University of Portland

Department of Mathematics

Fall 2009

MTH 201E Calculus 1

MWF 2:40-3:35 in Franz Hall 223

Th 2:30-3:25 in Franz Hall 006

INSTRUCTOR INFORMATION

Name: Aaron Wootton Office: BC278
Telephone: 943-7377 Email: `wootton@up.edu`

Official Office Hrs (BC278):

MWF	9:15-10:15
W	3:45-5:00
Th	10:00-11:00 & 12:00-1:00
or	by appointment

Unofficial Office Hrs (BC278):

MWThF	11:00-12:00
F	3:45-4:45

Course Webpage: `http://faculty.up.edu/wootton/Calc1/Calc1E.html`

TEXT AND READINGS

Calculus: Early Transcendentals Single Variable, 6th ed., by James Stewart (Thomson Learning, 2008).

ISBN-13: 978-0-495-38559-2

TECHNOLOGY

The course requires the use of a graphing calculator. The TI-83, TI-84, TI-86, or TI-89 series are highly recommended.

COURSE/BULLETIN DESCRIPTION

The study of differential and integral calculus with emphasis on applications in the natural and physical sciences. **Prereq: MTH 112 or equivalent.**

COURSE OUTLINE

Ch. 1	Functions and Models	(§1.1-1.3, 1.5, 1.6)
Ch. 2	Limits and Deivatives	(§2.1 - 2.8)
Ch. 3	Differentiation Rules	(§3.1 - 3.10)
Ch. 4	Applications of Differentiation	(§4.1 - 4.5, 4.7, 4.9)
Ch. 5	Integrals	(§5.1 - 5.5)

COURSE PERFORMANCE OBJECTIVES

Almost all the mathematics learned in high school comes to bear in elementary calculus.

In MTH 201, Calculus 1 students

- are exposed to the notion of *limit* as it pertains to functions, derivatives, Riemann integrals, and sequences and series.
- are exposed to the pervasive use of calculus in other disciplines, with emphasis on applications in the physical sciences
- are introduced to problem solving using continuous functions to model phenomena
- develop skills in using computer software or calculators to solve problems in differential and integral calculus

Upon completion of the course we expect students to be conversant in the rudiments of elementary calculus. They should be able to do the following:

- analyze functions defined graphically, numerically, or by formula
- articulate the fundamental properties of the trigonometric, exponential, and logarithmic functions
- articulate the fundamental properties of continuous functions, such as the intermediate and extreme value theorem
- articulate the notions of limit, continuity, derivative, and antiderivative, and graphically interpret them
- evaluate limits, derivatives, and antiderivatives
- apply the derivative in optimization problems, linear approximation, and evaluation of indeterminate forms
- articulate the relationship between the Riemann integral and area
- articulate the Fundamental Theorem of Calculus

This course also addresses two University Core Embedded Elements: analytical and logical reasoning and technology literacy.

Students in Analytical and Logical Reasoning enhanced courses will develop the ability to

- recognize and follow logical arguments and presentations
- construct valid arguments
- use specific disciplinary frameworks to solve problems.

Students in Technology Literacy enhanced courses will develop the ability to

- understand the use of technological tools in a disciplinary field
- identify and select the appropriate technological tools to facilitate learning, computing, and creating
- use technological tools effectively and responsibly.

METHODS OF ASSESSMENT

Course performance objectives are assessed by traditional means: graded homework assignments, online homework using WeBWorK, regular quizzes, 3 hourly examinations, and a cumulative final exam. The development of analytical and logical reasoning skills are inherent in the nature of mathematics and are assessed in conjunction with the course performance objectives. Computational technology use is required for successful completion of assignments and examinations.

Meeting the course objectives will be done through lectures and other activities introducing new material, question and answer sessions, homework assignments, quizzes, and exams.

Attendance

Though I will not be taking attendance, you are expected to attend each class session. If you miss a class activity such as a quiz due to absence, you will be given zero points for that activity and no opportunity to make it up except under extreme circumstances. You are responsible for noting any information or changes announced in class. We will have class meetings on all scheduled class days, including the Friday prior to Fall Break and the Wednesday before Thanksgiving. Do not make plans to leave early for Fall Break. Do not make plans to leave at the end of the term before checking the final schedule. **You may not take the final at a time other than when it is scheduled by the university.**

Homework

Minimal passing homework score: Doing homework regularly and on time is crucial to your success in this class. For this reason, to encourage homework participation, you are are **REQUIRED** to obtain a cumulative score of **AT LEAST 60%** on homework to pass the class - you will fail the class **REGARDLESS** of your grade on all other graded material if you do not achieve the minimal passing homework score.

Homework is split into TWO categories, Written Homework and WeBWorK Quizzes.

Written Homework (PP) will be assigned at the end of every section. The assigned problems from the book can be found under the relevant homework section on the course webpage at `learning.up.edu`. If you have any issues finding the assigned homework, you need to see me immediately. I strongly suggest you do your homework regularly; it's best done following class, every day. The material will be fresh in your mind, and you will spend less time on each assignment. **Do not expect that we will cover each assignment in class. If you have homework questions, general or specific, you need to come and see me immediately.**

No late assignments will be accepted, except those approved by the instructor prior to the class meeting time. Homework is considered late and will not be accepted if it is not turned in by 4pm the day it is due. Arithmetic and analytical work may be given partial credit when you have shown some aptitude. However, **no** credit will be given on problems for which an answer is given with insufficient work displaying the steps and reasoning needed for a solution. Where appropriate, answers must be written using complete sentences.

Homework will be graded both for completeness and correctness

Homework assignments, as with anything which is turned in to the instructor, must be done neatly. Problems must be written in numerical order. If you use more than one sheet of paper, the pages **must** be stapled at the upper left corner. Paper clips or "paper stapling" are not sufficient. Do not turn in pages which have been torn from a notebook without first removing the "fringe" on the side of the page. You may, if you wish, work in groups on homework assignments. Please indicate the names of the students with whom you worked on the back of the last page of your assignment.

Homework which fails to meet these basic guidelines will automatically be graded down.

WeBWorK (WW) In addition to traditional PP homework, for every section you will be required to complete a WeBWorK quiz which can be found through the course page at `learning.up.edu` Attached to this syllabus you will find an instruction sheet on how to work with WW.

Due dates: On the day I finish teaching any section, all homework for that section is officially assigned (both WW and PP). For paper homework, the table below shows the day I will collect it according to which day it is assigned:

Day Section is Completed	Homework Due Date
Monday	Wednesday
Wednesday	Friday
Thursday	Monday
Friday	Tuesday

It is your responsibility to be aware of due dates for homework – it will not always be possible to remind you in class.

WeBWorK homework will always close at 11:59pm on Sunday evening of the week it is assigned unless it is assigned on a Friday in which case it will close the following Sunday at 11:59pm.

Other Assignments As well as assigned PP and WW homework, from time to time you will be required to complete additional assignments in the form of additional WW sets and other types of written homework. Such assignments will count toward your homework grade. Additional sets will be assigned sporadically throughout the semester and will be announced in class.

Quizzes/Class Activities

Quizzes will be given frequently and generally unannounced. We will also have some in-class group activities which will count (in points) as quizzes. Quizzes will take one of the following formats:

- **Partner quizzes**: On some quizzes you will be able to work with a partner. Partner quizzes will generally be administered in class, though occasionally you will be able to finish them with your partner outside of class. As partners, you are expected to equally contribute to the quiz.
- **Traditional Quizzes**: At certain critical points of the semester, you will be given quizzes in class which you will have to complete on your own.
- **Group Quizzes** Some quizzes you will be able to work with a group of people. These quizzes will generally be take home quizzes. You are expected to meet with your group outside of class to work on the quiz and turn in solutions which all members have equally contributed to. You may also be asked as a group to present solutions on the board during class.

In addition to these quizzes, during the third meeting of class, you will take a Calculus 1 Diagnostic Quiz. This quiz will cover precalculus. The quiz will count for 25% of your quiz grade.

There will be no make-up opportunities for quizzes or other in-class activities. If you miss a quiz, you will earn a score of zero. There will be TWO quizzes during the final week of class.

Examinations.

There will be three tests and one final examination. The tests are (tentatively) scheduled to cover the following material:

Test 1: Chapters 1 & 2

Test 2: Chapter 3

Test 3 : Chaptesr 4 & 5

The dates of the midterms are tentative and the exact dates will depend upon the speed the relevant material is covered and will be announced in class. The final exam is cumulative and is scheduled at 10:30-12:30 on Thursday 17th December.

CALCULATOR USE

Students will be allowed to use graphing calculators on at least 50% of major exams, on average. Further, they will be able to use graphing calculators for at least 50% of the final exam.

ACADEMIC DISHONESTY

Academic dishonesty will not be tolerated. Although students may study in groups and may discuss assignments with each other, all work turned in must be done by each student, individually.

POLICY ON MAKE UP EXAMS

I do not give make-up exams. There are two, and only two, exceptions. These are an absence due to extreme hardship or a University sponsored event. In the latter case, you must inform me at least one week in advance, and within the first week of the semester if you must miss the final exam. You may be asked to take the exam early. In case of extreme hardship (e.g. illness or death of a family member), please notify me in advance if at all possible. I reserve the right to deny make-up work and penalize absences that are not verified (health practitioner's note, police report, etc.)

GRADING STANDARDS

Final grades will be based on assignments and examinations as outlined below.

- Homework: WW: 100 points
  PP: 100 points
- Quizzes: 100 points
- Midterms (3): 150 points each
- Final Exam: 250 points

The total number of points available is 1000. Exact final grades will be determined at the end of the semester, though will be no lower than those set forth in the following table PROVIDED the minimal passing homework score has been achieved.

Points	Percent	Grade	Points	Percent	Grade
$925-1000$	$92.5-100\%$	A	$900-924$	$90-92.4\%$	A-
$875-899$	$87.5-89.9\%$	B+	$825-874$	$82.5-87.4\%$	B
$800-824$	$80-82.4\%$	B-	$775-799$	$77.5-79.9\%$	C+
$725-774$	$72.5-77.4\%$	C	$700-724$	$70-72.4\%$	C-
$675-699$	$67.5-69.9\%$	D+	$625-674$	$62.5-67.4\%$	D
$600-624$	$60-62.4\%$	D-	$0-599$	$0-59.9\%$	F

GETTING HELP

Do *not* wait until the last minute to get help. Mathematics is a cumulative subject, and in particular, in this course material builds on prior knowledge. I have office hours in place during which you can stop by to get help on any problems. If you cannot make my office hours, make an appointment to see me for help. If you email me with a question (which is fine), please be specific about the problem – this text is heavy, and I may not have it at home with me, so e-mailing me that you need help with problem 42 won't get you very far. You also have the Learning Resource Center at your disposal. It is located in Franz 119, and will be staffed with math tutors who can help you. The department has also subscribed to hotmath.com, which you can use for homework help. I will give you a password in class so that you can use this online help system. Please do not abuse this resource.

In general, we will not take class time to go over questions on the homework. It is imperative that you come to see me with questions prior to the due date of the homework assignment.

WITHDRAWAL PROCEDURES

It is the student's responsibility to drop the course if he or she is no longer planning on attending the course or filling the other course requirements. In order to drop, the student must use and Add/Drop form available at the Registration Office. If a student does not properly withdraw from a course, he or she may receive an **F** for the course. A properly withdrawn student will receive a **W**.

INCOMPLETES

An incomplete **(I)** may be given when the quality of a student's work is satisfactory (C or better), but for some essential reason the course has not been completed by the student. An (I) is reserved for emergency situations only. To request an incomplete, the student needs a typed, signed and dated letter stating the reason(s) why an incomplete is appropriate. The letter should also contain the conditions for the completion of work. Acceptance of the request shall be at the instructor's discretion.

ACCOMODATION FOR DISABILITY

If you have a disability and require an accommodation to fully participate in this class, contact the Office for Students with Disabilities (OSWD), located in the University Health Center (503-943-7134), as soon as possible. You should also alert me to the accomodation plan.

UNIVERSITY OF PORTLAND'S CODE OF ACADEMIC INTEGRITY

Academic integrity is openness and honesty in all scholarly endeavors. The University of Portland is a scholarly community dedicated to the discovery, investigation, and dissemination of truth, and to the development of the whole person. Membership in this community is a privilege, requiring each person to practice academic integrity at its highest level, while expecting and promoting the same in others. Breaches of academic integrity will not be tolerated and will be addressed by the community with all due gravity (*taken from the University of Portland's Code of Academic Integrity*) *The complete Code may be found in the 2005-06 University of Portland Student Handbook, as well as the Guidelines for Implementation. It is the student's responsibility to inform him or herself of the Code and Guidelines.*

MINIMAL SYLLABUS

All sections of MTH 201 will cover at least the following sections:

Chapter 1	Functions and Models	
	1.1	Four ways to represent functions
	1.2	Mathematical models
	1.3	New functions from old functions
	1.5	Exponential functions
	1.6	Inverse functions and logarithms
Chapter 2	Limits and Derivatives	
	2.1	The tangent and velocity problems
	2.2	The limit of a function
	2.3	Calculating limits using the limit laws
	2.5	Continuity
	2.6	Limits at infinity; horizontal asymptotes
	2.7	Derivatives and rates of change
	2.8	The derivative as a function
Chapter 3	Differentiation Rules	
	3.1	Derivatives of polynomials and exponential functions
	3.2	The product and quotient rules
	3.3	Derivatives of trigonometric functions
	3.4	The chain rule
	3.5	Implicit differentiation
	3.6	Derivatives of Logarithmic functions
	3.8	Exponential Growth and Decay
	3.9	Related Rates
	3.10	Linear approximations and differentials
Chapter 4	Applications of Differentiation	
	4.1	Maximum and minimum values
	4.2	The Mean Value Theorem
	4.3	How derivatives affect the shape of a graph
	4.4	Indeterminate forms and L'Hospial's Rule
	4.5	Summary of curve sketching
	4.7	Optimization problems
	4.9	Antiderivatives
Chapter 5	Integrals	
	5.1	Areas and distances
	5.2	The definite integral
	5.3	The Fundamental Theorem of Calculus
	5.4	Indefinite integral and the total change theorem
	5.5	The substitution rule

Webwork Student Manual

Getting Started

- Logging in
  (1) Go to `learning.up.edu` and login.
  (2) Click on the tab for our class
- Doing WeBWorK Quizzes
  (1) On the main course page under each week is a list of homework assignments are due that week. Click on the set you want to do.
  (2) Once you click on a set, the first screen you will see is a list of all PP homework questions which are due for that section, Make sure to note them down so you can complete the paper homework for that section.
  (3) To start the WW homework, click the "preview quiz" button at the bottom of the screen.
  (4) Once you hit "preview quiz", you will arrive at a screen with all WW questions due for that section.
  (5) To answer a question, you type your answers to the questions in the relevant blank boxes and press the "submit" button. Webwork will tell you immediately whether your answer is right or wrong, and if you are wrong, for most questions, you will have the opportunity to try again.
  (6) When you submit an answer, if you are entering a particularly complicated equation, Webwork will provide a nicely formatted version of your answer. This is helpful in tracking down errors which sometimes occur in some of the more complicated problems. Be warned however that for certain questions such as multiple choice and true/false, you will only a certain number of submissions.
  (7) Once you have answered all of the problems correctly, you must hit the "submit all and finish" button at the bottom of the screen.
    – BE WARNED – if you do not hit this button before the due date of the quiz, you will receive zero credit for the quiz, even if you got some of the answers correct. This means even if you have not had chance to submit all answers before the due date, you should still "submit all and finish" before the due date so you receive credit for the questions you have answered.
    – BE WARNED – once you have hit the "submit all and finish" button, you cannot change your answers for credit. Therefore, make sure once you hit the button, all your answers in the boxes are correct, else you will only receive credit for the questions which have been answered correctly.
  (8) You can exit a homework at any point and return to answer questions later, though to make sure your answers so far are saved, you should use either the "save without submitting" button or the "submit" button.
- Help with Webwork and other Features
  (1) If the problem includes a picture that is hard to see, click the picture to get an enlarged version.
  (2) Webwork understands many functions such as "$\sin(x)$" and "$\ln(x)$". There is also special syntax used to answer questions (like how to express exponents). Most of the syntax and functions are fairly obvious, especially to those of you who are already familiar with computers. However, to be safe, I recommend printing the webpage
  http://webwork.math.rochester.edu/docs/docs/pglanguage/availableFunctions.html
  which has a list of all the functions webwork accepts.
  (3) Some questions will have functions/syntax specifically tailored for that question, and it may differ from earlier similar questions. Make sure you always read the question in full to check you are using the right syntax.
  (4) If you are stuck or convinced a problem is defective, you should stop by during office hours to discuss it with me. If this is not possible, use the e-mail instructor button at the bottom of the page to send me an e-mail outlining your problem. BE WARNED - the "e-mail instructor" button is for use when you are really stuck and absolutely cannot see me. Generally you should look at the questions way in advance of the due date and speak to me about any problems long beforehand. If you e-mail me five minutes before the due time, I will not be able to help you!!
  (5) After the due date, the problem set closes and you will not be able to submit any answers for credit.

Though at first it may be difficult to get the hang of, after time, I think you will really start to appreciate the different things Webwork has to offer that traditional pencil and paper homework does not. Also, remember, my office door is always open if you need help getting started. Good luck!