

## Math 381

Discrete Mathematical Modeling  
Autumn Quarter, 1999

**Time:** MWF, 11:30-12:20

**Place:** Mueller 155

**Instructor:** Randall LeVeque

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**Office hours:** M 3–4, W 1–2

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**Office hours:** M 2–3, Th 11:30–12:30

**Course webpage:** <http://www.amath.washington.edu/~rjl/m381>

### Textbook, Notes, References:

There is no required textbook. Some course notes will be available at the Engineering Library Copy Center (second floor). The first installment is available now.

There is no single book which covers exactly the topics we will cover. Several books which may be useful to you are on reserve in the Engineering Library. See the webpage for a list, and also for other references.

### Course Project:

A major feature of this course is development of a course project to be handed in at the end of the quarter. These modeling projects must be done in groups of at least 2 and at most 3 students. You can form groups on your own or we will help you to find others with similar interests who you can work with. The schedule for this project is:

|                        |  |
|------------------------|--|
| Wednesday, October 27: | Project proposal due from each group.  |
| Friday, November 5:    | Revised project proposal due.          |
| Friday, December 3:    | Turn in first draft of course project. |
| Tuesday, December 14:  | Turn in final draft of course project. |

### Homework:

There will be frequent homework assignments, sometimes small assignments due in the following class and sometimes longer problem sets or writing assignments. Homeworks will often be discussed in class and will be collected but not always graded in detail. Late homeworks will not be accepted.

### Exams:

There will be one midterm exam on Monday, November 15. There is no final exam; the course project is due during finals week. You may bring one sheet of handwritten notes (both sides) to the exam.

### Grading:

Course Project: 40%, Homework: 30%, Midterm: 30%.

**Class participation:**

It is essential that you come to class each time. Much of what we will discuss is not in the notes. In order to fully appreciate the process of mathematical modeling, you must be involved in development of numerous models, which is what we will often do in class. I will often ask you to think about modeling issues between classes and expect you to come to class prepared to contribute to the discussion.

**Writing assignments:**

Students in Math 381 earn W-credit and this is a writing course. The Course Project will be graded partly on the basis of writing style and clarity of explanations. Some homework assignments will also require writing descriptions of modeling problems or algorithms.

**Computer programming:**

Extensive computer programming is not required for this course, but you can tackle more interesting modeling problems if you can use the computer to solve equations or perform simulations. Some examples will be given in class, primarily using the MATLAB language. This is a very convenient language for testing simple algorithms, analyzing data interactively, and plotting results.

**Computer accounts:**

All students can obtain accounts at the Math Sciences Computing Center (MSCC). You may use either the Unix machines or the PC's at MSCC, as you prefer. There will be orientation sessions at MSCC (in the basement of Thomson Hall, Room 9) on 9/30: 2:30–4pm, 10/4: 2:30–4pm, and 10/6: 1:30–3pm. Consultants are always available in the Lab to help with basic questions on the computers.

**Material covered:**

The first set of Lecture Notes contains an introduction to what modeling is all about, and lists some of the types of problems and mathematical techniques we will study.

**Other resources:**

The course notes are not intended to be a complete textbook, but give an outline of some things discussed and some of the examples. You are responsible for augmenting these notes as needed by reading appropriate textbooks depending on your background. Some books are on reserve in the Engineering library, see the list on the webpage. Some other references are also listed on the webpage and/or in the notes. In addition to these books, there are *many* other books which discuss mathematical modeling and each of the various topics we will discuss. For the course project, you will almost certainly have to do additional research on your own.