

University of Washington

AMATH 502

Introduction to Dynamical Systems and Chaos

Winter 2019

**Instructor:** Craig Gin (cgin@uw.edu)

**Lectures:** MTWF 1:30-2:20 pm in LOW 216

**Office Hours:** Tuesday 9-11 am and Wednesday 6-8 pm in Lewis 211 or by appointment

**TAs:** Kelsey Marcinko and Jeremy Upsal

**TA Office Hours:** Thursday 12:15-2:15 pm in Lewis 115

**Course Description:** Overview methods describing qualitative behavior of solutions on nonlinear differential equations. Phase space analysis of fixed pointed and periodic orbits. Bifurcation methods. Description of strange attractors and chaos. Introductions to maps. Applications: engineering, physics, chemistry, and biology. Prerequisite: either AMATH 351, MATH 136, or MATH 307. Offered: W.

**Web Page:** <https://canvas.uw.edu/courses/1253458>

Check the canvas course page regularly. Homework assignments, course announcements, and grades will be posted there.

**Communication:** The main source of communication for this course will be Canvas.

- **Course Announcements:** The instructor will regularly post course announcements with information about what was done in class as well as upcoming due dates and scheduling changes. You are responsible for reading all of the announcements.
- **Discussion Board:** This term we will be using Piazza for class discussion. The Piazza discussion board is a great place to ask questions about the course material or discuss homework problems. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Piazza. You are encouraged to answer each other's questions, but the instructor will also regularly answer questions on the discussion board. While discussions about the homework are encouraged on the discussion board, no solutions should be posted.

<https://piazza.com/washington/winter2019/amath502/home>

- **Email:** Email is the best way to reach me if you have any other questions or concerns. When you send an email, please include your full name and course number.

**Textbook:** *Nonlinear Dynamics and Chaos With Applications to Physics, Biology, Chemistry, and Engineering*, 2nd Ed. by Strogatz.

The textbook is not required but is strongly recommended for use as a reference. Previous editions will suffice.

**Grading Policy:**

Homework	30%
Midterm Exam	30%
Final Exam	40%

**Class Meetings:** Monday, Tuesday, and Wednesday classes will be lectures given by the instructor which cover theories and core materials. Friday classes will be led by a TA and will cover relevant applications, numerical methods, and worked problem examples.

**Office Hours:** The office hours listed above will be shared by both online and on-campus students. Online students will be able to contact the instructor or TA via GoToMeeting. On Tuesday and Thursday, priority will be given to on-campus students. On Wednesday, priority will be given to online students.

**Exams:** There will be two exams. The midterm will be held during the normal class time. The tentative date is Wednesday, Feb. 13. The final exam will be held at the University designated time, Monday, March 18 at 2:30 pm. The final will be cumulative as the course material naturally builds on itself but will focus on the material after the midterm. The locations of the exams is TBD.

**Homework:** Homework assignments will be assigned regularly. The assignments will be posted to Canvas and turned in via Canvas. You should upload your assignment as a single pdf file, unless otherwise stated. Any scans should be high enough quality for the grader to be able to read it easily. Collaboration on homework is encouraged but each student must submit their own assignment. Copying will not be tolerated. The assignments will be graded for completeness and several problems will be randomly chosen and graded for correctness. The lowest homework score will be dropped.

**Attendance:** Although attendance will not be taken, I strongly encourage you to attend (or watch) and participate in every lecture. This is one of the best ways to ensure success in the course.

**Late Work and Make Up Policy:** Late work will not be accepted and make up exams will not be given unless class is missed by an unavoidable cause (<http://www.washington.edu/admin/rules/policies/SGP/ScholRegCH112.html#1>). Proper documentation must be provided. If possible, advance notice should be given to the instructor if class will be missed. If advance notice cannot be given, you must notify the instructor as soon as possible.

**Academic Misconduct:** All students are expected to abide by the University's Student Conduct Code (see <http://www.washington.edu/cssc/for-students/student-code-of-conduct/>) including the avoidance of academic misconduct as defined in Student Governance Policy, Chapter 209 Section 7.C (<http://www.washington.edu/admin/rules/policies/SGP/SPCH209.html#7>). Any instances of academic misconduct will be reported.

**Access and Accommodations:** Your experience in this class is important to me. If you have already established accommodations with Disability Resources for Students (DRS), please communicate your approved accommodations to me at your earliest convenience so we can discuss your needs in this course.

If you have not yet established services through DRS, but have a temporary health condition or permanent disability that requires accommodations (conditions include but not limited to; mental health, attention-related, learning, vision, hearing, physical or health impacts), you are welcome to contact DRS at 206-543-8924 or [uwdrs@uw.edu](mailto:uwdrs@uw.edu) or [disability.uw.edu](http://disability.uw.edu). DRS offers resources and coordinates reasonable accommodations for students with disabilities and/or temporary health conditions. Reasonable accommodations are established through an interactive process between you, your instructor(s) and DRS. It is the policy and practice of the University of Washington to create inclusive and accessible learning environments consistent with federal and state law.