

Professor: David McClendon (2046 ASC, phone x2574 (231-591-2574 off campus), hours _____ or by appointment, email: mcclend2@ferris.edu)

Web: I maintain a web page with a lot of Calculus 1 material at the following address:
<http://mcclendonmath.com/220.html>

Lectures: TR 4:30-5:45 in STR 120.

Computer lab sessions: M 4:00-4:50 PM in STR 105.

Required materials: You need two items for this course:

1. the textbook *Modeling the Dynamics of Life: Calculus and Probability for Life Scientists* (3rd ed.), ISBN 978-0840064189; and
2. a piece of software called *Mathematica*; a link to the site where you can download this software (for free) is on my web page.

You will also be provided with lecture notes as we go, to accompany our lectures. I also recommend bringing a couple of colored pens or pencils to class each day, as some of the pictures we will draw to explain concepts are much more easily understandable when drawn in color.

Prerequisite: MATH 126 or 130 with a grade of C- or better. Essentially this means algebra and trigonometry. Some of this information will be reviewed in the first week of class (see Chapter 1 of the lecture notes).

Course material: Functions, limits, differential calculus of functions of one variable, an introduction to the Riemann integral, and applications.

This honors section will dive more deeply into applications of calculus in biology and engineering, and will include the application of calculus to the study of discrete dynamical systems.

Learning outcomes: After completing MATH 220, it is my hope and expectation that students understand what calculus is—that is, that students know the difference between mathematics that is and is not calculus, and that given some problem solved by calculus techniques, students can identify the approximation to the solution, the parameter of the approximation, and the limiting procedure which produces the solution.

It is also my hope and expectation that students will be able to:

1. Explain why a given limit, derivative or integral does or does not exist.
2. Infer information about a function from a limit statement, derivative or integral.
3. Estimate limits, derivatives, and integrals numerically and graphically, using technology as appropriate.
4. Compute limits, derivatives, and integrals, using technology as appropriate.
5. Solve problems which apply limits, derivatives and integrals, using technology as appropriate.

This course is an honors course, so in addition students will:

1. Engage with challenging primary sources appropriate to the academic discipline and level.
2. Articulate areas or topics for further work in the topic area or discipline.

3. Show improvement in analytic writing and discussion, critical thinking and reading.
4. Demonstrate improvement in intergenerational cultural competency.
5. Take more responsibility for their own learning.

DISCLAIMER: This is the first time an honors version of MATH 220 has been offered at Ferris. To some degree, I am making the course up as I go, and therefore there will probably be some snafus. Please bear with me.

Grading policy: Attendance / class participation: 5%. Homework and lab assignments: 20%. Midterm exams: 15% each. Capstone project: 10%. Final exam: 20%.

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.

I reserve the right to change the weights of these items later, **but only in ways that would improve your course average.**

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 almost-daily homework assignments, announced in class. (Sometimes you will have some time in class to work on them in groups.) These may be problems from your textbook, or problems that I write. You are to turn in your work on these assignments, which will be graded for correctness.

Lab assignments: Most days that we meet in the computer lab, you will be given a lab assignment which requires you to use the computer package *Mathematica*. You will be given time during the class session to start the lab, but will be required to finish the lab on your own time. These labs are due the first class day that is at least one week after the lab is assigned, and are graded for correctness.

Midterms: There will be three midterms given in class on dates to be determined later. You will not be permitted to use any study aids, calculators or computers on the exams. The midterms are not directly cumulative, but mathematics is “inherently cumulative”.

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

Capstone project: At the end of the semester, you will research an application of calculus to your major, or to another field that interests you (I will help you pick a topic and give you some resources to get started). You are to give a ≈ 15 minute presentation to the class on your topic and prepare a written report (my guess is 2-3 pages). More details on this later.

Final exam: The final exam is optional.

- If you choose not to take the final, then for your final exam grade I will enter your worst midterm exam grade.

Example: your midterm exam grades are 70, 80, and 100. If you do not take the final, I give you 70% on the final.

- If you take the final and your score is worse than your lowest midterm exam grades, I ignore your final exam score and for your final exam grade I will enter the average of your two lowest midterm exam grades.

Example: your midterm exam grades are 70, 80, and 100. You take the final and score 57%. I give you 70% on the final.

- If you take the final and your score is better than your lowest midterm grades, then your final exam score counts.

Example: your midterm exam grades are 70, 80, and 100. You take the final and score 82%. I give you 82% on the final.

The final is cumulative and has the same structure as the midterms, but is twice as long.

Technology usage: Calculators are never, ever, ever permitted on any quiz or exam; questions on quizzes and exams use “easy” numbers and expressions that a calculus student should reasonably be able to compute and manipulate by hand. That said, we will learn how to use a software package called *Mathematica* which you will use on lab assignments and in some of the homework. The midterm exams include some basic questions involving *Mathematica* syntax.

Office hours / Getting help: My official in-person office hours, held in ASC 2046, are _____. Outside those hours, I am happy to meet with you most of the time when I am present. Feel free to ask me questions on lecture content, or to get help with any or all of the homework questions, and I can also videoconference with you through Zoom or Skype if needed. 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.

Additionally, the Academic Support Center (FLITE 120, x3543, asc@ferris.edu) may offer free tutoring as well. To schedule a (virtual) appointment with a tutor, you can use the online scheduling tool TutorTrac (located within the “Academic Support” link on MyFSU). I can also recommend tutors that you can hire.

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.