Calculus III (Math 253)
Winter 2019

Meeting times: Mon., Tues., Wed., and Fri. 2–2:50pm in 307 Deady

Instructor: Ben Elias
Office: Fenton 210
Office hours: M 3-4 and F 1-2
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Preferred Pronouns: he/him/his.
Course website: `http://pages.uoregon.edu/~belias/253-winter-2019/`
Midterms: Week 4 Wednesday and Week 8 Friday. In class, 50 minutes.
Quizzes: There will be weekly in class quizzes, each Wednesday.
Final: Thursday March 21, 2:45PM, 2 hours, in 307 Deady.

Textbook: *Calculus: Concepts and Contexts, 4th edition*, by James Stewart. We will cover Chapter 8.

Topics we will cover: sequences, series, various convergence and divergence tests, power series and Taylor series, Taylor's remainder theorem, power series solutions to differential equations (not in your textbook, but free supplementary materials will be made available).

Homework and Quizzes: There will be homework due each Wednesday by the start of class, and assigned the previous Wednesday (first homework due W 1/16). Check the course website each week, where the problems will be posted. Late homework will not be accepted without *prior* permission. We will *not* be using Blackboard or Canvas this term; all materials will be on the course website.

Each Wednesday that homework is due, a very short quiz will be administered at the beginning of class, on the same topic as the homework. Each Monday I will spend class time answering questions related to the homework.

Note to students: This course is different than previous calculus courses, requiring more insight and pattern-awareness than mere application of rules. Like any other new skill, it will take practice. Homework is meant to internalize the basic ideas and build intuition, and it is extremely important.

In my graduate courses, I assign one or two problems each lecture, due the next lecture. This keeps students on pace, and speeds the internalization process. Undergraduate schedules are more constrained so this would be unfair, and I assign weekly homeworks. But if you have the schedule, you'll be far more efficient if you try to do a few problems each day, or alternatively, if you look over the problems regularly and think about them, even if your group homework session is several days off. Mental knots need slow untying, and your brain will help you for free if you give it time.

Office hours: OFFICE HOURS ARE A VASTLY UNDERUSED RESOURCE. I am stuck in my office, waiting to answer your questions, so please use the opportunity!

Please, do not hesitate to ask questions in class. If you are confused, so are many of your colleagues, and they will thank you for speaking up. But you will surely have more questions, and office hours should be very helpful. If you can't make my office hours, email me to set up an appointment.

Attendance and Participation: If you miss a class, it is your responsibility to find out what happened from your colleagues. If your grade is borderline between one grade and another, then attendance and participation will be taken into account.

Homework policies In this course, you are encouraged to work on the homework problems with your colleagues. Math is a collaborative activity, and one which is easier to learn as a team. However, when it comes time to write up your homework answers, this should be done individually, without reference to any common solution or the work of others. By writing it up individually, you can really isolate those things you thought you understood in the group, but which did not make sense later. For example:

Ok: a study group works a problem on the blackboard, gets the answer. Erases the answer, each member tries to write up the solution individually, asks questions of the group when something goes wrong.

Not Ok: a study group works a problem on the blackboard, gets the answer. Members copy the answer from the board to their homework sheet, or write up the solution while referencing the solution on the board. This is cheating, even if credit is given to your collaborators (otherwise it is also plagiarism).

Definitely not ok: Using solution guides, or asking for/finding answers on an online forum. Copying or modifying answers from external solutions is cheating, plagiarism, and counts as academic misconduct. Students caught cheating on homework will be reported. Students who cheat and are not caught may have higher scores on homework, but tend to do poorly on exams, and receive lower grades overall.

Calculators: Neither calculators nor other electronic devices will not be permitted on any of the exams.

Grading and Exams: There will be two midterms, a final exam, and very short weekly quizzes. The dates of the two midterms will be decided on in the first week of class. There will also be a practice quiz (not for credit) before each midterm. The final exam is worth 40% of your grade, the midterms 30% together, homework 20%, quizzes 10%. Please bring your UO ID to all exams.

Prerequisite: Math 252 or the instructor's permission.

Learning Outcomes: The eventual goal of this course is to understand and use power series approximations of functions. Specific goals:

(1) Show sequences do or don't converge using the definition of a limit.
(2) Use standard series convergence tests. Find error bounds for partial sums.

(3) Estimate sums using the integral test, the alternating test, or the comparison test, depending on circumstances.
(4) Calculate radii of convergence for power series.
(5) Calculate Taylor series. Represent common transcendental functions as power series.
(6) Use Taylor's remainder theorem to approximate values of transcendental functions to given levels of accuracy.
(7) Give power series solutions to appropriate differential equations. Recognize solutions when common transcendental functions.

Learning Environment: The University of Oregon strives for inclusive learning environments. Please notify me if the instruction or design of this course results in disability-related barriers to your participation. You are also encouraged to contact the Accessible Education Center in 164 Oregon Hall at 541-346-1155 or `uoaec@uoregon.edu`. If you are entitled to extra time on exams, make sure to contact the AEC more than one week prior to the exam!

Academic Conduct: The code of student conduct and community standards is at:

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`http://conduct.uoregon.edu`

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It is not appropriate to help each other on exams, to look at other students exams, or to bring unauthorized material to exams. Any type of academic dishonesty will not be tolerated! Policies for homework were outlined above.