SYLLABUS FOR MATHEMATICAL MODELING 442-500 SPRING 1996

This course will meet MWF 11:30-12:40pm in Halb 105.

•**Professor:** Dr. D. Kirschner-Office: 327 Milner.
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•**T.A.:** Alex Sopasakis-Office Milner 031, 5x5258.
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•**Office hours:** are 2:45pm till 4:30pm MW and 10-11 W or by appointment
(just see me after class, email or phone)

•**Textbook:** *Mathematical Models in Biology* by Leah Edelstein-Keshet.
During the course of the semester, you will need to purchase class packs, (not available yet) and other reference material. If you are not very familiar with Maple, I highly recommend you purchasing the book *Solving ODE's with Maple V*, put out by the TAMU math department.

•**Pre-requisites:** Linear Algebra and Differential Equations. (304 or 423, 308 or 451)

•**Grades:** The final grade will be determined by these totals:

- 2 tests (1 midterm, 1 final-May 8, 10:30am): 20% each
- 2 projects (see description below): 20% each
- quizes, homework and class participation: 20% (see description below)
- grading scale: 90-100% A, 80-89% B, etc.

** Only pre-excused absences are allowed for test make-ups.

•**Projects**: Two projects will be assigned during the course of the semester. These will involve in-depth modeling problems and will constitute a major portion of your grade. For each project, you will be required to model and analyze a given situation or process and write a coherent, detailed report describing your findings.

•**Partners**: You will need to pair up with one other individual in the class. There are times when we will work independently, in pairs and in larger groups. The option to change partners into the semester, if you are not happy, is possible. I will need to know who your partner is by Monday's class next week (the 22nd).

•**Computer accounts**: Since most computation is easily carried out on the computer, and we can get immediate feed-back by way of graphs and charts, it will be necessary for us to use the computer for this purpose. To achieve this goal, we will use *Maple*. Therefore, you will all need to get accounts on the Calclab system (at least). You will be required to check your e-mail accounts and the class homepage daily (see other handout).

•**Homework and class participation:** Each week, depending on the material we are covering, there will be homework. The nature of this work will vary, but you will always be prepared for any work or homework given. Therefore, attendance will make a difference in your grade.

•**Objectives of Math 442:**

1. Illustrate the broad range of problems which can be modeled mathematically.
2. Synthesize mathematical models from non-mathematical descriptions of problems.
3. Interpret the results of models and evaluate their implications.
4. Show the necessity of simplification and approximation in models and identify their effects.
5. Work cooperatively in groups.
6. Enhance computer skills and the use of the internet through email and the world wide web.

•**First Homework Assignment: due Monday, January 22nd**: Send an email message to me using pine from your account including the following information: name, classification (i.e. when will you graduate?), major, e-mail address. I also would like to know when you had Differential equations and linear algebra and your grades. Then describe your (academic) interests, and why you are taking this class. What are your ultimate goals with your degree? Which subjects will be most interesting for you in this class? (i.e. Physics, Biology, Engineering, or other applications). I would also like to know your computer experience to date. Anything else you would like to share/add about yourself is fine.

••I encourage you all to feel free to contact me over e-mail for ANY questions you may have. I am in constant e-mail contact. I enjoy an interactive classroom, I hope you all will participate, taking advantage of the small class size, and will be challenged by this exciting course.