

Mathematics 485: Mathematical Problem Solving

Fall 2007

Instructor: Dr. Mark Klespis

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Office hours(421E): MW: 9:30-11 am; 2 - 3pm

TTh: 9-9:30 am; 1 - 2pm

& by appointment

Prerequisite: Upper division standing in mathematics or consent of instructor. Ideal preparation would include MTH 364, 363, and 461 or 477.

Description: This course focuses on solving mathematical problems including the use of proof as well as graphical and numerical methods. It extends and connects concepts from algebra, geometry, and calculus, including functions, graphs, complex numbers, trigonometry and number systems.

Textbook: Usiskin, Z, Peressini, A., Marchisotto, E., & Stanley, D. (2003). *Mathematics for High School Teachers: An Advanced Perspective*. Prentice Hall Publishers: New Jersey. Additional materials related to technology will be provided.

[I strongly recommend purchasing *How to Solve It* by George Polya. It is the seminal work in the area of mathematical problem solving. It is not a very big book and it is in paperback. It should be easy enough to order from the internet.]

Topics: We will be covering material from Chapters 1, in the text.

Calculator: Texas Instruments TI-84, 89, 92+, or Voyage 200. Other technology will be provided.

Attendance

- Regular and punctual attendance is required of every student.
- If you are absent or late, you are still responsible for all material covered in class, and you will need to check with a classmate about what was discussed.
- If you are unable to attend class regularly, you should drop the class.

Tests and assignment policies:

- The first test a student misses, the final exam will count double. No points awarded for any subsequent tests missed.
- Late assignments or projects do not exist.
- A missed final examination can be made up only by approval of the Dean of the College of Arts and Sciences.

Course Assessment

- *Writing assignments:* (20 points each) - Examples include, but are not limited to, mathematical essays, detailed explanations of particular problems, and abstracts.
- *Assignments:* (10 points each) - Assignments from the text or other sources will be turned in during the semester. There will be at least one assignment per week.
- *Group Project* (100 points) - There will be a cooperative group project worth 100 points. The goal is for you to unify some key ideas in problem solving by spending two weeks solving a group of related problems. Think of the project as mathematical equivalent of a term paper.
- *Exams* (500 points) - Three semester exams (100 points each) and a comprehensive final (200 points) are required.

Grading scheme:

A	90% to 100% of total points
B	80% to 89% of total points
C	70% to 79% of total points
D	60% to 69% of total points
F	Less than 60% of total points

Course assessments and grading scheme may be modified during the semester. Students will be notified of any changes as soon as possible.

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COMMUNICATION SKILLS STATEMENT

The ability to express ideas clearly is essential to the mastery of mathematics. Students, therefore, must be able to write and speak clearly about mathematical concepts.

Good assignments, projects, and presentations are characterized by:

- correct mathematics;
- a distinctly articulated thesis;
- appropriate use of English grammar and correct spelling;
- a well-organized topic with a beginning, middle, and end;
- unambiguous explanations of ideas, regardless of how complicated a topic might be;
- thorough checking of written materials.

Failure to meet the above standards could result in lower grades.

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