MATH 1B SECTION 3 SUMMER 2019

Instructor: **Dr. Zack Judson**

Email: judsonzack@deanza.edu (Note: I will not answer Math questions over email)

Prerequisite: Math 1A or an equivalent course

Required Materials

1) "Calculus Early Transcendentals, 8th Edition" by James Stewart
2) Calculator: TI83/84 graphing calculator or similar
   TI89 or any calculator with a CAS will not be allowed.
   Calculators will be required on about half of the tests and quizzes.

Accomodations

Those of you who need additional accommodations, due to disability, campus-related activities, or some other reason, please meet with me during the first week of class to discuss your options.

Grade

Your grade will be computed using the following grade distribution.

10%	Labs	15%	Quizzes
5%	Discussion	40%	Midterms (4)
		30%	Final

Grading Scale

Due to the complexity of the material the grading scale we will use is as follows

$A: 90-100$	$B+: 80-84$	$C+: 67-69$	$D: 50-59$	$F: 0-49$
$A-: 85-89$	$B: 75-79$	$C: 60-66$		
	$B-: 70-74$			

Exams

Four exams will be given, each worth 10% of your total grades. There will be no late, early, or make-up exams. If an exam is missed under extreme circumstances and for a very valid reason, an equivalent of the final score will replace the missing exam score. If such extreme circumstances occur it is the students responsibility to inform me immediately and provide documentation of the circumstances.

Final Exam

A two-hour comprehensive final exam will be given on the final day of class.

Quizzes

There will be two types of quizzes given throughout the quarter. The first quiz will be a prerequisite quiz which covers many of the things that you are supposed to know in order to be in this course and which will be used throughout this quarter. You will be given one hour for the prerequisite quiz, but you will not be allowed to use a calculator. Once or twice a week, following the attached schedule, we will have community quizzes. These quizzes will be 15 to 20 minutes long, but after the first ten minutes you may work with anyone and everyone in the class to complete your quiz. Each community quiz will be scored out of 20 points. The lowest quiz score will be dropped. There will be no make-ups for missed quizzes.

Tentative Schedule
Math 1B Summer Quarter 2019

	Monday	Tuesday	Wednesday	Thursday
July	Ch. 5.1 Prerequisite Quiz 1	Ch. 5.2 Lab 1 2	Community Quiz Ch. 7.7 3	Fourth of July 4
July	Community Quiz Lab 2 (Lab 1 due) 8 Ch. 6.1	Ch. 6.2 Discussion 9	Midterm 1 Ch. 6.4 10	Community Quiz Discussion 11 Ch. 6.4
July	Ch. 8.1 and 8.2 Lab 3 (Lab 2 due) 15	Community Quiz Discussion 16 Ch. 6.5	Ch. 4.9 and 5.3 17	Midterm 2 Lab 4 18
July	Ch. 5.3 and 5.4 (Lab 3 due) 22	Community Quiz Ch. 5.5 and 7.1 23	Discussion Ch. 7.2 and 7.3 24	Community Quiz Discussion Lab 5 (Lab 4 due) 25 Ch. 7.4
July/ August	Discussion Ch. 7.8 29	Midterm 3 Discussion 30	Community Quiz Ch. 9.1, 9.2 Lab 6 (Lab 5 due) 31	Discussion Ch. 9.3 1
August	Community Quiz Discussion 5 Ch. 8.5	Discussion Midterm 4 6	Reading Day (Lab 6 due) 7	Final 8

Discussion

The only way to learn math is to practice math. For this reason, we will have several discussions scheduled throughout the course. These discussions will provide you the opportunity to work in groups on additional problems. Discussions will be sent out the day before they take place in class. Before coming to class, read each problem and think about the steps you might follow to try to understand it. DO NOT SOLVE. Instead, do one or more of the following: draw a picture to illustrate the scenario; write some sentences about your approach; write a formula that might be needed to understand or set up the problem. On the day of the discussion I will review your preparation work and then you will work on the whiteboards with your classmates to solve the problems. You will be given points both for your individual preparation and for working together to solve the problems.

LABS

A half dozen times throughout the summer we will have lab assignments. The intentions behind lab assignments is to encourage students to think more deeply about the material. There will be some initial time allotted to these lab assignments during class, but you will need to work on them outside of class to complete them. No late lab assignments will be accepted. Your lowest lab score will be dropped.

Lab Grading Policies

Nobody makes it into a second quarter Calculus class without being exceptionally bright. For this reason, you may at some time in the past, have decided that it is easier to work alone than to work with others. This is unfortunate for two reasons:

> 1) The further you go in Math (or any other discipline) the more difficult the material becomes. If you go far enough, no matter how smart you are, you will reach a point that you cannot proceed without help.
>
> 2) Presumably the end result of your education will be to obtain a job that you enjoy and that will maintain you in a style in which you enjoy. Almost certainly this job will require you to work with others.

The labs we will cover in this class serve two purposes, they allow us to dig deeper into the fertile soil of the Calculus and they provide us the opportunity to develop our co-operative skills. Most of you, at some point after you transfer will take a class where a single group project might be worth as much as one of your midterms. It can be difficult to rely on others for such a large part of your grade. To ease you into these dynamics, your labs represent a relatively small part of your grade, each lab accounting for about 2%. Part of your grade for each of these labs will depend on the other members of your group.

General Grading: Lab reports should be stapled in the left-hand corner and both your name and your team name must be on the report. Each lab member is required to turn in their own lab report. Failure to turn in a lab report will result in a 0 for that lab member. Labs are due as soon as you walk into class on the day they are due. As I grade each section of the lab, I will randomly select different lab reports to assess. Every member of the lab group will receive the same score for a particular section as the one member whose report I assessed for that section. It is in your best interest to meet with your group outside of class time to make sure that everyone understands and agrees upon conclusions.

Group Size: Groups must consist of three or four people. Groups must be declared on the day a lab is introduced. After the first lab you will have the opportunity to choose your own groups provided that everyone who is present on time on a lab day has the opportunity to join a group with at least 3 members. If this is not the case, I reserve the right to reform groups as needed. You may change lab groups with each lab, but you are not required to do so. If you are not there on a lab day, you may still do the lab as a group of 1, but you will be subject to a 20% penalty. You may, of course, make arrangements with other members of the class to declare yourself as part of their group on the day groups are declared.

Incompletes: To avoid groups being penalized for a member who does not complete certain sections you will need to indicate whenever your lab is incomplete. You MUST write Incomplete at the top of the front page of your lab and indicate which sections you did not do. Your lab will only be graded out of the sections you completed. Failure to do this may result in a score of 0 for the individual who has an incomplete lab.

HOMEWORK

Due to the rapid nature of summer school, no homework for this course will be collected. Below you will find a list of recommended problems, mostly from the text, but also a few that I have written. These are the same problems that would be assigned during a normal quarter. Students are advised to think of these as minimal problem sets: i.e. every student should at least work these problems, but the successful student will work many more additional problems to ensure that they have a full command of the material. Exams and quizzes will be written with the belief that students will have completed all of the relevant homework questions prior to the assessment.

Section 5.1 1, 2, 8, 13, 21, 22, 24, 25
Section 5.2 6, 17, 18, 21, 22, 33, 34, 40, 62, 63

Additional Problems

Write each of the following limits in definite integral notation.

$a)$ $\lim_{n\to\infty}\sum_{k=1}^{n}\frac{1}{n}\sqrt{1-\frac{k^2}{n^2}}$ $b)$ $\lim_{n\to\infty}\sum_{k=1}^{n}\frac{\pi}{n}\sin\left(\frac{(2k-1)\pi}{2n}\right)$

Section 7.7 1, 2, 7, 10, 14, 19, 21c, 22, 29, 31, 32
Section 6.1 1, 4, 5, 6, 9, 12, 15, 16, 18
Section 6.2 1, 4, 6, 7, 9, 11, 14, 31, 32, 33, 45, 53, 55, 56, 57, 58, 59

Additional Problems

Use an integral to find the volumes of each of the described solids.

$a)$ A pyramid with a height of 30 feet and a rectangular base that measures 10 feet by 20 feet.

$b)$ A pyramid whose base and all of its faces are equilateral triangles whose edges all measure 7 meters.

$c)$ A frustrum of a pyramid with a square base of side 12 inches, a square top of side 6 inches, and a height of 8 inches. (The frustrum of a pyramid is like a pyramid whose top has been cut off.)

Section 6.4 3, 6

For the following problems Do NOT approximate with Riemann sums. Instead find the force applied to the object as a function of the objects position and use that to compute the work.

Section 6.4 13, 15, 16, 17, 18, 19

For the following problem you MUST approximate the required work using Riemann sums. Then take the limit to compute the work.

Section 6.4 20, 23, 24, 25, 26, 34

Section 8.1 1, 2, 3, 4, 5, 6, 7, 8, 24, 26
Section 8.2 1, 2, 3, 4, 5, 6, 13, 16, 20, 30
Section 6.5 9, 10, 15, 16, 17, 19
Section 5.3 2, 3, 4, 11, 14, 18, 29, 32, 38, 44, 58, 59, 62, 64, 65, 68, 69, 74, 82

Additional Problems

$a)$ Prove the Mean Value Theorem for Integrals (see Section 6.5) by applying the Mean Value Theorem for derivatives (see Section 4.2) to the function

$$F(x) = \int_a^x f(t)dt$$

Section 5.5 37, 40, 48, 67, 69, 73
Section 7.1 7, 11, 15, 17, 37, 40, 42
Section 7.2 3, 11, 14, 20, 30, 40

Additional Problems

$a)$ Evaluate the integral $\int \sin x \sin 2x \sin 3x \, dx.$

Section 7.3 4, 8, 10, 14, 21, 23, 24, 27, 29, 30
Section 7.4 9, 12, 16, 17, 19, 23, 40, 45, 47, 51
Section 7.8 2, 8, 10, 11, 13, 18, 19, 21, 23, 24, 26, 29, 30, 31, 36, 40, 55, 57, 58, 61
Section 9.2 1, 3, 4, 5, 6, 19, 21, 22, 23, 24
Section 9.3 1, 6, 9, 12, 13, 17, 19, 20, 21, 22
Section 8.5 3, 4, 5, 6, 8, 10, 11, 20

Additional Problems:

a) Randomly select a point on the triangular region whose vertices are $(0, 0)$, $(0, 40)$ and $(100, 0)$. Let the continuous random variable X denote the x-coordinate of the point. Find the cumulative distribution function, the probability density function, and the mean for this random variable.

b) The Beta Density function is defined on the interval $[0, 1]$ by

$$f(x) = (\beta + 1)(\beta + 2)x^{\beta}(1 - x).$$

where β is positive. Verify that the Beta Density function is in fact a probability density function and then find the associated mean.

Student Learning Outcome(s):

*Analyze the definite integral from a graphical, numerical, analytical, and verbal approach, using correct notation and mathematical precision.
*Formulate and use the Fundamental Theorem of Calculus.
*Apply the definite integral in solving problems in analytical geometry and the sciences.