Syllabus
MATH 10a: Techniques of Calculus (a)
Summer 2016

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Office hours: TBA

Text:

Prerequisite:
A solid knowledge of precalculus, which can be satisfied by taking Math 5a at Brandeis or by achieving a satisfactory score on the online math placement exam found here.

On exams you will work with expressions like:

- \( \ln(3\sin t) \)
- \( \tan(e^{3t}) \)
- \( \sec \left( \frac{\ln(x + 2)}{x + 2} \right) \)
- \( \ln \left( \frac{1}{\sqrt{x}} \right) \)
- \( a^{-2\log_a(2)} \)
- \( e^{2x} - 5e^x + 6 \)
- \( \ln(x^2 - 1) - \ln(x + 1) \)

Most students who lack a solid knowledge of precalculus struggle in Math 10a. If you are unsure whether Math 10a is the right course for you, you can contact the course coordinator, Professor Becci Torrey at rtorrey@brandeis.edu.

Learning Goals:
- Understand and be able to apply key ideas of calculus, including:
  - Develop a basic understanding of limits and learn to compute a variety of limits.
  - Understand the definition of the derivative, and its interpretation in terms of slope and instantaneous rate of change.
  - Compute derivatives of polynomial, rational, exponential, logarithmic and trigonometric functions, as well as combinations of these functions.
  - Use derivatives to find and sketch all the important features of graphs of functions (even quite complicated functions).
  - Use derivatives to analyze the behavior of functions, e.g., finding the extrema of functions and determining the end behavior of functions.
  - Use derivatives to solve a variety of optimization problems and to applied rate of change problems.
  - Compute antiderivatives of polynomial, rational, exponential, logarithmic and trigonometric functions.
  - Understand basic ideas of differential equations.
- Hone quantitative reasoning skills by solving problems that challenge you to understand the material on a deeper level and present the material in ways not demonstrated explicitly in class.
- Improve communication skills, particularly for communicating technical information, by practicing writing (on homework, quizzes and exams) and speaking (to classmates, evening help tutors and your instructor) with precision about these mathematical concepts.
- Develop a sense for how the specific skills learned in Math 10a will transfer to other disciplines by solving applied problems from other fields, such as biology, chemistry, physics and economics.

**Syllabus:**

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**Note:** Some topics may be added or omitted as time permits.

**Exams:**

There will be a midterm and a final.
- **Midterm:** Monday, June 20. In-class.
- **Final:** Thursday, July 7, or Friday, July 8. More details later.

**Grades:**

Your grade in the course will be determined by the following:
- **Homework (20% of your grade).**
  - Homework assignments will be collected once or twice a week.
– No late homeworks will be accepted, but your three lowest homework grades will be dropped.
– We encourage you to discuss homework problems with your classmates, but you must write up your own solutions. You may not use any solution manuals.

- **Quizzes (20% of your grade).**
  – Short quizzes will be given regularly.
  – **No make-up quizzes will be given.** Missed quizzes count as zeroes. However, the lowest 25% of your quiz grades will be dropped.
- **Two midterm exams (30% of your grade).**
- **Final exam (30% of your grade).**

**Calculators:**
Calculators are not allowed during exams or quizzes. You should have access to a scientific calculator for homework, but you do not need a graphing calculator.

**LATTE:**
All course materials for Math 10a will be available online on LATTE. You will need your Unet username and password to login.

**Self-quizzes:**
There is a link called “Self-quizzes” on your Math 10a LATTE course page. The Math 10a self-quizzes cover all the material being studied in Math 10a. Complete solutions to each self-quiz are given. These self-quizzes are optional and for your use only, and have no effect on your grade.

**Office Hours:**
You are encouraged to attend my office hours whenever you have questions about the course material. If you can’t attend office hours, don’t hesitate to ask for an appointment for another time.

**Students with Disabilities:**
If you are a student who needs academic accommodations because of a documented disability, you should present your letter of accommodation to me as soon as possible.

If you have questions about documenting a disability or requesting academic accommodations, you should contact Beth Rodgers-Kay in the Office of Academic Services at brodgers@brandeis.edu. Letters of accommodations should be presented at the start of the course to ensure provision of accommodations. Accommodations cannot be granted retroactively.

**Academic Integrity:**
You are expected to follow the University’s policy on academic integrity, which is distributed annually as section 4 of the Rights and Responsibilities Handbook. Instances of alleged dishonesty will be forwarded to the Department of Student Development and Conduct for possible referral to the Student Judicial System. Potential sanctions include failure
in the course and suspension from the University. If you have any questions about how these policies apply to your conduct in this course, please ask.

**Course Coordinator:**
Professor Becci Torrey, rtorrey@brandeis.edu.