University of Rochester Graduate Degree Program Assessment Plan Template

- **Program title: MATHEMATICS**
- **Program degree: PH.D.**
- **Program objectives and program learning outcomes:**

Program objective 1. Program will prepare students to make significant contributions to mathematics.

Core knowledge and methods: Students will demonstrate command of the foundational central areas of modern mathematics in their classwork, preliminary examinations, oral examinations and the Ph.D. defense.

Specialized knowledge, methods and literature: Students will demonstrate in depth command of one or more subfields of mathematics, including knowledge of the existing literature and the ability to read research articles independently in an informed, critical fashion. Students' command of this knowledge will be evaluated during the oral qualifying examination and the Ph.D. defense.

Scholarship: Students will produce original, creative and interesting contributions to mathematics, including, but not limited to the Ph.D. dissertation.

Program objective 2. Program will prepare students to be productive and ethical members of the mathematical community.

Dissemination: Students will present the results of themselves and others in an effective, convincing and scholarly manner.

Written: Students will write mathematical prose and proofs according to the standards of professional mathematical exposition. Students will learn how to prepare articles in TeX or equivalent software packages and post papers on preprint servers.

Oral presentation: Students will present mathematical talks of varying lengths to the standards of professional mathematical presentation. They will seek to expand their presentation skills, both inside and outside the University of Rochester, throughout their tenure as graduate students.

Professional development: Students will be able to prepare applications for internal and external funding. They will also learn about professional opportunities outside of academia and will be able to prepare industrial job applications.

Professional ethics: Students will be trained to conduct themselves according to ethical standards for research and professional activities, including, but not limited to, recognizing and avoiding plagiarism and racial/gender discrimination and valuing the humane treatment of colleagues.

Program objective 3. Program will prepare students to be effective mathematics educators.

Recitation/workshop based instruction: Students will teach effectively in a recitation or collaborative workshop setting, and prepare educationally relevant materials, activities and quizzes.

Classroom based instruction: Towards the end of their graduate careers, they will be trained to handle their own classroom with all the responsibility that this entails, including preparing educationally relevant materials, activities, quizzes and exams.

Web-based instruction: Students will be able to work effectively with existing web-based instructional, homework and testing technology in an educationally relevant manner. They will learn about other forms of technology currently in use in the mathematics classrooms nationwide and will be able to use it effectively.

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Program assessment methods- direct methods

1. Students will be evaluated based on course homework and written exams. Exams will be written, graded, reviewed and recorded by faculty. Homework will be assigned by faculty, graded by faculty or advanced graduate students, and reviewed and recorded by faculty. The resulting information will be recorded on internal records. The final examinations in the core courses will also serve as preliminary examinations.

2. Students will be evaluated based on written preliminary exams. Exams will be offered two times per year, in December and May as a part of the final examination in the core courses. The preliminary exams will be written by faculty teaching relevant courses, and edited and collated by Prelims subcommittee of Graduate Committee. The exams will be graded and reviewed by faculty. The results will be recorded in students' academic files. Six preliminaries exams in total will be given, consisting of five problems each.

3. Assessment of early progress. A student must solve at least three out of the five problems on three of the preliminary examinations by the end of

January of their second year in order to continue in the program. A problem is considered solved if the student obtains at least 8 out of 10 points. They must solve at least three out of the five problems on four of the six preliminary examinations by May of their second year as well as at least two of the five problems on the remaining two preliminary examinations. The Graduate Committee will meet each January to assess this situation and to make recommendations in the borderline cases.

4. Qualifying exams - oral. Preparation will be supervised by advisor.
Exam conducted by advisor and other faculty. Evaluations placed in students' files.

5. Doctoral dissertation - written. Thesis will be reviewed by advisor before registration for defense, and reviewed by other members of defense committee before defense. Comments will be relayed to student and summary evaluations placed in her academic file.

6. Doctoral dissertation - oral defense. Summary evaluations (beyond UCGS evaluations) will be placed in her academic file.

7. The department will keep track of awards and fellowships, both internal and external, given to students in the program. The information will be recorded by Administrative Assistant for the graduate program.

8. The department will keep track of refereed journal articles, conference proceedings and preprint server postings. Self reported by students or advisors, placed in files.

9. The department will keep track of job placement of former students. This information will be self reported by students or advisors and placed in the departmental files.

10. The department will keep track of cumulative placement data. The resulting information will be keep in the departmental files.

All of the above will be reviewed annually by the Graduate Committee, except #9, which will be reviewed every 5 years.

Program assessment methods- indirect methods

Instructions: Please list indirect assessment methods used to assess the above program learning outcomes and frequency of implementation. Indirect methods can include, for example, graduating student surveys; student focus groups; student exit interviews; alumni surveys; course evaluations, program advisory board review; post-gradation career data. Frequency of implementation can be annual, every other year, etc.

1. The department will arrange for monitoring of students by their pre-qualifying exam advisors (assigned by the department at orientation). Meetings with students will take place at least twice a semester. Notes of these meetings will replaced in students' academic files.

2. The department will arrange for monitoring meetings with all students in the Spring semester. Meetings will be conducted by pairs of faculty from the Graduate Committee, excluding members with conflicts of interest. Notes of the meetings will replaced in students' academic files.

3. The department will arrange for exit interviews. Meetings will be conducted by pairs of faculty from the Graduate Committee, excluding members with conflicts of interest.

4. The department will arrange for alumni survey. The students will be queried on retrospective satisfaction with their graduate education and how well it prepared them for their postgraduate careers. The surveys will be conducted every 5 years, in conjunction with review of #9 above.

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Program assessment data review

1. Data from pre-qualifying exam advisor reports preliminary exams will be reviewed twice each year.

2. Data from courses, preliminary, qualifying and doctoral dissertation exams,
and annual monitoring and exit interviews will be reviewed once a year.

3. Data from alumni placement data and alumni surveys will be reviewed once every 5 years.

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