

# Calculus 1A: Student Handout. Revised 1/16/09

Spring 2009, TTh 3:30am - 5:00pm, Room 105 Stanley Hall

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Instructor: Professor Zvezdelina Stankova

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Questions on Enrolment: Barbara Peavy, *Office:* Evans 967, *E-mail:* peavy@math.berkeley.edu

Prerequisites: Three and a half years of high school mathematics.

Discussion Sections: Each student will be assigned to a discussion section. The discussion sections, as well as lectures, are mandatory.

Textbooks: Stewart, "Single Variable Calculus", edition: Early Transcendentals for UC Berkeley, 2008, Cengage Learning. This is a special version of the textbook, prepared exclusively for the UCB Math Dept – check the UCB bookstore for its availability. The correct edition is essential for getting the correct homework assignment and class material.

Homework: HW will be posted on the web every week. If you miss lecture,

- **do NOT e-mail instructor or GSI to ask for missed handouts and announcements.**

Instead, ask your classmates. HWs will not be graded or collected but must be done by the following Wednesday. Homework solutions will be posted on the web a day before the quiz. Do **not** ask for solutions to be posted earlier: you must attempt to do your homework without help from posted solutions.

Quizzes: There will be approximately 12 quizzes in the discussion sections, usually given on Wednesdays. The lowest two quiz scores will be dropped when determining a student's final grade.

• **If you miss discussion sections when a quiz is taken, you cannot retake the quiz in other section, and your quiz score will be 0.**

Thus, when you miss discussion sections (for whatever reasons, including being sick or having a family emergency), keep in mind that only **two** quiz scores will be dropped, and **no further quiz scores will be dropped** regardless of your reasons. **No** exceptions will be made to this policy: please, do not bring to me or to your TA notes to be excused from quizzes. The quizzes will be based on the current or previous homework assignments.

- **For a student joining the course late: no quiz scores will be dropped.**

All quizzes from the time when the student joins the class will be counted towards the final grade. Thus, do **not** ask for exceptions to this policy.

Exams: There will be

- two in-class midterm exams on **Tue, February 17** and **Thur, April 2, 3:30-5:00pm**.
- a final exam on **Thursday, May 21, 12:30-3:30pm**.
- **no make-up midterms or final exams.**

Every student must take the midterms and the final exam on these dates and at these times: **no** exceptions. Do **not** buy tickets to leave before or to come after an exam: you must be here at the 3 exams dates above.

• **Do not take this class if you have conflicts with any of this exam schedule. Do not ask for earlier dates for the final due to flight reservations or other reasons: the final exams times are assigned campus-wide and there will be no personal exceptions.**

A substantial portion of the exams will be **based on homework assignments**.

• **Exams are not comprehensive.** The topics for each exam will be based on the portion of the course between exams. Yet you cannot forget previous material since parts of it may come up in the solutions.

Grading: Grades are computed by taking 15% quizzes, 25% each midterm, 35% final. The letter grades will be based on a curve. Please, consult the bonus credit appendix for more information and specific examples.

If you miss one of the midterms due to a *documented reason*, the following adjustment will be made in calculating your grade: 15% quizzes, 35% other midterm, 50% final. A *documented reason* means an official document on letterhead, dated and with appropriate signatures; such documents must be

- **submitted within a week of the missed midterm,**

or else they will not be accepted and you will receive 0 points on the missed midterm. If you miss one of the midterms due to a *undocumented reason*, your final grade will be computed as: 15% quizzes, 0% the missed midterm, 25% the other midterm, 35% final. Note that a conflict with other exams, classes or activities will not be considered a reasonable excuse for missing a midterm.

• **Missing both midterms, or missing the final exam, will result in automatic failure of the course,**

unless valid reasons are provided for requesting an incomplete grade. Please, consult the university policies regarding incomplete grades. Note that incomplete "I" grades are almost never given. The only justification for an I grade is a

- **documented serious medical problem or a genuine personal/family emergency.**

Falling behind in this course or problems with work load in other courses are not acceptable reasons.

Special Arrangements: If you are a student with a disability registered by the Disabled Student Services (DSS) on UCB campus, and if you require special arrangements during exams, you must provide me with the DSS document and you must contact me via e-mail or in office hours at least

- **10 days prior to each exam,**

explaining your circumstances and what special arrangements need to be done. If you do not contact me 10 days in advance, you will have to take the exam along with everyone else and under the regular conditions provided for the class. Please,

• **Do NOT ask to be given special accommodations, promising that in the future you will provide a DSS note: the note must be provided 10 days prior to the exam.**

Please, observe this policy: no exceptions will be made.

Reading Assignments: It is the students' responsibility to read carefully and thoroughly the assigned section(s) from the textbook and review their class notes after each class.

Bonus Work: Exams will consist of regular problems and bonus problems. Bonus problems are **not** substitutes for regular problems; they are usually harder and designed to provide extra challenge. Your final grade will be calculated via the above formulas using only your "regular" scores. After that, all the bonus credit from exams will be added up separately. Depending on what portion of the total bonus credit you have, and on my estimate of the difficulty of the overall assigned bonus work, your final grade may go up a step. However, I reserve the right to be the sole judge of how much (if at all) any bonus work can boost one's grade. Please,

• **don't make a big issue of bonus problems: there are only 3-4 bonus exam problems throughout the whole semester.**

Your midterm letter grades will be first determined based on your regular problems, and then I will decide if any bonus credit is enough to increase your letter grade. The important thing to remember is that the midterm letter grades will disappear once I start calculating your final score, and that bonus credit can never decrease your grade!

• **I shall not discuss bonus credit policy or grading policy with students throughout the semester. Please, do not ask me in the middle of the semester if and how much your bonus problem(s) will increase your final grade: I will not know the answer to this question until after the final exam when the grades are computed.**

Thus, please, consult carefully the appendix for more detailed information on grading.

• **Drop Deadline:** The results of the first midterm will likely be known **after** the drop deadline. The GSIs will inform those students that are failing the course based on their first (approximately) 4 quizzes. If you do not receive your first midterm letter grade by the drop deadline, no other grade information will be available up to that point. So don't e-mail me asking me if I think you are more likely to get, say, B- instead of C+: I will not know. Thus, the decision to drop the course will be entirely yours and you will have to make it based on your first several quizzes before the drop deadline. If you are not happy with this arrangement, you should **not** take this course.

Questions: Please, refer to the following list for contact when you have questions regarding the course. Contacting the wrong people will simply result in redirecting you to the appropriate contact person, and thus, will waste your and our time. TAs are instructed **not** to answer any questions outside of their realm of expertise as listed below.

• **The professor will not answer any math or grading policy questions on e-mail: professor's e-mail is only for emergencies.**

• **Administrative questions which are addressed in this handout or answered in lectures or sessions will not be answered on e-mail or otherwise. For any missed information: ask your classmates. For final exam room and time assignment: check the UCB final exam scheduling on the web; do not send e-mail to professor or TAs.**

#	Type of Questions	Person to Ask	When and How
1	enrollment and section placement	Barbara Peavy	office hours
2	quiz and exam scores	the student's GSI	office hours
3	missed handouts and announcements	classmates	
4	other administrative questions (not addressed in this handout or in lecture)	professor	office hours
5	math questions	GSIs, professor	sections, office hours
6	emergencies only	professor	office hours, e-mail, phone

#### GSIs Contact Information

#	Name	Office Hours	Office	E-mail
1	Sarah Iveson	M 11-12noon, Th 10-11am	Evans 743	siveson@math.berkeley.edu
2	Theo Johnson-Freyd	TTh 11-12noon	Evans 1058	theojf@math.berkeley.edu
3	Shenghao Sun	M 10-11am, W 9-10am	Evans 1004	shenghao@math.berkeley.edu
4	Andre Kornell	Tue 6-7pm, W 1:30-2:30pm	Evans 1020	kornell@math.berkeley.edu
5	Matthew Satriano	M 12:30-1:30pm, W 3-4pm	Evans 1004	satriano@math.berkeley.edu

#### Discussion Sections

#	DIS#	Time	Place	TA
53906	101	M W 0800 0900 A	0081 EVANS	Iveson, S
53912	103	M W 0900 1000 A	0087 EVANS	Iveson, S
53915	104	M W 1000 1100 A	B0051 HILDEBRAND	Kornell, A
53918	105	M W 1100 1200 P	B0051 HILDEBRAND	Kornell,A
53921	106	M W 1200 0100 P	B0051 HILDEBRAND	Sun, S
53927	108	M W 0100 0200 P	0004 EVANS	Sun, S
53930	109	M W 0400 0500 P	0004 EVANS	Satriano, M
53939	112	M W 0500 0600 P	0087 EVANS	Satriano, M
53941	PDP 113	M F 1100 0100 P W 1100 1200 P	0230C STEPHENS	Johnson-Freyd, T

## Tentative Plan of the Course<sup>12</sup>

1. Preview of Calculus. Functions and Graphs
2. Types of Functions and More on Graphs. Tangents to Graphs.
3. Limits and Limit Laws
4. Definition of Limit. Continuity
5. Continuity Laws. Infinite Limit Laws
6. Tangents and Derivatives
7. Derivative as a Function. Derivatives of Polynomials
8. Derivative of  $e^x$ . The Product and Quotient Rules
9. Derivatives of Trigonometric Functions. The Chain Rule
10. Applications of the Chain Rule. Implicit Differentiation
11. Applications of  $e$ . Higher Derivatives. Hyperbolic Functions
12. Linear Approximations and Differentials. Applications of Derivatives
13. Maximum and Minimum Values
14. Mean Value Theorem
15. Derivatives and Graphs
16. L'Hospital's Rule
17. Slant Asymptotes
18. Optimization Problems
19. Applications to Economics. Newton's Method
20. Antiderivatives
21. Areas
22. Definite Integrals
23. Fundamental Theorem of Calculus
24. Total Change Theorem
25. Substitution Rule
26. The Logarithm Defined as an Integral. Areas Between Curves
27. Volumes
28. More Applications
29. Review for Final Exam

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<sup>1</sup>*Note:* Particular topics may change without prior notice, depending on how the course proceeds. Hence, I shall **not** honor excuses such as "I tried to follow the syllabus, but different topics were covered in class, and that's why I wasn't prepared to do well on the quiz/exam this week." If a student misses class/discussion, it is the student's responsibility to find out from classmates what is currently covered in class/discussions and to stay on top of the material.

<sup>2</sup> In addition to the above schedule, there shall be two midterms and the final exam, whose dates are indicated earlier in this handout.

### Appendix on Bonus versus Regular Credit

The main points of the scoring (regular and bonus) are illustrated below via three hypothetical examples. 100r means "100 regular points", 20b means "20 bonus points". Student X, Y and Z receive the following scores:

Total	Midterm 1	Midterm 2	Final Exam	Quizzes
Student	100r, 20b	100r, 20b	140r, 27b	200r
Student X	85r, 8b	92r, 12b	128r, 2b	110r
Student Y	95r, 10b	95r, 19b	114r, 11b	123r
Student Z	90r, 14b	95r, 20b	134r, 22b	130r

To calculate final percentages, use the **weight formulas**

$$\frac{20(M1 + M2 + F) + 6Q}{80} \text{ for regular points, and } \frac{3(M1 + M2 + F)}{40} \text{ for bonus \%}.$$

Total	Regular%	Regular Grade	Bonus%	Adjusted %	Final Grade
Student	max 100%		max 5%	max 105%	
Student X	84.50%	B+	1.65%	86.15%	B+
Student Y	85.23%	B+	3.00%	88.23%	A-
Student Z	92.00%	A-	4.20%	96.20%	A

**Important points to remember:** All numbers above are made solely for the sake of this example.

- (1) The "weight formulas" are made under the assumption that the maximal total scores for the exams and quizzes are as shown in the second row of the table. These totals may change somewhat during this particular course; hence you can imagine that there will be a different weight formula reflecting again the relative weight of 25% each midterm, 35% final exam and 15% quizzes.
- (2) The "regular grades" in the table above are determined solely on the regular scores, according to the following **hypothetical** cut-off points: • A: above 94%; • A-: above 88%; • B+: above 83%, and so on. The cut-off points for this course will most probably be different, and they will be determined solely by me at the end of the semester.
- (3) The bonus total is set for 5% in the example, and is subject to change depending on my estimate of the overall difficulty of the bonus exercises.
- (4) The final grades are computed first based **solely** on the regular points. Only then the bonus adjustment is made, and whoever gets into the next grade range receives a grade bump. For example, student X did not have sufficient bonus work to make the bracket for A-, so no raise here; on the other hand, students Y and Z got bumps in their final grades since they entered the next grade brackets with their bonus work.
- (5) On the actual grading for this class, a bump of more than one step on account of bonus will not be allowed, e.g. B to A- will not be possible, but B+ to A- will be possible.
- (6) Note that one can actually end up with more than 100% total, which will result in one simple A+. Finally, **one can earn 100% without doing any bonus problems.**

The reason for the above *unconventional* grading system is two-fold: To give a chance to medium and poor students to be able to get the best grade they can get without feeling any extra pressure to do harder problems; and to give an incentive to more advanced students to do harder problems and challenge themselves to the level of their own ability.

The *traditional* bonus systems do in effect one of two things: either equalize very hard with not so hard problems (by giving students a choice of, say, 5 out of 7 problems on the exams), or force weaker students to sweat over very hard problems (by adding up all scores on exams). However, I want to be fair to all groups of students as much as possible. If one really wants to be fair to everyone, a more complicated system has to be designed, and the one described above is the best system I can think of in terms of fairness to everyone.

**Remember that I and the TAs will not discuss any grading or bonus policies during the semester. You are smart students - you can answer all your questions regarding grading policies from the examples above.**