EL 2301 ENGINEERING LEADERSHIP I
FALL 2015 SYLLABUS

MODELING AND SIMULATION

Mod/SIM provides an introduction to mathematical modeling and computer simulation of physical systems. You will:

1. Practice the steps involved in modeling and simulating physical systems.

2. Learn the role of models in explaining and predicting behavior.

3. Develop skills with the programming (MATLAB) and computational tools necessary for simulation.

Finding Nemo: Clownfish and anemones enjoy a symbiotic relationship in nature. You will learn mathematical and computational techniques that will enable you to model and simulate the population dynamics of these and other biological species.

INSTRUCTORS

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Office Hours: TBA2

COURSE DETAILS

ACES Complex (1st Floor)

CRN: 18335

Meeting Times: Monday and Wednesdays from 3:00 – 4:20pm

COURSE SCHEDULE

The complete and up-to-date course schedule can be found on Blackboard. This schedule is likely to change, so be sure to check it often!

REQUIRED TEXTS AND MATERIALS

MATLAB: A Practical Introduction to Programming and Problem Solving, 3e

http://www.mathworks.com/support/books/book79002.html

iWoz: Computer Geek to Cult Icon

http://www.amazon.com/iWoz-Computer-Invented-Personal-Co-Founded/dp/0393330435

Other required reading materials can be acquired from the University Printing Office.

EACH STUDENT MUST OBTAIN A CURRENT COPY OF MATLAB® FOR HIS OR HER PERSONAL COMPUTER

The most recent can be obtained from the University at http://etc.utep.edu/software/repository.htm. You may also be able to get a free copy if you contact ETC directly.

ATTENDANCE

Attendance in class is a required component of any college level course and is therefore not included as a separate component of your final grade. Absence from class will prevent you from being able to complete in-class assignments and fully engage in learning activities specifically designed to help students apply the material from their readings. However, you're an adult and have a busy life; so you can miss class if you need to, we're not forcing you to be here, but do so at your own risk. College should be your primary focus and missing too many classes *will* impact your final grade. Much of the work for this course (and therefore items that get graded) is done in class and missing class will directly impact your grade.

> *In-class activities and diagnostics cannot be made up without prior approval from the instructors*.

GRADE BREAKDOWN

Item/Deliverables	Estimated % of Final Grade
In-Class Activities	20
Learning Checkpoints	20
Project 1	30
Project 2	20
Professional Development Reading	5
Binder	5

Note on Readings

Many of the readings deal with learning to do things (for example, work with MATLAB.) Reading alone does not help you learn to do things – rather, you need actually to DO the thing. Therefore, the approach you take to the readings in this course should be somewhat different from the approach you might take when reading (insert your favorite author here.) Rather than relaxing on a couch, sipping tea, and casually contemplating the beauty of modeling as you rea, you should instead be trying stuff out on your computer or on paper as you read. Much of the reading is written in a way that encourages you to do exactly this; you'll find you learn a lot more from the reading if you try the examples, etc. as you read. Yes, this will take longer. But you will learn the material so much better and will thank yourself for it in the long run!

COURSE DELIVERABLES

Binder

To help you document what you have learned this semester, you are expected to keep an up to date binder with all printouts, handouts, returned homework, course deliverables, and sample code. Keep it well organized to get the full 5% of your final grade on the binder.

In Class Learning Checkpoints

We will, on a fairly regular basis, give you short *In Class Learning Checkpoints*. Think of these as quick, check-in quizzes. They can typically take about 10 minutes and are meant to help you make sure you have sufficient understanding of the material required for the activities that we will be doing in class that day.
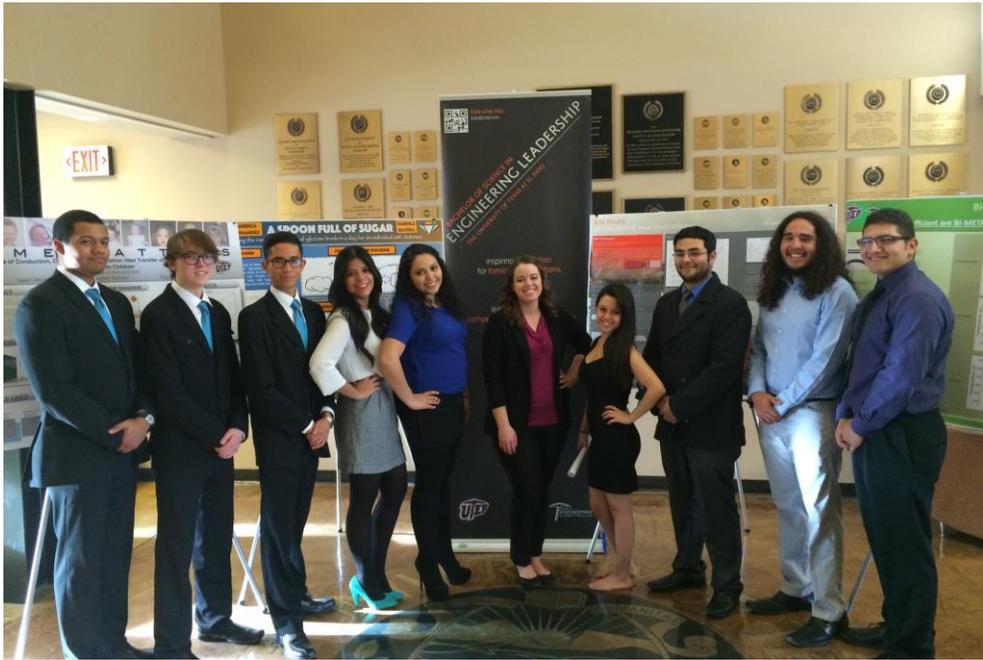
Out of Class Learning Checkpoints

We will also often give you somewhat meatier out-of-class assignments that require more in-depth work and understanding of the material. *Out of Class Learning Checkpoints* will generally be done outside of class time, although we will sometimes devote some class time to them. *Out of Class Learning Checkpoints* will be graded in a binary fashion - they are either checked off as correct, or they are not. If you do not complete an *Out of Class Learning Checkpoint* correctly at first, you are free to work on it some more until you get it right, and then get it checked off only once you have completed it correctly.

While we encourage you to discuss *Out of Class Learning Checkpoints* with your colleagues, they are intended to provide a way to check that you individually understand the material. So, while it is fine to talk about how to approach an *Out of Class Learning Checkpoint*, to look at someone's code, and to collaboratively work through a problem at the whiteboard, in the end you should only turn in work that you can reproduce and explain on your own.

Projects

There are two projects this semester. One individual project focused on difference equations and the other, a group project, on first order differential equations. In the first project all students will be exploring a similar modeling and simulation topic while the second project is intended to provide an opportunity for students to pose and solve an authentic problem of their own choosing. In addition, each project provides an opportunity for students to apply basic disciplinary knowledge and strengthen their skills in modeling and simulation. Each project ends with the creation of a material that graphically communicates your work (Timeline in Project 1 and conference style poster in Project 2), as well as (for Projects 2) a formal presentation, in the style of a poster session at a scientific conference. Both the technical quality of your work and the professionalism of your presentation will be assessed.

2014 Mod/Sim Project Poster EXPO

DOCUMENT/ASSIGNMENT SUBMISSION

In Class Learning Checkpoints

In-class Learning Checkpoints must be checked off in class by showing your results to one of the instructors. If your results are correct, you'll be told, "Congrats! You're done!" If there's some problem with your answers, we'll give you some suggestions, and tell you to work on it some more.

Out of Class Learning Checkpoints

Out of Class Learning Checkpoints must be completed by the start of class time on the assigned due date. You can submit your homework as a hard copy in class or via email. You will quickly receive feedback if your work is not complete, or if it is not clear that you have a good understanding of the concepts.

If you are emailing your *Out of Class Learning Checkpoints*, please send it as a SINGLE .pdf or image file including your name and course using the following convention: *LastName-ModSimFA2015-LearningCheckpoint1.pdf*. That might mean copying your code and final graphs into a word doc and then turning that into a .pdf, or scanning some handwritten work, or something more creative than that. Note that this means that if you're turning in code, the code has to be legible by a human being.

Make sure to comment your code in detail!!!!

Submitting Projects

Making physical representations of your ideas, and using those to inform your subsequent work, is a really handy approach. Interim and final deliverables for projects should be submitted at the start of class on the assigned due date. In addition, you can also submit your deliverables via email (they should still be posted to your Timeline). If you are emailing your Diagnostic, please send it as a SINGLE .pdf or image file including your name and course using the following convention: *LastName-ModSimFA2015-Project1Deliverable1.pdf*.

COURSE GOALS AND OBJECTIVES

This course will provide development and assessment of the following competencies:

- Oral and Visual Communication
- Qualitative Analysis
- Quantitative Analysis
- Posing and Testing Hypotheses
- Coding in Matlab
- Differential equations
- Leadership skills – Mentoring and constructive feedback

WORK IN PROGRESS DISCLAIMER

As this is a brand new course at UTEP, this syllabus is a work in progress! The faculty reserve the right to modify it as necessary throughout the semester. However, we will do our very best to adhere to this syllabus and will notify you if anything must change.

ACTION → REACTION → MODIFICATION →
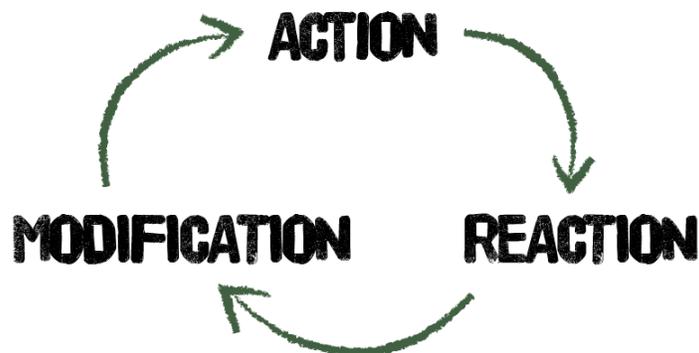
SPECIAL ACCOMMODATIONS

If you would like to request special accommodation due to a disability, we can certainly work that out. Please contact The Center for Accommodations and Support Services via their website http://sa.utep.edu/cass/.

ACADEMIC DISHONESTY

Cheating is taken very seriously. Students are encouraged to collaborate on most assignments throughout the semester but all graded materials must represent the student's individual work. (When in doubt, ask your professor!) Scholastic dishonesty is the attempt to present the work of somebody else as his or her own work or attempting to pass any examination by improper means. It is a serious offense and will not be accepted. Any academic misconduct will be handled according to the current university policy and will be reported. In accordance with University regulations, scholastic dishonesty on a given assignment will be referred to the Dean of Students and may result in a zero on the assignment, an "F" in the course, or even suspension from the university. If you need assistance with your assignments, please consult authorized sources of help. For more information on Academic Dishonesty visit the Dean of Students or http://studentaffairs.utep.edu.