

**SOUTHERN CONNECTICUT STATE UNIVERSITY
SCHOOL OF ARTS AND SCIENCES
DEPARTMENT OF MATHEMATICS**

**MAT 508: TECHNOLOGY ENRICHED MATHEMATICS INSTRUCTION I
COURSE OUTLINE**

I. Catalog Description.

Technology tools for the math teacher for lesson preparation and presentations. Techniques for integrating dynamic computer software applications and the graphing calculator and its applications in teaching. Designing technology-based activities for mathematics instruction. Graphing calculator required. Prerequisite: MAT 151.

II. Purpose.

This course is the first in the MAT 508-518 sequence. The focus of the course will be on using technology to develop educational material for the secondary school mathematics classroom. Students will learn the basic features of the graphing calculator, geometry software, internet applets and spreadsheets in the teaching of mathematics.

III. Number of credits: 3 credits.

IV. Mode of instruction: Students will be active participants in the learning process by working with the different forms of technology through in-class activities. Presentations and interactive lectures will be used as well. Students are expected to participate in class activities and discussions, to complete all assignments, and to present projects in class using presentation software.

V. Prerequisites: MAT 151.

VI. Technology.

- A graphing calculator is required.
- Lessons will often take place in the computer lab when working with educational and standard software.

VII. Course Objectives.

- Use knowledge of mathematics to select and use appropriate technological tools, such as spreadsheets, dynamic graphing tools, internet applets, graphing calculator, and presentation software (NCATE 6.1)
- Use technology as a teaching tool (NCATE 7.6)
- Use different types of instructional strategies in planning mathematics lessons integrating technology (NCATE 8.7)
- Plan inquiry-based activities to be used in classes to help students develop and test conjectures and generalizations (NCATE 8.8)

VIII. Outline

- A. Justification for Using Technology (10%)
 - 1. Research on Technology Use in Teaching Mathematics
 - 2. Presentations by Students of Research Findings
- B. Graphing Calculator Use in the Classroom (30%)
 - 1. Basic Features of a Graphing Calculator
 - a. Arithmetic Operations
 - b. Graphing of Functions
 - c. Tables
 - 2. Statistics Features of the Graphing Calculator
 - 3. Application Programs on the Graphing Calculator
 - 4. Calculator Based Ranger and Laboratory Use
- C. Geometry Software Use in the Classroom (25%)
 - 1. Basic features of geometry software.
 - 2. Advanced features of geometry software
- D. Spreadsheets Use in the Classroom (25%)
 - 1. Basic features of spreadsheets
 - a. Applications to algebra
 - b. Applications to statistics
 - c. Graphs and charts
 - 2. Advanced features of spreadsheets
- E. Introduction to Internet Resources for Teaching Mathematics (10%)
 - 1. Applets
 - 2. Lesson Resources
 - 3. Videos

IX. Probable Texts.

- A. *Exploring Geometry with The Geometer's Sketchpad: Version 4* by Dan Bennett, Grades 8-12, Key Curriculum Press, 2005
- B. *Technology-Supported Mathematics Learning Environments – Sixty-seventh Yearbook*, (William J. Masalski and Portia C. Elliott, Eds.), Reston, VA: National Council of Teachers of Mathematics, 2005

X. Bibliography.

- Mathematical Association of America. (1997). *Geometry Turned On: Dynamic Software in Learning, Teaching, and Research*. James King and Doris Schattchneider (eds). Washington, DC: MAA
- National Council of Teachers of Mathematics. (2003). *Computer Algebra Systems in Secondary School Mathematics Education*. James T. Fey (ed.). Reston, VA: NCTM
- National Council of Teachers of Mathematics. (2000). *Principles and Standards of School Mathematics*. Reston, VA: NCTM
- National Council of Teachers of Mathematics. (2007). *Second Handbook of Research on Mathematics Teaching and Learning: A Project of the National Council of Teachers of Mathematics*. Frank Lester (ed.). Charlotte, NC: Information Age Publishers

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