Statistics, BS

Requirements

The Bachelor of Science with a major in statistics requires a minimum of 120 s.h., including at least 47 s.h. of work for the major. Students must maintain a grade-point average of at least 2.00 in all courses for the major and in all UI courses for the major. They also must complete the College of Liberal Arts and Sciences GE CLAS Core.

Students who earn the major in statistics may not earn the major in data science.

Students complete 10 core courses that provide essential instruction in statistical methods, applications, and theory. In addition, they concentrate on an area of interest by completing four or five courses in one of the major's three emphasis tracks: statistics in business, industry, government, and research; statistical computing and data science; or mathematical statistics.

The BS with a major in statistics requires the following coursework.

Requirements	Hours
Core Courses	35
Emphasis Track	12-16

Core Courses

All students complete the following 10 core courses. The department recommends that well-prepared students who elect the mathematical statistics track take STAT:4100/IGPI:4100 Mathematical Statistics I and STAT:4101/IGPI:4101 Mathematical Statistics II in place of STAT:3100/IGPI:3100 Introduction to Mathematical Statistics I and STAT:3101/IGPI:3101 Introduction to Mathematical Statistics II to satisfy the core requirement in statistics.

Course #	Title	Hours
Computer Science		
This course:		
CS:1210	Computer Science I: Fundamentals	4
Mathematics		
All of these:		
MATH:1850	Calculus I	4
MATH:1860	Calculus II	4
MATH:2700	Introduction to Linear Algebra	4
MATH:2850	Calculus III	4
Statistics		
All of these:		
STAT:2010	Statistical Methods and Computing	3
STAT:3100/ IGPI:3100	Introduction to Mathematical Statistics I	3
STAT:3101/ IGPI:3101	Introduction to Mathematical Statistics II	3
STAT:3200/ DATA:3200/ IGPI:3200/ISE:3760	Applied Linear Regression	3
STAT:3210	Experimental Design and Analysis	3

Emphasis Track

Choose four or five courses from one of the following tracks to gain the skillset suitable for a particular career.

- Statistics in Business, Industry, Government and Research Track [p. 1]
- Statistical Computing and Data Science Track [p. 1]
- Mathematical Statistics Track [p. 2]

Statistics in Business, Industry, Government and Research Track

The statistics in business, industry, government and research track emphasizes statistical applications and data analysis. It is appropriate for students interested in careers as applied statisticians.

Course #	Title	Hours
This course:		
STAT:5810/ BIOS:5310/ IGPI:5310	Research Data Management	3
Three of these:		
STAT:3620/ CEE:3142/ISE:3600	Quality Control	3
STAT:4520/ IGPI:4522/ PSQF:4520	Bayesian Statistics	3
STAT:4540/ BAIS:4540/ DATA:4540/ IGPI:4540	Statistical Learning	3
STAT:4580/ DATA:4580/ IGPI:4580	Data Visualization and Data Technologies	3
STAT:5400/ DATA:5400/ IGPI:5400	Computing in Statistics	3
STAT:6220	Statistical Consulting	3
STAT:6530/ IGPI:6530	Environmental and Spatial Statistics	3
STAT:6550/ BIOS:6310/ IGPI:6310	Introductory Longitudinal Data Analysis	3
STAT:6560	Applied Time Series Analysis	3
BIOS:5130/ IGPI:5130	Applied Categorical Data Analysis	3
CS:3700/ MATH:3800	Introduction to Numerical Methods	3
DATA:4750	Probabilistic Statistical Learning	3
MATH:4820/ CS:4720	Optimization Techniques	3
MATH:4840	Mathematics of Machine Learning	3

Statistical Computing and Data Science Track

The statistical computing and data science track emphasizes statistical applications and requires additional coursework in computing. It prepares students for statistical work that

requires computing expertise for data management, analysis, and reporting.

Course #	Title	Hours
All of these:		
STAT:5810/ BIOS:5310/ IGPI:5310	Research Data Management	3
CS:2210	Discrete Structures	3
CS:2230	Computer Science II: Data Structures	4
Two of these:		
STAT:4520/ IGPI:4522/ PSQF:4520	Bayesian Statistics	3
STAT:4540/ BAIS:4540/ DATA:4540/ IGPI:4540	Statistical Learning	3
STAT:4580/ DATA:4580/ IGPI:4580	Data Visualization and Data Technologies	3
STAT:4740/ CS:4740/IGPI:4740/ MATH:4740	Large Data Analysis	3
STAT:5400/ DATA:5400/ IGPI:5400	Computing in Statistics	3
STAT:6220	Statistical Consulting	3
STAT:6530/ IGPI:6530	Environmental and Spatial Statistics	3
STAT:6550/ BIOS:6310/ IGPI:6310	Introductory Longitudinal Data Analysis	3
STAT:6560	Applied Time Series Analysis	3
CS:3700/ MATH:3800	Introduction to Numerical Methods	3
DATA:4750	Probabilistic Statistical Learning	3
MATH:4820/ CS:4720	Optimization Techniques	3
MATH:4840	Mathematics of Machine Learning	3

Mathematical Statistics Track

The mathematical statistics track provides a solid foundation in statistical theory and applications. It requires additional coursework in mathematics and is good preparation for graduate study in statistics.

Students who use STAT:4100/IGPI:4100 Mathematical Statistics I and STAT:4101/IGPI:4101 Mathematical Statistics II to satisfy the core requirements may not use those courses to satisfy the track requirement.

Course #	Title	Hours
This course:		
MATH:3770	Fundamental Properties of Spaces and Functions I	4
9 s.h. from these:		
STAT:4100-STAT:4101	Mathematical Statistics I-II (same as IGPI:4100-IGPI:4101)	6
STAT:4520/ IGPI:4522/ PSQF:4520	Bayesian Statistics	3
STAT:4540/ BAIS:4540/ DATA:4540/ IGPI:4540	Statistical Learning	3
STAT:4560	Statistics for Risk Modeling I	3
STAT:5120	Mathematical Methods for Statistics	3
STAT:6220	Statistical Consulting	3
STAT:6300-STAT:6301	Probability and Stochastic Processes I-II	6
STAT:6530/ IGPI:6530	Environmental and Spatial Statistics	3
STAT:6560	Applied Time Series Analysis	3
CS:3700/ MATH:3800	Introduction to Numerical Methods	3
DATA:4750	Probabilistic Statistical Learning	3
MATH:4820/ CS:4720	Optimization Techniques	3
MATH:4840	Mathematics of Machine Learning	3