

Center for University Studies and Programs 124: Calculus I Winter 2007

Develops modern calculus by investigating the questions, problems, and ideas that motivated its discovery and practice. Studies the real number system and functions defined on it, focusing on limits, area and tangent calculations, properties and applications of the derivative, and the notion of continuity. Emphasizes problem-solving and mathematical thinking.

Lectures Tuesdays and Thursdays, 11:00–12:25, room UW2-131.

Laboratories Fridays 11:00–12:25, room UW1-120.

Instructor Michael Stiber stiber@u.washington.edu, room UW1-341, phone 352-5280, office hours Tuesdays and Thursdays 12:30-1:30 or by appointment.

Course Web <http://courses.washington.edu/cusp124/stiber/>.

Blog We will be making heavy use of a [course blog](http://cusp124.blogspot.com/) at <http://cusp124.blogspot.com/> to provide an alternative means of communication and a record for the quarter. Read the blog regularly, subscribe to its RSS feed, or check the latest entries syndicated onto the course web page. Feel free to comment on postings; I will monitor these and respond when appropriate.

Required Textbook James Stewart, *Single Variable Essential Calculus: Early Transcendentals*, Thomson, 2007.

Additional readings and materials C.H. Edwards, *The Historical Development of the Calculus*, Springer-Verlag, 1979.

I will place additional materials on library reserve, e-reserve or link to them via the web site.

Course organization Our class meets three times a week: twice in an ordinary classroom and once (Fridays) in a computer lab. We will make use of the lab on Fridays to do hands-on activities, both as individuals and as groups. Generally speaking, our Tuesday meetings will include a brief quiz that reviews the previous week's work. Please note that this course is still under development, and expect to see schedule revisions, pointers to additional materials, and other announcements via the course web site and blog.

Class meetings and you In my mind, you are adults and I will treat you as such. I therefore do not take attendance and leave it up to you to come to class or not and to assume responsibility for the consequences of your decision. However, I *strongly* encourage you to come to class and, in fact, a portion of your grade will depend on your participation in in-class quizzes and labs. You will be held responsible for *all* material covered in class, regardless of its presence (or lack thereof) in the textbook. In fact, I guarantee that there will be material covered in class that is neither in the text nor the additional readings.

While in class, I ask that you not engage in behavior that may be disruptive or distracting to your colleagues. In particular, if you plan to use a computer during class, please sit at the rear of the class. In my opinion, computers are not the best way to take notes. Here is my suggested three-step method for note-taking:

1. Read the materials for the class (the textbook section(s) and any additional readings) *beforehand*. Take notes while you read. Don't just summarize; write down any questions you have — *you will want to ask these during class*. Work some of the examples/exercises yourself to check your initial understanding. You might want to leave extra space for additional notes (answers, corrections, clarifications) that you take during class. Some people like to use a different colored pen or pencil for notes, questions, attempted exercises, in-class versus out-of-class, etc.
2. Take notes during class. Make sure you get all of your questions answered and understand why you had trouble with any exercises you tried.

3. Later that evening, review your notes. If you like, you might rewrite them, integrating together the in-class and before-class components. Whatever method you choose, make sure that there aren't any "holes" in your understanding. Homework assignments will help you do this, too.

Grading Your grade will be composed of your performance on tests and homeworks, plus your classroom contributions as measured by lab reports and quizzes.

Both the midterm and the final are equally weighted. The homeworks are not; each homework's contribution to your homework average will depend on the number of points in that homework. Laboratory reports (either individual or group) will be graded pass/fail. You will receive credit for all quizzes that you complete (in other words, I won't give credit for blank sheets of paper).

Your course average will be computed as: 25% homework + 25% midterm + 25% final + 15% labs + 10% quizzes.

I don't grade on a curve. I compute everyone's quarter average based on the formula above. I then use my judgment to determine what averages correspond to an 'A', 'B', etc. for the quarter. Some quarters' assignments, etc. turn out harder, and so the averages are lower. Other quarters, averages are higher. I use my judgment to adjust for that at the end. Decimal grades are then computed using the equivalences in the [UW Catalog](#), linearly interpolating between letter-grade boundaries. Furthermore, I am well aware of the significance of assigning a grade below 2.0, in terms of impact on your career here at UWB. I can assure you that I examine *in detail* the performance in this course of each student before assigning a grade below 2.0.

What is the difference between this and grading on a curve? With the latter, the goal is to have X% 'A's, Y% 'B's, etc. My way, I would be happy to give out all 'A's (if they were earned). A shorthand summary of the qualitative meaning of letter grades is:

- A** Complete or near-complete mastery of all course subject matter. Participation in all or almost all labs and quizzes.
- B** Substantial mastery of most course material. Participation in all or almost all labs and quizzes.
- C (above 2.0)** To receive a decimal grade of 2.0 or above, you must have demonstrated sufficient mastery of the course material to, in my judgment, be capable of taking a course that has this one as a prerequisite or be qualified to receive a degree that has this course as one of its requirements. It may be that your test and homework performance indicates better than 'C'-level work, but that you have chosen not to participate in in-class activities. Such work habits are also suggestive of future success.

Assignments Assignments will be due at specific dates and times. I will *not* accept *any* lateness in this class — if your assignment is submitted late, it will *not* be graded, and you will receive a *zero* for that assignment. Except for special circumstances, such as medical and other emergencies, *no* exceptions will be made to this policy. You are more than welcome to submit work before the due date.

To ease homework grading and speed return of your work, please follow these homework preparation guidelines:

- Use lined paper with clean edges — no ragged spiral-pad "fringes," please.
- Write your name and student ID number on the upper left of the first page. Write at least your last name on each subsequent page.
- Staple your homeworks.
- Write your answers to the homework problems in order, in a single column, showing all your work. Write neatly; if I can't read it, it's wrong.
- Number the problems by section, i.e., problem 5 of section 2.3 should be numbered 2.3.5. If the problems are from a worksheet, rather than the textbook, use the numbering and order of the worksheet.

Podcasts We will be experimenting with a podcast this quarter. I will divide you into groups and assign each group a topic and discussion framework. Each week, one group will need to research their topic so they can carry on an intelligent conversation that addresses the issues outlined in the framework. You will deliver an MP3 file

to me by email for posting to our [podcast](http://courses.washington.edu/cusp124/stiber/private/) at <http://courses.washington.edu/cusp124/stiber/private/>. See the course web for additional information about podcast production (hardware, software, instructions, grading rubric). A podcast episode will count as one 100-point homework.

Special needs If you believe that you have a disability and would like academic accommodations, please contact Disability Support Services at (425) 352-5307 or at rlundborg@uwb.edu. In most cases, you will need to provide documentation of your disability as part of the review process.

Collaboration You are expected to do your work on your own. If you get stuck, you may discuss the problem with other students, provided that you don't copy from them. Assignments must be written up independently. You may always discuss any problem with me or with tutors at the Quantitative Skills Center or the Writing Center. You are expected to subscribe to the highest standards of honesty. Failure to do this constitutes plagiarism. Plagiarism includes copying assignments in part or in total, verbal dissemination of results, or using solutions from other students, solution sets, other textbooks, etc. without *crediting these sources by name*. Any student guilty of plagiarism will be subject to disciplinary action.

Problems If you have problems with anything in the course, please come and see me during office hours, or send email. I want you to succeed in this course. If you have trouble with the assignments, see me before they are due.

Tentative Course Schedule

Date	Topics	Readings	Assignments
1/4	Welcome; the real number system; functions	Stewart, § 1.1	
1/5	Lab 1: Working with functions	Stewart, § 1.2	
1/9	Limits	Stewart, § 1.3	HW 1 due
1/11	Calculating limits	Stewart, § 1.4	
1/12	Lab 2: Take me to the limit		Podcast 1 due
1/16	Discontinuities and singularities	Stewart, § 1.5	HW 2 due
1/18	Infinitesimals	Stewart, § 1.6	
1/19	Lab 3: To infinity and beyond		Podcast 2 due
1/23	Early notions of the tangent	Edwards, pp. 122–127	HW 3 due
1/25	Calculating tangents	Stewart § 2.1, pp. 73–76	
1/26	Lab 4: Going off on a tangent		Podcast 3 due
1/30	The derivative: the difference quotient	Stewart, § 2.1	HW 4 due
2/1	Change and the derivative	Stewart, § 2.2	
2/2	Lab 5: Approximation by finite differences		Podcast 4 due
2/6	Midterm review		HW 5 due
2/8	Midterm		
2/9	Lab 6: Archimedes and the birth of calculus?		
2/13	Properties of the derivative	Stewart, § 2.3, 2.4	
2/15	The chain rule	Stewart, § 2.5	
2/16	Lab 7: Working on the chain gang		Podcast 5 due
2/20	Applications I: related rates and linear approximation	Stewart, § 2.7, 2.8	HW 6 due
2/22	Derivatives of special functions: exponentials and logarithms	Stewart, § 3.1, 3.2	
2/23	Lab 8: Real world project I		Podcast 6 due
2/27	Exponentials and logarithms, cont'd	Stewart, § 3.2, 3.3	HW 7 due
3/1	Applications II: Exponential growth & decay; minima and maxima; optimization	Stewart, § 3.4, 4.1, 4.5	
3/2	Lab 9: Real world project II		Podcast 7 due
3/6	Applications III: Derivatives and graphs	Stewart, § 4.3, 4.4	HW 8 due
3/8	Applications, cont'd		
3/9	Lab 10: Putting it all together		Podcast 8 due
3/13	Final Exam		