

Mathematics Education (BS) and Statistics (BS) (Double Major)

The double degree in Mathematics Education (BS) and Statistics (BS) is one of two double degree options in the Mathematics Education program in the Department of STEM Education.

This degree program prepares teacher-leaders to have a deep understanding of the mathematics and statistics they will teach and knowledge about different pedagogical strategies they can apply in the classroom. Students take five courses focused on mathematics education, beginning in their sophomore year. Our professional courses in the junior and senior year offer relevant pedagogical experiences, emphasize teaching mathematics with technology, and provide rich field experiences in math classrooms. Graduates are recommended for an initial North Carolina teaching license in mathematics grades 9-12. They will be able to seek employment opportunities in education and make a positive difference in their communities.

In addition, students earn a degree in Statistics. Upper level statistics electives help prepare students for a variety of statistics-related fields in addition to teaching at the secondary level and graduate study in statistics or related fields.

Students in this program also have the opportunity to participate in:

- Undergraduate research
- Kappa student chapter of the NC Council of Teachers of Mathematics, and other high impact experiences such as Passport to Success, SAY Village, and study abroad
- Tutoring in local schools

For more information about this program, visit our website (<https://ced.ncsu.edu/programs/mathematics-education-middle-school-or-secondary-bachelor/>).

Program Coordinator:

Dr. Cyndi Edgington
 502J Poe Hall
 919.515.1754
 cpedging@ncsu.edu

Plan Requirements

Code	Title	Hours	Counts towards
Orientation Course			
ED 100	Intro to Education 2	2	
Natural Sciences			
Natural Science Elective (p. 2) 1		8	

To satisfy the science requirement, a sequence of two lab-based courses (BIO 181 and BIO 183, or CH 101/CH 102 and CH 201/CH 202, or PY 205 and PY 208, or PY 201 and PY 202, or PY 211 and PY 212) must be taken. The third science may be selected from the GEP list of approved science courses.

GEP Natural Sciences (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-natural-sciences/)	3
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Mathematical Sciences

MA 141	Calculus I ²	4
MA 241	Calculus II ²	4
MA 242	Calculus III ²	4
MA 225	Foundations of Advanced Mathematics ²	3
MA 405	Introduction to Linear Algebra ²	3
MA 403	Introduction to Modern Algebra ²	3
MA 408	Foundations of Euclidean Geometry ²	3

Statistics

ST 311	Introduction to Statistics ²	3
ST 312	Introduction to Statistics II ²	3
ST 307	Introduction to Statistical Programming-SAS ²	1
ST 308	Introduction to Statistical Programming - R ²	1
ST 421	Introduction to Mathematical Statistics I ²	3
ST 422	Introduction to Mathematical Statistics II ²	3
ST 430	Introduction to Regression Analysis ²	3
ST 431	Introduction to Experimental Design ²	3
ST 432	Introduction to Survey Sampling ²	3

ST 445	Introduction to Statistical Computing and Data Management ²	3
Advanced Statistics Elective (p. 3) ²		
Communication		
COM 112	Interpersonal Communication	3
Professional Education		
EMS 204	Introduction to Mathematics Education ³	2
ED 204	Introduction to Teaching in Today's Schools ²	2
EDP 304	Educational Psychology ²	3
ELP 344	School and Society ²	3
EMS 480	Teaching Mathematics with Technology ²	3
ED 311	Classroom Assessment Principles and Practices ²	2
ED 312	Classroom Assessment Principles and Practices Professional Learning Lab ²	1
EMS 472	Teaching Mathematics Topics in Senior High School ²	3
EMS 470	Methods and Materials for Teaching Mathematics ²	3
EMS 471	Student Teaching in Mathematics ²	10
EMS 490	School Mathematics from an Advanced Perspective ²	3
EMS 495	Senior Seminar in Mathematics and Science Education ²	2

ECI 416	Teaching Exceptional Students in the Mainstreamed Classroom ²	3
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GEP Courses

ENG 101	Academic Writing and Research ¹	4
GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/)		
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		2
GEP Interdisciplinary Perspectives (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/)		2
GEP Global Knowledge (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/) (verify requirement)		3
GEP US Diversity, Equity, and Inclusion (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-usdei/)		3
Foreign Language Proficiency (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/foreign-language-proficiency/) (verify requirement)		
Total Hours		126

¹ A grade of C- or higher is required.² A grade of C or higher is required.³ A grade of B- or higher is required.**Natural Science Lab Course Electives**

Code	Title	Hours	Counts towards
Chemistry Sequence			
CH 101 & CH 102	Chemistry - A Molecular Science and General Chemistry Laboratory	4	
CH 201 & CH 202	Chemistry - A Quantitative Science and Quantitative Chemistry Laboratory	4	

Biology Sequence

BIO 181	Introductory Biology: Ecology, Evolution, and Biodiversity	4
BIO 183	Introductory Biology: Cellular and Molecular Biology	4

Physics Sequence A

PY 205 & PY 206	Physics for Engineers and Scientists I and Physics for Engineers and Scientists I Laboratory	4
PY 208 & PY 209	Physics for Engineers and Scientists II and Physics for Engineers and Scientists II Laboratory	4

Physics Sequence B

PY 201	University Physics I	4
PY 202	University Physics II	4

Physics Sequence C

PY 211	College Physics I	4
PY 212	College Physics II	4

Advanced Statistics Elective

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 433	Applied Spatial Statistics	3	
ST 434	Applied Time Series	3	
ST 437	Applied Multivariate and Longitudinal Data Analysis	3	
ST 440	Applied Bayesian Analysis	3	

ST 442	Introduction to Data Science	3
ST 491	Statistics in Practice	3
ST 495	Special Topics in Statistics	1-6
ST 501	Fundamentals of Statistical Inference I	3
ST 502	Fundamentals of Statistical Inference II	3
ST 503	Fundamentals of Linear Models and Regression	3
ST 505	Applied Nonparametric Statistics	3
ST 506		3
ST 507	Statistics For the Behavioral Sciences I	3
ST 508		3
ST 511	Statistical Methods For Researchers I	3
ST 512	Statistical Methods For Researchers II	3
ST 513	Statistics for Management and Social Sciences I	3
ST 514	Statistics For Management and Social Sciences II	3
ST 515	Experimental Statistics for Engineers I	3
ST 516	Experimental Statistics For Engineers II	3
ST 517	Applied Statistical Methods I	3
ST 519	Teaching and Learning of Statistical Thinking	3
ST 520	Statistical Principles of Clinical Trials	3
ST 524		3
ST 533	Applied Spatial Statistics	3
ST 534	Applied Time Series	3

ST 535	Statistical Methods for Quality and Productivity Improvement	3
ST 537	Applied Multivariate and Longitudinal Data Analysis	3
ST 540	Applied Bayesian Analysis	3
ST 544	Applied Categorical Data Analysis	3
ST 546	Probability and Stochastic Processes I	3
ST 555	Statistical Programming I	3
ST 556	Statistical Programming II	3
ST 557	Using Technology to Teach and Learn with Data	3
ST 561	Applied Econometrics I	3
ST 562	Data Mining with SAS Enterprise Miner	3
ST 590	Special Topics	1-6

Semester Sequence

This is a sample.

First Year

Fall Semester		Hours
MA 141	Calculus I ³	4
ENG 101	Academic Writing and Research	4
ST 311	Introduction to Statistics ³	3
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		1
ED 100	Intro to Education ¹	2
Hours		14

Spring Semester

MA 241	Calculus II ³	4
Science ²		4
ST 312	Introduction to Statistics II ³	3
COM 112	Interpersonal Communication	3
ST 307	Introduction to Statistical Programming-SAS ³	1
Hours		15

Second Year

Fall Semester		Hours
MA 242	Calculus III ³	4

MA 225	Foundations of Advanced Mathematics ³	3
Science ²		4
ST 308	Introduction to Statistical Programming - R ³	1
EMS 204	Introduction to Mathematics Education ¹	2
ED 204	Introduction to Teaching in Today's Schools ¹	2
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		1

Hours 17

Spring Semester

ST 445	Introduction to Statistical Computing and Data Management ³	3
MA 405	Introduction to Linear Algebra ³	3
Science ²		3
ECI 305	Equity and Education ¹	3
GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/)		3
GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/)		3

Hours 18

Third Year

Fall Semester

ST 421	Introduction to Mathematical Statistics I ⁴	3
MA 403	Introduction to Modern Algebra ⁴	3
ED 311	Classroom Assessment Principles and Practices ²	2
ED 312	Classroom Assessment Principles and Practices Professional Learning Lab ²	1
EDP 304	Educational Psychology ^{D, 2}	3
ECI 416	Teaching Exceptional Students in the Mainstreamed Classroom ²	3
ST 430	Introduction to Regression Analysis ⁴	3

Hours 18

Spring Semester

ST 422	Introduction to Mathematical Statistics II ⁴	3
ST 432	Introduction to Survey Sampling ⁴	3
EMS 480	Teaching Mathematics with Technology ¹	3
EMS 472	Teaching Mathematics Topics in Senior High School ¹	3
ELP 344	School and Society ¹	3
GEP Interdisciplinary Perspectives (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/)		2

Hours 17

Fourth Year

Fall Semester

MA 408	Foundations of Euclidean Geometry ³	3
ST 431	Introduction to Experimental Design ³	3
EMS 470	Methods and Materials for Teaching Mathematics ¹	3
Advanced Statistics Elective (p.) ³		3

EMS 490	School Mathematics from an Advanced Perspective ¹	3
GEP US Diversity, Equity, and Inclusion (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-usdei/)		3
Hours		18
Spring Semester		
EMS 471	Student Teaching in Mathematics ¹	10
EMS 495	Senior Seminar in Mathematics and Science Education ¹	2
Hours		12
Total Hours		129

¹ A grade below a B- is not permitted in EMS 204. A grade below a C is not permitted in all other EMS, EDP, ECI, ELP, and ED courses.

² At most one grade below a C- is permitted in the courses satisfying the science requirement.

³ At most one grade below a C is permitted in the mathematics, statistics, and computer science courses. A C- or better is required in ST 421.