Text:


The course will cover the following sections of the text: Sections 1.1–1.5, 1.7, 1.8, 1.10, 1.11, 2.1–2.7, 4.1–4.5 and selected sections from Chapters 5 and 6.

Prerequisite:

There are no prerequisites for Math 5a. Students who are unsure of their placement and are considering Math 10a should take the calculus placement exam: [http://www.brandeis.edu/registrar/newstudent/testing.html#mathtest](http://www.brandeis.edu/registrar/newstudent/testing.html#mathtest).

Learning Goals for Math 5a:

- Become proficient in the skills necessary for succeeding in Calculus (Math 10a), including:
  - Solidify knowledge of algebra: working with exponents and radicals, simplifying polynomials and rational expressions, and solving polynomial and rational equations and inequalities.
  - Understand the definition of a function, and learn to identify the domain and range of a function and graph a number of basic functions.
  - Learn to find and work with combinations and transformations of functions.
  - Learn to solve applied problems involving functions.
  - Learn to find and graph the inverse of a function.
  - Learn to work with exponential, logarithmic and trigonometric functions and their graphs.
  - Learn to solve exponential, logarithmic and trigonometric equations and inequalities.

- Hone quantitative reasoning skills by solving problems that challenge you to understand the material on a deeper level by presenting 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.

- Acquire (or improve) ability to accurately represent mathematical expressions on a computer by practicing online problems with instant feedback.

- Develop a sense for how the specific skills learned in Math 5a will transfer to other disciplines by solving applied problems from other fields, such as biology, chemistry, physics and economics.
Here are a few additional goals you might choose to set for yourself:

- Build confidence in mathematical ability by practicing progressively more difficult problems until you can solve quite challenging problems with ease.

- Increase enjoyment of math by approaching class and assignments with a positive attitude and an open mind, ready for a challenge!

- Learn how to learn math by reflecting on the structure of this class (how it is designed to increase your success, in particular the reading assignments and reading quizzes) and by reflecting on what works best for you as a student.

**Topics covered in Math 5a (Prealculus)**

Section 1.1 Real Numbers
Section 1.2 Exponents and Radicals
Section 1.3 Algebraic Expressions
Section 1.4 Rational Expressions
Section 1.5 Equations
Section 1.7 Inequalities
Section 1.8 Coordinate Geometry
Section 1.10 Lines
Section 1.11 Making Models Using Variation

Section 2.1 What Is a Function?
Section 2.2 Graphs of Functions
Section 2.3 Getting Information from the Graph of a Function
Section 2.4 Average rate of Change of a Function
Section 2.5 Transformations of Functions
Section 2.6 Combining Functions
Section 2.7 One-to-One Functions and Their Inverses
Appendix Modeling with Functions

Section 4.1 Exponential Functions
Section 4.2 The Natural Exponential Function
Section 4.3 Logarithmic Functions
Section 4.4 Laws of Logarithms
Section 4.5 Exponential and Logarithmic Equations

Section 6.1 Angle Measure
Section 6.2 Trigonometry of Right Triangles

Section 5.1 The Unit Circle
Section 5.2 Trigonometric Functions of Real Numbers
Section 5.3 Trigonometric Graphs
Section 5.4 More Trigonometric Graphs

**Note:** Some topics may be added or omitted as time permits.
Exams:
There will be two midterm exams and a final exam. **TENTATIVE exam dates:**

- **Exam 1:** Tuesday, October 6, 7:00–9:00 p.m.
- **Exam 2:** Monday, November 2, 7:00–9:00 p.m.
- **Final Exam:** Tuesday, December 15, 9:15 a.m.–12:15 p.m.

Midterm exams will be held in the evening. If you have an academic conflict (such as a class, lab, or another exam) with a midterm exam, inform your instructor at least one week before the exam. If the conflict can’t be resolved, we will offer you a make-up exam.

Grades:
Your grade in the course will be based on the following:

- **Homework (10% of your grade).**
  - Homework assignments will be collected about twice a week.
  - **No late homeworks will be accepted,** but your five 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 (10% 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.
  - One of your quiz grades will be a grade for Reading Quizzes. You must read each section of the text before it is covered in class. On the days when a reading assignment is due, there will be a reading quiz online, which will be due before class. These are graded on completion only, so it is an easy way to boost your overall quiz grade. They are graded this way because it is important that you try these problems before class but if you don’t get them right, it’s ok.

- **Two midterm exams (each 25% of your grade).**
- **Final exam (30% of your grade).**

Calculators:
You should have access to a scientific calculator (an online one is fine). You do not need a graphing calculator in Math 5a. Calculators are not allowed during exams or quizzes.

LATTE:
All course materials for Math 5a will be available online on LATTE. Log in at [http://latte.brandeis.edu](http://latte.brandeis.edu) using your Unet username and password.
Self-quizzes:

There is a link called “Self-quizzes” on your Math 5a LATTE course page. The Math 5a self-quizzes cover all the material being studied in Math 5a. 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 your instructor’s 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.

Evening help sessions:

You are welcome to attend the Math Department’s evening help sessions whenever you like. These are drop-in sessions that are available to students in Math 5a, 10a and 10b every Monday, Tuesday, Wednesday and Thursday evening anytime between 7:00 pm and 9:00 pm. Help sessions are held in Goldsmith 101 and will begin on Tuesday, September 1st.

Four-Credit Course (with three hours of class-time per week):

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 in preparation for class (readings, papers, discussion sections, preparation for exams, etc.).

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 your instructor 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 x63470 or at brodgers@brandeis.edu. Letters of accommodations should be presented at the start of the semester 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 (see http://www.brandeis.edu/studentaffairs/srcs/rr/index.html). 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, Goldsmith 222, rtorrey@brandeis.edu.