This page sets out the requirements for Masters and Ph.D.s in Mathematics. In addition, one can consult the [Graduate Handbook](#) for valuable information.

It is expected that each graduate student who is a U.S. citizen or permanent resident should begin the process of establishing North Carolina residency during the first semester of graduate study. [Information can be found here.](#)

Requirements For The M.S. And M.A. Degrees

A candidate for a master's degree must satisfy each of the following requirements:

Time and residency requirements

A Master's student must earn at least two semesters of residency credit and complete all work for the degree within five years from the date of initial registration. Students who take a full load should be able to complete the Master's degree at the end of two years.

Course requirements

A Master's student must perform satisfactorily in 30 hours of graduate work in a program approved by the Director of Graduate Studies. Fifteen of these hours must be in graduate level courses numbered 600 and above in the Department of Mathematics. [More information…](#)

Computer language requirement

A Master's student must pass a computer language requirement by demonstrating a certain level of programming ability. This may be accomplished by either a) passing a computer language exam administered by the Mathematics Department or b) passing an approved undergraduate or graduate course in programming. [More information…](#)

Examinations

Students entering at the Master's level must pass one of the written Ph.D. qualifying exams. Master's candidates must also pass an oral exam conducted by the the student's Master's Committee after the completion of the thesis or project. [More information…](#)

Master's Thesis or Project

Each Master's student must either write a Master's Thesis or complete a Master's Project. This work may be done in one of the standard areas of specialization in the Mathematics Department, or, when appropriate, may be done under the direction of an approved adviser in an allied discipline. [More information](#)…

Ph.D. Requirements

The purpose of the Doctor of Philosophy program is to prepare the student for research and teaching.

Time and residency requirements

Ph.D students are required to take a minimum of 48 semester hours of course work, including at least 3 units of Math 994 (Ph.D. dissertation). Ph.D students must complete their degree within eight years unless special permission is given for an extension of time. Students who remain beyond 10 semesters are responsible for the payment of tuition.

First year courses

Courses taken during the first year are usually chosen from the following list, which is designed to prepare students for the Ph.D. qualifying examinations. Master's students will typically take these courses as well in the first year before focusing in the second year on the requirements for a Master's degree.

- 653
- 656
- 661
- 662
- 668
- 669
- 676
- 677
- 680
- 681

Qualifying Exam Requirements

There are five qualifying exams:

- Algebra: Math 676 and 677
- Analysis: Math 653 and 656
- Geometry-Topology: Math 680 and 681
- Methods of Applied Mathematics: Math 668 and 669
- Scientific Computation: Math 661 and 662

Ph.D. qualifying exams are given twice each year, near the beginning of classes in August and January. Ph.D. students are encouraged to take the Ph.D. qualifying exams early and in principle would be ready to take them in August after the first year. The qualifying exams (sometimes called comps) are subject to the following rules.

1. A Ph.D. student can pass either the Pure Math option for the for the qualifying examination or the Applied Math option.
2. To pass the Pure Math Option, a student is required to pass three of the five qualifying exams by the beginning of the sixth semester. Any three of the five can be passed.
3. To pass the Applied Math option, a student is required to pass Methods of Applied Math and Scientific Computation by the beginning of the sixth semester.
4. In each examination period a student can take any number of qualifying examinations (from one to five).

5. A graduate student who passes a Ph.D. qualifying examination, as determined by the Graduate Committee, will receive credit for that examination toward the Ph.D. requirements.
6. If a student does not pass at least one Ph.D. exam by the beginning of the fourth semester, the department will not guarantee financial support past the end of the fourth semester. However, if such a student passes one exam by the beginning of the fifth semester, then reinstatement of financial support will be considered.
7. To remain in the Ph.D. program, a graduate student must pass the written qualifying exam, with either the Pure Math or the Applied Math option, by the beginning of the sixth semester. A student who does not do this will be out of the Ph.D. program.
8. Any exceptional cases will be decided by the graduate committee.

Course Requirements

All Ph.D. students must take and pass at least six courses from the following two lists:

1. Comprehensive courses that are not basic courses for any of the three comprehensive exams passed by the student
2. Second tier courses
   o Algebra: Math 641, 643, 771, 774, 775
   o Analysis: Math 657, 751, 753, 754, 857
   o Applied Mathematics: Math 635, 761, 762, 768, 769, 892
   o Geometry-Topology: Math 781, 782, 773, 775, 776

Furthermore, of these six courses every Ph.D. student must take and pass three courses numbered over 700 from the second tier list

A student taking a pure math option (respectively an applied math option) may replace one (respectively one or more) course(s) in the second tier requirement with other graduate level courses inside or outside of the department. For each replacement course, the student must obtain permission, prior to registration, from both the adviser and the graduate director.

Oral examination requirement

When the student is prepared and has selected a direction for the Ph.D. dissertation, the Ph.D. candidate must pass an oral examination on material basic to the proposed dissertation area. The examination will be conducted by the Ph.D. committee of the student, which consists of five faculty members and is chaired by the student's adviser. The committee will recommend action to correct any deficiencies noted during the oral examination.

After passing the oral examination the candidate continues working in the area of concentration to complete the Ph.D. dissertation.

It is strongly recommended that the oral examination be taken no later than one year after passing the Ph.D. qualifying examinations.

Dissertation defense

After finishing the dissertation the candidate gives a public oral presentation of the thesis and is examined on it by the Ph.D. committee. For information about paper and electronic submission of dissertations consult the [Thesis and Dissertation guide](#).

Foreign Language Requirement

In addition to course work and dissertation the candidate for the Ph.D. must demonstrate reading competence in one approved foreign language (usually French, German, or Russian). [More information](#)…

Computer Language Requirement

The Ph.D. computer language requirement is identical to that for the Master's degree. [More information…](#)

Teaching Requirement

Students are required to take and successfully pass the TA Teaching Seminar (a special section of Math 920) during their first fall semester of their program. Students are also required to perform a minimum of two semesters of instructional service.