

# M **aster of Science Degree in Statistics**

There are several options for earning the Master of Science (MS) degree in Statistics. There are also several tracks for specialization in the MS degree. Each option features core training, elective courses, and a demonstration of mastery of statistical concepts.

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 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 you take courses elsewhere after you have begun your program here, then you may transfer at most 6 credit hours which must be approved by the Graduate Coordinator.

Note that the Graduate Coordinator is your coursework advisor, unless you are taking the Thesis Option. Even under the Thesis Option, the Graduate Coordinator is still your coursework advisor until you choose a research advisor.

## Core Requirements

The core of the MS degree consists of training in linear models, mathematical statistics or probability & inference, and consulting. The five courses required to develop this mastery are:

### **Linear Models:**

STAT 6420 and STAT 8260

### **Mathematical Statistics/Probability & Inference:**

Choose one sequence:

STAT 6510 and 6520

STAT 6810 and 6820

### **Consulting:**

STAT 8000

## Elective Requirements

You may choose either an Examination Option or a Thesis Option, which are described in more detail in the next section on demonstration of mastery. These choices have a direct effect on how many elective courses you may choose:

**Thesis Option:** Choose 4 electives.

**Examination Option:** Choose 6 electives.

At least 2 of the elective courses must be graduate Statistic; at most 2 of these may be approved graduate courses from some other discipline. At least 1 elective must be graduate-only.

Elective courses for the MS degree include all 6000- and 8000-level courses except STAT 6050, 6070, 6210, 6220, 6230, 6315, any 7000-level, 8040, 8050, 8200, 8250, 8910, 8920, 8930, and any 9000-level.

## Research Skills Requirements

All financially supported MS students are required to register for STAT 8910 and STAT 8920. These courses are designed to help you develop the habit of attending research talks to understand the research that is on the cutting edge of statistics, and to learn about other matters of professional development. Students who take the Thesis Option are gaining some of these skills already, in the course of researching and writing a thesis. More about these courses may be found in the chapter on Research Skills Requirements.

## Demonstration of Mastery

### Thesis Option

Under this option, you will choose a research advisor (also called your major professor) and write a thesis under that person's direction. You are expected to choose your research advisor during the first semester of your second year, as part of the expectations of STAT 8920.

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.

Once the thesis is written, your Advisory Committee will read your thesis, and you will present and defend your results to them.

The [Graduate Bulletin](#) contains more on the [Graduate School's requirements for a Master's thesis](#). Of specific interest to you, and with some modifications for the Department's purposes, are the following items.

### Program of Study

You must complete a Program of Study which constitutes a logical whole. The MS degree in Statistics requires a minimum of 33 semester hours. Under the Thesis Option, this means 9 courses plus 3 hours of STAT 7000 Thesis Research and 3 hours of STAT 7300 Thesis Writing. At least half of this course work must be open only to graduate students (exclusive of 7000 and 7300). You must use an asterisk (\*) to designate 6000-level courses open only to graduate students. No grade below C will be accepted on the

Program of Study. To be eligible for graduation, a student must maintain a 3.0 (B) average on the graduate transcript and a 3.0 (B) average on the Program of Study.

The typed Program of Study must be submitted on the [proper form](#), with approval by your major professor, the Department Graduate Coordinator, and the Dean of the Graduate School. This step should be completed by Friday of the second full week of classes of the semester in which degree requirements are completed. Exception: If degree requirements will be completed during summer term, the program of study will be due by Friday of the first full week of classes in that semester.

### **Advisory Committee**

The Advisory Committee, in consultation with you, is charged with approving your Program of Study, reading and approving your thesis, and administering your final examination.

Before the end of your third semester of residence and upon the recommendation of the Department Graduate Coordinator, the Dean of the Graduate School appoints an Advisory Committee for you. The Master's Advisory Committee must consist of a minimum of three members, at least half of which must be from Statistics. The chair (who is your advisor) and at least one other member must be members of the Graduate Faculty of the University of Georgia.

The third member may be a member of the Graduate Faculty or a person with a terminal degree holding one of the following ranks at the University of Georgia: professor, associate professor, assistant professor, public service assistant, public service associate, senior public service associate, assistant research scientist, associate research scientist, or senior research scientist. A UGA employee who holds one of these ranks or who holds a terminal degree in his/her field may be appointed as a third member upon approval by the Department Graduate Faculty and the Dean of the Graduate School. The third member can also be a non-UGA faculty member with a terminal degree in his/her field of study. No more than one non-UGA committee member may be appointed as a voting member. If there are more than three members on the committee, a majority of Graduate Faculty members must be maintained, and a majority of Statistics faculty must be maintained. Co-major professors count as one Graduate Faculty member. The committee will be recommended to the dean of the Graduate School by the Graduate Coordinator after consultation with the student and faculty members involved.

When nominating a non-UGA committee member, the Graduate Coordinator must submit the nominee's current CV with the appropriate forms, along with a letter addressed to the Dean of the Graduate School explaining why the services of the non-UGA person are requested. The non-affiliated member must attend meetings associated with the appointment.

### **Thesis**

Please refer to the Graduate School's [Thesis Guidelines](#) for more details than given here.

You must submit a thesis which shows independent judgment in developing a problem from primary sources. Your thesis shall be written under the direction of your major professor(s), but preparation of the thesis is your responsibility. Your thesis must be approved by the major professor, who will distribute copies to the remaining members of the Advisory Committee and schedule a final examination. The committee members must have three weeks to read and evaluate the completed thesis. Written assent of two of the three committee members will be required before a thesis will be approved as ready for a final defense.

One complete formatted copy of your thesis must be electronically submitted to the Graduate School no later than four weeks prior to graduation for a format check. All requirements for the thesis must be completed no later than two full weeks prior to graduation.

### Final Examination

You must submit to a final examination on the contents of your thesis, and this must be an oral examination. The final examination will be administered by your Advisory Committee, with your major professor serving as chair. All members of the Advisory Committee must be present for the entire examination period. An abstention is not an appropriate vote for the defense of the thesis or the final exam. Thesis approval can have no more than one dissenting vote.

### Submitting the Thesis and Final Clearance

The Graduate School must receive the Final Defense Approval form and an electronic submission of the corrected thesis no later than two weeks prior to graduation. 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 during the semester in which you complete your degree requirements unless additional stipulations are required by other units of the university.

### Time Limit

All requirements for the MS degree must be completed within six years beginning with the first registration for graduate courses on the Program of Study. An extension of time may be granted only for conditions beyond the control of the individual.

### Timeline for Defense

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

At T – 3 weeks you must give the next-to-final draft of your thesis to your Advisory Committee, allowing them sufficient time to read it.

Items to address will almost surely come up during the reading of the Thesis, 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.

### **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.

### **Examination Option**

The MS Qualifying Examination (QEM) is given twice every year, during January and May. The January exam is given prior to the beginning of Spring semester. The May exam is given following the end of Spring semester. The January and May exams are equivalent exams; that is, the January exam is not a "make-up" exam and the two exams have a similar level of difficulty.

### **Parts, Scope and Time Allowed**

The QEM tests material covered during the first year core of the MS program. This core corresponds to STAT 6420, STAT 8260, STAT 6510 and STAT 6520. However, the exam does not have separate sections for each course's material, but rather tests the first-year core in a comprehensive way that requires you to synthesize material from all four courses. The exam has 2 parts:

- Statistical Theory. This is an "in-class" exam which you have 6 hours to complete. During that time, you may refer to books and notes, but you will not have access to a computer or to the Internet. At the discretion of the Examination Committee, the Theory portion may include a take-come component.
- Applied Statistics and Data Analysis. This is a "take-home" exam which you have 2 days to complete. You will be presented with 2 or 3 problems, each with a corresponding data set, from which you must choose 1 problem to solve. The questions are open-ended, requiring you to analyze the data in some appropriate way and draw conclusions about the scientific question(s) of interest. You will hand in a short written report, detailing the decisions you made along the way (for example, which analyses were chosen and why), the

conclusions you drew, and so forth. You will be evaluated on both the quality of the analysis (the choices you made and how well you justified them) and of the written report (organization, etc.; English language usage specifically doesn't need to be a criterion, although reports do need to be understandable).

## **Grading**

Each part of your QEM is graded by at least two members of the committee that set the exam. The resulting scores will be averaged to determine your score for each part. A pass/fail grade will then be determined for each part of the exam. There will be no differentiation of different levels of passing (for example, pass at the MS level, or pass at the PhD level). You must pass both parts of the exam or write a thesis to earn an MS degree.

## **Rules for Taking and Re-Taking**

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

## **Faculty Responsibilities**

Two faculty committees, one for each part of the exam, have responsibility for setting the exam and administering it. Each of these committees has 4 members including at least one person who has recently taught one of the MS core courses, and at least one person who has not recently taught one of the MS core courses. Questions for the exam will be solicited from the membership of these exam committees as well as the broader faculty, who are encouraged, but not required, to contribute. The committees do not simply ask instructors of the core courses to formulate the exam. 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 will then vote on the results. These committees also have responsibility for the PhD Qualifying Examination.

## **Program of Study**

You must complete a Program of Study which constitutes a logical whole. MS degrees in Statistics under the Examination Option require a minimum of 11 courses. At least half of this course work must be open only to graduate students, and you must use an asterisk (\*) to designate 6000-level courses open only to graduate students. 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 your graduate transcript and a 3.0 (B) average on your Program of Study.

The typed Program of Study must be submitted on the [proper form](#) with approval by the Department Graduate Coordinator and the dean of the Graduate School. This step should be completed by Friday of the second full week of classes of the semester

in which degree requirements are completed. Exception: If degree requirements will be completed during summer term, the program of study will be due by Friday of the first full week of classes in that semester.

### **Advisory Committee**

For the Examination Option, the Advisory Committee is just a formality. Three faculty members who satisfy the requirements of the Advisory Committee for the Thesis Option must sign your Program of Study. You may choose these faculty members yourself, or you may allow the Graduate Coordinator's Assistant to choose them.

### **Time Limit**

Under the Examination Option, you should need no more than 4 terms to complete the requirements.

### **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.

### **Tracks for the MS in Statistics**

You have the option of structuring your Program of Study around one of five areas of concentration, or "tracks" for specific statistical applications, available in the program. To satisfy the requirement of a track, the student must satisfy the existing requirements for an MS degree as outlined previously in this section. In addition, your elective courses must include the three courses required for that track, as listed below. Additional electives related to the track may be taken but are not required.

Note that you are not required to participate in any track, and may choose your electives to suit your own purposes.

### **Business and Engineering**

STAT 6280 Applied Time Series Analysis  
STAT 6430 Design and Analysis of Experiments  
Choose 1: STAT 6240 Sampling and Survey Methods

STAT 6260 Statistical Quality Assurance  
STAT 8210 Multivariate: Theory and Methods

Additional recommended electives:

STAT 6100 Applied Stochastic Processes  
STAT 6360 Statistical Software Programming  
STAT 8060 Computing Techniques in Statistics I  
STAT 8070 Computing Techniques in Statistics II  
STAT 8290 Advances in Experimental Design

### **Environmetrics/Biometry**

STAT 6240 Sampling and Survey Methods  
STAT 6430 Design and Analysis of Experiments  
Choose 1: STAT 8230 Applied Nonlinear Regression  
STAT 8270 Spatial Statistics

Additional recommended electives:

STAT 6100 Applied Stochastic Processes  
STAT 6280 Applied Time Series Analysis  
STAT 6290 Nonparametric Methods  
STAT 6360 Statistical Software Programming  
STAT 8210 Multivariate: Theory and Methods  
STAT 8350 Bayesian Data Analysis

### **Social Sciences**

STAT 6240 Sampling and Survey Methods  
STAT 8210 Multivariate: Theory and Methods  
STAT 8620 Categorical Data Analysis and Generalized Linear Models

Additional recommended electives:

STAT 6290 Nonparametric Methods  
STAT 6360 Statistical Software Programming  
STAT 6430 Design and Analysis of Experiments  
STAT 8350 Bayesian Data Analysis

### **Statistical Genetics/Bioinformatics**

STAT 6630 and 6640 Bioinformatics I and II  
Choose 1: STAT 8090 Statistical Analysis of Genetic Data  
STAT 8620 Categorical Data Analysis and Generalized Linear Models

Additional recommended electives:

STAT 6100 Applied Stochastic Processes  
STAT 6360 Statistical Software Programming  
STAT 8060 Computing Techniques in Statistics I  
STAT 8070 Computing Techniques in Statistics II



STAT 6430 Design and Analysis of Experiments  
STAT 8330 Advanced Applications and Computing