

Math 100 – Introduction to the Profession

Course Description from Bulletin: MATH 100: Introduction to the Profession, 2 credits.

Introduces the students to the scope of mathematics as a profession, develops a sense of mathematical curiosity and problem solving skills, identifies and reinforces the student's career choices, and provides a mechanism for regular academic advising. Provides integration with other first-year courses. Introduces applications of mathematics to areas such as engineering, physics, computer science, and finance. Emphasis is placed on the development of teamwork skills. Prerequisites: None.

Enrollment: Required for AM majors. Elective for other majors.

Textbooks: Timothy Gowers, *Mathematics: A Very Short Introduction*, Oxford University Press (2002), ISBN 0-19-285361-9; Keith Devlin, *Sets, Functions, and Logic: An Introduction to Abstract Mathematics, Third Edition* (2003), ISBN: 1584884495.

Other required material: Cleve Moler, *Numerical Computing with MATLAB*, <http://www.mathworks.com/moler/chapters.html>

Prerequisites: None.

Objectives: Students will

1. understand the role of proof and conjecture in mathematics,
2. have an idea of what Mathematics is all about,
3. have seen brief accounts of some fundamental and fascinating topics, such as infinity (& limits), dimension, and non-Euclidean geometry
4. study some other basics that every applied math major should know, including logic, growth rates of common functions (in connection with computational feasibility), and MATLAB,
5. understand the different nature of “results” in various areas of pure and applied mathematics, such as: surprising truths, good definitions, estimates and approximation, good models, provably good algorithms, effective heuristics, inference (statistics),
6. get a taste of topics offered in upper-level courses,
7. learn about real world applications and careers for applied mathematicians.

Lecture schedule: Two 50 minutes meetings per week

Course Outline:	Classes
1. An Introduction to Mathematics	4
2. Logic, proofs, and certain other fundamentals	4
3. Projects (various faculty) and Careers (Emily from the CMC)	1
4. MATLAB (coordinator: Greg Fasshauer)	4
5. Topics:	
a. Discrete Applied Mathematics (coordinator: Michael Pelsmajer)	3
b. Applied Analysis (who?)	4
c. Computational Mathematics (who?)	4
d. Stochastics (who?)	4
	Total: 28

Assessment:	Class participation (including attendance and reading)	30-80%
	Daily homework (including MATLAB)	10-40%
	Group Project	10-40%

Project: All projects must be approved by a faculty member. A typical project will include a short paper, a presentation, and a computer program. Presentations will be given during our reserved slot for a final exam (or earlier). Groups will be graded both on the final project itself as well as on how well they stick to the following schedule:

September 20: Faculty propose various projects to students.

September 27: Deadline for formation of groups and choice of projects.

September 30 – November 30: Group meetings with the faculty advisor, once every two weeks or at the discretion of the faculty advisor. Students should be making “sufficient progress”, which is defined by the faculty advisor.

December: Group Presentations, during the time allotted for a final exam, and during an extra meeting to be scheduled.

Syllabus prepared by: Michael Pelsmajer

Date: August 21, 2007