

# Mathematical Modeling Syllabus, Fall 2014

- INSTRUCTOR: Dr. Hundley

OFFICE: Olin 234

OFFICE HOURS: 1PM on Mon, Tue, Thur. Fridays by appt.

I often end up at lunch meetings, so I may be a little later starting, about 1:15PM.

The rule of thumb for office hours: If my door is open (and no one else is in my office), then feel free to drop by with questions. If my door is closed, that means that I'm working on something with a deadline- Please interrupt me then only if it is something important. Feel free to drop me an email anytime- I will probably respond to that faster than a voice message.

OFFICE PHONE: 527-5151

EMAIL: hundledr@whitman.edu

Class Webpage: <http://people.whitman.edu/~hundledr/courses/M350.html>

- **Text:** "Introduction to Empirical Modeling", in progress. The course notes will be distributed as we go, and are available on our class website (as they are distributed).
- **Technology:** We'll be using Matlab extensively. We'll have some sporadic "Lab Days" where we'll meet in the computer lab to talk about Matlab specifics.

- **Grading Criteria.**

- HOMEWORK/LAB WORK:

Homework and lab work is extremely important for the class, and will be assigned daily and collected weekly. You are expected to produce your own solutions to all homework problems! There may be occasions when we do "group work", and even in those cases, each student should turn in their own copy of the work.

We'll discuss turning in solutions later (sometimes this can be done electronically). Collectively, homework will account for 25% of the overall grade.

- EXAMS:

We will have two midterms, one during week 5 (Tuesday, Sep 30), one at week 11 (Tuesday, Nov 11) and a final exam. They will all be weighted equally, and will take 75% of the overall grade. Some of these may have a take home (Matlab) component.

GRADING: Grading is done on a standard scale:

90-100%=A, 80-89%=B, 70-79%=C, 60-69%=D, 59 and below=F

I will use the plus/minus grading only sparingly in those borderline cases.

- Help! I encourage you to come see me. If you can't make it during office hours, either email me if you have short questions, or make an appointment.
- Academic Honesty. Academic standards will be *strictly* adhered to as outlined in the College's policies. This means that cheating will not be tolerated. Looking at another student's exam or quiz (whether or not you mean to copy answers) while taking it will be considered cheating. *Please don't test this policy!* Students caught cheating for the first time will fail the exam or quiz during which the cheating took place, and the Dean of Students will be notified. Continuation of this behavior will lead to an automatic failing grade for the course, and may include other administrative action.
- If you have a learning disability, please let me know as soon as possible so that we can make alternative assessment methods. Please do not wait until the day of the exam!
- Mathematical modeling is the process by which we translate some physical process into mathematical statements. There are several ways of doing this- Some modeling classes are mostly statistics, some are mostly differential equations (or partial differential equations), and still others are physics-based. We will consider some of these methods, but we will stick mainly with **empirical** modeling- That is, constructing models from data. We will spend some time reviewing linear algebra, statistics and some differential equations, then we will be applying these techniques and analyzing our results.

The first portion of the course will mostly be review and background material. We will begin to learn **Matlab**, which is software available on the computers in the Mathematics lab, we will review and extend ideas from linear algebra, discuss some topics from statistics (it is not necessary to have had stats before), and finish with some topics from an area known as *reinforcement learning*.