

Introduction to Mathematical Modeling

MATH 3550, CRN 21388, Fall 2023

http://faculty.weber.edu/aghoreishi/Math3550_f23/Math3550_f23.asp/

Prerequisites: Math 1200 and (Math 2270 or Math 2280).

Text: Required: A first Course in Mathematical Modeling by Giordano, Fox and Horton, 5th Edition, Cengage Learning, ISBN 978-1-285-0509-04. (A copy of this book is available in the Mathematics Students' Room: TY 231.)

Additional: I will provide most of references and supplementary material.

Software: I will use the computer algebra system (CAS) called Mathematica. However, you may also use other software. You can get access to Mathematica in the following three ways.

1. Get your own free copy at https://www.weber.edu/software/mathematica_request.html. Activate your copy of Mathematica through "Activate through your organization (SSO)". See Wolfram support page <https://support.wolfram.com/54713> for help. If you need a laptop/tablet, contact WSU Computing Services <https://www.weber.edu/ComputerLabs/laptopcheckout>.
2. Any campus computer lab, including Tracy Hall Computer Lab, TY 126, and Elizabeth Hall Computer Lab, EH 213.
3. Virtual Lab: For the Virtual Lab instructions, see <http://weber.edu/virtuallab>.

Class Meetings: MWF 11:30-12:20, TY 449.

Instructor Information: Dr. Afshin Ghoreishi, <http://faculty.weber.edu/aghoreishi/>. Office: TY 450M. Office Hours: M 9:30-10:20, T 9:30-10:20 and 11:30-12:20, W 9:30-10:20 and 12:30-1:20, and F 9:30-10:20. At other times, you can see me whenever I am in my office and not busy. You can also see me by making an appointment.

Procedures: You are encouraged and expected to read the book on your own. I will try to answer a few questions at the beginning of each class, but this time will be limited. Utilize office hours. We will cover parts of chapters 1-15, depending on interests of students. For the list of course coverage see below. We will have homework, individual and group projects and one or two exams.

Do not enter the class late & do not come to class if you have to leave early. Turn off pagers, cell phones and other such disruptive devices. Do not text message. Failure to follow these basic courtesies may result in a failing grade. **Excessive absences** (more than 5) **will result in a grade of UW.** However, I expect you to behave in a responsible manner and I prefer not to take attendance.

Homework: A problem list is included. To be successful in this class you should be able to solve all problems. Each Monday I will hand out a homework sheet consisting of 10 or less problems and most of them will be from the problem list. Homework will be due on Friday with the grace period until **Monday before start of the class.** **No late homework will be accepted.**

Do not solve two problems side-by-side, write only on one side of each page and staple your homework. Write your name on the top center position of the front page and number your pages as, for example; 1/7, 2/7, ... , 7/7 (if there are a total of 7 pages), on the top right hand corner of each page.

Projects: You will have one individual and one group project. Presentation, time allowing, will be part of the project. We will discuss this further.

Exams: We will have one or two exams. **No make-up exam will be given.** We will discuss this further.

Other Important Dates:

Labor Day Holiday	Sep	4
Last day to cancel a class	Sep	18
Fall Break	Oct	20
Last day to drop with a grade of W	Nov	7
Thanksgiving Holiday	Nov	23-24

If you decide to drop this class, please inform me of your decision..

Mathematics Mondays: The Mathematics Department offers you the unique opportunity to form a community of students and faculty, through weekly events on Mondays at 1:30 in TY 365. These events are free and open to all and include study sessions, puzzles and games, solving problems posed in mathematics journals, mathematics research, and talks by students, faculty and invited guests. Your level of participation is entirely up to you; from an interested observer, presenter of solutions to journal problems or interesting papers, to mathematics researcher. You can even earn credit through courses Math 2925/4925. Make Mathematics Mondays part of your weekly schedule for fun and enhancing the success of your post graduate plans.

Extra Credit: You can earn extra credit by correctly solving and submitting your solution to problems posted in mathematics journals. You can find these in the Fall 2022 folder in the shared P, J & R Directory, a Google Drive. You can also post your solutions there and work jointly together or with me. You may also earn extra credit by making a presentation to the Math Factor. **These can be facilitated by attending the weekly meetings of Math Factor or taking the one credit hour course Math 2925, both meeting Mondays at 1:30 in TY 365.** The following are the talks of special interest for this class.

1. Presentation of the second project to the Math Factor.
2. Develop your own solution of past MCM problems and present to the Math Factor.
3. I have a collection of other papers that you can choose one in your area of interest to read, comprehend, and present to the Math Factor.
4. Solve and submit your solution to any problem posted in certain mathematics journals. I will hand out these problems.

Grading: Exam will be curved as needed, but a minimum standard will be retained regardless of the class performance. The following is a possible grading scheme.

Homework	30%
Projects	40%
Exam	30%
<i>Extra Credit (optional)</i>	<i>up to 4%</i>

Total	100%

Extra Help: Mathematics Students' Room: TY 231 is a perfect place to study! You will find a copy of the textbook in that room.

Course Coverage and Problem List for Math 3550 Textbook: A first Course in Mathematical Modeling by Giordano, Fox and Horton, 5 th Edition This list may be adjusted, as needed.			
Section	Problems	Section	Problems
1.1	1-4, 9	5.3	1-4
1.2	1-5, 8	5.4	1-5
1.3	1-4, 7, 7* (Change a_0 to 200000), 8	5.5	1-5
1.4	3, 4, 6, 7	6.1	1, 2
2.1	1-10	6.2	1-3
2.2	1, 2, 5-8, 12-14	6.3	1, 2
2.3	2-4, 9, Projects 2 & 3 in pages 93-94	9.1	1-3, 5, 8, 9
2.4	1, 2	9.2	2-4, 6
2.5	1-3	9.3	1-3, 7
3.1	1-3, 5-7	9.4	2, 4, 5, 6
3.2	1-4	11.1	1-4, 6
3.3	1-4	11.2	1-5
3.4	1, 4-7	11.3	1, 2
4.1	1, 6-8, 10	11.4	1, 4-7, 10
4.2	1-3	14.1	3, 4, 7
4.3	1-3, 6, 8, 10, 11	14.2	2-4 7
4.4	1-4	14.3	1-3
5.1	1-4	14.4	1, 2, 6
5.2	1, 2	14.5	1, 3