# Course Information

|               | *Name:*             | Jake Wildstrom                                               |
|---------------|---------------------|-------------------------------------------------------------|
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| **Instructor:** | *Phone number:*   | (502)852-5845 (x5845)                                        |
|               | *Office:*           | Natural Sciences Building 113                               |
|               | *Office hours:*     | M12–13, T10–11, W14–15, R14:30–15:30, and by appointment    |

**Course Websites:**
https://blackboard.louisville.edu/webapps/uofl-redirect-bb_bb60/course_redirect.jsp?course_id=MATH-205-10-4188
http://aleph.math.louisville.edu/teaching/2018FA-205

**Lecture:** MTR 13:00–14:15 in Natural Sciences 317

**Prerequisites:** MATH 111-112, MATH/ENGR 190 or an appropriate score on a placement exam.

**Special notes:** MATH 205 is a four-credit-hour course. Credit may not be received for both MATH 205 and either MATH 180 or ENGR 101.

**Textbook:** *Calculus, Early Transcendentals* by James Stewart, eighth edition. Access to this book as an eBook is provided through WebAssign free with your purchase of WebAssign access for this class and it is *not* necessary to purchase a physical edition of the text.

**WebAssign:** You will need access to WebAssign in order to complete the assignments in this class. Access to WebAssign will also come with access to the full text of the text above. Access codes can either be purchased at the bookstore, or through other online vendors, or directly from WebAssign itself. Signing up for this class will require visiting the website https://webassign.com, clicking the "ENTER CLASS KEY" button, and entering the code louisville 8150 5442.

**Course Objectives:** Students who complete this course will be expected to describe the concept of the limit of a function and calculate limits both graphically and analytically; recognize the definition of the derivative and identify the relationship between derivatives and graphs of functions; describe the definition of the definite integral as a limit of Riemann sums and interpret the definition as an area; demonstrate understanding of the relationship between the definite integral and antiderivatives via the fundamental theorem of calculus; master the standard formulas for computing derivatives and antiderivatives.

**Cardinal Core and Learning Outcomes:** MATH 205 fulfills the quantitative reasoning component of the Cardinal Core program. Competency in each of five learningoutcomes will be assessed through performance on homework, quizzes, and exams.

> **Outcome 1:** Interpret information presented in mathematical and/or statistical forms.
> **Assessment:** Students will be required to apply the mathematical meanings of limits and derivatives presented in both graphical and analytical forms.
> **Outcome 2:** Illustrate and communicate mathematical and/or statistical information symbolically, visually, and/or numerically.
> **Assessment:** Students will be required to graph polynomial and rational functions using information provided by the first and second derivative.
> **Outcome 3:** Determine when computations are needed and execute the appropriate computations.
> **Assessment:** Students will be required to demonstrate competency in applying the rules of calculus to compute derivatives and antiderivatives.
> **Outcome 4:** Apply an appropriate model to the problem to be solved.

**Assessment:** Students will be required to apply the theory of differentiation to solve problems in optimization, related rates of change, population growth, and radioactive decay.

**Outcome 5:** Make inferences, evaluate assumptions, and assess limitations in estimation, modeling, and/or statistical analyses.

**Assessment:** Students will be required to use the derivative to make inferences on the local behavior of functions in both theoretical and applied situations.

**Responsibilities:** You are responsible for attending class on a regular basis and maintaining comprehension of the scheduled class objectives for each day. You are expected to be active participants in class, and to attend quizzes and examinations. Assignments are provided for your benefit and you are expected to complete them on schedule to receive full credit for your study.

**Special needs:** Any scheduled absence during a quiz or examination, or any other special needs, *must* be brought to my attention during the first week of class. Unscheduled absences will be handled on a case-by-case basis, with exceptions generally made only for documented emergencies.

**Calculators:** Calculators are unnecessary for any in-class work, and may not be used on quizzes or examinations. Calculators will also be unnecessary for most homework problems, but may be used at your discretion. For any calculation more complicated than simple arithmetic, you are expected to show your work.

**Honesty:** There are many resources available to help you succeed in this class, including consultation during office hours, secondary textbooks, and cooperation with other students. It is important, however, that all papers handed in and online work completed be the result of your individual comprehension of the course material. Duplication of others' work is both a disservice to your own education and a serious violation of the university's academic honesty policy.

**Grades:** Homework, completed on WebAssign, will account for 10% of your grade. Quizzes will be based on the homework problems, and will collectively account for 20% of your grade. The three midterm examinations will each be worth 15%, and the final examination is worth 25%. A 90% overall guarantees a grade of A–, 80% guarantees a B–, and 70% guarantees a C–. All in-class assessments except for the final exam may be revised to recover up to half of the lost credit; refer to the revision instructions on page 3 when revising.

**Title IX/Clery Act Notification:** Sexual misconduct (including sexual harassment, sexual assault, and any other nonconsensual behavior of a sexual nature) and sex discrimination violate University policies. Students experiencing such behavior may obtain confidential support from the PEACC Program (502-852-2663), Counseling Center (502-852-6585), and Campus Health Services (502-852-6479). To report sexual misconduct or sex discrimination, contact the Dean of Students (502-852-5787) or University of Louisville Police (502-852-6111). Disclosure to University faculty or instructors of sexual misconduct, domestic violence, dating violence, or sex discrimination occurring on campus, in a University-sponsored program, or involving a campus visitor or University student or employee (whether current or former) is not confidential under Title IX. Faculty and instructors must forward such reports, including names and circumstances, to the University's Title IX officer. For more information, see the Sexual Misconduct Resource Guide (`http://louisville.edu/hr/employeerelations/sexual-misconduct-brochure`).

**Changes:** The syllabus is subject to change. Changes will be announced in class and updated online.

# Revision Instructions

Exams and quizzes except for the final exam can be revised for up to half credit. These revisions must be completed and turned in *prior to the next assessment date* for credit. Papers will ordinarily be returned on the next class day after the quiz or exam. Unclaimed papers can be picked up during office hours. The first appearance of each incorrect element of the work will be circled; if you have questions or wish to have a discussion to clarify your own understanding, please come to office hours.

Revisions should consist of the original assessment, unaltered, with an attached document including, for each question, both an analysis of what was done incorrectly and the correct solution from the last correct point in the original solution. Revisions should be legible with explanations/analysis of errors in complete sentences. **No credit will be given for revisions which do not discuss the original solution.** Below are several examples of common types of errors and how an explanation for each might proceed.

**Sign errors or arithmetic errors:** These are easily explained, and are usually a matter simply of stating the error, e.g.

- "$4 + 7$ was calculated to be 13, when it is actually 11."
- "I thought the derivative of the cosine function was the sine function, but it's actually the opposite of the sine function."

**Unjustifiable manipulations:** The specific false "law" being applied should be given, as well as, if possible, a better law to use to achieve your goal, as below:

- "It isn't true that $(a + b)^2 = a^2 + b^2$. A good way to multiply out $(a + b)^2$ is as $a^2 + 2ab + b^2$."
- "In general the derivative of a product isn't the product of the individual derivatives. You have to use the product rule instead."
- "It's not true that $\sqrt{x + y} = \sqrt{x} + \sqrt{y}$, and there's no easy way to simplify this expression."

**Misinterpreting word problems:** When a mistake is made converting a description to mathematical language, indicate both your misconception and the correct intepretation:

- "I interpreted a 13% reduction in radiation as a multiplication by $-13$. However, if 13% of the radiation fades in a year, that actually corresponds to a multiplication by $100\% - 13\% = 0.87$."
- "The problem asked for us to maximize the area of a rectangle of dimensions $x \times y$; I maximized $2x + 2y$, which is ithe perimeter, instead of the area $xy$."

**Not knowing what to do:** Analyze the situation you got stuck at, and indicate both the next course of action and why it is chosen.

- "$\frac{d}{dx} \sin(x^2)$ is the derivative of a composition of the two simpler functions $\sin u$ and $x^2$, so we can find it with the chain rule."
- "Since this is a related rates problem with a right triangle, the distances in the problem will be related by the Pythagorean theorem."

These details are *not necessary* when you take the assessment originally, but are expected as part of the learning process when submitting revisions; the goal is not to harp on your errors but to provide you with the tools to understand and overcome them. Understanding the specfic mistakes is a key part of that process, which is why such a specific correction process is mandated.

# Course Schedule

This schedule is tentative and subject to change; assessment dates and due dates will not be changed, barring exceptional circumstances.

| Week | Monday | Tuesday | Thursday | |
|------|--------|---------|----------|---|
| 1 | August 20th<br>Precalc review | August 21st<br>Section 2.1 | August 23rd<br>Section 2.2 | |
| 2 | August 27th<br>Section 2.3 | August 28th<br>Section 2.3 | August 30th<br>Section 2.4<br>Quiz #1 | |
| 3 | September 3rd<br>Labor Day | September 4th<br>Section 2.5 | September 6th<br>Section 2.6<br>Quiz #2 | |
| 4 | September 10th<br>Section 2.7 | September 11th<br>Section 2.8 | September 13th<br>Section 3.1<br>Quiz #3 | |
| 5 | September 17th<br>Section 3.2 | September 18th<br>Section 3.3 | September 20th<br>Exam #1 | |
| 6 | September 24th<br>Section 3.4 | September 25th<br>Section 3.4 | September 27th<br>Section 3.5<br>Quiz #4 | |
| 7 | October 1st<br>Section 3.5 | October 2nd<br>Section 3.6 | October 4th<br>Inauguration | |
| 8 | October 8th<br>Mid-term break | October 9th<br>Mid-term break | October 11th<br>Section 3.9<br>Quiz #5 | |
| 9 | October 15th<br>Section 3.9 | October 16th<br>Section 3.10 | October 18th<br>Section 4.1<br>Quiz #6 | |
| 10 | October 22nd<br>Section 4.3 | October 23rd<br>Section 4.4 | October 25th<br>Exam #2 | |
| 11 | October 29th<br>Section 4.4 | October 30th<br>Section 4.5 | November 1st<br>Section 4.7<br>Quiz #7 | |
| 12 | November 5th<br>Section 4.7 | November 6th<br>Section 4.8 | November 8th<br>Section 4.9<br>Quiz #8 | |
| 13 | November 12th<br>Section 5.1 | November 13th<br>Sections 5.2 | November 15th<br>Section 5.3<br>Quiz #9 | |
| 14 | November 19th<br>Section 5.3 | November 20th<br>Exam #3 | November 22nd<br>Thanksgiving | |
| 15 | November 26th<br>Section 5.4 | November 27th<br>Section 5.4 | November 29th<br>Section 5.5 | |
| 16 | December 3rd<br>Section 5.5<br>Quiz #10 | December 4th<br>Reading day | December 6th<br>No class | Friday, December 7th<br>Final exam, 14:30–17:00 |