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

The double degree in Mathematics Education (BS) and Mathematics (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 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 Mathematics. Upper level mathematics electives help prepare students for a variety of math-related fields in addition to teaching at the secondary level and graduate study in mathematics 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:

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Plan Requirements

Code	Title	Hours	Counts towards
Computer Science [5]			
E 115	Introduction to Computing Environments	1	
or COS 100	Science of Change		
Introduction to Computing (Choose one): [1]		3	
CSC 112	Introduction to Computing-FORTRAN		
CSC 116	Introduction to Computing - Java		
MA 116	Introduction to Scientific Programming (Math)		
Communications			
COM 112	Interpersonal Communication	3	
Sciences [5]			
CH 101 & CH 102	Chemistry - A Molecular Science and General Chemistry Laboratory [2]	4	
PY 205 & PY 206	Physics for Engineers and Scientists I and Physics for Engineers and Scientists I Laboratory	4	
Or			
PY 201	University Physics I		
Science Elective: (4 credit hours, choose from the list below)		**4**	
PY 208	Physics for Engineers and Scientists II		
PY 209	Physics for Engineers and Scientists II Laboratory		
BIO 181	Introductory Biology: Ecology, Evolution, and Biodiversity		
BIO 183	Introductory Biology: Cellular and Molecular Biology		
CH 201	Chemistry - A Quantitative Science		
CH 202	Quantitative Chemistry Laboratory		
Mathematics [5]			
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 341	Applied Differential Equations I [1]	3
or MA 351	Introduction to Discrete Mathematical Models	
MA 405	Introduction to Linear Algebra [1]	3
MA 407	Introduction to Modern Algebra for Mathematics Majors [1]	3
MA 408	Foundations of Euclidean Geometry [1]	3
MA 421	Introduction to Probability [1]	3
MA 425	Mathematical Analysis I [1]	3
Math Electives (p. 3) [1]		12
Statistics [4,5]		**3**
ST 370	Probability and Statistics for Engineers	
ST 372	Introduction to Statistical Inference and Regression	
ST 421	Introduction to Mathematical Statistics I	
ST 422	Introduction to Mathematical Statistics II	
Professional Education		
ECI 416	Teaching Students with Disabilities in Inclusive Classrooms [1]	3
ED 100	Intro to Education [1]	2
ED 204	Introduction to Teaching in Today's Schools [1]	2
ED 311	Classroom Assessment Principles and Practices [1]	2
ED 312	Classroom Assessment Principles and Practices Professional Learning Lab [1]	1
EDP 304	Educational Psychology [1]	3
ELP 344	School and Society [1]	3
EMS 204	Introduction to Mathematics Education [3]	2
EMS 480	Teaching Mathematics with Technology [1]	3
EMS 470	Methods and Materials for Teaching Mathematics [1]	3
EMS 471	Student Teaching in Mathematics [1]	12
EMS 472	Teaching Mathematics Topics in Senior High School [1]	3
EMS 490	School Mathematics from an Advanced Perspective [1]	3
EMS 495	Senior Seminar in Mathematics and Science Education [1]	3
General Education Program (GEP) Courses		
ENG 101	Academic Writing and Research [2]	4
GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/)		6
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)		
GEP US Diversity, Equity, and Inclusion (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-usdei/)		3

World Language Proficiency (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/world-language-proficiency/) (verify requirement)	
Total Hours	**129**

[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.
[4] The preferred statistics sequence is ST 370 with MA 421. Alternatives include ST 371 with ST 372, or ST 421 with ST 422. If ST 370 is taken, MA 421 will be an advanced mathematics elective. If ST 371/372 is taken, ST 371 will be a free elective. If ST 421/422 is taken, ST 421 will be a free elective.

[5] At most one grade below a C is permitted in required and elective math, statistics, and computer science courses

Math Electives

Code	Title	Hours	Counts towards
Math Electives <400			
MA 325	Introduction to Applied Mathematics	3	
MA/LOG 335	Symbolic Logic	3	
MA 341	Applied Differential Equations I	3	
MA 351	Introduction to Discrete Mathematical Models	3	
Math Electives >400			
MA 401	Applied Differential Equations II	3	
MA 402	Mathematics of Scientific Computing	3	
MA 405	Introduction to Linear Algebra	3	
MA 407	Introduction to Modern Algebra for Mathematics Majors	3	
MA 408	Foundations of Euclidean Geometry	3	
MA 410	Theory of Numbers	3	
MA 412	Long-Term Actuarial Models	3	
MA 413	Short-Term Actuarial Models	3	
MA 416	Introduction to Combinatorics	3	
MA 421	Introduction to Probability	3	
MA 425	Mathematical Analysis I	3	
MA 426	Mathematical Analysis II	3	
MA 427	Introduction to Numerical Analysis I	3	
MA 428	Introduction to Numerical Analysis II	3	
MA 430	Mathematical Models in the Physical Sciences	3	
MA 432	Mathematical Models in Life Sciences	3	
MA 437	Applications of Algebra	3	
MA 440		3	
MA 444	Problem Solving Strategies for Competitions	1	
MA 450	Methods of Applied Mathematics I	3	
MA 451	Methods of Applied Mathematics II	3	
MA 491	Reading in Honors Mathematics	1-6	
MA 493	Special Topics in Mathematics	1-6	
MA 494	Major Paper in Mathematics	1	
MA 499	Independent Research in Mathematics	1-6	
MA 501	Advanced Mathematics for Engineers and Scientists I	3	
MA 502	Advanced Mathematics for Engineers and Scientists II	3	
MA 504	Introduction to Mathematical Programming	3	
MA 505	Linear Programming	3	
MA 512		3	
MA 513	Introduction To Complex Variables	3	

MA 515	Analysis I	3
MA 518	Geometry of Curves and Surfaces	3
MA 520	Linear Algebra	3
MA 521	Abstract Algebra I	3
MA 522	Computer Algebra	3
MA 523	Linear Transformations and Matrix Theory	3
MA 524	Combinatorics I	3
MA 526	Mathematical Analysis II	3
MA 531	Dynamic Systems and Multivariable Control I	3
MA 532	Ordinary Differential Equations I	3
MA 534	Introduction To Partial Differential Equations	3
MA 537	Nonlinear Dynamics and Chaos	3
MA 540	Uncertainty Quantification for Physical and Biological Models	3
MA 544	Computer Experiments In Mathematical Probability	3
MA 546	Probability and Stochastic Processes I	3
MA 547	Stochastic Calculus for Finance	3
MA 548	Monte Carlo Methods for Financial Math	3
MA 549	Financial Risk Analysis	3
MA 551	Introduction to Topology	3
MA 555	Introduction to Manifold Theory	3
MA 561	Set Theory and Foundations Of Mathematics	3
MA 565	Graph Theory	3
MA 573	Mathematical Modeling of Physical and Biological Processes I	3
MA 574	Mathematical Modeling of Physical and Biological Processes II	3
MA 583	Introduction to Parallel Computing	3
MA 584	Numerical Solution of Partial Differential Equations--Finite Difference Methods	3
MA 587	Numerical Solution of Partial Differential Equations--Finite Element Method	3
MA 591	Special Topics	1-6

Semester Sequence

This is a sample.

First Year		
Fall Semester		**Hours**
MA 141	Calculus I [1]	4
CH 101 & CH 102	Chemistry - A Molecular Science and General Chemistry Laboratory [2]	4
ENG 101	Academic Writing and Research	4
E 115 or COS 100	Introduction to Computing Environments or Science of Change	1
ED 100	Intro to Education [4]	2
	Hours	**15**
Spring Semester		
MA 241	Calculus II [1]	4
PY 205 & PY 206 or PY 201 ***and*** PY 202	Physics for Engineers and Scientists I [2] or University Physics I ***and*** University Physics II	4
Introduction to Programming (p. 1) [3]		3
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		1
COM 112	Interpersonal Communication	3
	Hours	**15**
Second Year		
Fall Semester		
MA 242	Calculus III [1]	4
MA 225	Foundations of Advanced Mathematics [1]	3

PY 208 & PY 209	Physics for Engineers and Scientists II and Physics for Engineers and Scientists II Laboratory [2]	4
GEP Interdisciplinary Perspectives (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/)		2
GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/)		3
	Hours	**16**
Spring Semester		
MA 341 or MA 351	Applied Differential Equations I [1] or Introduction to Discrete Mathematical Models	3
MA 405	Introduction to Linear Algebra [3]	3
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		1
EMS 204	Introduction to Mathematics Education [4]	2
ED 204	Introduction to Teaching in Today's Schools [4]	2
GEP US Diversity, Equity, and Inclusion (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-usdei/)		3
EDP 304	Educational Psychology [4]	3
	Hours	**17**
Third Year		
Fall Semester		
MA 407	Introduction to Modern Algebra for Mathematics Majors [3]	3
MA 408	Foundations of Euclidean Geometry [3]	3
ELP 344	School and Society [4]	3
ED 311	Classroom Assessment Principles and Practices [4]	2
ED 312	Classroom Assessment Principles and Practices Professional Learning Lab [4]	1
ST Elective (p. 1) [8]		2
ECI 305	Equity and Education	3
	Hours	**17**
Spring Semester		
MA 425	Mathematical Analysis I [3]	3
Math Elective (p. 3) [1, 3]		3
Math Elective (p. 3) [1, 3]		3
EMS 472	Teaching Mathematics Topics in Senior High School [4]	3
EMS 480	Teaching Mathematics with Technology [4]	3
MA 421	Introduction to Probability [3]	3
	Hours	**18**
Fourth Year		
Fall Semester		
MA 426 or MA 512	Mathematical Analysis II (Or other MA elective) [1, 3] or	3
Math Elective (p. 3) [1, 3]		3
EMS 490	School Mathematics from an Advanced Perspective [4]	3
ECI 416	Teaching Students with Disabilities in Inclusive Classrooms [4]	3
EMS 470	Methods and Materials for Teaching Mathematics	3
GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/)		3
	Hours	**18**
Spring Semester		
EMS 471	Student Teaching in Mathematics [4]	10
EMS 495	Senior Seminar in Mathematics and Science Education [4]	2
	Hours	**12**
	Total Hours	**128**

Major/Program Footnotes:

[1] A grade below C is not permitted in MA 141, 241, 242, 225, 341 or 351.
[2] At most one grade below a C- is permitted in courses satisfying the science requirement.
[3] At most one grade below a C is permitted in required mathematics courses >400, elective math courses, statistics, and computer science courses.
[4] 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, ED courses.

Career Opportunities

Career Titles

- Elementary School Teacher
- High School Teacher
- Math Professor
- Middle School Teacher

Learn More About Careers

NCcareers.org (https://nccareers.org/)
Explore North Carolina's central online resource for students, parents, educators, job seekers and career counselors looking for high quality job and career information.

Occupational Outlook Handbook (https://www.bls.gov/ooh/)
Browse the Occupational Outlook Handbook published by the Bureau of Labor Statistics to view state and area employment and wage statistics. You can also identify and compare similar occupations based on your interests.

Career One Stop Videos (https://www.careeronestop.org/)
View videos that provide career details and information on wages, employment trends, skills needed, and more for any occupation. Sponsored by the U.S. Department of Labor.

Focus 2 Career Assessment (https://careers.dasa.ncsu.edu/explore-careers/career-assessments/) (NC State student email address required)
This career, major and education planning system is available to current NC State students to learn about how your values, interests, competencies, and personality fit into the NC State majors and your future career. An NC State email address is required to create an account. Make an appointment with your career counselor (https://careers.dasa.ncsu.edu/about/hours-appointments/) to discuss the results.

National Council of Teachers of Mathematics (https://www.nctm.org/About/)
North Carolina Association of Educators (https://www.ncae.org/)
American Mathematical Society (https://www.ams.org/home/page/)
Society for Industrial and Applied Mathematics (https://www.siam.org/)