

Professor: David McClendon (2046 ASC, phone x2574 (231-591-2574 off campus), hours MR 11-12, T 12:30-1:30 or by appointment, email: mcclend2@ferris.edu)

Lectures: TR 1:30-2:45 in STR 120.

Web: I maintain a personal MATH 324 web page at <http://mcclendonmath.com/324.html>.

The course also has a Canvas shell at <https://ferris.instructure.com/courses/22510>.

Required Materials: My lecture notes, which are available on my web page and through the FSU bookstore as a Course Pack (bring them every day).

A separate list of homework problems will be distributed in class; you can get a spare copy of this list on my web page.

Recommended Materials:

1. The textbook *How to Prove It*, 3rd ed., by Velleman (which can be purchased at [this link](#))
2. Colored pens or pencils (for better note-taking).
3. A three-ring binder for the lecture notes and other handouts.

Prerequisite: MATH 230 with a grade of C- or better. (You need this for the “mathematical maturity” more so than the actual calculus.)

Course material: Logic, basic set theory, proof techniques, relations and functions.

Learning outcomes: In MATH 324, it is my hope and expectation that students will:

1. formulate, evaluate and prove conjectures using methods of mathematical proof;
2. solve problems and write proofs about statements involving logical reasoning, algebra and number theory, set theory, relations and functions; and
3. contribute to graded small-group activities, critique classmates’ written proofs, review oral presentations, and make an oral presentation to the class.

Grading policy: Written work: 30%. Three midterms: 13% each. Final exam: 20%. Oral presentation: 7%. Attendance and class participation: 4%. 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.

Written work: There are several different types of written work you will do in this class:

Proofs: You will write and submit lots and lots of proofs - this is the heart of the class. I reserve the right to add and/or subtract proofs from the packet of exercises I distribute in class (a copy of this packet is available on my website), as needed.

Starting with homework from Section 1.6, **all proofs must be typeset** (not handwritten) **using a free program called Overleaf** that runs in a browser (not using Word or *Mathematica*). The Overleaf program will produce a pdf of your work which can you save to your computer and then upload to Canvas. I will give you a lesson (or two) in class on how to use Overleaf.

Non-proof homework: This comes from the same list of HW problems as the proofs. This work may be typeset or hand-written; you are to upload your work to Canvas.

Exercises in the homework marked with (★) are optional, extra credit problems.

Preview assignments: Sometimes, I will hand out (or upload to Canvas) an assignment that you must complete (and turn in) **before** we cover the material in class. These are designed to get you to think about the upcoming material and/or introduce simple ideas (so we don't have to spend time in class introducing them).

In-class activities: From time to time, we will work in groups in class on activities that help move us through the material. These activities facilitate mathematical exploration and require you to collaborate with your classmates in learning the material. To receive credit for these activities, you must be present on the days in class that we work on them. Your willingness to work actively with others on these assignments factors into your class participation grade.

Each assignment has a due date/time on Canvas. No late preview assignments are accepted under any circumstances. Otherwise, my policy is that if your assignment is turned in before I grade everyone's work, the assignment isn't late; beyond that, late work is not accepted. You may work with others on proofs, other homework and preview assignments, but everyone needs to submit their own solutions.

How written work is graded: Each proof or problem solution in this course will be graded carefully in areas including, but not limited to:

- appropriate justification of reasoning;
- proper use of mathematics notation, symbols, syntax and language;
- correct proof formatting (spacing, indenting, alignment, paragraphs, etc.);
- precision and efficiency of language; and
- legibility (this shouldn't be a problem since your proofs will be typed).

The heart of this course is learning how to write mathematics arguments well. As such, I will be ~~rather picky~~ psychotically anal about the way I want you to write and/or present certain things. With time, you will get used to my standards (and hopefully come to appreciate them).

Redoing proofs: In this course, I want you to become better at writing mathematical arguments. A key step in doing this is to recognize what you do wrong, and fix your errors. Toward this end, I will allow you to resubmit proofs (not other homework, preview assignments or in-class work) and earn back some of the points on each proof that you lost, subject to the following rules:

- The original assignment must have been turned in on time, and some effort must have initially been made on any problems you are resubmitting (i.e. you can't redo a 0).
- The redone assignment must be turned in within three business days of when the graded assignment is returned (or graded online).
- You must submit your redone assignment in Canvas separately from your initial submission (in the Canvas assignments marked "redos").
- You can only resubmit each assignment once.

Midterms: There are three midterm exams, tentatively scheduled for **Thursday, October 14**, **Thursday, November 11**, and **Thursday, December 9**. I have not decided on the exact format of the exams: they may be done entirely in class, or a mix of take-home and in-class questions. The only thing you may use on exams is a writing instrument.

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.

The midterms in this course are fairly cumulative, due to the nature of the subject matter.

Final exam: The final exam covers the entire semester, and will be held **Wednesday, December 15** at **2 PM** in the usual classroom STR 120. Check MyFSU to confirm this date and time.

Oral presentation: An important part of mathematics is communicating with your peers, not only in writing but in person. To give you experience with this, near the end of the semester each of you will make a 5-15 minute oral presentation of a proof (by yourself or in a pair) to your classmates. We will go over the details later in the semester, but here's how your score on the oral presentation will be determined:

- I will assess your presentation (60% of your presentation grade)
- Your peers will assess your presentation (20% of your presentation grade)
- I will assess how accurately you grade your peers (20% of your presentation grade)

Sample evaluation forms are distributed with this syllabus.

Getting help: The best place to receive help is my office. In class, I will not have time to take 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.

The class also has a discussion board in its Canvas shell, which is an excellent place to post questions that I or one of your classmates can answer. I much prefer dealing with questions on the discussion board to answering emailed questions.

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). ECDS will send me a letter outlining the accommodations to make for you.

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.

Of particular importance in MATH 324: every proof I assign you can be found on the internet. **Do not steal proofs from the internet.**