

MATH 10a: Techniques of Calculus (b)
Summer 2023

Instructor: Sarah Dennis
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Modality: Classes will be held in-person **9-11am, Mon – Thurs** in **Goldsmith TBD**.

Calculus:

Calculus is one of the most fundamental intellectual achievements of humankind. The beautiful idea at the heart of this subject allows us to explore both the infinite and the infinitesimal. The methods of calculus allow us to model and analyze any phenomena where change occurs; may that be a change in population, wealth, energy, or pretty much anything!

Goals for Math 10b:

1. Learn the fundamental ideals and skills of Integral Calculus.
2. Build intuition for applying familiar concepts and ideas in unfamiliar contexts.
3. Develop mathematical literacy and communication skills.
4. Foster and leverage a positive learning environment and mathematical community.

Prerequisite knowledge:

We expect students to have a solid working knowledge of differential calculus. You can check whether your calculus skills are sufficient by taking the online [placement self-test](#). These skills are covered in our Math 10a (Calculus I) course.

Textbook:

This course will follow *Calculus*, Volume II, by Gilbert Strang. The text is available for free [here](#).

LATTE Course Page:

All course materials for Math 10b will be available online on LATTE. Log in [here](#) using your Unet username and password. Please check our LATTE page regularly for class announcements.

Syllabus

I plan for us to cover the following chapters from *Strang, Calculus II*. This list is subject to change, and topics may be added or removed as time permits.

Section	Topic
1.1	Approximating Areas
1.2	The Definite Integral
1.3	Fundamental Theorem of Calculus
1.4	Integration Formulas and the Net Change Theorem
1.5	Substitution
1.6	Integrals involving exp & log functions
1.7	Integrals resulting in Inverse Trig Functions
2.1	Areas Between Curves
2.2	Determining Volumes by Slicing
3.1	Integration by Parts
3.4	Partial Fractions
3.7	Improper Integrals
4.1	Basics of Differential Equations
4.3	Separable Equations
5.1	Sequences
5.2	Infinite Series
5.3	Divergence and Integral Tests
5.4	Comparison Tests
5.5	Alternating Series
5.6	Ratio and Root Tests
6.1	Power Series and Functions
6.2	Properties of Power Series
6.3	Taylor and Maclaurin Series
6.4	Working with Taylor Series

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Grading

Letter Grade:

Your letter grade for this course is determined by the table below. Points are accrued through...

- **Class Participation:** Group work and individual handouts will be a staple of our class time. Handouts will be graded partially on correctness and partially for completion. Participation will account for 30% of the final grade.
- **Assessments:** There will be two primary assessments. The first will be held in class (tentatively July 25) and the second will be held during the exam period (Aug 10-11). Each assessment will count for 25% of the final grade.
- **Homework Assignments:** There will be 5 homework assignments due weekly. Homework scores will account for 40% of the final grade.

A grade table will be available here once assignments are finalized.

Other Course Information

Four-Credit Course:

Success in this 4 credit hour course is based on the expectation that students will spend a minimum of 9 hours of study time per week working on readings, homeworks, preparation for exams, etc.

Accommodations:

Brandeis seeks to welcome and include all students. If you are a student with accommodations as outlined in an accommodations letter, please contact me (and share your accommodations letter) as soon as you can. We will work together on how best to facilitate your learning.

Please note that in order to provide test accommodations, we need your accommodations letter at least 48 hours in advance.

If you have questions about documenting a disability or requesting accommodations, please contact Student Accessibility Support (SAS) at 781.736.3470 or access@brandeis.edu

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 (see [here](#)). 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.

Communication:

Please use your Brandeis email to reach out to me, and check this inbox regularly for updates. I am usually actively online from 11am until 5pm. I will do my best to respond to any emails within 24 hours, although during the weekends and over holidays it could take me longer.

About Me: Sarah Dennis (she/they)

I am a third year PhD student in the Math Department at Brandeis. I grew up in Sydney, Australia, but have now lived in the US for 10 years! I graduated with a BA from Sarah Lawrence College in 2020 where I focused on math and computer science. My current research interests are in mathematical modeling techniques for dynamical systems. In my spare time I enjoy roller skating, playing video games, and petting with my cat. I love teaching and look forward to getting to know you all better.