Objective: The purpose of this course is to prepare you for the introductory math sequence at University of Michigan. Although the subject matter may look familiar, you will likely find this course very different from your high school math experience. We will focus on developing deep understanding of the principles of calculus, as well as the flexibility to apply this knowledge to unfamiliar problems. We will not emphasize memorization or “plug and chug” calculation (although you’ll inevitably have to remember a couple of rules).

Text: We will use Calculus: Single Variable, by Hughes-Hallett, Gleason, McCallum, et al., 5th Edition (the same book used in Math 115-116). I plan to cover approximately sections 1.1-1.8, 2.1-2.6, 3.1-3.5, 4.1, 4.2, and 4.4, with adjustments as needed to keep a good pace in the classroom.

An important part of your homework is to read the book—specifically, to read each section before the day it is discussed in class, and to come prepared with questions about anything you didn’t understand. (You may find it helpful to re-read a section after it is covered in class.) Reading math is not like reading a novel; you’ll get the most out of it if you take notes as you go, work through the examples yourself, and resist the temptation to skim over parts that aren’t clear. Some parts will go quickly, but expect to spend as long as 30 minutes per page when the going gets tough. (Or longer! But by that point, you should ask for help.)

I’ll announce the reading schedule as we go. Please bring your book to class every day.

Calculator: You will need a TI-84 or equivalent graphing calculator. If you have a different model, you will be responsible for knowing how to use it. Bring your calculator to class and to the final exam.

Methods of evaluation:

1. Daily homework. Problems will be assigned in class and collected at the next class.
2. Team homework. Due Thursdays at 10pm; corrections due Tuesday. (More information below.)
3. Quizzes. There will be one 30-minute quiz in class each week.
4. Participation. Students are expected to actively participate in class and on group work.
5. Final exam. The exam is scheduled for Tuesday, July 26.

During the last two days of class, I will hold consultations with each student individually to discuss his or her performance in the course. You will not receive a composite grade, but a “report card” showing your results in each of the above areas.
Writing mathematics: Good communication is just as essential in mathematics as in other areas of life—as you will surely recognize if your eyes have ever glazed over during a poor mathematical explanation. Also, good communication has benefits even for the communicator; careful writing enforces careful thinking, exposes mistakes, and helps reinforce learning.

In this course, you will practice clear mathematical writing, in which complete and logical sentences are just as important as formulas and figures. All team homework (as well as designated problems from the daily homework) should be written up in “essay style,” which means that:

- The overall strategy for solving the problem is explained.
- All notation is explicitly defined (e.g., “We use \(x\) to stand for the length of the iron bar”).
- The reader’s advanced knowledge of calculus is not taken for granted. (Write for your classmates, not for me.)
- All conclusions are fully justified. (If you think a claim is true but can’t back it up with logic, say so.)
- Numerical answers are stated with units, and are interpreted in the context of the problem.
- Graphs, diagrams, and tables are included wherever they are useful.

There is no set length for a good write-up—a solution which does all of the above things may be successful whether it is half a page or four pages. You will receive extensive feedback on your writing which is aimed not only at correcting mathematical mistakes, but at improving your style.

Team roles: The goal of team homework is to ensure that everyone learns with and from the other members of the group. This means that when the work is completed and submitted, every member of the group should be able to explain how to solve all the problems. All team members should think about every problem on their own before meeting, then contribute actively to a discussion whose end result is a consensus solution.

In addition, team members are to rotate the following four special roles, with each member performing each role once during the course:

1. **Scribe.** The scribe is responsible for writing up the single final version of the homework to be handed in. This is the only set of solutions which will be accepted or graded. Each member of the group will receive the same grade as long as they work with the team.

2. **Reporter.** The reporter is responsible for taking notes during all team meetings, and then preparing a record of how those sessions went. I will provide a template for this report, which should be attached to the front of the team homework. The reporter’s notes should be made available to the scribe as an aid in writing up the final solutions.

3. **Clarifier.** During meetings, the clarifier assists the group by paraphrasing the ideas presented by other group members, e.g., “Let me make sure I understand, the graph goes up …”. The clarifier is responsible for making sure that everyone in the group understands the solutions to the problems and is prepared to present the problems in class if the team is called on.

4. **Manager.** The manager is responsible for arranging and running the meetings, keeping the conversation on topic and making sure that everyone is heard. When the homework is returned, the manager sees that it is photocopied and distributed so that each team member’s portfolio contains a copy of the problems with the grader’s feedback. The manager is also responsible for assigning corrections (this will be discussed in class).