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

MAT 518: TECHNOLOGY ENRICHED MATHEMATICS INSTRUCTION II
COURSE OUTLINE

I. Catalog Description.
Techniques for creating new tools and using advanced options in dynamic software, writing and using calculator programs to enhance mathematics instruction, and designing inquiry-based activities using technology for mathematics instruction. Graphing calculator required

II. Purpose.
This course is the second 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 how to create new tools and to use advanced options in dynamic software, design inquiry-based activities using computer software or graphing calculator, and how to write graphic calculators programs to enhance mathematics instruction.

III. Number of credits: 3 credits.

IV. Mode of instruction: The course will provide students with minds-on experience with calculator programming and dynamic software. 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.

V. Prerequisites: Grade of C or higher in MAT 508.

VI. Technology.
- A graphing calculator is required.
- A laptop is recommended

VII. Course Objectives.
- Use knowledge of mathematics to select and use appropriate technological tools for teaching, such as spreadsheets, dynamic graphing tools, computer algebra systems, graphing calculator
- Create original lessons using graphing calculator or dynamic software for high school Mathematics class
- Create new technological tools, such as macro tools
- Write calculator programs
- Create a Calculator program that is useful for teaching and write a teaching activity incorporating the program.

- Use different types of instructional strategies in planning mathematics lessons integrating technology
- Plan inquiry-based activities to be used in classes to help students develop and test conjectures and generalizations
- Compare and contrast different software and technologies and choose the most adequate to make the teaching of a concept as effective as possible

VIII. Outline

PART I: Dynamic software: (50%)
- o Explore advanced options of a dynamic software in geometry and algebra
- o Write new tools (or macro constructions) for a dynamic software to use them in the teaching of mathematics
- o Create dynamic worksheets to be used as inquiry-based activities in the teaching of mathematics
- o Create dynamic worksheets to be used by students for drill and practice

PART II: Calculator programs and applications: (35%)
- o Exploring calculator applications and using them to teach a concept
- o Writing calculator programs
- o Create programs to be used as inquiry-based activities in the teaching of mathematics
- o Create programs to be used by students as drill and practice

PART III: Other technologies (15%)
- o Compare and contrast different software and applets and integrate the most adequate tool in teaching mathematics
- o Use CAS to teach mathematics (calculator or software)

IX. Texts. None

X. Bibliography.
- o Computer Algebraic Systems in Secondary School Mathematics Education - NCTM – 2003
- o Kenneth Goldberg: Using Technology for Problem Solving in Middle and High School Mathematics – 2007

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