

# Graduate Student Teacher Training Program Brandeis University Math Dept.

**Contact:** Rebecca Torrey  
rtorrey@brandeis.edu  
781-736-3054

**Introduction:** The mathematics department at Brandeis University has a long-running teacher training program for its graduate students. The program is organized and run by two full-time faculty members: Susan Parker, the Elementary Mathematics Coordinator, and Rebecca Torrey. In this program, the graduate students receive training in their first year and then receive extensive support as they teach their first classes starting in their second year.

## Quick Facts:

### About Brandeis:

- Location: Waltham, MA, about ten miles west of Boston
- Undergrads: about 3,500
- Graduate Students: about 1,900 (about 40 in math)
- Faculty: about 500 (about 15 in math)

### About our Math Grad Students' Teaching:

- They teach 4 semesters of calculus (and sometime precalculus).
- They teach their own sections of 20-25 students.
- They do not teach their first year.

## Further Details about our Program:

**First Year & Apprentice Program:** First-year graduate students in the math department do not teach. During this year they become acclimated to graduate school; since many are international students, they also have to adapt to life in this country. First-year graduate students act as graders for upper level undergraduate courses. They also tutor in the math department's evening drop-in tutoring program, which gives them their first exposure to working with Brandeis undergraduates in calculus and precalculus. In this program, they are supervised by the Elementary Mathematics Coordinator.

In the spring of the first year, each graduate student participates in the department's Teaching Apprenticeship Program. In this program, each first-year student (the "apprentice") is paired with an experienced graduate student instructor or faculty member (the "coach") who serves as mentor. The apprentice visits several of the coach's classes to study the coach's teaching methods. The apprentice then, with continued guidance from the coach, prepares and teaches three consecutive classes, the second of which is videotaped. The apprentice and coach thoroughly discuss each class, and the coach provides constructive

criticism and suggestions. We watch the videotape of the second class together with both the coach and apprentice, offering extensive feedback on both content and technique. Throughout the program, we work closely with the coaches and apprentices to answer questions and provide advice and guidance.

**Teaching:** Students who pass successfully through the Apprenticeship program begin to teach in the fall of the second year. Each graduate student teaches a section of 20 to 25 students in precalculus, differential calculus, or integral calculus. In each of these courses, a faculty coordinator teaches one section and supervises the graduate students teaching the other sections. The graduate student instructors do everything that a regular faculty member would do: prepare and deliver lectures, prepare written class handouts, write and grade quizzes and exams, and hold office hours. Currently, students teach 4 semesters in the course of their graduate careers.

Graduate students continue to receive regular guidance and instruction in teaching techniques throughout their graduate careers. Graduate student instructors are provided with extensive pedagogical notes on each topic covered in the elementary courses, discussing how best to approach each topic. We meet regularly with them, both individually and in groups, to discuss teaching problems and ideas. Because classes are small, graduate student instructors get to know their students well and therefore gain insight into the kinds of difficulties undergraduates have in college mathematics classes. They also develop the kind of interactive classroom style that we feel is necessary for good teaching, in which students feel free to ask questions and are encouraged to answer them. Graduate student instructors also learn how to deal with many of the teaching responsibilities they will some day have as junior faculty members, such as choosing syllabi, writing exams and assigning grades.

Our graduate student instructors also learn a great deal from each other about effective teaching. One of the strengths of our program is that it fosters a cooperative culture among the graduate students in which teaching is regularly discussed, materials are freely shared and advice is frequently sought.