Statistics, MS

Learning Outcomes

Graduates will be able to:

- understand the mathematical and statistical theory that underlies commonly used statistical methods;
- choose appropriate statistical methods for data analysis;
- correctly and effectively implement descriptive and inferential statistical methods;
- identify and criticize inappropriate use of statistics;
- consult with non-statisticians to help collect and analyze data; and
- acquire effective communication skills for disseminating statistical findings.

Requirements

The Master of Science in statistics requires 32 s.h. of graduate credit. Students must earn a minimum Graduate College major program grade-point average of 3.00. It includes a solid foundation in statistical computing, statistical modeling, experimental design, and mathematical statistics plus electives in statistical methods and/or theory. Students have the opportunity to concentrate on theory or applications or a combination of the two.

Students must take a computer programming proficiency test during the first semester of study; those who display inadequate programming skills are assigned activities to build their proficiency. In addition to required coursework, students must pass a two-part graduate final examination.

All coursework must be taken on an A–F graded basis, with the exception of STAT:5090 and STAT:6990.

The MS in statistics requires the following coursework.

Requirements	Hours
Core Statistics Courses	23
Elective Courses	9
Final Examination	

Core Statistics Courses

Course #	Title	Hours
All of these:		
STAT:5090	ALPHA Seminar	1
STAT:5100	Statistical Inference I	3
STAT:5101	Statistical Inference II	3
STAT:5200/ IGPI:5199	Applied Statistics I	4
STAT:5201	Applied Statistics II	3
STAT:5400/ DATA:5400/ IGPI:5400	Computing in Statistics	3
STAT:6220/ DATA:6220	Consulting and Communication With Data	3
STAT:6300	Probability and Stochastic Processes I	3

Elective Courses

Students complete at least 9 s.h. in elective courses. A maximum of one course numbered 7000–7999 is permitted to apply toward the MS.

Course #	Title	Hours
STAT:4540/ BAIS:4540/ DATA:4540/ IGPI:4540	Statistical Learning	3
STAT:4580/ DATA:4580/ IGPI:4580	Data Visualization and Data Technologies	3
STAT:4750/ DATA:4750	Probabilistic Statistical Learning	3
STAT:5120	Mathematical Methods for Statistics	3
STAT:6301	Probability and Stochastic Processes II	3
STAT:6530/ IGPI:6530	Environmental and Spatial Statistics	3
STAT:6547/ PSQF:6247	Nonparametric Statistical Methods	3
STAT:6560	Applied Time Series Analysis	3
STAT:6970	Topics in Statistics	3
STAT:6990	Readings in Statistics (if taken, two enrollments of 1 s.h. each required)	2
STAT:7100	Advanced Inference I	3
STAT:7101	Advanced Inference II	3
STAT:7190	Seminar: Mathematical Statistics	arr.
STAT:7200	Linear Models	4
STAT:7290	Seminar: Applied Statistics	arr.
STAT:7300	Advanced Probability	3
STAT:7390	Seminar: Probability	arr.
STAT:7400/ DATA:7400/ IGPI:7400	Computer Intensive Statistics	3
STAT:7500/ BAIS:7500	Statistical Machine Learning	3
STAT:7510/ BIOS:7410	Analysis of Categorical Data	3
STAT:7520	Bayesian Analysis	3
STAT:7560	Time Series Analysis	3
STAT:7570/ BIOS:7210/ IGPI:7210	Survival Data Analysis	3

Readings in Statistics

All students are encouraged to complete 2 s.h. in STAT:6990 Readings in Statistics, engaging in a project that aligns with their application and career interests. Students typically register for the course in the fall and spring semesters of the second year for 1 s.h. each; they may complete it earlier if ready. Students must present orally in a Statistics Student Organization meeting and earn a satisfactory grade from the advisor's evaluation of the work and presentation.

If a student wishes to pursue the PhD in statistics, this course must be completed within one calendar year of passing the

MS final examination. It is highly advantageous that the advisor for this course becomes the PhD advisor.

PhD Preparation

Students interested in pursuing the PhD in statistics are encouraged to include STAT:5120 Mathematical Methods for Statistics, 2 s.h. of STAT:6990 Readings in Statistics, and one statistics course (prefix STAT) numbered 7000 or higher in their course selections. See the PhD in statistics in this section of the catalog for more information.

Final Examination

The final examination consists of two parts. One covers the topics presented in STAT:5100 Statistical Inference I and STAT:5101 Statistical Inference II; the other covers the topics presented in STAT:5200/IGPI:5199 Applied Statistics I, STAT:5201 Applied Statistics II, and STAT:5400/DATA:5400/IGPI:5400 Computing in Statistics. Each part includes a few problems that test readiness for the PhD program.

Final examinations are offered the week before the fall semester begins in August. Study guides are available in the department office. Students who do not succeed the first time they take the exam may repeat it once, the week before the spring semester begins in January.

Students must complete all requirements and be granted the Master of Science degree within one calendar year of passing the MS final examination; those who do not meet this deadline are required to take the exam again.

Students entering the PhD program, who will choose either biostatistics, probability/mathematical statistics, or data science as their concentration area, and who already have taken the equivalent of the first-year courses, may take the MS final examination in statistics before beginning further studies.

Admission

Applicants must meet the admission requirements of the Graduate College; see the Manual of Rules and Regulations on the Graduate College website.

Career Advancement

Statistics and probability are vital to many fields, so the demand for well-trained statisticians is strong. Statisticians work in medicine, engineering, law, public policy making, marketing, manufacturing, engineering, agriculture, varied social and natural sciences, and numerous other areas.

The MS program prepares students for careers as professional statisticians or for entry into a PhD program. To learn more about job opportunities, see Your Career on the American Statistical Association website.

The Pomerantz Career Center offers multiple resources to help students find internships and jobs.

Academic Plans

Sample Plan of Study

Sample plans represent one way to complete a program of study. Actual course selection and sequence will vary and should be discussed with an academic advisor. For additional sample plans, see MyUI.

Statistics, MS

Course	Title	Hours
Academic Career		
Any Semester		
32 s.h. must be graduate level coursework; graduate transfer credits allowed upon approval. More information is included in the General Catalog and on department website. [a]		
Students interested in pursuing the PhD in statistics are encouraged to include STAT:5120 Mathematical Methods for Statistics, 2 s.h. of STAT:6990 Readings in Statistics, and one statistics course (prefix STAT) numbered 7000 or higher in their course selections.		
	Hours	**0**
First Year		
Fall		
STAT:5090	ALPHA Seminar	1
STAT:5100	Statistical Inference I	3
STAT:5200	Applied Statistics I	4
STAT:5400	Computing in Statistics	3
	Hours	**11**
Spring		
STAT:5101	Statistical Inference II	3
STAT:5201	Applied Statistics II	3
Elective course [b]		3
	Hours	**9**
Second Year		
Fall		
Exam: Master's Final Exam [c]		
STAT:6300	Probability and Stochastic Processes I	3
STAT:6990	Readings in Statistics [b, d]	1
Elective course [b]		2
	Hours	**6**
Spring		
STAT:6220	Consulting and Communication With Data	3
STAT:6990	Readings in Statistics [b, d]	1
Elective course [b]		2
	Hours	**6**
	Total Hours	**32**

a Students must complete specific requirements in the University of Iowa Graduate College after program admission. Refer to the Graduate College website and the Manual of Rules and Regulations for more information.

b Students must complete at least 9 s.h. in elective courses. A maximum of one course numbered 7000-7999 is permitted to apply toward the MS. See the General Catalog for list of approved courses.

c The two-part written final examination is offered the week before classes begin in August; it covers the material presented in STAT:5100, STAT:5101, STAT:5200, STAT:5201, and STAT:5400. Students who do not succeed the first time they take the exam may repeat it once the week before the spring semester begins in January.

d All students are encouraged to complete 2 s.h. in STAT:6990, engaging in a project that aligns with their

application and career interests. Students typically register for the course in the fall and spring semesters of the second year for 1 s.h. each.