Math 120 (Section 1) : Calculus 2 $\qquad$ Spring 2014

SYLLABUS $\hfill$

Prof. Ron Buckmire

Where and When: Fowler 309 at 10^{40} am-11^{35} am

Texts: *Single Variable Essential Calculus (Early Transcedentals)* by James Stewart (2nd Edition)

Instructor:

Ron Buckmire: Office Hours: MWF 1^{30} pm-2^{30} pm, Fowler 313

$\qquad\qquad\qquad$ MWF 4^{00} pm-5^{00} pm, Fowler 313

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Appointments:

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Important Course Information:

Course Description: This course is centered around the key concepts in the Integral Calculus. While *Calculus 1* is centered around derivatives, the instantaneous change of functions of one variable, *Calculus 2* examines the anti-derivatives and computing definite integrals of functions of one variable. We begin by examining integration and the Fundamental Theorem of Calculus. We spend some time practicing techniques for evaluation and approximation of definite integrals, and then examine applications of integrals in various contexts. We then grapple with the concept of infinity in multiple ways when we discuss sequences, series and Taylor polynomials. The class is divided into three units, with each unit concluded with an exam.

Unit 1: Introduction to the Integral Calculus

Unit 2: Applications of Integration

Unit 3: Sequences and Series

Course Learning Objectives: The student learning objectives of this course are listed below. By the end of the course, students in Math 120 should be able to do the following.

To find antiderivatives of a broad class of functions

To compute definite integrals numerically and analytically

To use integrals to compute areas, arc-lengths, volumes and other quantities of scientific interest

To check whether a given infinite series converges or diverges

To expand functions of a single variable into their Taylor series

Student Learning Outcomes: The Math Department student learning outcomes for Math 120 are listed below.

Outcome 1.1 : Students will solve fundamental problems in single- and multi-variable Calculus

Outcome 1.4 : Students will utilize appropriate technology to illustrate basic mathematical knowledge, to graph functions, and to approximate.

Outcome 2.2 : Students will learn and communicate mathematics to each other in a collaborative group setting.

Homework: Homework is important. You should work on homework in groups of two, three (or sometimes four) students. Homework will be assigned daily but collected weekly. You should try to complete the questions on your own and then compare your results with your teammates. You will hand in individual homework solutions. These solutions will be evaluated and returned. **No late homework solutions will be accepted.** If homework is missed due to illness or emergency it will not be graded but it also will not be counted in determining your final course grade. **Forgetting to turn in homework does not count as an emergency or illness!**

Quizzes: During the semester, there will be approximately ten (10) in-class quizzes. Work on quizzes are subject to the same rules as exams. To do well on quizzes you will need to do the homework. Quiz questions will be similar (sometimes identical) to homework questions and former exam questions. Quiz solutions will be available on the course website.

Labs: Labs are not optional. Labs are an opportunity to explore the concepts in the class in more depth with your peers and professors in a smaller group setting. Labs are intended to support the large group setting by allowing easier access to technology, collaborative learning and peer instruction. Attendance at labs will be taken as a measure of class participation and in-class exams (and, possibly, some quizzes) will occur during lab periods. You must be registered in a lab section which is taught by the same professor as your main class. In this case, Labs Section 8 (R 1:30pm) and Section 9 (R 3:00pm) are connected with Math 120 Section 1 (MWF 10:40am).

In-Class Exams: There will be **three** in-class exams. Exams will be given in lab on **Thursday February** 13th**, Thursday March** 20th **and Thursday April** 17nd. If you can not take an exam you must inform the instructor **before** the scheduled exam time, by email, by phone or in person. Make-up exams will only be scheduled in exceptional cases. Failure to make prior arrangements with the professor will result in no credit for the missed exam.

Final Exam: Friday May 9th **(6:30-9:30pm)**. The final exam time is scheduled well in advance in order to assist students in making their travel arrangements. The rules of Occidental College will not recognize travel plans as an excuse to move a final exam time. All students in the class are expected to take the final exam.

Gateway Exams: There will be (2) **two REQUIRED Gateway Exams** this semester. Failure to pass a Gateway Exam by the announced deadline will result in lowering your final course grade by 2.5 percentage points. See the webpage on the Gateway exams for more details about the particular Gateway Exams you must pass and the schedule for Gateway Workshops this spring. NOTE: You can also use Gateway

Exams to increase your final course grade by 1 percentage point each by passing BONUS gateway exams on FUNCTIONS and LIMITS by the end of the semester (April 30).

Calculator Use: A scientific calculator will most likely be needed in this class. If you already have one, it will suffice. Calculators will NOT be allowed on Exams.

Course Policies: You are expected to know and follow the policies below.

Honest Academic Work: Shared commitment to ethical principles is essential to the educational purposes and fairness of the academic enterprise. Occidental College assumes that students and faculty will embrace a high ethical standard for academic work. Fundamental to academic ethics is a spirit of honor. A spirit of honor thrives when students challenge each other to attain the highest levels of scholarship, civility, and responsibility. For more information, see `http://www.oxy.edu/student-handbook/academic-ethics/academic-ethics`

Classroom Conduct: Our primary goal in this classroom is to teach/learn/discuss/debate/enjoy/do calculus. This is best accomplished when we feel free to question and doubt, free to argue and exchange creative ideas. If one feels threatened or unwelcome, this becomes impossible. Therefore, the classroom should be a safe space. All are welcomed and encouraged to actively participate in the learning of calculus, regardless of gender, race, nationality, native language, sexuality, political ideology, and especially personal mathematical history. Any student who feels she or he is experiencing a hostile environment should contact me by electronic mail.

Special Note on Classroom Questions: There is no such thing as a stupid question. If you do not understand something said or written in class, do not hesitate to ask a question. If you do not understand the reply, ask another question. As a teacher, I make every effort to answer questions to the best of my ability, but both teacher and student should understand that they are viewing the same material from different sides of an experiential gulf. This can make it difficult for me to explain the answer to your question in words that you understand, and also makes it difficult for you to ask a question using words that I understand. Patience and individual attention can help in this communication process. Of course, you can (and should) come to office hours to have your questions answered, as well.

Special Note On Use Of Electronic Devices: I am aware that almost all of us carry around electronic devices (smartphones, laptops, tablet computers, etc). I am generally a strong believer in technology but I want to insure that the classroom environment is most conducive to learning for all students. Please turn all cellphones on silent while you are in class. If you use laptops or tablets do not distract other students or else I may revisit my policy of allowing their use in class.

Tardiness: There is no excuse for being late for lectures or labs. Entering late disrupts the flow of class and sends the message that you do not respect your fellow students or your professors. If you arrive late, enter quietly and deal with missed handouts after class. If you will be late on a regular basis, please come and share the reasons with us before we approach you.

Students With Disabilities: Occidental College complies with the Americans with Disabilities Act (1990), Section 504 of the Rehabilitation Act of 1973, and all other federal, state and local requirements regarding students with disabilities. Students who are registered with Disability Services are required to present their accommodation letters to the instructor at the beginning of each semester. Students should feel free to contact Disability Services at 323-259-2969 to learn more about available services and support.

Syllabus: The syllabus should be thought of as a learning contract between the professor and the students. The official version of the syllabus is on the course website.

Resources: Here are some resources I suggest you consult during the semester to improve your chances for success in the class.

Academic Mastery Program (AMP) http://www.oxy.edu/academic-mastery-program

Center for Academic Excellence (CAE) http://www.oxy.edu/center-academic-excellence

Grading: The table below explains how your final average in this course will be determined.

	Score		percent	
Homework		×	10%	=
Quizzes		×	15%	=
Exam # 1		×	15%	=
Exam # 2		×	15%	=
Exam # 3		×	15%	=
Participation		×	10%	=
Final Exam		×	20%	=
			Total:	

The grade scale below assumes that you have passed all of the gateway exams:

final average	< 60	60–67.5	67.5–70	70–72.5	72.5–77.5	77.5–80
letter grade	F	D	D+	C-	C	C+
final average	80–82.5	82.5–87.5	87.5–90	90-92.5	≥ 92.5	100
letter grade	B-	B	B+	A-	A	A(+)

Unfortunately, I am NOT allowed to enter A+ or D- in the final official course grade.

You are expected to keep track of your own quiz and lab averages. You should also keep all of your quizzes and labs. This way, discrepancies can be worked out easily. I will endeavor to upload grade information on Moodle.

Online Component: We have a class mailing list, to which all registered students in Math120 are subscribed. The addresses are `Math120sec1-L@oxy.edu`. You should use this mailing list to communicate with your colleagues in the class in a professional manner. In addition, we have a class website, available at `http://faculty.oxy.edu/ron/math/120/14/`. You can use the class website to review homework solutions, check on the course schedule and give feedback to professors on the course.

Math 120 Spring 2014
Gateways Exams – Information Sheet

The gateways are short diagnostics which will measure your abilities in certain fundamental skills. There are four areas to be covered this semester, two review topics and two new topics. You must eventually show 90% proficiency in each. The topics are described below. We consider the skills in the gateways to be fundamental to your proficiency in mathematics and science. That is why we have separated these diagnostics out from the other evaluation tools in this class.

You will be given the first version of all the gateways in class. We will announce an upcoming gateway exam ahead of time, so you can prepare for it. If you achieve 90% proficiency on any gateway, you will pass that gateway. Those of you who don't achieve 90% proficiency will need to retake the exam at the Gateway Workshops until you achieve 90% proficiency. Your final semester grade will be adjusted for each gateway passed. You **lose 2.5 percentage points** for every required gateway you do not pass by the deadline and **gain one percentage point** for each bonus gateway exam you pass by the end of the semester. These changes are to your final semester grade.

The Gateway Workshops will be offered at various times during the week. Students attending the workshop will be given a new version of the gateway exam. If you score 90 or better, you may leave. If you score below 90, you will remain and work with the gateway faculty coordinator or one of the student assistants on a worksheet designed to help you learn the skills you need to pass the exam. The schedule for the Gateway Workshops will be announced in the next two weeks.

You should also take advantage of the assistance of classmates, the Center for Academic Excellence or your professors. We expect all students to progress through all required gateways this semester. It is imperative that you get started as soon as possible and keep up the pace throughout the semester.

Gateway 1 – Derivatives Review:

1. Know the derivatives of elementary functions, e.g. x^n, $\sin(x)$, $\cos(x)$, a^x and $\ln(x)$, etc.

2. Know the rules of differentiation (product, quotient and chain) and be able to use use them individually and in combination.

3. Know the limit definition of the derivative

NOTE: You Must Pass The Derivatives Gateways Before Spring Break Begins on March 8 or Lose 2.5 percentage points on Final Course Grade.

Gateway 2 – Integrals:

1. Know the antiderivatives of elementary functions, e.g. x^n, $\sin(x)$, $\cos(x)$, a^x and $\ln(x)$, etc.

2. Know the methods of anti-differentiation (u-substitution and trigonometric substitutions, partial fractions and integration by parts) and be able to use use them individually and in combination.

   BONUS GATEWAYS: Worth +1 percentage point (each) on final course grade if passed by April 30, 2014.

Gateway 3 – Functions

Gateway 4 – Limits/Sequences/Series