SOME TIPS FOR GETTING INTO MATH GRADUATE SCHOOL
(an unofficial guide by Ismar Volic and Stanley Chang)

The following is a list of suggestions for the steps that Wellesley math majors might take throughout their undergraduate career to make themselves serious and marketable candidates for competitive math graduate programs in the United States. As you read this, please bear in mind that admission into a good graduate program does not require you to follow all the suggestions below; in fact, it may be impractical or impossible to accomplish everything listed.

1. Take as many classes as possible. Even though the requirement for the major is currently nine courses, a good major for a graduate school-bound student will consist of at least twelve math classes, at least six of which are at the 300 level (not including independent studies). This courseload obviously requires that you take more than one math class some semesters (by the end of the sophomore year), and in some cases two 300-level courses at the same time (junior and senior years). In graduate school students customarily take three or four courses at any given time, so you should learn quickly by experience to manage such workloads. Below are some more specific suggestions:

  (a) Take 302 and 305 as soon as you can. Introductory real analysis and abstract algebra are the gateway courses for most 300-level courses and are absolutely essential for most graduate sequences in pure mathematics. In particular, in order to take full advantage of our advanced offerings, students should take Math 302 by the conclusion of the sophomore year.

  (b) Take 303, 306, 307 and 310. Every pure mathematician considers these subjects to be part of core mathematical knowledge, and any serious graduate school candidate in analysis, algebra, number theory, topology and geometry will have taken them all.

  (c) Take special topics courses. Such courses are numbered 349 and will usually be offered every semester. A student may take as many 349 courses as she wishes in her Wellesley career. The topics are typically not a part of our standard curriculum, but build on previous courses in a deeper way. Examples are algebraic number theory, advanced linear algebra, functional analysis, measure theory, differential geometry and algebraic geometry. However, you should keep in mind that topics courses should not be substitutes for course offered in the standard curriculum.

  (d) Take a course at MIT. You should take advantage of Wellesley's cross-registration by taking a course at MIT to see how mathematics is taught and done at a large research institution. This sort of exposure lessens the culture shock experienced by students transitioning from the comforts of a liberal arts college to the imposing and sometimes impersonal environment of research science.

2. Enroll in independent studies. Some of our faculty members are very open to supervising independent studies (Math 350) for advanced students who have exhausted our current offerings. Depending on the professor, the student may be asked to work through texts, deliver explanatory lectures and compose expository articles. These skills are important to foster. Recent independent studies have been in the topics of representation theory, knot theory, Markov chains and covering spaces. Students should keep in mind, however, that independent studies should not substitute as easier alternatives to courses offered in the yearly curriculum. In fact, duplicate Math 350s are often not tabulated as allowable 300-level classes in the course-count for the major requirements and Honors.

3. Participate in the student seminar. Almost every university and top liberal arts college has a long tradition of student seminars, in which students deliver short lectures on topics accessible to an

undergraduate audience (after polishing it with the help of a faculty member). These lunchtime events are typically very popular and well-attended; in fact, students in some math departments are even required to participate as part of their major requirement. Graduate admissions committees may look favorably upon such experience with seminar presentations. These talks will also provide you with the opportunity to speak clearly about mathematics in a manner that will be required of you when you become graduate instructors.

4. Do an honors thesis. A year-long project will not only provide you with deep exposure to some branch of mathematics, but will also give you the opportunity to mimic a graduate thesis in its level of expository sophistication. The honors thesis is often a long, hard, demanding process, but potentially one of the most rewarding things in your undergraduate career. An honors project including original ideas may result in a publication, which may be the single most important signal to graduate schools that you have the background and creativity to think deeply and expansively.

5. Go to conferences. There are three major math societies in the United States which offer regional weekend conferences with a supply of good talks intended for an undergraduate audience. They are the American Mathematical Society (AMS), the Mathematical Association of America (MAA) and the Society for Industrial and Applied Mathematics (SIAM). Another association of particular importance to Wellesley is the Association for Women in Mathematics (AWM). These meetings provide a venue for establishing contacts from other institutions and exchanging ideas about curriculum and pedagogy. Our faculty members frequently organize trips to such events; you should check the Math Announcements conference regularly for such opportunities.

6. Participate in intensive math programs. The two most popular extra-Wellesley programs in mathematics are the Budapest Semesters in Mathematics (BSM) and the Research Experience for Undergraduates (REU). Participation in these programs has become more the norm rather than the exception for serious math students. The former is a semester-long stay in Budapest, during which students take four mathematics courses. The REU summer programs, usually eight weeks in length, are funded by the National Science Foundation, but financial support is available only to United States citizens or permanent residents (in the past, however, international Wellesley students have secured money from the Science Center to attend). This program focuses on exposing undergraduates to accessible types of mathematical research. Oftentimes the results are suitable for publication.

7. Work in math helproom or grade for a course. You might find that tutoring or grading for a course is the perfect way to solidify a math subject in your brain. There is also currently a growing need for Supplemental Instruction (SI) at Wellesley, by which an undergraduate acts as a graduate teaching assistant and runs recitations once a week. Please speak to Professor Chang about this program.

8. Try to obtain good scores. One cannot expect admission into a good graduate program by the Wellesley name alone. To be in reasonable standing for graduate admissions, consider as a rough target a mathematics GPA of 3.5, a general mathematics GRE score of 780, and a subject mathematics GRE score of 700.

SUGGESTED SCHEDULE

Below are possible schedules for the student bound for graduate studies in pure math. The four columns correspond to initial placement into 115, 116 or 205, with two versions of the schedule that start with 115 (one more accelerated than the other). You should keep in mind that there will almost invariably be differences between your actual schedule and these suggestions, simply because they do not take into account special topics courses (349) or the fact that some courses (303, 307, 310) are offered only once every two years. The table only lists core courses, but your schedule can certainly be supplemented with additional classes like 210, 220, 223, 225 and 309. Courses listed with a slash have biyearly status. Special topics courses can be taken whenever they are offered, typically once per semester.

	Courses to take (accelerated)	Courses to take	Courses to take	Courses to take
First year fall	115	115	116	205
First year spring	116	116	205	206
Second year fall	205, 206	205	206	305
Second year spring	302	206	302	302, 306
Third year fall	305, 303/307	305	305,303/307	303/307, 349
Third year spring	306, 310/349	306, 302	306, 310/349	310, 349
Fourth year fall	303/307, 349	303/307, 349	303/307, 349	303/307, 349
Fourth year spring	310, 349	310, 349	310, 349	310, 349