Doctor of Philosophy Degree in Statistics

The Doctor of Philosophy (PhD) program in Statistics is designed to prepare you to work on the frontiers of the discipline of Statistics, whether your career choice leads you into research and teaching or into leadership roles in business, industry and government.

The program is very flexible particularly in the choice of electives and of research topic. You may even choose to do research on the interface of Statistics and some other discipline, such as Computer Science, Genetics, Forestry, Bioinformatics, Economics, etc. The course requirements are designed to ensure that you have sufficient training in Probability, Statistical Inference, Computing, and Applications to prepare you for research on the cutting edge of Statistics.

The MS degree is not a prerequisite for the PhD program, but training equivalent to that specified in the MS program is necessary preparation for the PhD core courses. An incoming PhD student may waive the MS-level core with the appropriate equivalent training from another institution; however, a student who is missing any element of the MS-level core will be required to pass the PhD Qualifying Examination. Proficiency in mathematics, particularly in Real Analysis, and in computing is indispensable for successful completion of the PhD program.

Many items in this section, with some modifications for the Department's purposes, are taken from the [Graduate Bulletin](#).

A full-time student who is receiving financial assistance from the University must take a total of at least 12 credit hours. Supported students supplement their full course load with STAT 6811, STAT 6821, STAT 8261, STAT 7770 and/or STAT 8910-20 until research begins. Other full-time students must take a total of at least 9 credit hours.

No credit from a previous degree program or institution may be transferred to use toward your degree program at UGA if that credit counted toward any previous degree. You may transfer at most 6 credit hours which must be approved by the Graduate Coordinator.

Selection of Research Advisor

If you are earning your PhD degree, then you are expected to choose your research advisor while you are taking your PhD core, as part of the expectations of STAT 8910.

The relationship between you and your advisor is one which both of you must agree to. It is, however, not set in stone, and either you or your advisor can terminate this relationship when it is not working out for whatever reason.

The Graduate Coordinator is your coursework advisor, until you choose a research advisor.

Residence

The Graduate School requires that a minimum of 30 hours of consecutive course work included on your Program of Study must be spent in resident study on this campus. Undergraduate courses taken either to fulfill research skills requirements or to remove deficiencies may not be calculated in the 30 consecutive hours of resident credit.

Core Requirements

The core of the PhD degree consists of two parts: A First-Year core, for students who have not had previous equivalent training elsewhere, and a Second-Year core.

The First-Year core is in fact one of the options that you may choose for the MS degree outlined in the chapter immediately preceding this one. That First-Year core provides training in

Linear Models:

For students who entered in Spring 2018 or after: STAT 6430 and STAT 8260
For students who entered in Fall 2017 or before: STAT 6420 and STAT 8260

and

Probability and Inference: STAT 6810 and 6820.

From Fall 2018, the department has introduced three 1-credit hour supplemental study sessions, STAT 6811, STAT 6821, and STAT 8261, one for each of the respective core courses, STAT 6810, STAT 6820, and STAT 8260. In each case, enrollment in the session will be optional for students in the corresponding core course, but students will not be able to enroll in the problem session (e.g., STAT 6811) without being in the corresponding 3-hour course (STAT 6810). That is, STAT 6810 will be a co-requisite for STAT 6811, but not vice versa. The co-requisite relationship will hold for STAT 6820-21 and STAT 8260-61.

The Second-Year core covers

For students who entered in Spring 2018 or after:
STAT 8060 Computing Techniques in Statistics I,
STAT 8170 Probability Theory,
STAT 8350 Bayesian Data Analysis, and
STAT 8530 Advanced Inference.

For students who entered in Fall 2017 or before:
STAT 8170 Probability Theory,
STAT 8530 Advanced Inference,
STAT 8620 Categorical Data Analysis and Generalized Linear Models, and
STAT 8700 Stochastic Processes.

Sub-Core Requirements

For Spring 2018 or later entrance: No Sub-Core Requirements

For Fall 2017 or before entrance: You are required to choose two of the following sub-core courses.

STAT 8060 Computing Techniques in Statistics I,
STAT 8210 Multivariate, Theory and Methods,
STAT 8540 Advanced Statistical Inference II, and
STAT 8630 Longitudinal Data Analysis.

Elective Requirements

You may choose

6 for Spring 2018 or later entrance
4 for Fall 2017 or before entrance

for electives from among all 8000-level courses, *except* 8040, 8200, 8250, and any other 8000-level course aimed at students who are not in Statistics; 8910 and 8920; and any 8000-level course cross-listed with Biostatistics and Bioinformatics (*e.g.*, 8050, 8220, 8440,…).

Research Skills Requirements

To pursue research effectively you must develop a facility with certain research skills and tools such as reading research papers and effectively communicating results to an audience. Toward this goal, the Department requires all supported students to enroll in STAT 8910 (1 credit) from second to sixth semester. In Semester 2, students will attend talks by departmental faculty; in semesters 3-6 students will be required to attend departmental colloquia. The Department also strongly encourages all students to take STAT 8920. These courses are designed to help you develop the habit of attending research talks, understand the research that is on the cutting edge of statistics, learn about professional development as a research scientist, and get a head-start on your dissertation research. More about these courses may be found in the chapter on Research Skills Requirements.

PhD Qualifying Examination

The PhD Qualifying Examination (QEP) is given every year during August, approximately one week prior to the start of Fall semester. This exam is given only once per year.

A student taking the QEP for the first time must attempt both parts of the exam: Theory and Data Analysis. A student who passes the Data Analysis part of the QEP is eligible for an MS degree in Statistics, pending the completion of the appropriate coursework. See the previous chapter for more details.

An incoming PhD student with credentials supporting mastery of the First-Year PhD core course materials may request permission from the Graduate Coordinator to take the PhD Qualifying Examination (QEP) before beginning his/her first year in the PhD program. The Graduate Coordinator will review the student's credentials before granting permission to take the QEP. This attempt will be considered as the "zeroth attempt" and a student must take the Theory and the Data Analysis parts of the QEP. If the student does not pass both parts of the exam, then s/he will have two more chances to take the QEP. If the student fails one or both parts of the QEP on the zeroth attempt, then the student should address areas of weakness by taking relevant first-year core courses before proceeding to take the Second-Year core courses. The Graduate Coordinator will determine these First-Year remedial courses after reviewing the student's performance on the QEP and his/her prior training.

Parts, Scope and Time Allowed

The QEP tests material covered during the First-Year core of the PhD program. However, the exam does not have separate sections for each course's material, but rather it tests this core material in a comprehensive way that will require students to synthesize material from all four courses. Students must complete all First-Year Core courses before attempting the QEP. A student who is on academic probation cannot take the QEP until s/he removes herself/himself from academic probation.

The exam will have two separate parts:

- Statistical Theory. This is an "in-class" exam which the students have 6 hours to complete. During that time, examinees may refer to books and notes but will not have access to a computer or the Internet. At the discretion of the Examination Committee, the Theory portion may include a take-home component.
- Data Analysis. This is a "take-home" format exam with a 4-day time limit requiring a written report focusing on the analysis of a data set or another applied statistical problem. The exam will include 2 or 3 problems, each of which will typically have a corresponding data set, and each student must choose 1 problem to solve. The questions will be open-ended, requiring the examinee to analyze the data in an appropriate way and draw conclusions about the scientific questions of interest. Each examinee will hand in a written report describing the analysis, why it was chosen for the problem, results, conclusions, etc. Exams will be evaluated on the quality of the analyses and the written report. English language usage is not a grading criterion *per se*, but effective communication is essential.

Grading

The QEP consists of two parts: a Theory portion and a Data Analysis portion; the grading and pass/fail recommendations for these two parts are handled separately by two distinct faculty committees. Each committee ensures that every exam is graded by at least two faculty members and then makes recommendations to the Graduate Faculty of the Department, who then vote to determine the final results. Students must pass both parts of the exam to continue in the PhD program.

Rules for Taking and Re-Taking

For your initial attempt, you must take both parts of the QEP. If you do not pass both parts on your initial attempt, you may retake the part or parts of the exam you failed the following August. More than two attempts at the exam will not be allowed.

Rules Appeal Dismissal from PhD Program After Second Unsuccessful Attempt at QEP

A graduate student may appeal dismissal from the PhD program after an unsuccessful second attempt at QEP exam provided that he or she is not under departmental or Graduate School academic warning status or probation at the time of taking the exam.

To appeal dismissal, the student must submit a letter within two weeks of the announced initial pass/fail decision to the department's Graduate Faculty, by care of the Graduate Coordinator, expressing compelling reasons for allowing him/her to continue in the program. At that time, the student may present any evidence which s/he thinks may be relevant, including, but not limited to: performance in classes, performance on parts of the exam, other teaching or research accomplishments. The appeal to continue in the program must be accompanied by a letter of support from at least one member of the Graduate Faculty. The appeal will be considered and voted upon by the Graduate Faculty. An appeal receiving less than two-thirds support of the Graduate Faculty will be considered unsuccessful. A successful appeal will require the student to address his/her weakness revealed in the qualifying exam by suitable remediation. Such remediation will be chosen and supervised by the advisor who plans to supervise the PhD research of the student in consultation with the student's advisory committee.

Faculty Responsibilities

Two faculty committees, one for each part of the exam (stat theory and applied stats/data analysis), have responsibility for setting the exam and administering it. Each of these committees have 4 members, including at least one person who has recently taught one of the first year PhD core courses, and at least one person who has not recently taught one of the first year PhD core courses. Questions for the exam are solicited from the membership of these exam committees as well as the broader faculty, who are encouraged, but not required, to contribute. The committees are responsible for ensuring that the exam is appropriate and reasonably consistent from year to year. They also have the responsibility for grading the exams and making pass/fail recommendations to the entire Graduate Faculty of the Department, who then vote on the results. These committees also have responsibility for the QEM.

Advisory Committee

Within one year of successful completion of the QEP, you should seek a major professor and, in consultation with your major professor, select faculty to form your PhD

Advisory Committee. The form for declaring your Advisory Committee is available on the Graduate School's web site, grad.uga.edu, on their forms page.

The Advisory Committee must consist of the major professor as chair, and four additional Graduate Faculty members. At least half of the Advisory Committee must come from the Department of Statistics. Additional voting members may be appointed to the committee, including no more than one non-UGA faculty, who must hold a PhD in his/her field. The Advisory Committee will be recommended to the Dean of the Graduate School by the Graduate Coordinator after consultation with you and the faculty members involved.

The Advisory Committee is charged with approving your Program of Study, arranging and executing the written and oral Comprehensive Examinations, approving a subject for the dissertation, approving the completed dissertation, and approving your defense of your research.

Changes in membership of the Advisory Committee require approval of the Graduate Coordinator and the Dean of the Graduate School.

Program of Study

A Preliminary Program of Study, developed by you, the Graduate Coordinator, and your major professor and approved by a majority of your Advisory Committee, may be submitted to the Graduate Coordinator by the end of the Second-Year core. Filing a Preliminary Program of Study is not necessary; however, you must file a Final Program of Study before you complete your Comprehensive Examination.

Programs of Study are not intended to be standardized. If you are interested in special applications of Statistics, you may include study in the relevant discipline.

The Program of Study should consist of 18 or more semester hours of approved 8000-level courses in addition to research, dissertation writing, and directed study. No grade below C will be accepted on the Program of Study. To be eligible for graduation, you must maintain a 3.0 (B) average on the graduate transcript and a 3.0 (B) average on the Program of Study.

You must submit a final, typed Program of Study to the Graduate School prior to notification of the Comprehensive Examination. This Program of Study must be submitted on the proper form for approval by the Advisory Committee, the Graduate Coordinator, and the Dean of the Graduate School. The Final Program of Study must show all graduate courses relevant to the doctoral program and not just courses satisfying the minimum degree requirement. Courses from the MS degree and courses taken at other universities may be listed in the "Relevant Master's or Other Graduate Degree Courses" section of the program of study form. The Program of Study must carry a minimum of 30 hours of course work, three hours of which must be dissertation writing (9300).

The Graduate Committee or your Advisory Committee will evaluate carefully and fully your progress and qualifications at the end of each year of study in order to advise you whether or not to continue in the program.

Comprehensive Examination

You must pass formal, comprehensive written and oral examinations before being Admitted to Candidacy for the PhD. These examinations are administered by your Advisory Committee.

The written Comprehensive Examination, although administered by the Advisory Committee, is prepared and graded according to the procedures and policies given in this section. The oral Comprehensive Examination is an inclusive examination within your field of study. An examination of your dissertation prospectus (proposal) takes place on a date after the oral Comprehensive Examination and may not take the place of the oral Comprehensive Examination. All members of your Advisory Committee must be present simultaneously for the oral examination and prospectus (proposal) presentation.

The oral Comprehensive Examination is open to all members of the faculty and shall be announced by the Graduate School. The Graduate Coordinator must notify the Graduate School of the time and place of the examination at least two weeks before the date of the examination.

Following each of the written and oral examinations, each member of the advisory committee will cast a written vote of pass or fail on the examination. To pass each examination, the agreement of the Advisory Committee is achieved with no more than one dissenting vote. An abstention is not an appropriate vote for the Comprehensive Examination. The results of both examinations will be reported to the Graduate School within two weeks following the oral examination.

Grade Requirement

You are required to achieve at least a B+ average grade (3.3 GPA) in the Second-Year core courses. Failure to meet this requirement will result in a remedial measure to be imposed by your Advisory Committee. The choice of remedial measure is at the discretion of the Advisory Committee but could involve retaking a course, completing an independent study or assignment in the area of deficiency.

Any remediation must be completed before you begin the Comprehensive Examination.

Timing

The Comprehensive Examination is taken after completing the Second-Year core courses. If you are required to remediate, then you must complete the prescribed remedial measures before taking your Comprehensive Examination.

Typically, your Comprehensive Examination should be undertaken during the Summer or Fall following the completion of your Second-Year core coursework, but no later than the end of the Spring semester beyond finishing the Second-Year core. You are expected to have made substantial progress on the relevant literature review, although it is not necessary for you to have any novel results nor even a specific research proposal. The Comprehensive Exam is separate from the dissertation proposal and must be completed prior to the presentation of the proposal.

Parts, Scope and Time Allowed

To begin the Comprehensive Examinations, you and your major professor notify the Graduate Coordinator that you are ready, and you call a meeting of your Advisory Committee. At that meeting, you give a short presentation (15 minutes) and/or write-up (1 or 2 pages) of your area of research. Also at that meeting, the Advisory Committee will discuss your record and whether any remediation is warranted.

The Comprehensive Examination must consist of two parts: one written, and one oral. Both parts of the exam are formulated and administered by your dissertation Advisory Committee.

- The written portion of the exam is administered over a period of several days or perhaps as much as four weeks. Typically, each committee member in turn poses questions to you, and these questions are answered in written format. The topics to be examined include:

  1. The PhD core courses with emphasis on the second year core;
  2. Coursework outside of the core that is particularly relevant to your intended research area (including relevant material taught outside the department, conceivably); and
  3. The existing literature related to your intended research area.

- The Oral portion of the exam follows the Written portion. Committee members may examine you on the topics listed above, including, but not limited to, follow-up questions related to the written portion of the exam. There is no time limit for this portion of the exam, but it typically takes 1-3 hours. All committee members must be present for this exam.

You must notify the Graduate Coordinator, who must then notify the Graduate School, of the time, date and location of the Oral Comprehensive Examination at least two weeks in advance.

Grading

Your PhD Advisory Committee has responsibility for evaluating your performance on the Comprehensive Exam. In accordance with Graduate School rules, each committee member assigns pass/fail grades separately for the written and oral portions of the exam. You must pass both the oral and written portions with no more than one "fail"

vote in each case. Subject to the committee's discretion, passing grades may be assigned conditional on remedial measures to address a particular area of weakness. For example, you may be required to complete additional coursework and/or directed reading. In the case that you fail either the oral or written components, you may re-attempt either component(s) one time. Failure of either component more than once will result in your being dismissed from the PhD program.

Dissertation

All PhD students at UGA must present a dissertation on some subject connected with his/her major field of study. The dissertation must represent originality in research, independent thinking, scholarly ability, and technical mastery of a field of study. The conclusions must be logical, the literary form acceptable, and the contribution to knowledge meriting publication.

Persons who serve on your Advisory Committee at the time the dissertation research is undertaken must be faculty members knowledgeable in the areas of your research. The major professor has the primary responsibility for guiding your research, but you should consult all members of the Advisory Committee to draw upon their expertise in relevant areas.

Dissertation Prospectus and Proposal

The major professor and Advisory Committee shall guide you in planning your dissertation. To inform your Advisory Committee of your research will write a Dissertation Prospectus, and then give a presentation to your Advisory Committee in which you propose your planned research.

The Dissertation Prospectus is an essay on your proposed dissertation research. This essay should review the pertinent literature, present any new preliminary results you have obtained, and give a clear indication of the direction of proposed research for your dissertation. The essay should demonstrate concise professional writing and should not exceed 30 standard pages of typescript (single-spaced, and in 12-point font).

When your major professor certifies that your Dissertation Prospectus is satisfactory, it must be formally considered by the Advisory Committee in a meeting with you. This meeting is an oral examination during which you present to your Advisory Committee your literature review and preliminary research results, and describe how you intend to complete your dissertation. Your Advisory Committee examines you on the proposed research, considers its feasibility, and advises you accordingly. In rare situations, it is possible that you will be advised to seek another, hopefully related, research topic.

Note that this formal consideration may not take the place of the oral Comprehensive Examination, by specific directive of the Graduate School.

Approval of the Dissertation Prospectus, and of your presentation of its content, signifies that members of the Advisory Committee believe that you have proposed a

satisfactory plan for your research study. Approval of the Prospectus requires the agreement of the Advisory Committee with no more than one dissenting vote as evidenced by their signing an appropriate form, which, together with the approved Prospectus, is filed with the Graduate Coordinator.

Admission to Candidacy

Admission to Candidacy for the PhD degree is a formal designation by the Graduate School which indicates that you have passed your Comprehensive Examination and have successfully proposed your dissertation research direction. Prior to Admission to Candidacy, a PhD student should register for STAT 9000, Dissertation Research; after, the student should register for STAT 9300, Dissertation Writing.

You are responsible for initiating an application for Admission to Candidacy so that it is filed with the dean of the Graduate School at least two full semesters before the semester of graduation. This Application is a certification by the Department of Statistics that you have demonstrated ability to do acceptable graduate work in your chosen area of research and that:
  a. all prerequisites set as a condition to Admission have been satisfactorily completed;
  b. research skills requirements have been met;
  c. the Final Program of Study has been approved by the Advisory Committee, the Graduate Coordinator, and the dean of the Graduate School;
  d. an average of 3.0 (B) has been maintained on all graduate courses taken and on all completed courses on the Program of Study;
  e. written and oral Comprehensive Examinations have been passed and reported to the Graduate School;
  f. the Advisory Committee, including any necessary changes in the membership, is confirmed and all its members have been notified of their appointment;
  g. a Dissertation Prospectus has been approved; and
  h. the Graduate School's residence requirement has been met.

Once a student has been Admitted to Candidacy, the Department has an ethical responsibility to ensure that appropriate faculty mentorship is provided to the Candidate for completion of the degree.

For more information on dissertation writing, please see the [Graduate School's Dissertation Guidelines](#).

Dissertation Approval and Defense

The dissertation must constitute an achievement in research and advance in knowledge in Statistics or on the interface of Statistics and an area of its application. Dissertation topics take on a wide range from development of new theory to innovative application in substantially new ways. Because of the great diversity of topics in Statistics, standards of length and style cannot be prescribed. The basic criterion for approval shall be the excellence of the research conducted to meet the objectives of the approved Dissertation Prospectus. As a minimum guide, any

dissertation should be of such quality as to yield at least two papers in refereed journals.

The dissertation is written by you, in consultation with your major professor. Your major professor advises you on the technical aspects of the dissertation topic, the presentation of results, and the organization of your presentations and manuscripts. The Advisory Committee is advised of progress on the dissertation, with members participating in those aspects of your research where they can offer guidance. Members of the Advisory Committee will assist you and your major professor to ensure integrity, correctness and completeness of your research.

Preparation of the dissertation is your responsibility. The writing style in your dissertation must be of professional quality.

When your major professor is satisfied with the completed dissertation, s/he will certify that it has his/her approval and is ready to be read. The major professor will then distribute copies of the dissertation to the remaining members of the Advisory Committee and schedule a final oral defense. The dissertation must be given to the Advisory Committee at least 5 weeks prior to the last day to turn in the final copy of the dissertation to the Graduate School. The date for the final oral defense of the dissertation must be at least 1 week prior to the last day to turn in the final copy of the dissertation to the Graduate School.

The Graduate Coordinator must notify the Graduate School at least 2 weeks prior to the defense. Subsequently, the Graduate School will announce the time and place of the defense of the dissertation to the University community.

Written assent of the committee members (other than the major professor) will be required before a dissertation will be approved as ready for a final defense. No more than one dissenting vote may be allowed for the approval of the dissertation. If the Advisory Committee declines to approve the dissertation as ready for the final defense, the major professor will notify the student and the Graduate School.

The defense of the dissertation will be chaired by your major professor and attended by all members of the Advisory Committee simultaneously for the entire examination period. It is open to all members of the University community, and as such, is given as a Departmental Colloquium. The Advisory Committee must approve your dissertation and defense with no more than one dissenting vote and must certify their approval in writing. An abstention is not an appropriate vote for the final defense. The results of the defense of the dissertation must be reported to the Graduate School at least two weeks prior to graduation for the current semester.

Once the dissertation has been approved by the Advisory Committee and the final oral examination has been passed, the dissertation must be submitted to the Graduate School for final approval no later than two weeks prior to graduation. Dissertations which are not submitted by this deadline must be defended again and approved by the Advisory Committee before they will be considered by the Graduate School for final approval.

Timeline for Defense

Let T be your defense date, which must be at least 1 week before the final copy of your dissertation is due to the Graduate School.

At T – 4 weeks you must give the next-to-final draft of your dissertation to your Advisory Committee, allowing them sufficient time to read it.

Items to address will almost surely come up during the reading of the dissertation, the Final Defense and Final Examination, so you will be able to make the requested changes during the week before the final copy must be turned in to the Graduate School.

Submitting the Dissertation

One complete formatted copy of the dissertation must be electronically submitted to the Graduate School for a format check no later than four weeks prior to graduation. The Graduate School must receive the Final Defense Approval form and an electronic submission of the corrected dissertation no later than two weeks prior to graduation. This official copy of the dissertation will be electronically submitted by the Graduate School to the main library for archiving.

You may not submit a dissertation to the Graduate School for format checking or the dean's approval between the last day of classes and late registration of the following term.

Time Limit

All requirements for the PhD degree, except the dissertation and final oral examination, must be completed within a period of six years. This time requirement dates from the first registration for graduate courses on your Program of Study. A candidate for the PhD who fails to complete all degree requirements within five years after passing the Comprehensive Examination, or being Admitted to Candidacy, will be required to take the Comprehensive Examinations again, or be Admitted to Candidacy a second time.

Graduation

An application for graduation must be filed with the Graduate School no later than Friday of the second full week (the first full week for summer) of classes in the semester of the anticipated graduation date. The application must be submitted online. The link is available from the Graduate School's web page for forms.

All requirements for the degree must be completed and reported to the Graduate School no later than one week prior to graduation. You must enroll for a minimum of 3 hours of credit the semester in which graduation requirements are completed.

To be eligible for graduation, you must maintain a 3.0 (B) average on the graduate transcript and a 3.0 (B) average on the program of study.