

# Mathematics and Statistics

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## Mathematics

### Admission Criteria

Graduate study is offered in the Department of Mathematics and Statistics leading to the degrees of Master of Science in Mathematics and Doctor of Philosophy in Mathematical Sciences. For unrestricted admission to the master's degree program, a degree applicant must submit three letters of recommendation and transcripts from all former institutions attended. The applicant must present the equivalent of an undergraduate major in mathematics, as described in the general catalog, with a minimum grade point average of 2.75 on a 4.00 scale on the last two years of undergraduate academic work. In addition, a student is expected to possess those qualities that, in the judgment of the departmental graduate faculty, indicate that the applicant has the ability to do graduate work at the appropriate level. A minimum score of 477 PBT (153 CBT or 53 iBT) on the Test of English as a Foreign Language (TOEFL) or a score of 4.5 on the International English Language Testing Systems (IELTS) is required of international students (with some exceptions). An applicant for the Ph.D. program must meet the requirements for admission to the master's degree program and submit a satisfactory score on the Graduate Record Examination (GRE) General Test. The department awards a limited number of teaching assistantships. It is recommended that teaching assistantship applicants who do not have English as their native language must submit a score of at least 600 PBT (100 iBT) on the TOEFL or 7.5 on the IELTS.

### Provisional Admission

An applicant who has not fully met the GPA requirement stipulated by the University may be admitted on a provisional basis. The provisionally-admitted student is eligible for a change to regular status after receiving a 3.00 GPA on the first 9 hours of graduate courses at Mississippi State University (with no grade lower than a C). The first 9 hours of graduate courses must be within the student's program of study. Courses with an S grade, transfer credits, or credits earned while in Unclassified status cannot be used to satisfy this requirement. If a 3.00 is not attained, the provisional student **shall** be dismissed from the graduate program. Academic departments may set higher standards for students to fulfill provisional requirements; a student admitted with provisional status should contact the graduate coordinator for the program's specific requirements. **While in the provisional status, a student is not eligible to hold a graduate assistantship.**

### Academic Performance

Continuous enrollment in the University or in a specific graduate program is dependent upon a satisfactory evaluation of academic performance and progress toward the completion of a specified degree. A student's progress is considered satisfactory unless judged to be unsatisfactory by the department and/or the dean of the college offering the program.

Unsatisfactory progress in a degree program may be defined as one or more of the following.

- A student's failure to maintain a B average on all graduate courses attempted after admission to the program
- Failure of a Master's Core Examination or a Ph.D. Comprehensive Area Examination
- Failure of the preliminary examination

In January, May, and August of each year, the Graduate Coordinating Committee will review the academic records of students who were admitted with contingent or provisional status, are currently on probation, have earned a grade of D, F, or U during the previous semester, or have earned more than two grades below B. The Graduate Coordinating Committee will consider making a recommendation to the Dean of the Graduate School that a student be dismissed from his/her degree program if any of the following conditions exist.

- The student's progress in his/her degree program is deemed unsatisfactory
- The student is not making satisfactory progress toward satisfying any condition of his/her contingent admission
- The student is on academic probation and cannot meet the requirements for good academic standing within the next 9 credit hours taken in the student's program of study

Any of the following will result in a recommendation for dismissal from a graduate degree program.

- Two failures on the Master's Core Examination or a Ph.D. Comprehensive Area Examination
- Failure of a student in provisional status to achieve a 3.00 GPA on the first 9 hours of regular graduate level coursework taken at Mississippi State University
- More than two grades below a B
- A grade of D, F, or U in any course (graduate or undergraduate) taken while the student is enrolled in a graduate program in mathematics or statistics

The student and advisor (if different from the graduate coordinator) will be notified in writing when the first and second unsatisfactory grades are received. A student enrolled in a graduate program in the Department of Mathematics and Statistics will be placed on academic probation if the student fails to maintain a 3.00 GPA or earns a grade below a B in a prerequisite course. To be removed from academic probation, the student must achieve an overall GPA of 3.00 or higher on coursework taken toward the degree.

To be eligible for the preliminary/comprehensive examination, a graduate student must maintain an overall B average in all graduate courses attempted while in a specific program. Individual programs may have additional requirements.

## Statistics

### Admission Criteria

Graduate study is offered in the Department of Mathematics and Statistics leading to the degrees of Master of Science in Statistics and Doctor of Philosophy in Mathematical Sciences. Admission to the master's degree program in statistics is open to graduates in all disciplines. An applicant must submit three letters of recommendation and transcripts from all former institutions attended. The student must present the equivalent of a bachelor's degree, with a minimum grade point average of 2.75 on a 4.00 scale on the last two years of undergraduate academic work. In addition, a student is expected to possess those qualities that, in the judgment of the departmental graduate faculty, indicate that the applicant has the ability to do graduate work at the appropriate level. A minimum score of 477 PBT (53 iBT) on the Test of English as a Foreign Language (TOEFL) or 4.5 on the International English Language Testing Systems (IELTS) is required of international students (with some exceptions). An applicant for the Ph.D. program must meet the requirements for admission to the master's degree program and submit a satisfactory score on the Graduate Record Examination (GRE) General Test. The department awards a limited number of teaching assistantships. It is recommended that teaching assistantship applicants who do not have English as their native language must submit a score of at least 600 PBT (100 iBT) on the TOEFL or 7.5 on the IELTS.

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### Academic Performance

Continuous enrollment in the University or in a specific graduate program is dependent upon a satisfactory evaluation of academic performance and progress toward the completion of a specified degree. A student's progress is considered satisfactory unless judged to be unsatisfactory by the department and/or the dean of the college offering the program.

Unsatisfactory progress in a degree program may be defined as one or more of the following.

- A student's failure to maintain a B average on all graduate courses attempted after admission to the program
- Failure of a Master's Core Examination or a Ph.D. Comprehensive Area Examination
- Failure of the preliminary examination

In January, May, and August of each year, the Graduate Coordinating Committee will review the academic records of students who were admitted with contingent or provisional status, are currently on probation, have earned a grade of D, F, or U during the previous semester, or have earned more than two grades below B. The Graduate Coordinating Committee will consider making a recommendation to the Dean of the Graduate School that a student be dismissed from his/her degree program if any of the following conditions exist.

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To be eligible for the preliminary/comprehensive examination, a graduate student must maintain an overall B average in all graduate courses attempted while in a specific program. Individual programs may have additional requirements.

### Prerequisite Courses

The master's degree program in Statistics requires as prerequisite expertise in the following: Matrix Algebra, Computer Concepts, and Calculus at the level of MA 2743 Calculus IV.

### Master of Science in Mathematics - Thesis

|                           |   |    |
|---------------------------|---|----|
| MA 6153                   | Matrices and Linear Algebra <sup>1</sup>                          | 3  |
| MA 6753                   | Applied Complex Variables <sup>1</sup>                            | 3  |
| MA 6933                   | Mathematical Analysis I <sup>1</sup>                              | 3  |
| MA 6163<br>or MA 6943     | Group Theory<br>Mathematical Analysis II                          | 3  |
| MA /ST 6543<br>or MA 6313 | Introduction to Mathematical Statistics I<br>Numerical Analysis I | 3  |
| MA XXXX                   | Additional graduate-level coursework                              | 15 |
| MA 8000                   | Thesis Research/ Thesis in Mathematics                            | 6  |
| Total Hours               |   | 36 |

<sup>1</sup> Requires an examination.

### Master of Science in Mathematics - Non-Thesis

|                           |   |    |
|---------------------------|---|----|
| MA 6153                   | Matrices and Linear Algebra <sup>1</sup>                          | 3  |
| MA 6753                   | Applied Complex Variables <sup>1</sup>                            | 3  |
| MA 6933                   | Mathematical Analysis I <sup>1</sup>                              | 3  |
| MA 6163<br>or MA 6943     | Group Theory<br>Mathematical Analysis II                          | 3  |
| MA /ST 6543<br>or MA 6313 | Introduction to Mathematical Statistics I<br>Numerical Analysis I | 3  |
| MA XXXX                   | Additional graduate-level coursework                              | 18 |
| MA 7000                   | Directed Individual Study in Mathematics <sup>2</sup>             | 3  |
| Total Hours               |   | 36 |

<sup>1</sup> Requires an examination.

<sup>2</sup> A project is required.

### Doctor of Philosophy in Mathematical Sciences - Mathematics

|  |  |       |
|--|--|-------|
| Graduate-level coursework in each of four areas of mathematics and/or statistics | 24   |       |
| Graduate-level coursework in area of specialization                              | 9-12   |       |
| MA 9000  | Dissertation Research /Dissertation in Mathematics | 20    |
| Total Hours  |  | 53-56 |

Comprehensive area examinations, a preliminary examination, a dissertation, and dissertation defense are required. Before taking the preliminary examination, a Ph.D. student must satisfy the departmental foreign language requirement.

Research areas for the Ph.D. include

- applied and computational mathematics,
- ordinary and partial differential equations,
- functional analysis and operator theory,
- topology,
- graph theory,
- geometric combinatorics, and
- statistics.

For further details and specific degree requirements contact the Graduate Coordinator (<http://catalog.msstate.edu/archives/2019-20/graduate/colleges-degree-programs/arts-sciences/mathematics-statistics>).

## Master of Science in Statistics - Thesis

|             |   |    |
|-------------|---|----|
| ST 8533     | Applied Probability <sup>1</sup>                        | 3  |
| ST 8603     | Applied Statistics <sup>1</sup>                         | 3  |
| ST 6543     | Introduction to Mathematical Statistics I <sup>1</sup>  | 3  |
| ST 6573     | Introduction to Mathematical Statistics II <sup>1</sup> | 3  |
| ST 8613     | Linear Models I <sup>1</sup>                            | 3  |
| ST 8000     | Thesis Research/ Thesis in Statistics                   | 6  |
| ST XXXX     | Additional graduate-level coursework                    | 15 |
| Total Hours |   | 36 |

<sup>1</sup> Requires an examination over these core courses.

## Master of Science in Statistics - Non-Thesis

|             |   |    |
|-------------|---|----|
| ST 8533     | Applied Probability <sup>1</sup>                        | 3  |
| ST 8603     | Applied Statistics <sup>1</sup>                         | 3  |
| ST 6543     | Introduction to Mathematical Statistics I <sup>1</sup>  | 3  |
| ST 6573     | Introduction to Mathematical Statistics II <sup>1</sup> | 3  |
| ST 8613     | Linear Models I <sup>1</sup>                            | 3  |
| ST XXXX     | Additional graduate-level coursework                    | 18 |
| ST 7000     | Directed Individual Study in Statistics <sup>2</sup>    | 3  |
| Total Hours |   | 36 |

<sup>1</sup> Requires an examination over these core courses.

<sup>2</sup> A project is required.

In addition, there is ample flexibility in the non-thesis option to allow a graduate student with special interest in an area of statistical application to acquire an area of emphasis in that particular applied field.

## Doctor of Philosophy in Mathematical Sciences - Statistics

|  |   |       |
|--|---|-------|
| Graduate-level coursework in each of four areas of mathematics and/or statistics |   | 24    |
| Graduate-level coursework in area of specialization                              |   | 9-12  |
| ST 9000  | Dissertation Research /Dissertation in Statistics | 20    |
| Total Hours  |   | 53-56 |

Comprehensive area examinations, a preliminary examination, a dissertation, and dissertation defense are required. Before taking the preliminary examination, a Ph.D. student must satisfy the departmental foreign language requirement.

Research areas for the Ph.D. include

- linear models,
- multivariate statistics,
- probability theory and stochastic processes, and
- statistical methods.

Many applied courses are offered that are suitable for a minor in statistics at the master's or doctoral level.

For further details and specific degree requirements, contact the Graduate Coordinator (<http://catalog.msstate.edu/archives/2019-20/graduate/colleges-degree-programs/arts-sciences/mathematics-statistics>). (p. 1)