

# MATH 1914–010 Differential and Integral Calculus I

This is the information sheet for Differential and Integral Calculus I, MATH 1914–Section 010, for the Spring Semester 2014. It is your responsibility to acquaint yourself with all the information in this handout, and with any modifications to it that may be announced in class.

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**Class and Discussion Times:** The class meets 3 days per week: on Mondays and Wednesdays in 108 PHSC from 1:30pm to 2:45pm; and on Fridays in 108 PHSC from 1:30pm to 2:20pm.

You should be attending one of the discussion sessions in addition to the class meetings. There are two discussion sessions; one meets at 3:30-4:20 on Mondays in BL 104 and is led by Michael Tilles, and the other meets at 9:00-9:50am on Thursdays in PHSC 212 and is led by Jonathan Merlini.

**Course Web Page.** <http://math.ou.edu/~nbrady/teaching/s14-1914>

**Office Hours (Brady).** Held in 521 PHC. Tue and Wed 9am-10am, Thu 11am-noon, or by appointment.

**Office Hours (Merlini).** Held in 209 PHC. MWF 10:30am-11:30am.

**Office Hours (Tilles).** Held in 209 PHC. M 4:30-5:30pm; TuTh 12-1:30pm.

**Text and Course Outline.** We shall cover Chapters 1 through 5.1 of the textbook; *Calculus* (7<sup>th</sup> Edition), by James Stewart.

In this course we will start with a review of functions and their graphs. This is material that you will have covered in a precalculus class. Then we will consider several seemingly unrelated problems about functions and their graphs.

- The first is a geometric problem. It asks one to find the slope of a “tangent line” to the graph of a function at a given point.
- The second is an analytic problem. It asks one to find the rate of change of a function’s output values with respect to its input values.

We will discuss at length a common solution to both problems: namely, one forms “difference quotients” of the function, and then takes a “limit” of a suitable collection of these difference quotients. This limit (if it exists) is called the *derivative* of the function. The two motivational problems now give us two interpretations of the derivative: a geometric interpretation as a slope of a tangent line, and an analytical interpretation as a rate of change.

We establish a set of rules which enables one to compute derivatives in a very mechanical way (without all the pain and stress that computing limits may entail!). Finally we explore some of the many applications of derivatives. From the analytic interpretation of the derivative we can discuss problems involving displacement, speed and acceleration, and can deal with many applications involving “related rates”. From the geometric interpretation of the derivative we can talk about extremal points on graphs, maxima and minima, and can tackle many problems involving optimization and curve sketching. We can also understand the geometry behind a powerful method of approximating roots of functions, Newton’s method.

In Chapter 4 and Section 5.1, we will consider two additional problems about functions and graphs.

- The first is a geometric problem. It asks one to compute the “area under the graph” of a function.

- The second is an analytic problem. It asks one to find the “average value” of a function on a given input interval.

We will see that these are essentially the same problem., and we will introduce a second piece of machinery, the *definite integral*, to solve them. We will learn about the *Fundamental Theorem of Calculus*, which says that taking derivatives and computing definite integrals are inverse operations.

**Lectures.** You are expected to attend all lectures, and are responsible for all information given out during them. In particular, this includes any changes to the midterm dates or content.

Your participation is important in lectures. I will call on people to present answers to problems at the board from time to time. You should try to participate in classroom discussions. As in any course, you will optimize your gain from the lectures if you try to read the relevant sections of the textbook **before** attending class.

**Grading Scheme.** Grades will be assigned by weighting your totals from Class and Discussion Session Participation, Homework, Webwork, Midterms, and a Final Examination as follows:

<i>Discussion Session Grade.</i>	2%
<i>Front Row Duty.</i>	1%
<i>Homework</i>	12%
<i>Webwork</i>	6%
<i>Midterm Total</i>	54%
<i>Final Examination</i>	25%

The total number of points in the course is 100. Grades are assigned on the following scale:

$$A : 85 - 100, \quad B : 70 - 84, \quad C : 55 - 69, \quad D : 40 - 54, \quad F : 0 - 39.$$

Here are more details about each of these components.

**Homework.** Homework is due in class at the **start** of class; the due dates are specified on the course web page. You are responsible for ensuring that your homework gets turned in on time. Late homework will not be accepted; it upsets the grading process and is unfair to other students.

**Webwork.** Part of your homework will not be written up and turned in, but instead will be entered into an online system called *Webwork*. As the course gets underway I will provide more detailed information about using Webwork

**Midterms.** There are three midterms, two of which are held during regular lecture times in the usual classroom, and the third is a set of extra homework. They are held/due on the following dates:

*Midterm 1:* Friday, Feb. 14.

*Midterm 2:* Friday, Mar. 14.

*Midterm 3:* Friday, Apr. 18.

**Final Examination.** The final examination is cumulative. It is scheduled for Tuesday, May 06 from 8:00am until 10:00am, and is held in the usual classroom — PHSC 108.

**Taking Examinations.** Here are a few notes on taking Examinations.

- I usually hold extra Office Hours and/or schedule Review Sessions before the Midterms and Final Examinations. You are strongly encouraged to attend the Review Sessions and to attend Office Hours regularly.

- You cannot use calculators/computers, books or any type of notes during the examinations.
- All examinations must be taken at scheduled times, except in *extreme circumstances*. So be careful not to make travel arrangements that conflict with examination times. If you cannot take an examination at a scheduled time, you should contact me *well in advance of the test time*. Otherwise, an absence at an exam will result in a score of zero.

**Policy on W/I Grades.** You can find the Spring 2014 academic calendar at

[http://www.ou.edu/content/admissions/academic\\_calendar.html](http://www.ou.edu/content/admissions/academic_calendar.html)

Until Jan. 27, there is no record of grade for dropped courses. From Jan. 28 through Mar. 28, you may withdraw and receive an automatic W grade, *no matter what scores you have so far achieved*. From Mar. 31 onward, University regulations specify that you may withdraw only with the permission of your College Dean.

Students who are failing the course should not expect to receive an “I” grade in place of a “W” grade. I will only consider assigning an “I” grade if the situation satisfies the following criteria:

1. the student is already maintaining a passing grade;
2. the student has completed most of the course work; and
3. the student can demonstrate that he/she is unable to complete the work at this time due to circumstances beyond his/her control.

**Academic misconduct.** You should be familiar with University policy regarding academic misconduct

<http://integrity.ou.edu>.

**Accommodation of Disabilities.** The University of Oklahoma is committed to providing reasonable accommodation for all students with disabilities. If you require special accommodation in this course you are requested to speak with me as early in the semester as possible (preferably by the end of the first week). Students with disabilities must be registered with the Office of Disability Services prior to receiving accommodations in this course. The Office of Disability Services is located in Goddard Health Center, Suite 166, phone (405) 325-3852 or TDD only (405) 325-4173. Their website is at <http://drc.ou.edu>.

**Religious Holidays.** It is the policy of the University to excuse absences of students that result from religious observances and to provide without penalty for the rescheduling of examinations and additional required class work that may fall on religious holidays.

Students who plan to observe a religious holiday which may conflict with a class time, should notify me as soon as possible (preferably within the first week of the semester), so that we can make appropriate arrangements.

**Mathematics Department student resource page.** The [Undergraduate Information](#) page on the Mathematics Department server is a good resource. It has links to the Math Center, the OU MathClub blog, and has information about obtaining a Mathematics minor or major.

**The Math Center.** The [Math Center](#) (PHSC 209) is open 5 days a week. It is staffed by mathematics graduate students who can help with your Math 1914 questions. You should definitely take advantage of this terrific resource!

**The OU MathClub Blog.** The [OU MathClub blog](#) is an excellent way of finding out what’s going on math-wise at OU.