

Statistics (BS)

To see more about what you will learn in this program, visit the Learning Outcomes website (<https://apps.oirp.ncsu.edu/pgas/>)!

The Bachelor of Science in Statistics curriculum provides foundational training for careers in statistics and data science, and also prepares students for graduate study in statistics or related fields such as analytics. Our program's emphasis on statistical computing is unique, and prepares our graduates for careers in the rapidly evolving Data Science sector. While our curriculum is centered on statistics, mathematics, and computer programming, it is also designed to have a flexible interdisciplinary flavor. Each statistics major works with their advisor to formulate an individualized plan for 12 credits of "Advised Electives", and this plan typically leads to a minor or second major in fields including business and finance, agriculture and life sciences, computer science, industrial engineering, or the social sciences.

For more information, see the website (<https://statistics.sciences.ncsu.edu/undergraduate/>) for our major.

Contact

Dr. Spencer Muse

Professor and Director of Undergraduate Programs
 Department of Statistics
 NC State University Campus Box 8203
 5276 SAS Hall
 Raleigh, NC 27695-8203
muse@ncsu.edu

Plan Requirements

Code	Title	Hours	Counts towards
Orientation			
COS 100	Science of Change (verify requirement)	0	
Communication & Advanced Writing			
Select one of the following Communications courses:		3	
COM 110	Public Speaking		
COM 112	Interpersonal Communication		
COM 211	Argumentation and Advocacy		
Select one of the following Advanced Writing courses:		3	
ENG 331	Communication for Engineering and Technology		
ENG 332	Communication for Business and Management		
ENG 333	Communication for Science and Research		

ENG 101	Academic Writing and Research ¹	4
Mathematics & Sciences		
MA 141	Calculus I ¹	4
MA 241	Calculus II ¹	4
MA 242	Calculus III ¹	4
MA 225	Foundations of Advanced Mathematics ¹	3
MA 305	Introductory Linear Algebra and Matrices ¹	3
or MA 405	Introduction to Linear Algebra	
Students considering graduate school are strongly encouraged to select MA 405		
GEP Natural Sciences (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-natural-sciences/)		11
Selected courses must include (i) at least two laboratory classes and (ii) at least three 3- or 4-credit courses.		
Computer Science/Statistical Computing		
ST 114	Statistical Programming ¹	3
ST 307	Introduction to Statistical Programming-SAS ¹	1
ST 308	Introduction to Statistical Programming - R ¹	1
ST 445	Introduction to Statistical Computing and Data Management ¹	3
Select one of the following Computational Statistics courses: ¹		3
CSC 442	Introduction to Data Science	
ST 440	Applied Bayesian Analysis	
ST 442	Introduction to Data Science	
ST 446	Intermediate SAS Programming with Applications	
ST 540	Applied Bayesian Analysis	
Statistics		
ST 311	Introduction to Statistics ¹	3

Students transferring into the Statistics major having already taken BUS 350, ST 350, ST 370, or ST 371 may substitute that course for ST 311.

ST 312	Introduction to Statistics II ¹	3
--------	--	---

Students transferring into the Statistics major having already taken ST 372 may substitute that course for ST 312.

ST 421	Introduction to Mathematical Statistics I ¹	3
--------	--	---

ST 422	Introduction to Mathematical Statistics II ¹	3
--------	---	---

ST 430	Introduction to Regression Analysis ¹	3
--------	--	---

ST 431	Introduction to Experimental Design ¹	3
--------	--	---

ST 432	Introduction to Survey Sampling ¹	3
--------	--	---

ST Electives 400 Level (p. 2) ¹		6
--	--	---

Advised Electives

Advised Electives ^{1,2}		12
----------------------------------	--	----

A documented plan for the 12 credits of the Advised Electives will be created in conjunction with the student's academic advisor. These courses may or may not be statistics courses. Students are encouraged to use Advised Elective credits to pursue a minor or second minor. Note that many courses used as Advised Electives might have prerequisites or other restrictions.

GEP Courses

GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/)		6
--	--	---

GEP Social Sciences (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/)		6
---	--	---

GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		2
---	--	---

GEP US Diversity, Equity, and Inclusion (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-usdei/)		3
---	--	---

GEP Interdisciplinary Perspectives (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/)		5
--	--	---

GEP Global Knowledge (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/) (verify requirement)		
---	--	--

Foreign Language Proficiency (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/foreign-language-proficiency/) (verify requirement)		
---	--	--

Free Electives

Free Electives (12 Hr S/U Lmt) ²		9
---	--	---

Total Hours		120
--------------------	--	------------

¹ A grade of C- or higher is required.

² Students should consult their academic advisors to determine which courses fill this requirement.

* No more than 6 total credits from undergraduate research, independent study, credit by examination, or other similar types of courses may be used to meet program requirements (credit from AP exams or transfer credits is not included under this restriction). If you are unsure if a course falls into this category, please confer with your advisor.

ST Electives 400 Level

Code	Title	Hours	Counts towards
ST 401	Experiences in Data Analysis	4	
ST 404	Epidemiology and Statistics in Global Public Health	3	
ST 405	Applied Nonparametric Statistics	3	
ST 412	Long-Term Actuarial Models	3	
ST 413	Short-Term Actuarial Models	3	
ST 421	Introduction to Mathematical Statistics I	3	
ST 422	Introduction to Mathematical Statistics II	3	
ST 430	Introduction to Regression Analysis	3	

ST 431	Introduction to Experimental Design	3
ST 432	Introduction to Survey Sampling	3
ST 433	Applied Spatial Statistics	3
ST 434	Applied Time Series	3
ST 435	Statistical Methods for Quality and Productivity Improvement	3
ST 437	Applied Multivariate and Longitudinal Data Analysis	3
ST 440	Applied Bayesian Analysis	3
ST 442	Introduction to Data Science	3
ST 445	Introduction to Statistical Computing and Data Management	3
ST 446	Intermediate SAS Programming with Applications	3
ST 491	Statistics in Practice	3
ST 495	Special Topics in Statistics	1-6
ST 497	Professional Experience in Statistics	1-3
ST 498	Independent Study In Statistics	1-6
ST 499	Research Experience in Statistics	1-3

Semester Sequence

This is a sample.

First Year

Fall Semester		Hours
COS 100 or E 115	Science of Change or Introduction to Computing Environments	2
ST 311	Introduction to Statistics ¹	3
MA 141	Calculus I (CP) ¹	4
Select one of the following: ¹		3
ST 114	Statistical Programming (CP)	
CSC 111	Introduction to Computing: Python	

CSC 116	Introduction to Computing - Java	
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		1

Hours 13

Spring Semester

Select one of the following:		3
COM 110	Public Speaking	
COM 112	Interpersonal Communication	
COM 211	Argumentation and Advocacy	
MA 241	Calculus II (CP) ¹	4
ENG 101	Academic Writing and Research	4
ST 312	Introduction to Statistics II (CP) ¹	3
ST 307	Introduction to Statistical Programming-SAS (CP) ¹	1

Hours 15

Second Year

Fall Semester

MA 242	Calculus III (CP) ¹	4
MA 225	Foundations of Advanced Mathematics (CP) ¹	3
ST 445	Introduction to Statistical Computing and Data Management ¹	3
GEP Requirement (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/)		3
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		1

Hours 14

Spring Semester

ST 308	Introduction to Statistical Programming - R ¹	1
GEP Requirement (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/)		3
ST 431	Introduction to Experimental Design ¹	3
MA 305 or MA 405	Introductory Linear Algebra and Matrices (CP) ¹ or Introduction to Linear Algebra	3
Advised Elective (p. 1) ¹		3
Free Elective		3

Hours 16

Third Year

Fall Semester

ST 421	Introduction to Mathematical Statistics I (CP) ¹	3
ST 430	Introduction to Regression Analysis (CP) ¹	3
GEP Requirement (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/)		3
Advised Elective (p. 1) ¹		3
Free Elective		3

Hours 15

Spring Semester

ST 422	Introduction to Mathematical Statistics II (CP)	3
--------	---	---

GEP Requirement (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/)	3
Computational Statistics Elective (p. 1) ¹	3
GEP Natural Sciences (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-natural-sciences/)	4
Statistical Elective (p. 2) ¹	3
Hours	16
Fourth Year	
Fall Semester	
Select one of the following:	3
ENG 331 Communication for Engineering and Technology	
ENG 332 Communication for Business and Management	
ENG 333 Communication for Science and Research	
GEP Requirement (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/)	3
Advised Elective (p. 1) ¹	3
Statistics Elective (p. 2) ¹	3
GEP Natural Sciences (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-natural-sciences/)	3
Hours	15
Spring Semester	
ST 432 Introduction to Survey Sampling ¹	3
GEP Natural Sciences (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-natural-sciences/)	4
Advised Elective (p. 1) ¹	3
Free Electives	3
GEP Requirement (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/)	3
Hours	16
Total Hours	120

¹ At most one D level grade is permitted in Advised Electives, Statistics Electives, or required MAT, ST, or CSC courses. C- or better is required in ST 307 Introduction to Statistical Programming- SAS, ST 311 Introduction to Statistics, ST 312 Introduction to Statistics II and ST 421 Introduction to Mathematical Statistics I.

Career Opportunities

The importance of sound statistical thinking in the design and analysis of quantitative studies is reflected in the abundance of job opportunities for statisticians. Because one can improve the efficiency and use of increasingly complex and expensive experimental and survey data, statisticians are in demand wherever quantitative studies are conducted. Statisticians are highly valued members of teams working in such diverse fields as biomedical science, global public health, weather prediction, environmental monitoring, political polling, crop and livestock management, and financial forecasting. Statistics is at the core of Data Science and Analytics, and our department provides an outstanding environment to prepare for careers in these areas. In addition to finding exciting careers in industry and government, our graduates are also very successful moving on to graduate programs in statistics and related fields at top universities around the globe.