

## SYLLABUS

Ron Buckmire

**Schedule***Class Meetings:*

Section 1 Fowler 302, Mon Wed Fri 1<sup>30</sup> pm–2<sup>25</sup> pm  
 Section 2 Fowler 302, Mon Wed Fri 2<sup>30</sup> pm–3<sup>25</sup> pm

*Lab Sessions:*

Section 1 Fowler 307, Thu 8<sup>30</sup> am–9<sup>55</sup> am  
 Section 2 Fowler 307, Thu 10<sup>00</sup> am–11<sup>25</sup> am  
 Section 3 Fowler 113, Thu 1<sup>30</sup> pm–2<sup>55</sup> pm  
 Section 4 Fowler 113, Thu 3<sup>00</sup> pm–4<sup>25</sup> pm

**T**exts: *Calculus (Early Transcendentals / Single Variable)* by Anton, Bivens, Davis (8th Edition)  
*Calculus* by Hughes-Hallett (excerpts, provided in class)

**I**nstructor: Ron Buckmire

<http://faculty.oxy.edu/ron>

Office Hours:

MWF 3<sup>30</sup> pm–5<sup>00</sup> pm, Fowler 313

T 3<sup>00</sup> pm–4<sup>00</sup> pm, Fowler 313

Phone: x2536

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**C**ourse Website: <http://faculty.oxy.edu/ron/math/110/07/>

**Important Course Information:**

**C**ourse Description and Objectives: Models in the natural and social sciences often take the form of a system of differential equations. We approach the study of calculus by examining how these models are constructed and used for analysis. The mathematical theme running throughout the course is that of local linearity and error estimation. *This course will help you to understand and master the techniques associated with differential calculus, increase your analytical skills, as well as improve your communication and writing skills in mathematics.* The course will proceed sequentially, divided into the following three units.

Unit 1: Modeling, Euler's Method, and Successive Approximation

Unit 2: Local Linearity and Differentiation

Unit 3: Optimization and Other Applications of Derivatives

**C**lass Environment: The classroom environment should be one in which everyone is empowered and encouraged to learn, grow and participate. I feel strongly that students and faculty should work together to create and maintain an environment in which learning can occur. This process involves mutual respect, consideration and attentiveness. This learning environment is not just limited to the classroom but should extend to all sorts of different interactions between students, between students and faculty, in and out of the classroom.

**O**ffice Hours: If you are not making use of the multiple opportunities you have to interact with faculty on a one-on-one level then you are not getting the most effective benefits from your education at a small, liberal arts college at Occidental! In addition to my office hour times listed above, I have online office hours available by Instant Message using AIM which you can almost always reach me.

**Goals and Outcomes:** The Mathematics Department has developed a number of goals and measurable outcomes during its Assessment process. In this class, we hope to make Introductory Progress towards fulfilling the following Goals and Outcomes:

Goal 1: Students will develop a fundamental knowledge of continuous and discrete mathematics:

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.

Goal 2: Students will learn how to learn mathematics independently and collaboratively.

Outcome 2.1: Students will complete an individual or group project related to the content of an upper division mathematics course, and present the results of the project through a paper, poster, or talk

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

**Homework:** Homework will be assigned daily but collected weekly and graded. **Homework is due each Thursday by 5 pm in the Math 110 Homework Box in Fowler 311.** You are encouraged to attempt all of the assigned problems. In order to learn mathematics, one must practice mathematics. You are encouraged to work in groups, but the homework you submit must represent your *own* understanding and work. **No Late Homework Will Be Accepted.** Please read further instructions about Homework on the web.

**Quizzes:** There will be quizzes given on a near weekly basis. Quizzes will generally be given in lab section; however, some quizzes will be given as take home quizzes. The quizzes will resemble homework problems which connect or advance important concepts and skills. Work on quizzes is subject to the same rules as on exams (see below). **No Late Quizzes Will Be Accepted.**

**Labs and Lab Write-ups:** Although listed by the Registrar as worth zero credit, labs are not optional. You must be registered for a section of lab and a section of "lecture." In the labs, you will have the chance to collaborate with your fellow classmates in teams of two or three students. This work will frequently involve computers using software such as **True BASIC**, **Derive**, and **Excel**, but no prior knowledge of computers or programming is necessary. The lab is a place where you will explore the content of the course in more depth, both because the computers can perform so many computations so quickly and because your team will generally prepare a written report based on your work in lab. Labs are your opportunity to struggle with the difficult skill of successfully communicating your ideas and actively listening to the ideas of others as you work together in groups to produce well-written lab reports and essays.

**Course Projects:** There will be one course project for this class. Projects will be done in teams of two. Each pair will choose their own project. The goal of the project is to further your understanding of differential calculus as well as to advance your technical writing and oral communication skills in a context specifically tailored to your interests. A separate handout will be forthcoming on project details and information. Projects will be completed by **Wednesday, December 5.**

**In-Class Exams:** There will be three 1-hour evening exams. Exams will be given on the last Thursday of each month: **Thursday September 27**, **Thursday October 25**, and **Thursday November 29.** All exams are currently scheduled from 7:00 pm-9:00 pm. It is likely class will be cancelled the following day. The reason exams are being offered in the evening is to provide you with as much time as possible to take the exam instead of being limited to a 55-minute time slot. (The exam itself is written to be completed in 55-minutes.) If you have a conflict with the announced exam times please contact me as soon as possible and alternate arrangements can be made. Students participating in athletics and co-curricular events should pay careful attention to this exam schedule and inform me in advance of any conflicts.

**Final Exam: TBA.** The rules of Occidental College will not recognize travel plans as an excuse to move a final exam time.

**Gateway Exams:** There will be three (3) Gateway Exams that will be given this semester. Failure to pass a Gateway will result in lowering your final course grade by one third of a grade, per failed Gateway. See the forthcoming Gateway Information handouts and the Course Website for more information on the Gateway exams.

**Class Handouts:** Classes will combine lectures with more active learning. There will be daily handouts and worksheets supplementing the text for the course. You are strongly encouraged to utilize a system of organization that suits you and will allow you easy access to course materials. I suggest you purchase a 3-ring binder to organize these handouts and your notes.

**Independent and Group Study:** Students are strongly encouraged to study in groups, although work turned in for evaluation must be your own. Our experience is that many successful calculus students combine individual and group study. The *Academic Mastery Program* will be available for this course, offering a more structured form of group study. This program is very helpful in providing a consistent setting in which you can work on the topics of the course, *with* the guidance of an experienced tutor who consults with the faculty regularly. In addition, students often work together at the *Center for Academic Excellence*, located on the ground floor of the library. The CAE also offers *Peer Advising* in mathematics by upper-class students on a regular basis with a schedule to be announced later in the semester.

**Technology:** In the interests of enhancing active learning by students, I have decided to use Personal Response Devices (informally known as “clickers”) in a technology-ready room to provide opportunities for students to demonstrate their engagement with the course material in a novel way. This is a new experience for me as well for (most, if not all of) you so I encourage your patience and welcome your honest and well-considered feedback on the efficacy of this teaching innovation.

**Online Component:** In the Math Department we are strongly committed to the use of technology to improve and enhance teaching and learning. We make use of a number of Internet resources to assist students. We have class mailing lists, to which all registered students in Math 110 are subscribed. The addresses are [Math110sec1-L@oxy.edu](mailto:Math110sec1-L@oxy.edu) for Section 1 (1:30 pm) and [Math110sec2-L@oxy.edu](mailto:Math110sec2-L@oxy.edu) for Section 2 (2:30 pm). You should use the mailing list and our web-based bulletin board to communicate with your colleagues in the class in a professional manner. You can use the class website to review homework and exam solutions, check on the course schedule and interact with students and the professor to continue engagement with course material outside of the classroom. I hope to provide online access to your course grades by the end of the semester. Try to check the Course Blog at least once before coming to each class. Important course announcements often may be found online before they occur in class.

**Calculator Use:** You will need at least a scientific calculator with graphing capabilities for this course. If you do not at present own a calculator, I recommend you buy the TI-83 graphing calculator. If you already own a different graphing calculator, you do not need to go out and buy a TI-83, but you may have some work to do to figure out how our TI-83 specific instructions can be translated to work with your calculator. We will be using the TI-83 in class, in lab and on exams.

The use of calculators on exams is encouraged, BUT inappropriate use will not be tolerated. For instance, using the programming capabilities to record notes is dishonest work. If a question on an exam expressly forbids the use of the graphing capabilities of your calculator, it means just that. If you have any doubt about using any features on your calculator on exams, ask one of the instructors. Do not trust your classmates to know what is allowed and what is not allowed. If you are caught using your calculator in an unacceptable manner, the matter will be referred to the Judicial Board

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

**Honest Academic Work:** It is expected that each student in this class will conduct her- or himself within the guidelines of the Student Handbook. All academic work should be done with the complete honesty and integrity that this college demands.

**Accommodations:** Please let me know immediately if you have specific physical or learning disabilities and require accommodations. These discussions will remain confidential. Documentation requirements can be obtained from the Center for Academic Excellence (x2849).

**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 speak to the faculty about it, immediately.

**Make-Up Work:** No late homework or quizzes will be accepted. If you know you must miss a scheduled quiz or exam, let me know as soon as possible beforehand and we will try to work something out. If work is not handed in due to an illness or emergency it will be ignored in the computation of your grade.

**Tardiness:** 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 I approach you.

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

	Score	percent	
Participation & Homework Average	×	15%	=
Quiz Average	×	15%	=
Project	×	15%	=
Lab Average	×	10%	=
Exam # 1	×	10%	=
Exam # 2	×	10%	=
Exam # 3	×	10%	=
Final Exam	×	15%	=
	Total:		

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

average	below 60	60–68	68–70	70–72	72–78	78–80
letter grade	F	D	D+	C-	C	C+
average	80–82	82–88	88–90	90–92	93+	100
letter grade	B-	B	B+	A-	A	A(+)

Unfortunately, there is no official A+.

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.