

# Math 311: Introduction to Mathematical Modeling

TTh 12:50 AM – 2:20 PM; DA 304

Spring 2017

**Instructor:** Professor C. Crawford  
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**Office Hours:**  
Monday 11:00 AM – 12:00 PM  
Tuesday 10:00 AM – 11:30 AM  
Thursday 2:45 PM – 3:45 PM  
Also by appointment

**Course Description:** The **primary objective** of this course is to introduce students to the process of mathematical modeling where mathematical concepts are applied to “real world” problems. Students will learn how to (1) identify problems and develop appropriate models and (2) analyze models to determine validity and sensitivity, as well as to uncover underlying assumptions of given models. Crucial to mathematical modeling is the ability to communicate effectively the entire process of identifying problems, formulating models, utilizing resources, and interpreting results. Hence, **secondary objectives** (but equally important) will help students (3) refine their communication skills by working in groups, writing coherent reports, and presenting projects, (4) increase their proficiency in technical reading and researching through the library, web, and other resources, and (5) utilize and appreciate technology as a powerful tool to further explore problems. *Prerequisite:* MTH 152.

**Required Text:** *A First Course in Mathematical Modeling, 5th Edition* by Giordano, Fox, and Horton. We will be covering most of chapters 1-4, & 7 and selected portions of chapters 5-6, 8-12.

**Technology:** You should have a graphing calculator such as one of the TI series. We will be using other resources such as Maple, Excel, and other software, which are available in the computer labs and via Citrix.

## Grading

<b>Seminar</b>	<b>15 pts</b>	
<b>Attendance/Participation</b>	<b>15 pts</b>	
<b>Homework/(Quizzes)</b>	<b>70 pts</b>	
<b>Projects</b>	<b>100 pts</b>	
<b>Final Project</b>	<b>100 pts</b>	Presentations: 5/16 at 1:00 PM – 3:00 PM (finals week)
<b>2 Exams (100 pts each)</b>	<b>200 pts</b>	<b>Tentative Dates: 3/16 &amp; 5/11</b>
	<b>500 pts</b>	

Your final letter grade for the course will be based on the percentage of total points earned. Excessive and consistent disruptions (e.g. tardiness, leaving class for drinks or the restroom, cell phones, etc.) may result in lowering your grade up to one full letter grade. **All cell phones must be turned completely off and put away.** *Having a cell phone out during an exam or quiz will result in an automatic 0 grade for the exam or quiz.*

**EXAMS:** Two exams are ***tentatively*** scheduled for **Thursdays, March 16 and May 11 (last day of class)**. You must take all exams in class on the announced dates (subject to change at my discretion). **No make-up exams will be allowed.** *Since there is no final exam, there is no replacement policy.*

**HOMEWORK/(QUIZZES):** Homework problems will be assigned and collected regularly. Homework may also include reading the text or researching other resources for additional information. You have a **one-day** grace period on assignments without penalty (unless this option is abused or otherwise noted). You will be docked 10% for each *day* late thereafter. **Late homework will not be accepted after the assignment has been graded.** I may choose to give quizzes to determine whether you have completed the homework or reading/research assignments. For every 4 homework assignments (and quizzes) graded, I will drop 1.

**PROJECTS:** You will be completing several projects throughout the course, some as an individual and some with a group. Most of them will require in-depth thought and additional reading/research. All projects will require a written report that follows the guidelines given. Larger projects will be due about 2 weeks after they are assigned and may include a presentation. *Any oral presentations must be completed on the day scheduled.* You have a **one-day** grace period on the written report without penalty (unless this option is abused or otherwise noted). You will be docked 10% for each *day* late thereafter. Depending on the size and difficulty of the project they will range from 20-50 points each. **You will not be allowed to drop any projects.** The total of all project points will be scaled to 100 points.

**FINAL PROJECT:** The final project will be more comprehensive than the other projects and is worth 100 points. It will include a presentation given during the scheduled final exam time: **Tuesday, May 16 from 1:00-3:00 PM.**

**GROUP PROJECT GRADING:** Once a group project has been graded, each group member will obtain a percentage of the points earned based on self- and peer-evaluations. The average of group member responses will be used to determine the effect on each individual grade for the project. See the sample evaluation question below.

*Please rank yourself and each member in your group on the level to which you/he/she contributed to the project.*

	Problem		Unsatisfactory		Satisfactory					
Name (include yourself)	See Dr. Crawford		20% Deduction		10% Deduction			No Deduction		
	1	2	3	4	5	6	7	8	9	10

**ATTENDANCE AND PARTICIPATION:** Regular attendance is expected and obviously important. We may discuss some material differently than is presented in the text. There will often be class discussions and group work. Your participation grade will be based on attendance and active involvement in class. If you miss a class day or do not participate, then your score for that day will be 0. You may miss two of these days without penalty. The remainder of your attendance and participation grades will be scaled to 15 points.

**SEMINAR:** As part of your grade, you are **required to attend one of the math seminars** typically held Wednesdays 4:00-5:00 PM in CS 213 and hand in a 1-2 page Summary/Evaluation Paper. Seminar Summary/Evaluation Papers receive a holistic (overall) grade based on the guidelines below.

Seminar Summary/Evaluation Paper Guidelines	
<b>Attend the seminar and submit a written paper.</b>	~60%
<b>Clearly summarize the main point(s) and some details of the talk.</b> [Note: You will often not understand everything in the talk, nor are you expected to. But you should be able to explain the main point(s)/some details clearly (e.g. Imagine trying to explain what you did understand to another math/science major who was not in attendance).] <b>Evaluate the topic.</b> [Note: The evaluation is not a critique of how well the speaker presented the material, but more about the ideas presented and their potential impact on you and to the broader science or education community. You should also consider any limitations or questions you have about the talk along with possible extensions for further work.]	~20%
The paper should be clearly organized, well-written and respectful. It should be error-free and neat. (1-2 pages, double-spaced, 1"-margins)	~20%

**Policies and Academic Integrity:** You are expected to adhere to the College Academic Integrity Policy as stated in the *E-Book* as it applies to this class. For example, *obtaining or attempting to use unauthorized materials or information or unauthorized help from another person or source is considered cheating.*

- Test and quizzes, whether take-home or in-class, are to be your own work unless otherwise stated.
- Calculators and notes are not allowed on quizzes and tests unless otherwise stated. If calculators are allowed, you may not store any notes or unauthorized programs on the calculator.
- Having a cell phone out during an exam or quiz will result in an automatic 0 grade for the exam or quiz.
- **You may work with others on your homework and are encouraged to do so.** But you must turn in your own homework unless specifically stated as group work requiring one submission.
- Individual projects should be your own work. All group members should make quality contributions to group projects.

**Accommodations:** The College will make reasonable accommodations for persons with documented disabilities. A student with a disability that may have some impact on work in this course should contact Dr. Corinne Smith, Disabilities Service Coordinator, at 630-617-6448 and **then contact me.**