

Math 413 – Modern Applied Math I – Fall 2018

Dates/Times TR 10:30-11:45

Location James Buchanan Hall D003

Textbook *Nonlinear Dynamics and Chaos*, Steven Strogatz, 2nd edition.

Instructor Matt Holzer, Exploratory Hall 4458

Email mholzer@gmu.edu

Office Hours T 12:00-1:00, R 1:00-2:00, F 10:00-11:00 (others by appointment)

Course Description Synthesis of pure mathematics and computational mathematics. Emphasizes interplay between discrete and continuous mathematics. Mathematical structure revealed from equilibrium models in discrete and continuous systems. *Applied Math* is an immense field of mathematics and we will focus on topics related to ordinary differential equations – qualitative understanding of solutions and their use as models of natural phenomena.

Prerequisites C or better in MATH 203 and 214 or 216.

Important Dates

Thursday October 4th : Exam #1

Tuesday October 9th: No class (Columbus Day)

Thursday November 22nd: No class (Thanksgiving holiday)

Thursday December 6th : Exam #2

Tuesday December 18th: Final Exam 10:30-1:15

Attendance Attendance is not an explicit requirement for this course, but as you will see below it is an implicit requirement.

Recaps Before each class, you must turn in a one-page recap of what was covered in class the previous day.

Each day one student will be required to give a brief presentation of important topics from the previous days lecture or a brief summary of the homework problem that they solved. Presenters will be determined randomly – failure to be prepared for the presentation or unexcused absences will result in a loss of points.

Each recap is worth one point and the presentation is worth three. You be allowed to drop two recap grades at the end of the semester. You may opt out of one recap presentation.

Homework Homework will be assigned weekly, collected and graded. You may discuss homework problems with other students (in fact it is encouraged!), but you must write up your solutions individually. Homework is graded using a check/rewrite/zero scoring system.

- Check – work is sufficient and will be scored one point
- Rewrite – work is insufficient, but a rewrite will be accepted the following week. Zero points are awarded until the work is correct, at which point one point is scored
- Zero – work is either not turned in, or turned in with insufficient progress made to award a rewrite. A score of zero is recorded and no rewrites are accepted.

Final Exam Options

- **Paper Presentation** You will be required to read an academic research paper or book section on a topic in applied mathematics. In lieu of a final, you will be required to make a 15 minute presentation to me at the end of the semester about your project. Topics proposals will be due in the first half of the semester at a time TBD.
- **Final Exam Option** A comprehensive final exam will be offered on December 18th for those who prefer to take a conventional final exam.

Additional Exercises Periodically, we will do in class exercises or group work that will be graded and count towards the homework total. Also, class participation may be required and will contribute to the homework grade.

Grade Your final grade will be computed giving 40% weight to homework, 20% each to the midterm exams and 20% for the paper presentation or Final Exam. Final grades will be given according to the breakdown (94 for an A, 90 for an A-, 87 for a B+, etc). I reserve the right to shift these gradelines lower, but they will not be raised.

Academic Integrity You are bound by the Mason Honor Code and its policies related to Academic Integrity. Violations will be taken seriously.

Disability Services Students may be eligible for accommodations through the Office of Disability Services

Communication All email communication is to take place through your gmu email account.