M.A. Program Handbook 2019-2020
Mathematics Department Brandeis University

The Brandeis Mathematics Graduate Program offers a Master of Arts degree in Mathematics for students with a strong undergraduate background in mathematics. The master’s program usually takes three semesters, but students with strong backgrounds may complete it in two. Students leverage the master’s program either to apply for a Ph.D. program in mathematics or to prepare for a career outside academia (e.g. in data science, finance, or software engineering).

The purpose of this handbook is to provide more program details than are included in the Math Bulletin. It is meant to complement various other sources which apply more broadly to all students at Brandeis University (e.g., the Brandeis University Bulletin, the Rights & Responsibilities Handbook, and information on Student Accessibility Support) or to students in the Graduate School of Arts and Sciences (e.g. the GSAS Student Handbook). Please make sure you read the Bulletin carefully:

- GSAS: https://www.brandeis.edu/registrar/bulletin/provisional/gsas.html
- Math: https://www.brandeis.edu/registrar/bulletin/provisional/courses/subjects/4700.html

This handbook will answer many, but probably not all, of your questions. Further questions about the graduate curriculum and requirements should be directed to the Graduate Advising Head (GAH), Olivier Bernardi. Concerning non-academic matters such as office assignments, see the Mathematics Department Administrator, Catherine Broderick. For academic paperwork and information about different on campus resources, see the Grad Affairs Office Academic Administrator, Emily Palmer.

1. The M.A. Program

Full-time Master’s students will register for at least 12 credits of courses every fall and spring semester. The program includes seven required courses and one math elective numbered 130 or higher, which may be a reading course. If you would like to count a course outside the Brandeis math department towards your requirements, this requires written approval of the Graduate Advising Head.

1.1. Required Courses. This curriculum is devoted to building a strong mathematical foundation.

All students are required to master the material of the following four core courses: Math 131a (Algebra I), Math 141a,b (Real and Complex Analysis), and Math 151a (Topology I). In addition, students are required to take at least three of the following seven courses: Math 131b (Algebra II), Math 140a (Geometric Analysis), Math 151b (Topology II), Math 161a (Advanced Bifurcation Analysis), Math 162a (Numerical Methods), Math 16XX (Probability), and Math 16XX (Partial Differential Equations). The last three courses are in the process of being approved or developed; the department plans to start offering them on a regular basis within the next two academic years from now.

Each student is responsible for mastering the material in these courses. This requirement can be fulfilled in one of two ways:
(1) Take the course and earn a satisfactory grade (officially B- to A+, but grades in the B range are often signs of trouble).

(2) Place out of the course by demonstrating a thorough understanding of the “core topics” in the syllabus. This must be done during the first two weeks of the semester in which you want to place out of the course. The placement exam (which may be written or oral) is usually given by the faculty member who most recently taught the course. This year’s examiners are listed in Appendix A. The Graduate Advising Head may also grant exemption from the course on the basis of having excelled in a similar course at another university. Students who place out of required courses are expected to take more advanced courses.

To determine the course-load that makes the most sense for you, please consult with the Graduate Advising Head. It is department policy that to continue in good standing you must pass at least two out of the required courses each semester during your first year. If you do not, or if your performance in these courses is judged inadequate, you will be asked to withdraw from the program or warned that failure to improve your performance will result in your withdrawal.

Students who have completed all 8 courses for the Master’s degree need to file an Application to Graduate by the specified deadline: https://www.brandeis.edu/registrar/forms/graddegree.html

1.2 Residency requirement. The minimum academic residence requirement for the master’s program is one year. Students typically take 2-4 semesters to complete the program. Students who take more than two semesters to complete the program are considered “extended Master’s students”: https://www.brandeis.edu/registrar/bulletin/2014-2015/registrar/bulletin/provisional/gsas.html. Please note that extended master’s students will have a different tuition rate: https://www.brandeis.edu/gsas/financing/cost.html.

1.3 Planning for Program Completion. Most of our students either apply for jobs that require strong mathematical and analytical skills (e.g. data science, finance and software engineering) or apply to math Ph.D. programs. If you are going to apply to Ph.D. programs, we recommend that you meet with the Graduate Advising Head early on in the semester to seek advice on your personal statement and letters of recommendation. In preparation for a job search, we highly recommend creating a Brandeis Handshake account (Brandeis’s equivalent of LinkedIn: https://brandeis.joinhandshake.com/login) and making an appointment with the Brandeis GSAS Center for Career and Professional Development. The Center (https://www.brandeis.edu/gsas/career/index.html) provides one-on-one coaching on interviewing, networking, resumes and CVs. During the semester, you can read postings on Handshake and emails about career-related networking events, such as data science or computer science job fairs.
1.4 **Teaching Assistants and Graders.** Half teaching assistant (half-TA) and grader positions are generally reserved for Ph.D. students but may be available depending on demand. Half-TAs work an average of 5 hours per week, while graders work an average of 7 hours per week. Students who are half-TAs or graders are required to attend the Title IX training, which is held several times a year, including during orientation.

1.5 **The ELP program.** The university’s English Language Program (or ELP) program provides English language support. All students from other countries (with the exception of students from or who have completed a degree in Australia, Canada, Ireland, New Zealand, South Africa, the US and the UK) will be required to take an English language exam during orientation. Based on these exam results from Brandeis’s English Language Program, students may or may not be required to take ESL courses. If you are asked to take an ELP class, then attendance and participation are required in order to maintain good academic standing, and a passing grade is a university requirement for graduation.

1.6 **Boston Area Graduate Consortium.** It is possible for Brandeis graduate students to cross-register for mathematics courses at Boston University, Boston College, and Tufts. Graduate students should check with their advisor and the Graduate Advising Head before cross-registering for courses. For information on cross-registering, see [https://www.brandeis.edu/registrar/registration/graduates.html](https://www.brandeis.edu/registrar/registration/graduates.html). Graduate students sometimes sit in on courses at Harvard or MIT, but it is not possible to formally cross-register for these courses.

2. **Seminars and other activities**

There are seminars and numerous other activities that graduate students benefit from, academically and otherwise. You are encouraged to take advantage of the opportunities available to you as a student in the department, at the university, and as part of the Boston area mathematical community.

2.1 **Seminars.** The department has a variety of (usually) weekly seminars. Some are intended to be accessible to all graduate students, while others require more background. The *Everytopic Seminar* is intended to expose graduate students and undergraduates to research topics in mathematics and occasionally related areas, such as physics and computer science. The Graduate Student Seminar, organized by the graduate students, is one in which the students lecture to each other on topics of interest and eat pizza.

The *Joint Brandeis-Harvard-MIT-Northeastern Colloquium* is a weekly event that rotates among the four universities and meets at Brandeis 2 or 3 times a semester. The speakers are leading mathematicians from around the world, and the talks are often accessible to graduate students. The department takes the speaker to dinner afterwards and subsidizes dinners for graduate students.

The *New Directions Lecture Series*, also known as the NOSY (for Not Only Second Year) Seminar, is a series of lectures or mini-courses offered in the fall semester of each year. They are given by faculty members and are designed to introduce students to a current area of research in more depth than is possible in a single seminar lecture.

The *Topology Seminar* tends to choose a theme for the semester and works as a learning seminar with participants taking turns giving talks. Outside speakers sometimes give talks as
The Combinatorics Seminar is an introductory seminar for combinatorics. The talk should be accessible to graduate students.

There are a number of informal learning seminars on topics of interest to students in a particular area. In the past academic year this included working seminars on dynamics and number theory, modular and automorphic forms, and other topics.

The Undergraduate Math Club sometimes organizes interesting and accessible interdisciplinary lectures.

There are many other seminars in the Boston area that are regularly attended by Brandeis faculty and students—MIT’s Combinatorics Seminar, Harvard’s Number Theory Seminar, the Harvard-MIT Algebraic Geometry seminar, Harvard’s Gauge Theory and Topology Seminar, the Boston College Geometry and Topology Seminar, and the Boston University Algebra Seminar, to name a few.

2.2 Social events. The department’s friendly and informal atmosphere fosters interaction among faculty and students and enhances the environment for learning and research. A variety of social events contribute to this atmosphere. There is an afternoon tea in the department lounge two days each week when classes are in session. Two or three Thursdays each semester, the Joint Colloquium is held at Brandeis; it is preceded by a tea in the department and followed by dinner at a local restaurant. In addition, there are several annual events, usually including a fall barbecue and a holiday party.

2.3 GSAS, GSA and ISSO. The mathematics graduate program is one of many that comprise Brandeis University’s Graduate School of Arts and Sciences. GSAS is responsible for overseeing these programs. GSAS provides a variety of support services for graduate students. These include an orientation program and workshops throughout the year. The GSAS Bulletin and newsletters provide information on a variety of topics such as academic policy and events.

The Graduate Student Association is a student organization devoted to enhancing graduate student life and representing graduate student concerns at Brandeis. There are also many other student groups, including but not limited to: Brandeis Queer Grad Student Union, Brandeis Graduate Science Social Committee, Diverse Brandeis Scholars, Career Development for the Sciences and Women in Science Initiative.

International students will also certainly avail themselves of the services of the International Students and Scholars Office, which assists with visa and immigration issues and helps international students adjust to life at Brandeis.

3. Administration

The Graduate Advising Head is responsible for overseeing the instruction and advising of graduate students in the mathematics department. This responsibility includes making recommendations to the university concerning admission, readmission, and the granting of graduate degrees. Another resource is the Academic Administrator in the Graduate Affairs Office, who assists the Graduate Advising Head with academic matters and tracking student progress. If the Graduate Advising Head is unavailable, or unable to address a particular concern, then the matter should be taken care of by the Department Chair. Academic grievance
and petition procedures are described in the GSAS Website:
https://www.brandeis.edu/gsas/current/academic-status-and-regulations.html.

3.1 Advising. All students should meet with the Graduate Advising Head at the beginning of each semester to discuss courses and plans for the semester and progress towards the degree. The Graduate Advising Head serves as the primary advisor for all M.A. students.

3.2 Evaluation. The mathematics faculty meets at the end of each semester to evaluate the graduate students and a progress letter is sent to students in May (if the student is continuing into a second year in the program). Each faculty member who has taught the student reports on the student’s performance. Minor problems are handled informally by the Graduate Advising Head. Major problems result in a letter to the student and a meeting with the Graduate Advising Head. These letters are usually quite serious and warn of the student’s possible required withdrawal from the program if performance does not improve.

3.3 M.A. Scholarships. M.A. students may be eligible for merit-based or need-based financial aid from Brandeis in the form of reduced tuition. Students should contact GSAS regarding this and other financial aid opportunities, such as student loans. More information can be found here: https://www.brandeis.edu/gsas/financing/masters/index.html

3.4 Rights and Responsibilities. The university’s Rights and Responsibilities Handbook sets forth policies governing rules of conduct that apply to all Brandeis students. The Rights and Responsibilities Handbook also explains university policies, including those of Equal Opportunity and Affirmative Action. Brandeis is also committed to providing reasonable accommodations to community members with disabilities. For more information, students should contact the GSAS Student Accessibility Support office: https://www.brandeis.edu/accessibility/.

Within Brandeis, the Mathematics Department forms a strong community that values research and learning and cultivates an atmosphere of respect and support for fellow students, faculty and staff. As a graduate student in the department, you are responsible for helping maintain that environment.

On a less lofty note, we have to remember to take care of the physical environment as well as the intellectual one, and keep the shared offices, lounge, and kitchen reasonably clean.

At the end of each academic year, the graduate students elect three or four Graduate Student Representatives for the following year. These representatives have the additional responsibility of looking after graduate student interests within the department. This includes expressing the opinion of graduate students on matters such as hiring and course offerings. There is also the opportunity for students to voice their opinions and concerns during an annual Town Hall.
Appendix A: Contact Information

- Department Chair: Joel Bellaiche ([jbellaic@brandeis.edu](mailto:jbellaic@brandeis.edu)) (Dmitry Kleinbock, kleinboc@, is currently acting as DC)
- Graduate Advising Head: Olivier Bernardi (bernardi@)
- Elementary Mathematics Coordinator: Rebecca Torrey (rtorrey@)
- Math Department Administrator: Catherine Broderick (cbroderi@)
- Academic Administrator: Emily Palmer (emilydpalmer@) / (scigradoffice@)
- Grad Student Representatives: Shujian Chen (shujianchen@), Eric Hanson (ehanson4@), Kewen Wang (swterry@), and Job Rock (jobrock@)

Placement Examiners:
- Algebra I (131a): Bernardi
- Algebra II (131b): Kiyoshi Igusa (igusa@)
- Geometric Analysis (140a): Alan Mayer (mayer@)
- Real Analysis (141a): Kleinbock
- Complex Analysis (141b): Mayer
- Topology I (151a): Ruth Charney (charney@)
- Topology II (151b): Corey Bregman (cbregman@)
- Advanced Bifurcation Analysis (161a): Jonathan Touboul (jtouboul@)
- Numerical Methods (162a): Thomas Fai (tfai@)

Important Offices:
- Math Department: Goldsmith 218, 781-736-3050
- Graduate Affairs Office: Ros-Kos Connector Room 3-RK02, 781-736-2369 (Emily)/781-736-2352 (main line), scigradoffice@brandeis.edu
- Graduate School: Kutz Hall (2nd floor), 781-736-3410, GSAS@brandeis.edu
- Registrar: Kutz 121, 781-736-2010, registrar@brandeis.edu