

**MOUNT SAINT MARY COLLEGE**  
NEWBURGH, NEW YORK 12550

**Mathematics For Secondary School Teachers I**  
**ED 5542 Spring 2007**

**Contact Information:**

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**Resources:**

Text: Content Area Mathematics for Secondary Teachers: The Problem Solver, Cook and Romalis, 2006  
TI 83 or 84 graphing calculator

**Office Hours:**

Wednesday 3:00-4:00 or by appointment

**Course Description:**

High School Mathematics content is studied through a lens that enables students to deepen their understanding of mathematics by making connections between mathematical ideas, seeing the content in new contexts, applying mathematics in a range of settings, and appreciating the historical development of ideas. Topics include real and complex numbers, functions, equations, algebraic structures and statistics. Field work is required

**Course Objectives:**

At the end of this course students will be able to:

1. Identify the connections between school mathematics and the principles of more abstract algebra.
2. Explain the ways that basic ideas of number theory and algebraic structures underlie rules for operations on symbolic expressions, equations and inequalities.
3. Use algebraic reasoning effectively for problem solving.
4. Appreciate the unifying role of functions across a variety of disciplines in mathematics.
5. Identify functions according to their algebraic and graphical characteristics, as well as the data patterns they model.
6. Use a variety of functions, functional representations, and manipulations to analyze data and solve problems.

7. Use calculator and computer technology effectively and appropriately to study individual functions and classes of related functions.
8. Understand and be able to use complex numbers, and polar coordinates.
9. Understand and be able to use trigonometric functions and identities.
10. Read mathematic.
11. Discuss mathematics.
12. Write about mathematics.
13. Evaluate mathematical arguments and solutions

**Course Policies:**

**Attendance:**

Regular attendance is assumed and will be monitored. Although it is impossible to reconstruct classroom discussions and activities, in the event of unavoidable absence, the student will assume full responsibility for any material and/or announcements missed. Grades will be reduced by 20% for assignments turned in late. The instructor strongly urges students to form a study team with one or two other students.

**Group Work:** Working in groups is strongly encouraged when working on homework. the insights of your peers will often lead to greater understanding, and explaining material to others will also help solidify your understanding. Some assignments are to be turned in as a group, but others will be turned in individually. On individual assignments, you may discuss the problem together, but you are expected to write up the assignment by yourself. No two individual assignments should be handed in looking too much alike.

**Academic Honesty:** The standards of academic honesty at MSMC will be enforced. The minimum penalty for violation for submitting work other than your own will be failure on the exam or assignment. Note: It is necessary when writing up mathematics to properly credit information obtained from other sources. This includes information from the World Wide Web, textbooks, and from other individuals.

**Grading Based On:**

Class participation and explanation of solved problems 30%

Unsolved problem sets 40%

Essay 30%

Class participation and in class assignments. This course will be conducted as a seminar. The students will be expected to read the assigned material and be prepared to discuss the material and the solved problems. Problems and readings will be assigned each week from the text.

Un solved problem sets will be given. Students will be graded on the correctness of the assignments and their ability to explain the assignment to the class

Essay: You will submit an essay on how this course relates to what you will be teaching. This must be a well thought out and clearly written document. Your ideas should be substantiated by creative lessons or activities that you might use in your teaching. Reflection on how this course will impact the ways you teach the topics you choose should be included .

**Grading**

A	93-100	C	72-74
A-	88-92	C-	68-71
B+	85-87	D+	65-67
B	82-84	D	60-64
B-	78-81	F	below 60
C+	75-77		

## COURSE OUTLINE

Class Date	Topic	Assignment
1/23/08	Real and complex numbers and their properties	1.2 unsolved problems
1/30	Divisibility rules, Fundamental Thm of Arith., ratio and proportion	1.3 unsolved probs. # 1, 2, 3, 5 1.4 unsolved probs. # 1, 2, 4, 5
2/6/08	Algebra, problem solving, linear functions and absolute value	2.1 unsolved probs. 1-13
2/13/08	Linear and quadratic equations and inequalities	2.3 unsolved problems #1-4. 8-10, 12
2/20/08	Equations and inequalities involving absolute values and triangle inequality	2.4 unsolved problems 1-10
2/27/08	Radian measure, trig functions, special angles	4.1 unsolved problems 1-8
3/5/08	Law of sines, cosines and graphs of trig functions	To be assigned by worksheet
3/12/08	Polar coordinates	4.4 unsolved problems # 1-4
3/26/08	Functions and their graphs	To be assigned by worksheet
4/2/08	Transformation of functions	To be assigned by worksheet
4/9/08	Composite and inverse functions	To be assigned by worksheet
4/16/08	Counting techniques, binomial expansion and Pascal's triangle	To be assigned by worksheet Essay Due
4/23/08	Contingency tables; discrete and compound probabilities	To be assigned by worksheet
4/30/08	Measures of central tendency and dispersion	To be assigned by worksheet
5/7/08	Summary	