

# MATHEMATICS, PH.D.

## Admission Requirements

To be admitted for a graduate degree, students are expected to satisfy the general requirements of the Graduate School, as stated in the Admission Criteria section of this catalog. In support of the application, each applicant must submit scores on the general test of the Graduate Record Examination; the advanced portion is desirable but not required.

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

## The Doctor of Philosophy Degree in Mathematics

The Doctor of Philosophy degree in Mathematics is intended as a research degree and is awarded based on scholarly proficiency (as demonstrated by course work and the Qualifying Examination) and the ability to conduct independent, original research (demonstrated by the PhD dissertation). A successful student must:

A) Complete 48 hours of graduate-level courses with a minimum of 39 hours in Mathematics. (The following courses do not count toward this degree: MATH 504 Topics Mod Math Teachers, MATH 505 Geometry: Secondary Teachers, MATH 508 Topics In Algebra, MATH 551 Math Stats W/Applictn I, MATH 552 Math Stats W/Applictn II, MATH 570 Prin Modern Algebra I, MATH 586 Intro Real Analysis I, MATH 587 Intro to Real Analysis II, and MATH 591 Teaching College Math (except Math Education students).

B) Not take more than three courses from the following: MATH 522 Mathematics For Finance I, MATH 537 Applied Math Topics I, MATH 585 Intro Complex Variables, and MATH 588 Theory Diff Equations I.

C) Pass the PhD Qualifying Examination in two areas of Mathematics (see below).

D) Fulfill PhD candidacy requirements.

E) Complete at least 24 semester hours of dissertation research.

F) Write and submit a dissertation based on original research in an area of Mathematics.

G) Give an oral defense of the dissertation results.

For university rules regarding transfer credit, residency requirements, and other policies and deadlines, refer to the Academic Policies section of the Graduate Catalog, or see the Graduate Program Director.

## Course Work Requirement

Students must complete 48 credit hours in order to qualify for the PhD. Most of the courses required for a Master's Degree, but not all, are part of the approved collection. In consultation with the student's dissertation advisor, the Graduate Program Director must approve the student's program of study. Study plans for students wishing to focus in Algebra, Analysis, Scientific Computing/PDE, Topology, Math Education, or Optimization can be found in the student handbook.

**The following core course requirements must be completed: One course with grade of B or better from each of the following two categories representing Pure and Applied areas respectively, and three two-course sequences.**

**Category 1: Pure (Choose 1) 3**

MATH 571 Prin Modern Algebra II

MATH 573 Abstract Algebra I

MATH 674 Abstract Algebra II

MATH 580 Real Analysis I

MATH 681 Real Analysis II

MATH 565 Intro General Topology

MATH 566 Intro Algebraic Topology

**Category 2: Applied (Choose 1) 3**

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 642 Partial Differential Equations

MATH 554 Math Statistics I

MATH 555 Math Statistics II

**Two Course Sequences (Choose 3) 18**

Algebra

MATH 571 Prin Modern Algebra II  
& MATH 573 and Abstract Algebra I

Boundary Value Problems and Partial Differential Equations

MATH 541 Boundary Value Problems  
& MATH 642 and Partial Differential Equations

Mathematical Statistics

MATH 554 Math Statistics I  
& MATH 555 and Math Statistics II

Numerical Analysis

MATH 511 Numerical Analysis I  
& MATH 512 and Numerical Analysis II

Optimization

MATH 520 Linear Optimization Theory  
& MATH 521 and Non-Linear Optimization Theory

Real Analysis

MATH 580 Real Analysis I  
& MATH 681 and Real Analysis II

Topology

MATH 565 Intro General Topology  
& MATH 566 and Intro Algebraic Topology

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. For example, students in the Ph.D. program may be initially advised to take the Master's level analysis course, MATH 587 Intro to Real Analysis II, before taking MATH 580 Real Analysis I.

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.

Because a doctoral degree usually requires five years of full-time study, financial support is provided for five years, with the possibility of a sixth year of support. A typical course load is three courses per semester. If a student is employed as a Graduate Teaching Assistant (equivalent to a 6-hour teaching load), the minimum course load is 6 hours. However, the total course load plus teaching must be between 12 to 18 hours inclusive.

Students are expected to finish the required core courses listed above in the first two years of the program (or the first three years, if foundation courses are taken). The core course requirement makes up from 18 to 21 of the necessary 48 hours, so students can specialize and broaden their studies.

After their second or third year, students should be focusing in areas related to their dissertation. Students are advised to take at least 12 hours of coursework in their chosen research area. A focused area of study such as Computer Science, Engineering, Finance, or Physics could be advisable for students in Applied Mathematics. These areas may also be beneficial to students who plan to work outside an academic setting. Up to three courses at the 500-level from outside the Mathematics Department may be taken subject to the Graduate Program Director's approval. Be aware that the fees for courses in the Graduate School of Business are considerably higher than those charged by the College of Arts and Sciences. For example, in the spring of 2017, the fees a graduate course in Economics were \$284.50 compared to \$73.50.

## Acceptable Progress toward a PhD in Mathematics

1st Year – Maintain a 3.00 GPA or higher, and take 3 courses per semester.

2nd Year – Complete three of the 2-course sequences and core courses with a satisfactory GPA and pass two qualifying exams.

3rd Year – Maintain a satisfactory GPA, apply for candidacy, form a Supervisory Committee by the middle of the 3rd year, contact Marcia Black at [mblack@ua.edu](mailto:mblack@ua.edu) to reserve a room for the research proposal presentation; obtain approval of the research proposal from the Supervisory Committee and begin dissertation research. Although optional, it is recommended that one of the Committee members be from outside the Department of Mathematics.

4th Year – Complete the 48 hours with a satisfactory GPA, submit the Plan of Study to the graduate school (via Natalie Lau at [klau@ua.edu](mailto:klau@ua.edu)), and form a Dissertation Committee by the end of the fourth year. Note that one of the Committee members must be from outside the Department of Mathematics.

5th Year – Check the student deadlines from the graduate school's website, at <https://graduate.ua.edu/current-students/student-deadlines/>. Students who plan to graduate in the Spring semester, for example, have to submit an online application for degree at the beginning of that semester. At least one month before the deadline for submission of the dissertation to the graduate school, students must distribute a hardcopy of their dissertation to committee members, and the defense needs to be scheduled to give students at least one week to make corrections. Contact Marcia Black at [mblack@ua.edu](mailto:mblack@ua.edu) to reserve a room for the defense. The last day to submit a defended dissertation at the Proquest website, including changes suggested by the committee, is usually the towards the end of October in the fall semester, and towards the end of March in the spring semester. Provided satisfactory progress towards the PhD is being made, a student's 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.

## Preliminary Examination

The Director of Graduate Studies, in consultation with the Graduate Program Committee, may require a student upon entering the Ph.D. program in Mathematics to take the preliminary examination consisting of two parts, one focusing on Real Analysis and the other on Linear Algebra. The level of difficulty is similar to advanced senior level courses in analysis (such as the sequence Math 486/ Math 487) and in linear algebra (such as Math 371). This exam takes place during the week before fall classes start and lasts four hours. Students who do not perform adequately will be required to take the Master's sequences in Real Analysis (Math 586 and Math 587) and in Linear Algebra (Math 572 and Math 510 or Math 570).

## The PhD Qualifying Examination

PhD students must pass two qualifying exams from five subjects: Algebra; Topology; Real Analysis; Numerical Analysis and Partial Differential Equations within three exam sessions by the beginning of their seventh semester in order to remain in the PhD program. Exams are given twice a year, during the week before the fall and the spring semesters begin, lasting four hours each. Students may take one qualifying exam at a time, until they have passed two subject areas within three exam sessions and the specified time limit. A student may not fail any qualifying exam more than twice. If a student takes a given exam and fails, and then chooses a different exam (e.g., replacing the analysis exam with the PDEs exam), the first exam failure will still count. If a dispute arises, the final interpretation of the exam scores will be made by the Graduate Program Committee.

Each exam is written and graded by a committee consisting of at least two faculty members selected by the Chair in consultation with the graduate program committee (GPC) in the subject area of the exam. After the qualifying exam is graded, the exam committee makes a recommendation of a grade of Fail or to the GPC and the Graduate Director. The GPC will have the final authority to assign the grade, which is then conveyed to each student by the Graduate Director.

## Doctoral Degrees

The University offers several types of doctorates, each of which is described below.

The minimum period in which a doctoral degree can be earned is three full academic years of graduate study after completion of a baccalaureate degree, although in most disciplines the period is longer. Graduate teaching assistants (GTA) or graduate research assistants (GRA) whose work assignments are 10 hours per week (i.e. the equivalent of 3 semester hours) or more should expect to take more than the minimum period of 3 academic years to earn a doctoral degree. The only exception to the three-year minimum is the practice-focused DNP.

### Doctor of Philosophy Degree

The Doctor of Philosophy (PhD) degree is regarded as the researcher's degree. Program requirements include the acquisition of special skills for conducting independent, scholarly research of publishable quality. Requirements traditionally include a working knowledge of one or more foreign languages, but currently a number of foreign-language alternatives have been approved by departments. Through acquisition of these skills, PhD candidates demonstrate their potential for careers as independent, publishing scholars. Refer to departmental sections of this Catalog for details on foreign-language requirements or alternatives.

The Doctor of Philosophy (PhD) degree is granted on the basis of scholarly proficiency, distinctive achievement in a special field, and capacity for independent, original investigation. The first two criteria

are tested in coursework and a comprehensive examination, the last in a dissertation in which the student must present clearly and effectively the results of substantial research. A combination of these accomplishments, rather than the mere accumulation of residence and course credits, is the essential consideration in awarding the PhD degree. The PhD differs from the EdD in a number of ways, including the fact that the PhD Plan of Study and comprehensive examination demonstrate a higher-level research focus, and there is a greater number of dissertation hours and higher level of complexity and independent thought in a PhD-level dissertation.

**Field of Specialization** - A defined field of specialization is required of all candidates for the Doctor of Philosophy degree. A minimum of 48 semester hours of non-dissertation course credit is required. Candidates should consult their departments or the appropriate section of this Catalog for additional requirements. The doctoral course as a whole must be unified, and all its parts must contribute to an organized program of study and research. In addition, a student must complete a minimum of 24 hours of dissertation research.

**Research skill/language requirements** - There is no university wide foreign language/research skill requirement for doctoral students; each college or department offering the PhD degree may set its own requirements. This policy reaffirms the importance of research skills and foreign languages in the highest academic degree granted by American universities, but it also recognizes that the departments offering the degrees are in the best position to determine the number and nature of such requirements in the interests of their students. For further information about PhD foreign language/research skill requirements, students may contact their departments.

### **Interdisciplinary Studies**

There is a PhD degree program in interdisciplinary studies, and it is administered by the Graduate School. In addition to the general requirements for the PhD degree, the program of study and the supervisory committee for the prospective interdisciplinary studies degree candidate must be approved by the dean of the Graduate School before the student is admitted to the program. See Interdisciplinary Studies (IDS) at the Graduate School's website for information on prerequisites, admission procedures, course of study, and other aspects of IDS programs.

### **Doctor of Education Degree**

The Doctor of Education (EdD) requires a minimum of two years of graduate study beyond the master's degree for the completion of the EdD program. The student is required to complete 60 semester hours in approved graduate coursework research beyond the master's degree, or 90 semester hours of approved graduate courses, and to defend a dissertation. The student must complete a minimum of 12 hours of dissertation research. In the College of Education section of the Graduate Catalog, there are specific regulations governing the EdD program.

### **Doctor of Musical Arts Degree**

The Doctor of Musical Arts (DMA) degree requires a minimum of 48 semester hours beyond the Master of Music degree, plus recitals and other examinations as determined by faculty of the School of Music. Specific requirements for each major area are outlined in the School of Music section of the Graduate Catalog.

### **Doctor of Nursing Practice**

The Doctor of Nursing Practice (DNP) is a joint program offered by the University of Alabama in Huntsville College of Nursing (UAHCON), the University of Alabama at Birmingham School of Nursing (UABSON), and The University of Alabama Capstone College of Nursing (UACCN). The

DNP is a practice-focused degree that is detailed in the Nursing section of this Catalog.

### **Doctor of Social Work**

A Doctor of Social Work (DSW) degree is a practice doctorate degree in social work. It provides coursework on theory and skills in social work practice that are more advanced than what one would typically experience in an MSW program for social work.

### **Admission to Doctoral Degree Programs**

Admission to any doctoral program is limited to students whose scholastic records show distinct promise of success in doctoral study. Admission to the Graduate School and the earning of a master's degree from The University of Alabama does not guarantee acceptance into a doctoral program. Students in doubt about their acceptance into doctoral programs should consult with departmental advisors and the Graduate School, which makes the final decision about admission. A department may terminate a student's doctoral admission if there is documented unsatisfactory academic or other progress toward completion of the degree.

### **Residency Requirements**

The University of Alabama recognizes that doctoral students should be immersed in advanced study and inquiry, interact extensively and meaningfully with faculty and peers, engage with the academic community in their field, and have access to the educational resources of the University. To achieve these goals, a minimum of 50 percent of coursework hours to be counted in a student's doctoral program must be from The University of Alabama (exclusive of dissertation research hours and subject to the Graduate Catalog's Transfer of Credit policies). Additionally, 100 percent of dissertation credit hours must be from The University of Alabama. Diverse academic traditions, rapidly changing instructional modalities, and new student populations are acknowledged and accommodated with this policy.

### **Graduate Credit**

A student must be admitted to the Graduate School and must register as a graduate student in order to receive graduate credit. Approval for graduate registration must be obtained from program advisors prior to registration.

### **Graduate Credit for Noncredit Experiences**

All course credit used toward a UA graduate degree must be taught at the graduate level. No graduate credit may be earned by correspondence study or for experiential learning not conducted under the direct supervision of graduate faculty of The University of Alabama. UA does not offer graduate credit for noncredit workshops, seminars, continuing education experiences, professional development, internships, work/life experience, and so forth.

### **Transfer of Credit**

Graduate credit earned in the field of the doctoral degree from a regionally accredited institution in which the student was enrolled in the graduate school of that university may be considered for transfer and applied towards the requirements for a doctoral degree if approved by the department and the Graduate School. Evaluation of credit for transfer will not be made until after the student has enrolled in the Graduate School of The University of Alabama.

In some cases, foreign educational credentials may not meet the Graduate School's criteria for transfer of credit. It may be necessary for students in this situation to secure an evaluation of their credentials from World Education Services Inc. (WES), an external foreign credential

evaluation service. Additional information on their services can be found at their website.

There are two options for possible transfer of graduate credit at the doctoral level.

1. All doctoral programs: Up to one-half of the required coursework (exclusive of dissertation research hours) for a doctoral degree may be transferred from another institution if the credit was in-field and was earned during the six-year period (18 fall, spring and summer semesters) preceding the semester of admission to the UA doctoral program. Revalidation (recertification) of credits more than 18 semesters old at the time of admission to a doctoral program is not an option. Only courses in which a student earned a "B" grade or better may be transferred. Under this option, a Request for Transfer of Graduate Credit form must be submitted to and approved by the Graduate School.
2. PhD Programs Only: A student holding an earned, in-field master's degree may request approval for up to 24 hours of credit to be applied to the PhD. To do this, the student must have earned at least a "B" overall graduate GPA from the awarding institution. If approved for transfer, these hours would count toward the minimum 48 coursework hours required for the PhD degree. When exercising this option, a Request for Transfer of Graduate Credit form must be submitted to and approved by the Graduate School. The requested transfer credit hours must be listed on the PhD Plan of Study as MSC501 under the transfer credit section. If the in-field master's degree was awarded *more than six years prior to admission to the current doctoral degree program*, the graduate program director or department head/chair must also submit to the Graduate School for evaluation, a Field-Related Employment Since Earning Master's Degree form with the student's CV must be submitted by the department through the UA DocuSign system in myBama. In addition, the department is asked to provide the following, attached to the approved Plan of Study :
  - a. An annotated work history from the student. This history should include job titles and major duties for all positions since earning a master's degree.
  - b. A brief paragraph from the corresponding faculty member, attesting that he/she has reviewed the work history and how that work applies to the current Ph.D. degree program.

The Graduate School will make the final determination about whether up to 24 prior master's hours can be applied to the Ph.D. requirements.

PhD awarding departments that want to participate in offering Option 2 to their doctoral students, need to "opt in" by informing the graduate dean in writing that they wish to be among the approved departments.

Consideration of transfer of credit or the acceptance of an earned master's degree as credit toward a PhD program is subject to a final decision by the Graduate School. In either case the student must ensure that the Graduate School has an official transcript of all credit involved. This will ensure that the student and advisor are fully aware of course hours needed when submitting the required Plan of Study, which must be submitted by the time the student completes 30 hours of transfer plus UA coursework. Planning to transfer courses in the final semester typically will delay graduation.

Please note that some departments allow fewer than 24 hours of graduate transfer credit. Be sure to check with your department's graduate coordinator regarding your department's transfer policy. Dissertation Research (699) may not be transferred in from an outside institution.

## Time Limits

All requirements for the doctoral degree must be completed within nine years (27 fall, spring, and summer semesters) following admission to the doctoral program, with the following specific exception approved by the Graduate Council: Modern Languages and Classics (ten years if entering the doctoral program with a baccalaureate, not master's, degree).

Previous graduate credit may be applied to the doctoral degree if the credit was earned during the six-year period prior to admission to the doctoral program or accepted by the Graduate School as part of Option 2. Such credit must be identified clearly on the Outline of PhD Program (Plan of Study) and requires Graduate School approval. Only those students graduating within the time limit for their doctoral program may apply previously approved graduate credit to the doctoral degree. Revalidation (recertification) of any expired course credit is not an option.

## Plan of Study

Early in the graduate program, each student must confer with the appropriate departmental advisor or major professor to select courses, discuss when and by which method the doctoral residency requirement will be completed, discuss research interests, and so forth. Then a Plan of Study must be prepared and submitted to the Graduate School by the time the student has completed 30 coursework hours.

The PhD Plan of Study and DMA Plan of Study are submitted by the department through the UA DocuSign system in myBama. The Plan of Study for other doctoral programs (Ed.D., DNP, DSW) are available from the student's department, college, or school. All doctoral students must have a completed Plan of Study approved by the Graduate School no later than the semester during which the student will complete 30 semester hours of UA and/or transfer credit toward the doctoral degree. Otherwise, a "hold" may be placed on future registrations.

A copy of the approved Plan of Study must be submitted to the Graduate School when the department submits the Admission to Candidacy for Doctoral Degree form through the UA DocuSign system in myBama.

## Preliminary or Comprehensive Examination

A preliminary or comprehensive qualifying examination is required of all doctoral candidates. This examination is given after

- any foreign language/research skill requirements are met (PhD students only);
- two full years of graduate study are completed; and
- the supervisory committee deems the student to have adequate preparation in the major and minor fields of study.

The examination is conducted by the student's supervisory committee or other committee established in the program area. Whereas one of the purposes of the preliminary examination is to determine the student's research competence to begin work on a dissertation, the examination should be completed at least nine months before the degree is to be awarded. A student may take the oral or written examination only twice. Failing the examination twice results in dismissal from the degree program and the Graduate School.

## Admission to Candidacy

The requirements for advancing to candidacy include passing the qualifying (major or preliminary) examination; completion of all coursework as listed on the approved program of study; receiving departmental approval of the dissertation subject (although some departments require the defense of a dissertation proposal and/or writing one or more preliminary sections of the dissertation as well); and having the committee recommend the student for Admission to Candidacy for

the Doctoral Degree. The completed candidacy form is submitted to the Graduate School well in advance of the final semester.

### Continuous Dissertation or Document Registration

Once a student has met the requirements for admission to candidacy, received approval for the dissertation research proposal, or initiated enrollment in 699 (dissertation/document research) or 739 (project research), the student must pursue completion of the dissertation without interruption by enrolling each fall and spring semester of the academic year

-PHD and EDD students are required to register for a minimum of 3 hours each semester.

-DMA and DNP students are required to register for a minimum of 1 hour each semester.

Summer enrollment is expected if the student is working on the dissertation/document/project and using any University facilities or resources, including faculty time. The only time summer registration is required for dissertation/document/project research is when a doctoral student is graduating in August or defending the dissertation/document/project during the summer semester. This is true whether or not the student has formally submitted an Application for Admission to Candidacy.

Each doctoral student must have completed the minimum number of dissertation research hours required for their degree program.

-PHD students must complete a minimum of 24 hours of dissertation research (699).

-EDD students must complete a minimum of 12 hours of dissertation research (699).

-DMA students must complete a minimum of 4 hours of document research (699).

-DNP students must complete a minimum of 7 hours of dissertation research (699).

The amount of dissertation/document/project research for which a student enrolls in any given semester should be commensurate with the progress a student is expected to make on the dissertation, as well as reflective of the extent to which University facilities and faculty time are invested in the proposed activities.

**To assist faculty and students in determining the appropriate registration for doctoral research, the following guidelines are recommended:**

**Three semester hours.** Little or no progress will be made on the dissertation, only minimal use of University facilities will be involved, and/or there will be only slight faculty contact with the student; the work and writing of the dissertation are complete and only final grammatical corrections and the oral examination on the dissertation remain to be accomplished.

**Six semester hours.** The student will be devoting approximately one-half of a full-time academic load to the dissertation. Moderate progress on the dissertation is expected of the candidate, only limited use of University facilities will be involved, and/or faculty contact with the student will be limited.

**Nine semester hours.** The student will be devoting approximately three-fourths of a full-time load to the dissertation. Substantial progress on the dissertation is expected of the student, there will be major use of University facilities, and/or considerable faculty contact with the candidate is anticipated.

**Twelve semester hours.** The student will be working full-time on the dissertation. Extensive progress on the dissertation is expected, there will be considerable use of University facilities, and/or faculty contact with the student will be extensive.

### Dissertation Proposal

The dissertation proposal aims to show the appropriateness, manageability, and significance of the projected research. The student formally presents the written proposal to the dissertation committee and defends it in a meeting with the committee. The proposal normally includes an introduction giving an overview and stating the significance of the proposed research, review of the literature, and methodology. Departments determine the details of the dissertation proposal's format with respect to such things as the length of the introduction and detail of the review of the literature.

Once the student and dissertation chair have developed a proposal, and the graduate dean has approved the dissertation committee, the student schedules the dissertation proposal meeting that includes all committee members. The student cannot propose a dissertation and have its final defense in the same semester.

### Dissertation

A dissertation showing the ability to conduct independent research and skill in organization, writing, and presentation must be prepared on a topic in the major field. It must constitute an original contribution to knowledge. Early in the process, the subject of the dissertation must be approved by the dissertation committee of the major department or division and by the dean of the Graduate School.

A dissertation committee, with the director of the dissertation as its chairperson, supervises the preparation of the dissertation. The dissertation committee shall have not fewer than five members, all of whom are appointed by the dean of the Graduate School. Students may set up their committee through the Graduate Academic Activities portal on the Graduate School website.

All members of a dissertation committee must hold Graduate Faculty status at The University of Alabama and must represent at least two academic departments. The chair of the committee must be a full member of the Graduate Faculty, as described in the Catalog's section on Qualifications of the Graduate Faculty. A majority of the Dissertation Committee members must be full-time regular University of Alabama faculty. If the outside member is not a full or associate member of the UA Graduate Faculty (e.g., if s/he is a highly qualified person from another university, a business or industry), the graduate dean needs to appoint that member by approving Affiliate Graduate Faculty status for the specific purpose of serving on the student's dissertation committee.

The graduate dean's approval of the proposed dissertation committee is expected to be obtained before significant progress is made on the dissertation—typically just before or just after the dissertation proposal meeting. For this purpose, the student submits the Appointment/Change of a Doctoral Dissertation Committee through the Graduate Academic Activities portal on the Graduate School website.

The final oral dissertation defense is the culminating experience in the doctoral program. Once the dissertation committee has agreed that the student is prepared for the final oral dissertation defense, the student and committee members will set the defense date. As such, all members of the dissertation committee are expected to attend and participate in real time. Virtual attendance via interactive video or teleconference is permitted for off-campus external committee members, but the student and Tuscaloosa campus faculty should attend in person unless extraordinary circumstances dictate the need for virtual attendance. In

circumstances where virtual participation is necessary, all participants must follow the Virtual Participation guidelines found below.

## Virtual Participation

### Scope and Goals

All members of a student's graduate committee are expected to attend and participate, usually in person, in any oral examination as part of the student's graduate (Master's or Doctoral) degree program. Traditionally, oral examinations are conducted with the student meeting their committee while gathered in one physical location on campus. However, the need occasionally arises for virtual participation in the oral examination. In these cases, graduate programs must ensure adherence to the following if any graduate-level oral examination involving the student's entire thesis/dissertation committee includes virtual participation.

- The student's consent must be sought and obtained in advance of conducting the oral examination with virtual participants.
- Virtual participation by committee members *must* include both audio and visual capability so that:
  - each committee member can hear the student and view the student, any presentation slides, and any demonstrations;
  - the student can hear and view each committee member.
- All committee members must participate interactively and in real-time for the *entire* examination, including any preparatory discussion leading up to it, the presentation itself, its discussion and evaluation.

The following sections provide detail on the technical and attendance requirements for an oral examination with virtual participation. Departments and programs may enforce stricter guidelines than those outlined, including an on-campus-only policy if deemed necessary and appropriate.

### Technical Requirements

Real-time and fully interactive audio and video communications must be maintained throughout the examination and any related discussion. The audio/video communications facilities must allow the student and all committee members to see and hear each other during the entire examination. There must be adequate provision for the transmission of text, graphics, or writings referenced or generated during the examination (e.g., slides, whiteboard). The use of audio-only communications is not permitted.

In case of technical difficulties or technology failure, the committee will decide whether to continue the examination once the difficulty is resolved, or to cancel the examination and reschedule it for a later date, without prejudice to the student.

If the student or any committee member(s) have a disability that will be impacted by virtual participation, reasonable accommodations should be provided.

### Attendance Requirements: campus-based programs

Programs should ensure that students are advised about virtual participation guidelines related to an oral examination, including reference to these guidelines as well as any other program-specific requirements.

It is generally expected that members of a graduate student's committee be physically present with the student for each oral committee examination. However, an oral examination may have virtually participating committee members according to the following rules:

- **Any one member** of the graduate student's committee (excluding the chair / advisor) can participate at a distance without seeking further authorization.
- The **committee chair** will be allowed to participate at a distance only if rescheduling the oral examination for a time when they are on campus would cause hardship to the student. In this case, the committee chair should submit a petition to the Dean of the Graduate School, outlining the reasons leading to the request.
- Similarly, a petition from the committee chair to the Dean of the Graduate School is also required if **more than one committee member** is to participate at a distance. Such petitions will only be considered if rescheduling the oral examination to a time when only one member of the committee would be participating at a distance would cause significant hardship to the student, as outlined in the petition.

All committee members participating virtually must be able to **fully interact** in the oral examination via audio and video capability; participation by viewing a recording of the oral examination is specifically prohibited. All members of the committee, on- or off-site, must participate in the evaluation of the examination; provisions must be made to record their vote and collect their signatures as necessary.

**Student participation at a distance** in graduate oral examinations involving their committee is generally not allowed for campus-based graduate programs. However, the committee chair and/or the graduate program director, in agreement with the student, may draft a petition to seek permission from the Dean of the Graduate School to conduct such an oral examination. This arrangement will only be considered if the committee chair agrees to it, and if rescheduling the oral examination for a time when the student is on campus would cause great hardship to the student; the petition should clearly outline the extenuating circumstances leading to this need.

### Attendance Requirements: online or hybrid programs

An online graduate program is defined as a program in which no aspect of the degree program occurs on-campus, including oral examinations. A hybrid program is defined as a program which has both online and on-campus elements.

For online and hybrid programs that handle oral examinations in an online setting, all committee members as well as the student may participate virtually in the oral examination. However, these programs must fully adhere to the guidelines outlined in the Technical Requirements section above for any oral examination involving the entire committee.

Hybrid programs that require oral examinations to take place on campus must adhere to the guidelines set forth for campus-based programs.

## Final-Semester Dissertation (699) Minimum Registration Hours

The dissertation must comply with the guidelines in A Student Guide to Preparing Electronic Theses and Dissertations. Graduate School deadlines, including each semester's dissertation deadline, are available at the Graduate School's homepage.

Consult the ETD website for details of ETD submission, including information on what needs to be submitted to the Graduate School. The graduate dean must approve the dissertation before the student can be cleared for graduation.

The Catalog section on Continuous Dissertation Registration for Doctoral Students states that once a student qualifies for doctoral candidacy, the student must enroll each semester for at least 3 hours of dissertation (699) research. If certain conditions are met for the student's final semester, the student may qualify to enroll for fewer than 3 hours of

699 dissertation research. A zero-hour or one-hour 699 registration is permitted only in the final semester. This exception applies only to students who registered for at least 3 hours of dissertation (699) research in the preceding semester and only under the conditions described in the table below:

When was the *completed electronic dissertation submitted to ProQuest/the Graduate School?	Minimum hours of 699 registration required in the final semester
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By 4:45 p.m. on the last-possible day for instructors to post grades for the semester before the student's final semester (date published in the <sup>2</sup> University Academic Calendar)	0
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After 4:45 p.m. on the last-possible day for instructors to post grades for the semester before the student's final semester, but before 4:45 p.m. on the last-possible day to register or add a course for the student's final semester (both dates published in the University Academic Calendar)	1
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After 4:45 p.m. on the last-possible day to register or add a course for the student's final semester (date published in the University Academic Calendar)	3
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"Completed" means submitted to ProQuest after being successfully defended and carefully edited following the defense meeting. The dissertation chair or department designee must submit the Committee Acceptance Form (CAF) through the UA DocuSign system. The CAF is must be signed by all committee members, department chairperson, and graduate dean. The CAF is submitted by the department through the UA DocuSign system in myBama. At the time of ProQuest submission, the student also must submit the Survey of Earned Doctorates through the NORC website.

#### Footnotes

<sup>1</sup> International students on F-1 or J-1 student visas are not permitted to use the zero-credit hour exception above as the basis of maintaining minimum enrollment requirements as active students. Please see "USCIS" section under "Minimum Hours—Other Policies and Regulatory Bodies" on page 3 of this policy.

<sup>2</sup> The University Calendar is available at the Academics tab of the website of the University Registrar.

## Article-Style Dissertations

This approach is intended for doctoral students whose dissertation will consist of a number of related manuscripts or articles that represent independent research or creative activity. It is an option available only to students in certain fields in which the faculty have received Graduate Council approval from the Graduate Council. A complete list of these fields is below:

- Accountancy
- Aerospace Engineering and Mechanics
- Applied Statistics
- Biological Sciences
- Chemical Engineering

- Chemistry
- Civil Engineering
- Computer Science
- Economics
- Education (all departments)
- Electrical and Computer Engineering
- Finance
- Geological Sciences
- Health Education and Promotion
- Human Nutrition
- Interdisciplinary Studies
- Management
- Management Science
- Marketing
- Mechanical Engineering
- Metallurgical and Materials Engineering
- Physics
- Psychology

Article-style dissertations must be based upon research completed while the student is enrolled at The University of Alabama. For each article used, the student must be the first author, or equivalent, as defined by the discipline.

As with traditional dissertations, the article-style dissertation must be the student's original idea. It must be a unified work and include a sequence of articles of publishable quality around a cohesive theme, with a comprehensive review of literature demonstrating an in-depth understanding of the unifying framework.

- In article-style dissertations there will be introductory material to describe the studies, show how they are related, and explain their significance;
- connecting language to bridge each study to the next; and
- a summary making clear the importance of the studies, integrating the major findings, and discussing the implications for the overall topic.

These components do not have to be separate sections or chapters. They may be parts of the manuscripts or may be accomplished in an abstract.

All parts of both traditional and article-style dissertations must conform to the provisions set forth in A Student Guide to Preparing Electronic Theses and Dissertations, except when the circumstances of a specific project or discipline's style manual require deviation. Students considering the article-style approach should contact the Graduate School before beginning their work if they have questions concerning specific problems or deviations from traditional procedure.

All doctoral candidates must give members of the dissertation committee a minimum of two weeks to read the dissertation before the date of the required final oral examination.

**Electronic submission of dissertations:** August 15, 2009, is the date when electronic submission began to be required and paper submission no longer was accepted. Consult the ETD website for details of ETD submission, including information on what needs to be submitted to the Graduate School. The graduate dean must approve the dissertation before the student can be cleared for graduation.

## **Protection of Human Subjects for Research**

Scientific research involving human subjects has produced substantial benefits for society, but it also has significant ethical questions. The mission of the University's Institutional Review Board (IRB) for Protection of Human Subjects is to ensure that research involving human subjects is conducted ethically. University and federal policies require that review and approval to use human subjects in research precede the research, no matter how great or small the involvement of the human subjects. In the case of dissertation research that involves the use of human subjects, the principal investigator is responsible for contacting the college Human Research Review Committee to obtain approval for the planned research. The University's IRB approval form is available at the IRB website.

## **Final Dissertation Defense**

The final oral dissertation defense is the culminating experience in the doctoral program. Once all committee members are in agreement that the dissertation is ready for the final oral defense, the student and committee members will set a defense date. As such, all members of the dissertation committee are expected to attend and participate in real time. Virtual attendance via interactive video or teleconference is permitted for off-campus external committee members, but Tuscaloosa campus faculty should attend in person unless extraordinary circumstances dictate the need for virtual attendance. The dissertation must comply with the regulations in *A Student Guide to Preparing Electronic Theses and Dissertations*.

"Completed" means submitted to ProQuest after being successfully defended, carefully edited following the defense meeting, and having the Committee Acceptance Form (CAF) signed by all committee members, department chairperson, and graduate dean. A majority of the dissertation committee must approve the written dissertation and defense before submission to the Graduate School. The CAF is submitted by the department through the UA DocuSign system in myBama.

Graduate School deadlines, including each semester's dissertation deadline, are available at the Graduate School's homepage. Consult the ETD website for details of ETD submission, including information on what needs to be submitted to the Graduate School. The graduate dean must approve the dissertation before the student can be cleared for graduation.

## **Final Examinations**

When the dissertation has been completed, the candidate will be given a final oral examination by a committee of not fewer than five members, one of whom must be from outside the student's major department or, for students in the College of Education, outside the student's program (not department), and appointed by the dean of the Graduate School. This examination will focus primarily on the candidate's research work, as embodied in the dissertation, and the field in which the dissertation lies, but it may encompass the complete program for the degree. The majority of the committee must approve that the student successfully defended the dissertation. The results of the examination must be reported to the Office of the Graduate School at least six weeks before the commencement at which the degree is to be conferred.

## **Application for Graduation**

Each candidate for a doctoral degree must submit an Application for Degree via myBama no later than the last day to register or add a course for the semester (or first term of the summer semester) in which requirements for the degree are to be completed. That specific date is published each semester at the Graduate School's website under *Current Students/Deadlines for Graduate Students*.

## **Withholding or Withdrawing an Advanced Degree**

The University of Alabama reserves the right to withhold or withdraw an advanced degree on the recommendation of the graduate faculty.