APPLIED MATHEMATICS, PHD

The Applied Mathematics PhD program is a joint program with The University of Alabama in Birmingham and The University of Alabama in Huntsville.

Admissions

In addition to the minimum Graduate School admission requirements, to be considered for regular admission an application must include:

- A resume/CV
- 3 letters of recommendation.

Scores on the general test of the GRE are optional. We encourage applicants to submit GRE scores if they think doing so will boost their chance of getting admitted. However, applications with and without GRE scores will both get full consideration.

See the Admission Criteria section of this catalog for more information.

Curricular Requirements

Students must complete 54 coursework hours and 24 dissertation research hours in order to qualify for the PhD in Applied Mathematics. The grade of each course has to be at least a B. The student's supervisory committee and the Joint Program Committee must approve the selection of all these courses. At least 18 hours must be in a major area of concentration, selected so that the student will be prepared to conduct research in an area of applied mathematics, while at least 12 hours have to be in a minor area of study, which is a subject outside mathematics.

Code and Title		Hours
A major area of applied mathematics		**18**
These 18 credit hours can come from any of the following courses. This is not an exhaustive list courses options. Other options may include from The University of Alabama in Huntsville and The University of Alabama in Birmingham may be selected with advisor approval.		
MATH 510	Numerical Linear Algebra	
MATH 511	Numerical Analysis I	
MATH 512	Numerical Analysis II	
MATH 520	Linear Optimization Theory	
MATH 521	Non-Linear Optimization Theory	
MATH 541	Boundary Value Problems	
MATH 554	Advanced Math Statistics I	
MATH 555	Advanced Math Statistics II	
MATH 557	Stochastic Processes I	
MATH 559	Stochastic Processes II	
MATH 610	Iteratve Meth Linear Sys	
MATH 611	Numerical PDEs	
MATH 642	Partial Diff Equations I	
MATH 643	Partial Diff Equations II	
A minor area of study		**12**
These 12 credit hours can come from graduate level courses offered by the Departments of Physics, Computer Science, Aerospace Engineering and Mechanics, Chemical and Biological Engineering, Economics, or Applied Statistics.		
Additional Courses		**24**
Additional courses are available to students that provide the foundation to do research at the PhD level. Students with an uneven preparation at the undergraduate level may be advised to take foundation courses before proceeding with the program above. See the preliminary test requirements listed above. Only courses with numbers above 500 are accepted for graduate credit; however, some courses have dual numbers so that they can be taken for either undergraduate or graduate credit. For example, students cannot take both MATH 465 and MATH 565 for credit. This situation may apply to students who have been undergraduates at UA. Also, be aware that some 500-level courses may count toward the Master's degree requirement, but not toward the PhD requirement.		
Dissertation		**24**
MATH 699	Dissertation Research	

Transfer Credit

See the Graduate School policy.

Doctoral Plan of Study Requirement

The programs of study require prior approval by the Joint Program Committee. See also the Graduate School Policy on the Doctoral plan of study.

Joint Program Examinations

Every student planning to earn the PhD in Applied Mathematics must pass the two Joint Program Examinations. One exam covers real analysis. The other exam covers linear algebra and numerical linear algebra.

The exams are administered twice a year. During each administration, a student may take one or both of the exams. A single exam may be attempted at most twice, with a maximum of three attempts allowed for passing both exams; those who do not will be dropped from the program.

Comprehensive Exam

Students will take the Comprehensive Qualifying Examination after three years of graduate studies. The examination will cover the program of study, with a written and an oral component, and will be jointly prepared and graded by the student's Graduate Study Supervisory Committee. This will consist of six faculty members: the student's advisor serves as Committee Chair; two others from the student's home department; one faculty member from each of the Mathematics departments at UAB and UAH; and one from outside the department in the student's minor area. The written component will consist of three parts; two parts will be devoted to the student's major area, and one part will be devoted to his minor area. Three hours will be allowed for each part. The oral portion will cover the entire program of study. Copies of old exams are available on the department's website.

If the judgment of the Supervisory Committee is that the student's performance on the test is not satisfactory, then they may, at their discretion, and without obligation, elect to give the test at most one additional time. The second test, if given, will conform to the above policies for the first test. Students must pass both the written and oral component by the end of their fourth year of full-time graduate studies; those who do not will be dropped from the program.

Admission to Candidacy Requirements

Advancing to candidacy requires the passing of the joint program examinations, the language requirement, the comprehensive exam, the completion of all the course- work as listed on the approved plan of study, and the approval of the dissertation subject by the supervisory dissertation committee.

Continuous Enrollment Policy

See the Graduate School policy.

Dissertation Requirements

See the Graduate School policy.

Time Limits for Degree Completion Requirements

See the Graduate School policy.

Student Progress Requirements

Coursework may be finished within two years after the Qualifying Exam. Research should be started while coursework is still underway. Typically, work on the thesis itself takes 12-18 months. Therefore, depending on your background, it can take four to six years to obtain both the M.S. and the Ph.D. degree.

Additional Requirements

Language Requirement

The language requirement for each student will be set by the Joint Program Committee with the approval of the appropriate Graduate Dean.

Academic Misconduct Information

See the Graduate School Policy.

Withdrawals and Leave of Absence Information

See the Graduate School Policy.

Academic Grievances Information

See the Graduate School Policy.

Grades and Academic Standing

See the Graduate School Policy.

Graduate School Deadlines Information

See the Graduate School Deadlines.

Application for Graduation Information

See the Graduate School Policy on application for graduation.

Financial assistance is available to all graduate students on a competitive basis, and is subject to availability of funding, continued good progress towards obtaining a degree and a good employment record. The forms of financial assistance usually include graduate teaching assistantships (GTA), graduate research assistantships (GRA), and fellowships. The o#er of any assistantships is contingent upon receipt of acceptable results on a pre-employment background report.

Eligible students who excel in the program may be nominated by the Department for UA fellowships. Nominees are selected by a committee consisting of departmental faculty, and are based upon prospective nominee research productivity, academic performance, and contributions to the Department.

Stipend and Benefits of Graduate Teaching Assistants

The appointment as a Graduate Teaching Assistant (GTA) pays a monthly stipend that is equally distributed through the academic year (fall and spring). It also provides a 100% full-time tuition scholarship for up to 15 credits in each of the fall and spring semesters, a single coverage health insurance, and payment of college and departmental fees. The stipend and amounts used to pay health insurance and college and departmental fees are taxable. All amounts are subject to change by The University of Alabama Trustees.

Continuation of the GTA position at any time is contingent upon continued enrollment in the PhD program in mathematics, the availability of funding, satisfactory progress toward the degree objectives, remaining in academic good standing, and satisfactorily completing the duties associated with this assistantship.

Duties of Graduate Teaching Assistants

Each GTA will be required to work an average of 20 hours per week under the supervision of the Graduate Program Director. This constitutes a full-time equivalency appointment (FTE) of 0.50 (50%) . The specific assignments and duties, determined by the supervisor, will be included in the Memorandum of Appointment.

The workload for a GTA (with 0.50 FTE) is six credits of teaching per semester. This translates into the teaching of two 3-credit courses (0.25 FTE each), or an equivalency of the combination of classroom and non-classroom duties. The workload for a half GTA (with 0.25 FTE) is the teaching of one 3-credit course (0.25 FTE), or an equivalency of the combination of classroom and non-classroom duties.

With the approval of the Graduate Program Director and the Department Chair, lower division courses are assigned by the Director of Lower Division Instruction, and tutoring/proctoring duties are assigned by the Supervisor of Tutors and Proctors. GTAs need to talk to the Graduate Program Director if they have concerns about their duty assignments.

Performance Expectations for Continuing Financial Support

Because a PhD usually requires at least five years of full-time study, financial support is ordinarily provided for a duration of five years. A sixth year of funding is made available on a case by case basis. Requests for extensions of financial support into the 7th year or above are generally not considered.

All the following requirements must be met for financial support to be renewed.

1. Students must carry out the teaching and/or other duties assigned to them by the department and the university.
2. Students must meet the following expectations on academic progress:
    a. Students must maintain a 3.0 GPA or better throughout the program.
    b. Students must satisfy the first year coursework and preliminary exam requirements by the start of the second year.
    c. Students must pass either two written qualifying exams or the comprehensive exam by the start of their fourth year.

d. Students must have a dissertation proposal that is approved by their dissertation committee by the start of their fifth year.
e. Students must report substantial progress in their dissertation research work to their dissertation committee by the end of the fifth year.

If all above requirements are satisfied and the student's advisor is content with the student's progress, the advisor may request an extension for a 6th year of support. This request must be made before the end of the semester before the last semester of funding.

Conditions for Termination of Financial Support

Students who meet one or more of the following criteria will result in prorated stipend, the termination of their assistantships, or the suspension from the graduate program.

1. Failing to carry out the teaching and/or other duties assigned to them by the department and the university. Examples of failing to carry out duties include, but are not limited to
   a. Failure to teach assigned classes or perform assigned duties in the MTLC.
   b. Failure to consult with course coordinator or the Director of Lower Division Instruction about changes to their courses.
   c. Failure to consult with the Supervisor of Tutors and Proctors or the MTLC Lab Coordinator about changes to MTLC schedules or duties.
   d. Leaving before the end of the semester (defined as the date grades are due) or returning after the Monday before classes start without permission of the MTLC Lab Coordinator and the Graduate Program Director.
2. Failing to meet the expectations on academic progress described in Performance Expectations for Continuing Financial Support.
3. Resolved finding of Academic Misconduct. Penalties, including potential loss of financial support, will be determined with guidance from the UA Graduate School and/or the UA College of Arts and Sciences.