

Math 399, Math Problem Solving, Spring 2011, Colgate University

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Office: 201K McGregory Hall
Office Hours: Tu,W 1:00-2:30
Course web site: <http://math.colgate.edu/~mionescu/math399s11>

Office visits: Visits to my office may be made during the office hours indicated on this syllabus. If you wish to see me at another time, please make an appointment with me at least 24 hours in advance.

Webpage: The syllabus and other important communications will be conveyed via the course web page:

<http://math.colgate.edu/~mionescu/math399s11/>

Course outline The main goal of the course is two fold 1) to use techniques that you have learned in different Math courses in order to solve math problems and to write correct and clear solutions; 2) to write a final research project. This project might involve both theoretical and computer work. I will present a list of possible topics for the final project. You may also work on a topic you chose based on your interests, as long as you discuss it with me and receive my approval. I will present the background material needed for the final projects. You will present your final projects in class during the last two weeks of classes.

Another goal of the course is to learn how to type the homework problems, final project, and your presentation of the final project using the LaTeX typesetting system. This is how all mathematicians (and many other scientists) write mathematics.

The primary goal of this class is for you to become an expert on one or more of the topics covered so that you can write a comprehensive research paper. To accomplish this, you should be able to exhibit knowledge of mathematics theory and produce clear, well reasoned arguments with a high standard of writing skill.

This course is your capstone course in the Mathematics curriculum. As such, you will hone the following liberal arts skills: writing, theory and computer manipulation, formulating research questions, discussing your ideas, doing background research, presenting your findings, and working in a group.

Homework: I will assign weekly assignments for the first 10 weeks. They will consist of problems related with different courses that you took at Colgate. I will try to mix problems from many fields such as Analysis, Calculus, Differential Equations, Algebra, Logic, Geometry, Probability, together with problems based on the topics covered in class. You should form groups of 2 or 3 people and work and submit you homework solutions in groups. Students will be picked randomly to present solutions after you submit each homework. Starting with the third homework, I will accept the solutions **only** if you type them using LaTeX.

Final project: You should pick a topic for the final project (either from the list that I will provide or a topic of your own as long as you discuss it with me) by March 11. Some of the projects will involve computer work in addition to theoretical

work. The final projects are **individual**. Starting with the week of March 21, each Monday you have to present your progress and possible questions to your group mates. Each student must provide feedback and suggestions to peer's questions by the Friday of the same week. You will give presentations of your final projects in the last two weeks. You will use slides created with LaTeX and Beamer. You will hand in your final project on the last day of classes, April 29. The solutions must be entirely your own work. You are on your honor not to copy solutions from different books.

Info about LaTeX Here are some websites where you can find tutorials and information about LaTeX:

- <http://www.ctan.org/tex-archive/info/lshort/english/lshort.pdf>
- <http://www.math.harvard.edu/texman/>
- <http://www.maths.tcd.ie/~dwilkins/LaTeXPrimer/>
- <http://www.latex-project.org/intro.html>

How to install and use LaTeX

- If you are using Linux then you should install Texlive using your favorite software manager. Suggested editors are: texmaker, kile, emacs (for the power users)
- If you are using Windows then you should install Miktex <http://miktex.org/>; suggested editor: texmaker; there are many other Latex editors for Windows but I am not familiar with them.
- If you are using MacOSX then you should install TexShop
<http://pages.uoregon.edu/koch/texshop/>. It comes with its own editor. You can also use texmaker. The web address for texmaker is <http://www.xm1math.net/texmaker/>.

Beamer Beamer is a special LaTeX package that you can use to create great presentations. The website of the project is

<https://bitbucket.org/rivanvx/beamer/wiki/Home>. You should be able to install easily beamer from Miktex or Texshop. If you use Linux you can install the beamer package using a software manager.

You can find the beamer manual at

<http://www.ctan.org/tex-archive/macros/latex/contrib/beamer/doc/beameruserguide.pdf>.

I will post all these links on the course webpage as well.

Grading:

Homework 60%
Final project 40%.

Academic conduct: Class policies on matters such as cheating, plagiarism, and sanctions for academic dishonesty are governed by The Colgate University Academic Honor Code. However, it seems prudent to clarify in advance the policy on cheating. I will assume that no student will submit work which is not his or her own. Any use of cell phones during the exams is prohibited. The violation of this policy will be considered academic misconduct. All incidents of cheating will be reported to the department chair and the appropriate deans.

Students with disabilities Any student who feels s/he may need an accommodation based on the impact of a disability should contact me privately to discuss

your specific needs. Please contact Lynn Waldman, Director of Academic Support and Disability Services, at 315-228-7375 in the Center for Learning, Teaching, and Research to coordinate reasonable accommodations for students with documented disabilities.

Other: Please turn off your cell phones. No talking and **no text messaging** during the lectures allowed.