

EL 2301 (Modeling and Simulation)

The University of Texas at El Paso – Fall 2019

Course Overview

Instructor: Scott Starks, PhD, PE, Professor of Engineering Leadership

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CREaTE Office, E230 B

Office Hours: 1:30 – 3:30 TR and 1:00 – 2:30 W

Course Details

Course Number: EL 2301

Meeting Room Number: CBRL 001

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

Required Texts and Materials

All required reading materials will be posted on Blackboard. No textbook is required!

A note on the readings: many of the readings deal with learning to do things (e.g., 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 this reading 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 read, you should 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 thank yourself for it in the long run!

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. The ETC Staff will also assist you in the installation if you need help.

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!

Grade Breakdown

Item/Deliverables	Percentage of Final Grade
Diagnostics/Assignments	20
Quizzes	10
Project 1 (Individual)	25
Project 2 (Team)	25
Final Exam (including Leadership Readings)	20
Total	100

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. 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.

Attendance will be checked each class period. You will be required to sign in at the start of each class. ***Each Absence will result in a deduction of 3% from your Final Grade.***

Course Deliverables

Diagnostics/Assignments

You will also be given somewhat meatier out-of-class assignments that require more in-depth work and understanding of the material. These *Diagnostics* will generally be done outside of class time, although we will sometimes devote some time to them.

Diagnostics will be graded in a binary fashion - they are either checked off as correct, or they are not. If you do not complete a *Diagnostic* 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 *Diagnostics* 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 a *Diagnostic*, 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.

Diagnostics must be completed by the start of class time on the assigned due date. You are required to submit your homework via the course's Black Board website. The PDF file that you submit should include your Name along with the Name of the Diagnostic/Assignment. For example: ***Mendez-Diagnostic2.pdf***. 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.

Learning Check Points/Quizzes

Learning Check Points are short in-class assignments that are designed to evaluate your progress at learning the material of the course. *Learning Check Points* will be administered typically at the start of class. Students will be made aware of the dates of *Learning Check Points*.

Learning Check Points 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 will give you some suggestions, and tell you to work on it some more.

The Instructor reserves the right to give a Quiz. Quizzes are typically administered when the Instructor feels that students are not coming to class prepared. If students are diligent in coming to class, getting prepared or keeping up with new material.

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 Project 2) a **Formal Presentation**, in the style of a poster session at a scientific conference. Don't be scared of a **Timeline**. It is just a collection of all the work (folder) that you did on Project 1. You will be asked to make a very short presentation of 5 minutes or less that addresses your Timeline at the end of Project 1.

You are working on a Timeline during Project 1 so that you can take advantage of the ability to post your work. 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 via Black Board at the start of class on the assigned due date. If you are submitting your work electronically, please send it as a PDF file including your **Last Name** along with the **Deliverable Number** using the following convention: *LastName-Deliverable1.pdf*.

Both the technical quality of your work and the professionalism of your presentation will be assessed.

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
- Difference equations and their analytical solutions
- Differential equations and their analytical solutions
- Leadership skills – Mentoring and constructive feedback

Student Outcomes – ABET

ABET Student Outcome 1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science and mathematics.

ABET Student Outcome 3. An ability to communicate effectively with a wide range of audiences.

ABET Student Outcome 7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Academic Dishonesty

Academic Dishonesty 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 instructor!) 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>.

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/>.