

The aim of this course is to provide a rigorous foundation for Calculus I, II which I presume that all of you have studied in high school. Calculus was invented by Newton and Leibnitz in the mid seventeenth century (although the theory of integration has its roots in Archimedes method of exhaustion to compute areas, logarithms were introduced by Napier in the sixteenth century and many people were studying the tangent line to a curve from 1635 onward.) However the modern understanding of Calculus did not take place until the late nineteenth century. That is precise notions of limit and continuity were slow to develop and the fundamental properties of continuous functions were logically impossible to prove until a rigorous definition and construction of the real number system was developed by Cantor and Dedekind.

In this course we will introduce the axioms of the real number system (most of which are familiar) and in particular introduce the “completeness” axiom which intuitively says that there are no gaps in the real number line. The basic properties of continuous functions rely on this axiom in a subtle way. We will cover most of Spivak’s book in one semester which means that you will be expected to read the book and work through the material. Learning occurs by doing so you will be expected to do lots of problems.

My goal is not so much to cover a certain amount of material but to teach you how to think about Calculus and write a correct proof. This will serve you well in all your courses!

- Week1 Sept 10-12 sections 1,2 and parts of section 8 on lub and glb (sup and inf).
- Week 2 Sept 17-19 sections 3,4,5.
- Week 3 Sept. 24-26 sections 5,6,7.
- Week 4 Oct. 1-3 sections 7,8.
- Week 5 Oct. 8-10 section 13.
- Week 6 Oct. 15 no class, Oct 16-17 review Oct. 17 exam 1.
- Week 7 Oct 22-24 sections 9,10.

- Week 8 Oct 29-31 sections 11-12.
- Week 9 Nov 5-7 sections 14-15.
- Week 10 Nov 12 sections 18 Nov 13,14 review Nov 14 exam 2
- Week 11 Nov 19-21 sections 19,20
- Week 12 Nov 26-28 sections 22-23
- Week 13 Dec 3-5 section 24
- Week 14 Dec. 10 review Final exam Friday Dec 14, 9am-12 noon.

About the particulars of the course. Homework is a very important part of the course and will count 25%. In addition there will be two midterms (20% each) and the final exam (35%). I will try to find a time outside of class time for the midterms so you can have plenty of time and are not rushed. Hopkins is now on the Honors system and you are expected to do your own work. With respect to homework, you may discuss homework with me, the TA and your classmates but *you are expected to write up your own solutions*. With regard to exams the following ethics statement of the University applies:

Cheating is wrong. Cheating hurts our community by undermining academic integrity, creating mistrust, and fostering competition. The university will punish cheaters with failure on an assignment, failure in a course, permanent transcript notation, suspension, and/or expulsion. Offenses may be reported to medical, law, or other professional or graduate schools when a cheater applies.

Violations can include cheating on exams, plagiarism, reuse of assignments without permission, improper use of the Internet and electronic devices, unauthorized collaboration, alteration of graded assignments, forgery and falsification, lying, facilitating academic dishonesty, and unfair competition. Ignorance of these rules is not an excuse.

On every exam, you will sign the following pledge: "I agree to complete this exam without unauthorized assistance from any person, materials or device[signed and dated]" .

For more information, see the guide on “Academic Ethics for Undergraduates” and the Ethics Board website (www.jhu.edu/ethic).