MA 361/519: MATHEMATICAL MODELING

ALEXANDER BLOKH

SYLLABUS

The main prerequisite is Calculus I. The main goals are as follows.

(1) Learn to build models.
(2) Understand and interpret mathematics behind the models.
(3) Improve understanding of mathematical concepts.
(4) Communicate mathematics.

We will model using mathematical equations, spreadsheets, and computer simulation software.

PLACES AND TIMES

The class meets at 9:30am - 10:45am in HHB 221. The room will be open at times throughout the week (the times will be announced later). Another important place is the Math Learning Lab on 2nd floor of Heritage Hall. Computers on far right side wall have our software.

My office is CH 494A. My office hours are Tuesday and Thursday, 1pm-2pm or by appointment.

SOFTWARE

The following software packages will be used.

1. Microsoft Excel (part of Microsoft Office). Available, very inexpensively, from the campus bookstore. Makes sense to purchase, since it is so inexpensive. Also includes Microsoft Word, which is also useful for assignments.

2. iseesystems Stella. Available from http://www.iseesystems.com/ ($129 for full student version, $59 for a 6-month subscription). You do NOT have to purchase this. It will be available in the labs.

ASSIGNMENTS

One or two assignments each week Graduate students may have harder assignments Written work has at most two authors. You may work together with a partner on the computer.
MIDTERM TESTS

Two tests, one about every five weeks. Given in the computer lab. Testing for competency in creating and analyzing the sorts of models and behaviors we study. Responsible for mathematics and logic. Graduate students tests are harder. There is no final exam.

SYSTEM DYNAMICS STORIES AND PROJECTS

Everyone must complete a System Dynamics Story as a final project. System Dynamics Stories Scenarios describing realistic situations to be modeled. Entirely independent work! No partners! Construct a model and write a 5-10 page technical paper (template provided). Project milestones to be announced as we go along. Graduate students are to do an additional model (but not an additional paper).

GRADING

MA361: Assignments are worth 40%, each test is worth 15%, model 1 is worth 10%, paper is worth 20%.

MA519: Assignments are worth 30%, each test is worth 15%, model 1 is worth 10%, model 2 is worth 10%, paper is worth 20%.

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