

Professor: David McClendon (ASC 2046, phone x2574 (231-591-2574 off campus), hours MW 3-4, T 12-1 or by appointment, email: DavidMcClendon@ferris.edu)

Web: <http://mcclendonmath.com/330.html> contains the lecture notes, old exams, and other useful information.

Lectures: MWF 10-10:50 in STR 137.

Required Materials:

1. My lecture notes, which can be obtained in either of two ways:
 - as a course pack, at the bookstore; or
 - online, at my web page (as a pdf file).

Bring the lecture notes to class every day.

2. A copy of the mathematical software *Mathematica*. A link to a site where you can purchase a license for this software is on my web page.

Extensive information on *Mathematica* commands can be found in Appendix B of my lecture notes. I will give a demonstration on how to use the software in class—bring your laptop on that date.

Recommended Materials: colored pens or pencils (for better note-taking).

Prerequisite: MATH 230 with a grade of C- or better, or the equivalent. Here are the essential skills I expect a student in this class to possess:

- Strong algebra skills (exponent rules, factoring, multiplying out, moving terms from one side of an equation to the other, etc.)
- Strong calculus 1/2 skills (especially computing limits, derivatives and integrals; also some knowledge of basic calculus theory)

Some material from MATH 320 (Calculus III) and MATH 322 (Linear Algebra) is useful in differential equations but will be covered in this course as necessary.

Course material: Ordinary differential equations (ODEs) (and systems of ODEs). What are they? Which ones can you solve? How do you solve those ones? What do you do with the ones you can't solve?

Learning outcomes: After completing MATH 330, it is my hope and expectation that students will be able to:

1. solve first-order ODEs using analytic methods; analyze first-order ODEs using graphical techniques; and estimate solutions to first-order ODEs using numerical methods;
2. solve systems of first-order ODEs using analytic methods; analyze first-order systems of ODEs using graphical techniques; and estimate solutions to first-order systems of ODEs using numerical methods;
3. solve higher-order linear ODEs using analytic methods; and
4. model problems applying first-order ODEs, first-order systems and/or higher-order linear ODEs.

Grading policy: Homework: 30%. Two midterms: 20% each. Final exam: 30%. Grades will be curved at the end of the semester, but an average of 90% guarantees you at least an A-, an average of 80% guarantees you at least a B-, etc.

Attendance policy: I have no formal attendance policy. That said, **nothing** is more correlated with strong performance in my classes than attendance in lectures.

Homework: There will be regular homework assignments, coming from Appendix A in the back of my lecture notes, due on dates listed on the attached calendar. (Many exercises require *Mathematica*.) You can turn in homework in class or by putting it in the slot next to my office door marked "MATH 330" (HW is due whenever I go home on the day it is due). I will grade a subset of the homework problems for correctness.

Some of the homework questions are meant to be challenging! In advanced math classes, you learn not only from lectures but by thinking about difficult homework problems. If you get stuck, come to office hours and ask questions, or work with a more able classmate, or go to the math club's tutoring hours.

Midterms: There are two in-class midterms on **Monday, October 9** and **Monday, November 27**. No computers, calculators, textbooks, etc. are allowed on the midterms. No notes are allowed on the first midterm, but on the second midterm you will be permitted to use an index card with whatever you want written on both sides of it. Old exams (with solutions) are available on my website.

You may make up an exam that you miss (whether your absence is excused or not) but the makeup exams are considerably more difficult. If you miss an exam, contact the professor; you are to make up the exam at the *earliest possible time*.

Final exam: The final exam covers the entire semester, and will be held **Tuesday, December 12** at **10 AM** in the usual classroom. You may use one sheet of paper (max size 8.5" × 11") with whatever you want written on either side on the final.

Getting help: The best place to receive help is my office. In class, I will take few (if any) homework questions, and I will not be able to present all perspectives on a topic. In office hours, I am able to discuss the material at a much more friendly pace and offer some alternate viewpoints that may help you understand the material better.

If you cannot make my scheduled office hours, you can come talk to me anytime my office door is open. Also, I am more than happy to make an appointment to discuss the material with you. Send me an email.

Finally, Khan Academy ([khanacademy.org](https://www.khanacademy.org)) has several free videos available on differential equations which do a good job explaining the material of Chapters 1 and 2.

Students with disabilities who require reasonable accommodations to fully participate in course activities or meet course requirements should register with the Educational Counseling and Disability Services office (x3057, ecds@ferris.edu). While ECDS will send me a letter outlining the accommodations to make for you, I would appreciate it if you could contact me immediately for assistance with any necessary classroom accommodations.

Academic dishonesty: Papers will be monitored for "magic answers". Issues with academic dishonesty are taken very seriously, will almost always result in an F for the class, and will be referred to the Office of Student Conduct.