DYNAMICAL SYSTEMS
MATH 3280, CRN 35191, Spring 2026

http://faculty.weber.edu/aghoreishi/Math3280_S26/Math3280_S26.asp/

Text: **Required:** Dynamical Systems with Applications using Mathematica by Stephen Lynch, BirkHauser, 2007, ISBN 978-0-8176-4482-6, 1st Edition
A copy of this book is available in Mathematics Students' Room, TY 231.

Optional: Differential Equations, Dynamical Systems & An Introduction to Chaos by Hirsch, Smale, and Devaney, Academic Press, 2nd Edition, 2004, ISBN 0-12-349703-5.
An Introduction to Dynamical Systems by R. Clark Robinson, Prentice Hall, ISBN 0-13-143140-4.

Prerequisites: Math 2270 and Math 2280.

Class Meetings: MWF 11:30-12:20, TY 363.

An advantage of taking this course, along with Math 2280, and other applied Math courses, is preparation for competing in Math contests: The Mathematical Contests in Modeling (MCM), Jan 29 - Feb 2, 2026, https://www.comap.com/contests/mcm-icm; SIMIODE Challenge Using Differential Equations Modeling (SCUDUM) in the Fall of 2026, https://qubeshub.org/community/groups/scudem.

Instructor Information: Dr. Afshin Ghoreishi, http://faculty.weber.edu/aghoreishi/. Office: TY 450M. Office Hours: M 10:30-11:20, T 9:30-10:20, 10:30-11:20, W 10:30-11:20, 12:30-1:20, and F 10:30-11:20. 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 have weekly homework, two exams and a final exam. **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.

Almost all students will do better by actively participating in class (attending class, taking notes, asking questions, etc.) and some can benefit from a little encouragement to do so. The following policy is to help you earn your best possible grade. **Excessive absences** (more than 5) **may result in a grade of UW.** However, if you don't like this policy, I will be happy to find you other accommodations.

Note: The university administration has reduced the length of the spring semester by 4 days. This means we will have two less classes than usual. I will do my best to still devote adequate time to all topics, questions and reviews.

Course Coverage: We will cover parts of chapters 1-10, as time permits, supplemented with some additional material. In this course, we will use ordinary differential equations and linear algebra concepts. We will review them as needed. However, for reference, I have placed a copy of standard textbooks for these topics in the Mathematics Students' Room: TY 231.

Homework: The textbook has a limited number of problems at the end of each chapter with all answers in the back. You should try to solve all problems from the sections we will cover.

A computer algebra system, like Mathematica, is helpful in visualizing and analyzing dynamical systems. We will go over new commands, as needed. However, your textbook provides the necessary commands in sections called Mathematica Commands in both text and electronic formats. The file containing the commands for the entire text book is available in the course website.

You may access Mathematica (now called Wolfram) in the following three ways. I highly recommend that you follow the first option.

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 214.
3. Virtual Lab: For the Virtual Lab instructions, see http://weber.edu/virtuallab.

Each Friday I will hand out a homework sheet consisting of up to 10 problems with many problems from the textbook. Homework will be due next Wednesday with the grace period until **Friday 11:30**. **No late homework will be accepted.**

Do not solve 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 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. **No** late homework will be accepted.

Exams: Exams I & II may be administered at the Tracy Hall Testing Center. You may use electronic calculators in the exams. Exams can be taken anytime during the time periods listed below. **No** make-up exam will be given.

Exam I	Feb 19-20
Exam II	Apr 9-10
Final Exam	Hand Out: Apr 17, Due Date: Apr 21, **11:00 am**

The Testing Center is located in the Tracy Hall, Rm. 101C, and will be open M-R 8:30 am - 8:00 pm, F 8:30 am - 4:30 pm, Sat 10:00 am - 4:30 pm. You must complete an exam by one hour after their closing time. You must also take along a picture I.D. **We will meet for our regular lectures during exam days.**

Other Important Dates:

Martin Luther King Holiday	Jan	19
Last day to cancel a class	Jan	26
Presidents' Day Holiday	Feb	16
"Spring" Break	Mar	2-6
Last day to drop with a grade of W	Mar	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 almost semiweekly 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 shared P, J & R Directory, a Google Drive. I will send you its link. 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 meetings of Math Factor or taking the one credit hour course Math 2925, both meeting Mondays at 1:30 in TY 365.**

Grading: Exams will be curved as needed, but a minimum standard will be retained regardless of the class performance.

Exam I	100 points
Exam II	100
Homework	100
Final Exam	100
Extra Credit (optional)	*up to 20 points*
Total	400 points

Extra Help: **Mathematics Students' Room:** TY 231 is a perfect place to study! You will find the reference books mentioned above in that room.

Study Sessions: I am willing to attend study sessions, but you have to organize it.