Course Syllabus  
MA 530  
Teaching Secondary Mathematics Using Technology

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Three credits

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Brief Course Description: This course is designed to help pre-service and in-service secondary teachers of mathematics use technology to increase student learning in mathematics. Students will use technology, explore the issues surrounding the classroom use of technology, and develop technology-based lessons that encourage secondary students to develop greater conceptual understanding of the major ideas of mathematics. Technology used in the course includes the TI-83 graphing calculator, CBR or CBL unit, dynamic geometry software, spreadsheet, and a computer algebra system (Maple or TI-92).

Required Course Textbooks and materials:
You are required to order and purchase the below books published by the NCTM. The bookstore is unable to sell these books because NCTM requires upfront payment. Therefore you must order them online or telephone NCTM. See the NCTM website. Some of these books may be available at internet sources that sell second hand books. The Lund and Anderson book should be available in the bookstore (Graphing Calculator Activities). The TI-83 and TI-83+ are available in the bookstore, Wallmart, Staples, etc.

1. Full membership in the National Council of Teachers of Mathematics (NCTM) and subscription to one journal. You may specify you want to receive either "The Mathematics Teacher", the secondary school journal, or "Teaching Mathematics in the Middle School", the middle school journal. You can join and order books from NCTM by telephoning 1-800-235-7566, completing an order form at the web site: www.nctm.org, or downloading an order form and mailing it.


7. A TI-8, TI-83+, TI-89, or TI-92 graphing calculator. TI-82, TI-85, or TI-86 is not satisfactory. Any class instruction will be based on the TI-83 or TI-83+ because that is the calculator most used in regional schools.

8. You are required to obtain a Rivier College academic computing account. We will be using the campus computer lab during class times so please do this before the class begins. Go to the Rivier College website, www.rivier.edu and select Information Technology. Follow the directions (and clicks) to obtain a free Rivier Academic Computing account email.
9. You must own or have ready access to a computer with spreadsheet software. Excel will be used in class.

Further information about technology used in the course:

TI-83 or TI-83+
If you already have a TI-83 calculator, that’s fine. Most schools in the region use the TI-83. If you are purchasing a new calculator, you might consider the benefits of the TI-83+ over the TI-83. The TI-83+ includes the ability to link with integrated computer software for mathematics and science. You can expect to pay about $79 for the calculator, if you shop around. Rivier College Bookstore, Walmart, K-mart, Target, etc. TI-81, TI-82, TI-85, and TI-86 calculators are not suitable because they do not have the list and statistics capabilities we will be using. The TI-89 and TI-92 are fine, but I don’t keep up to date on the latest capabilities of each. I also think the TI-84 is satisfactory, but I have not bought one to check. You may speak to me about the suitability of other models or brands of graphing calculators. Unfortunately, I do not have the time to keep up-to-date on all of the different brands of calculators available and the constantly changing capabilities and menus of each.

Geometer’s Sketchpad
You also will be required to do assignments on Geometer’s Sketchpad. Geometry Sketchpad is available for use in some computer labs at Rivier College. You may ask the Rivier College Bookstore to obtain a student version of the software if you wish to purchase it.

Symbol Manipulation Software
We will use MAPLE for the in-class symbolic manipulation work. Like SPSS, MAPLE is available on Rivier College computers.

CBL
We will be using a CBL.

Course Objectives:
- To help participants become more proficient users of the technology that is frequently available in regional schools.
- To help participants and their students deepen and broaden their understanding of mathematics concepts through their interaction with curriculum materials that incorporate technology.
- To help participants learn to evaluate, modify, and write curriculum materials that include the use of technology.
- To help participants align their teaching with the NCTM “Principles and Standards for School Mathematics” and state curriculum frameworks.
- To enable participants to assess students’ conceptual understanding after investigations using technology.

Teaching Strategies:
- Use of technology during and outside of class
- Computer labs
- Lecture and large and small group discussions
- Writing, analysis, evaluation, and revision of curriculum materials
- Development and analysis of teaching units and lessons that incorporate the use of technology
- Implementation of technology-based activities and lessons in school classrooms and analysis of implementation and outcomes
- Videos of teachers using technology in their classrooms

Course Requirements:
• Class attendance and engagement and participation in class discussions and activities
• Assessment of published, student-revised, and student-written curriculum materials
• Collaborating, cooperating, and assisting others to use course technology without employing direct instruction
• Development of classroom activities to enhance student understanding of math concepts.
• Independent reading, working through, and figuring out tutorials, reference manuals, and technology directions
• Self- and peer-assessment of classroom use of various pedagogical techniques
• Assessment and evaluation of student work
• Referencing and citing of all curriculum materials incorporated in activities and lessons according to the APA Style Guide
• Completion of all assignments
• Reading of pedagogical and curriculum material beyond that directly assigned

**Methods of Assessment and Computation of Grades:**

Attendance, preparation for, and engagement in class activities, discussion, and labs  40%
Written assignments 20 %
Lesson and Unit Plans 40%

You are expected to arrive in class with completed assigned activities and written responses to questions to guide your reading.
You will be assigned to write approximately five short papers in which you summarize and interpret authors’ viewpoints.
You will be assigned to develop approximately six lesson plans and one unit plan.