

Calculus 1A: Student Handout. Revised 1/18/04

Spring 2004, TT 8:00am - 9:30pm, Room 2050 Valley LSB

Instructor: Professor Zvezdelina Stankova

Office: Evans 713, *Tel:* (510) 642-3768, *Office hours:* TT 9:40-11:10am

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Head TA: Michael West, *Office:* 1045 Evans, *E-mail:* west@math.berkeley.edu

Regular office hours: Tu, F 12:30-2pm.

Extra office hours for first two weeks of classes: M 12-2pm, W 10am-1pm, Thur 10am-12pm.

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

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

Textbooks: Stewart, "Calculus: Early Transcendentals", Brooks/Cole, 5th edition, 2003, or its abbreviated version sold through UCB bookstores and containing only materials for Calculus 1A and 1B.

Homework: See the list of weekly Homework assignments below. HWs will not be graded or collected, but will be due on Wednesdays. Homework solutions will be distributed in discussion sessions on Mondays.

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 sessions (for whatever reasons, including being sick or having a family emergency), keep in mind that only **two** quiz scores will be dropped. **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 assignment.

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 **February 26, 8:00-9:30am**, and **April 8, 8:00-9:30am**; and a final exam on **May 22, Saturday, 8-11am**. There will be **no make-up midterms or final exams**. Every student must take the midterms and the final exam on these dates and at these times. There will be **no** exceptions. **Do not take this class if you have conflicts with any of this exam schedule.** A substantial portion of the exams will be based on homework assignments.

Grading: Grades are computed by taking 15% quizzes, 25% each midterm, 35% final. The final letter grades will **not** be based on a "curve", but on a score percentage cut-off scale, to be determined by me at the end of the semester. 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, 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. In past experience, about 25% of my students have benefitted from this bonus policy by completing a considerable part of the bonus work. However, I reserve the right to be the sole judge of how much (if at all) any bonus work can boost one's grade.

This raises a subtle point with the *midterm* letter grades, as midterms involve both regular and bonus problems. Again, I will first determine your letter grade 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. Thus, please, consult carefully the appendix for more detailed information on grading.**

Tentative Plan of the Course¹

1. Jan 20 Preview of Calculus. Functions and Graphs
2. Jan 22 Types of Functions and More on Graphs. Tangents to Graphs.
3. Jan 27 Limits and Limit Laws
4. Jan 29 Definition of Limit. Continuity
5. Feb 3 Continuity Laws. Infinite Limit Laws
6. Feb 5 Tangents and Derivatives
7. Feb 10 Derivative as a Function. Derivatives of Polynomials
8. Feb 12 Derivative of e^x . The Product and Quotient Rules
9. Feb 17 Derivatives of Trigonometric Functions. The Chain Rule
10. Feb 19 Applications of the Chain Rule. Implicit Differentiation
11. Feb 24 Applications of e . Higher Derivatives. Hyperbolic Functions
12. Feb 26 Midterm I
13. Mar 2 Linear Approximations and Differentials. Applications of Derivatives
14. Mar 4 Maximum and Minimum Values
15. Mar 9 Mean Value Theorem
16. Mar 11 Derivatives and Graphs
17. Mar 16 L'Hospital's Rule
18. Mar 18 Slant Asymptotes
19. Mar 30 Optimization Problems
20. Apr 1 Applications to Economics. Newton's Method
21. Apr 6 Antiderivatives
22. Apr 8 Midterm II
23. Apr 13 Areas
24. Apr 15 Definite Integrals
25. Apr 20 Fundamental Theorem of Calculus
26. Apr 22 Total Change Theorem
27. Apr 27 Substitution Rule
28. Apr 29 The Logarithm Defined as an Integral. Areas Between Curves
29. May 4 Volumes
30. May 6 More Applications
31. May 11 Review for Final Exam

¹Note: Particular topics and dates 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.

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 either.

#	Type of Questions	Person to Ask	When and How
1	enrollment and section placement	Head TA	office hours, e-mail
2	quiz and exam scores, missed handouts	the student's TA	office hours
3	other administrative questions (not addressed in this handout)	professor	office hours
4	math questions	TAs, professor	discussion sessions, office hours
5	emergencies only	professor	office hours, e-mail, phone

TAs Contact Information

#	Name	Office Hours	Office	E-mail
1	Arun Sharma	M,F 9-10, W 1-2	836 Evans	asharma@math.berkeley.edu
2	Meghan Anderson	M,W 10-11:30	855 Evans	manders@math.berkeley.edu
3	Jeff Brown	M,W 10:30-12:00	1062 Evans	jbrown@math.berkeley.edu
4	John Voight	Tu,W 2-3:30	853 Evans	jvoight@math.berkeley.edu
5	Michael West	Tu,F 12:30-2	1045 Evans	west@math.berkeley.edu
6	Dragos Ghioca(PDP)	MW 3-4 (230C Stephens), F 10-11 (845 Evans)	845 Evans	dghioca@math.berkeley.edu

Discussion Sections

#	#	Time	Place	TA
54306	101	MWF 8 - 9am	187 Dwinelle	M. Anderson
54309	102	MWF 8 - 9am	258 Dwinelle	A. Sharma
54312	103	MWF 9 - 10am	187 Dwinelle	M. Anderson
54315	104	MWF 10 - 11am	2 Evans	J. Voight
54318	105	MWF 11 - 12pm	2 Evans	J. Voight
54321	106	MWF 12 - 1pm	156 Dwinelle	J. Brown
54324	107	MWF 1 - 2pm	183 Dwinelle	J. Brown
54327	108	MWF 2 - 3pm	105 Dwinelle	A. Sharma
54336	111	MWF 3 - 4pm	247 Cory	M. West, Head TA
54338 (PDP)	112	MW 1 - 3pm, F 11 - 12pm	230C Stephens	D. Ghioca

Homework Assignments

HW1. Due January 27. Read §1.1-1.3, §2.1-2.2. Solve and Write Problems:

§1.1: #2,10,14,18,26,28,38,42.

§1.2: #2,8,10,12,14,16,18.

§2.1: #2,4,6,8.

§2.2: #6,8,12,14,26,36(a)-(b).

HW2. Due February 3. Read §1.5-1.6, §2.2-2.5. Solve and Write Problems:

§2.3: #2,4,14,20,26,28,32(b)(c),42,48.

§2.4: #2,4,6,12,13,16,24.

§2.5: #4,6,38,42,43.

HW3. Due February 10. Read §2.5-2.8. Solve and Write Problems:

§2.5: #44,46,48,52(a),54(a).

§2.6: #4,6,12,16,18,26,52,60.

§2.7: #2,6(a)(i),6(b),10,12.

§2.8: #4,6,8,10(a),18,22.

HW4. Due February 17. Read §2.9, §3.1-3.2, skim §3.3. Solve and Write Problems:

§2.9: #2,4,6,8,12,28,30,38; Review, pp.178: #38,46.

§3.1: #12,16,22,24,30,42,46,56.

§3.2: #2,4,6,12,20,32,42.

HW5. Due February 24. Read §3.4-3.6, §3.8-3.9. Solve and Write Problems:

§3.4: #2,10,16,22,30.

§3.5: #2,4,8,10,20,22,34,46,52*,58.

§3.6: #6,10,18,22*,26,30,48,50.

§3.8: #4,6,12,14,32,40,44.

HW6. Due March 2. Read §3.5-3.9. Solve and Write Problems:

§3.5: #38,42,48(a):

§3.6: #29,35,42,44.

§3.7: #2,4,8,16,24,34,40,48.

§3.8: #28,46,47.

§3.9: #30, 32, 40*.

HW7. Due March 9. Read §3.11, §4.1. Solve and Write Problems:

§3.11: #4,8,10,18,22,26,36.

Problems Plus for Chapter 3, p.275: #2,12,14.

§4.1: #4,6,10,14,18,20,22,24,26,32,36,38,40,46.

HW8. Due March 16. Read §4.2-4.3. Solve and Write Problems:

§4.2: #2,4,6,8,10,12,14,16,18,19,21(a),24,30,31,32.

§4.3: #2,6,8,12,14,20,22,32,34,38,42.

HW9. Due March 30. Read §4.4-4.5. Solve and Write Problems:

§4.4: #6,10,12,18,22,24,26,28,30,32,40,36,42,44,46,48,50,56.

§4.5: #10,12,14,30,60,62,64.

HW10. Due April 6. Read §4.7-4.9. Solve and Write Problems:

§4.7: #2,4,6,8,10,12,16,18,22.

§4.8: #2,4,6,8,10,12,14,16,18,20.

§4.9: #2,4,6,12,14,36.

HW11. Due April 13. Read §4.10. Solve and Write Problems:

§4.10: #4,8,10,12,16,18,22,28,32,34,40,42,44,46,48,62,68,74,76,78.

HW12. Due April 20. Read §5.1-5.2, Appendix E(p.A38). Solve and Write Problems:

App. E: #6,10,16,22,30,36.

§5.1: #2,4,18,20,22.

§5.2: #2,6,8,12,18,20,34,38,40,47,48,52,54,62.

HW13. Due April 27. Read §5.3-5.4. Solve and Write Problems:

§5.3: #4,8,10,16,22,26,30,32,40,42,50,52,62,66.

§5.4: #2,4,22,28,38,40,44,48,54,56,58.

HW14. Due May 4. Read §5.5-5.6, §6.1. Solve and Write Problems:

§5.5: #2,4,6,8,12,14,18,24,28,32,38,42,52,56,58,64.

§5.6: #2,4.

§6.1: #2,4,10,14,16,24,45.

HW15. Due May 11. Read §6.2, §6.5. Solve and Write Problems:

§6.2: #2,4,10,12,14,16,18,32,34,36,40,44,48,49,54,56.

§6.5: #2,4,5,6,8,10,14,18,19.

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%	<i>B+</i>	1.65%	86.15%	<i>B+</i>
Student Y	85.23%	<i>B+</i>	3.00%	88.23%	<i>A-</i>
Student Z	92.00%	<i>A-</i>	4.20%	96.20%	<i>A</i>

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.
- 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.