9-12 Noon
B-169 BMH

Instructor: Mr. Ronald L. White
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Mathematics Department: B-168 BMH **Phone Number:** 757.823.8820

Course Description: Study of methods designed to assist prospective secondary teachers in defining and implementing the knowledge and skills necessary to effectively perform in the classroom.

Prerequisites: SED 380 and a completion of junior level mathematics/science courses.

Co-requisites (Math Majors Only): MTH 310, MTH 311

Course Rationale: The purpose of this course to help fulfill the requirements for certification by Virginia Department of Education.

Course Goals and Measurable Intended Student Learning Outcomes:

- To produce caring, competent, compassionate, and committed leaders who can model best practices in secondary mathematics/ science education as suggested by the National Council of Teachers Mathematics (NCTM) and the National Science Teachers Association (NSTA).
- To assist in meeting state requirements for certification in math and science for grades 7-12.

At a competence level not less than 70%, the student will be able to:

- Discuss mathematics/ science education reform within the last fifty to sixty years.
- Plan, model, and explain the effective use of technologies such as graphing utilities, virtual manipulatives, and spreadsheets as tools for problem solving and understanding mathematical/ scientific ideas.
- Select, explain, and create formative, summative, and alternative assessment tools.
- Develop, model, explain, and develop strategies for differentiating math and science instruction by product, process, and/or content given a variety of diversity issues and disabilities.
- Model, adapt, and explain collaborative learning strategies designed to increase and assess mathematics/ science learning.

- Recognize and recapitulate trends and issues in math and science education
- Recognize and discuss the structure of content strands in math and science within the framework of the Virginia Standards of Learning
- Select, adapt, use, plan, and evaluate instructional resources/ direct instructional strategies within a variety of content strands.

Required Texts:

For Math Majors-

Teaching Mathematics for the 21st Century (2000) written by Linda Huetinck and Sara Munshin, Prentice Hall.

Cooperative Learning and Mathematics (2001) written by Dina Kushnir, Kagan.

Curriculum and Evaluation Standards for School Mathematics (1986), The National Council of Teachers of Mathematics.

For Science Majors-

Cooperative Learning & Science High School Activities- Grades 8-12 (2001) written by Michael Michels, Angela Manzi & Janina Mele, Kagan.

Science Instruction in the Middle and Secondary Schools: Developing Fundamental Knowledge and Skills for Teaching (6th Ed-2006.) written by Eugene Chiappetta and Thomas Koballa, Prentice Hall.

Primary Method(s) of Instruction: Students will be engaged by using a workshop approach to teaching. That is, each session will begin a small lecture, followed by some type of hands-on learning and/or alternative assessment activity.

Topical Outline:

- I. History and Introduction to Reform: School Mathematics from the 1950's to Standards-based Curricula
- II. Mathematics/Science Teaching and Learning: A Review of Basic Instructional Strategies and Learning Theories
- III. The Effective Use of Technology in Math and Science Education
- IV. Promoting Communication in the Classroom through Writing, Questioning, and Collaboration
- V. Differentiating Mathematics and Science Instruction for Academically Diverse and Physically Challenged Students
- VI. Assessment and Evaluation in Math and Science Education

VII. Formal Planning of Learning Experiences Using a Standards-based Curriculum

VIII. Opportunities for Professional Growth as a Math and Science Educator

Related University-Wide and Course Specific Requirements:

- **Writing:** Each learning activity will require students to reflect on their experiences in writing. Students will be expected to use good grammar and sentence structure in their responses.
- **Quantitative Reasoning:** Given the nature of the course, all learning activities will help to develop quantitative reasoning skills.
- **Oral communication:** Students will make oral presentations in the form of mini-lessons and demonstrations. Students will also be expected to contribute to classroom discussions in this way.
- **Scientific Reasoning:** Students will be expected to go through the scientific process when they develop and create activities to demonstrate and model.
- **Information Technology Literacy:** Though the web will serve as a significant resource for this course, students will be required to submit and manage some assignments electronically.
- **Critical Thinking:** Students will be expected to engage in critical thinking in their planning, modeling, reflective learning experiences.

Evaluation: The final grade will be based on the successful completion of 10 learning activities. Each project/assignment will be worth 10 points and be graded with a rubric.

Grading Standards

<u>PERCENT</u>	<u>GRADE</u>
98-100	A
97-95	A-
94-88	B+
87-85	B
84-80	B-
79-78	C+
77-75	C
74-70	C-
69-68	D+
67-65	D
64-60	D-
Below 59	F

A grade of “C” is required to pass this course.

Academic Integrity Policies: Students are expected to attend all class sessions. Missing 20% or more of such sessions may result in an automatic failing grade. Further information regarding academic or academically related misconduct, and disciplinary procedures and sanctions regarding misconduct may be obtained by consulting the NSU Student Handbook.

Americans with Disabilities Act (ADA) Statement: In accordance with section 504 of the 1973 Rehabilitation Act and the Americans with Disabilities Act (ADA) of 1990, we ask if you have a disability or think you have a disability, please make contact with the Supporting Students Through Disability Services (SSDS) Office in the Lyman Beecher Brooks Assistive Technology Lab in room 240 (2nd Floor) of the library. The coordinator for the program is Ms. Marian E. Shepherd and she can be reached at 757.823.8014.

University Assessment Statement: As part of NSU's commitment to provide the environment and resources needed for success, student may be required to participate in a number of university-wide assessment activities. The activities may include tests, surveys, focus groups and interviews, and portfolio reviews. The primary purpose of the assessment activities is to determine the extent to which the university's programs and services maintain a high level of quality and meet the needs of the students. Students will not be identified in the analysis of results. Unless indicated otherwise by the instructor, results from University assessment activities will not be computed in the student grades.