

Mathematics Education (BS): Middle Grades Mathematics Concentration

The Mathematics Education: Middle Grades Concentration (BS) degree is one of four undergraduate 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. In addition, students take courses specific to teaching content in the middle grades. 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 6-9. Students in this program have the option to pursue a dual teaching license. This means they will receive a BS in Mathematics Education but they may be recommended for licensure in both middle grades mathematics and middle grades science. They will be able to seek employment opportunities in education and make a positive difference in their communities.

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 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
Orientation Course		
ED 100	Intro to Education ²	2
Statistics		
ST 311	Introduction to Statistics ²	3
Mathematics		
MA 141	Calculus I ²	4
MA 241	Calculus II ²	4

MA 225	Foundations of Advanced Mathematics ²	3
MA 403	Introduction to Modern Algebra ²	3
MA 408	Foundations of Euclidean Geometry ²	3
Linear Algebra Elective ²		3

MA 205		
MA 305	Introductory Linear Algebra and Matrices	
MA 405	Introduction to Linear Algebra	
Discrete Math Elective		3
MA 103	Topics in Contemporary Mathematics	
MA 105	Mathematics of Finance	
MA 114	Introduction to Finite Mathematics with Applications	

Sciences

CH 100	Chemistry and Society ²	4
or CH 101 & CH 102	Chemistry - A Molecular Science and General Chemistry Laboratory	
BIO 105 & BIO 106	Biology in the Modern World and Biology in the Modern World Laboratory ²	4
PY 131	Conceptual Physics ²	4
Science Elective (p. 2) ²		3

Communication

COM 112	Interpersonal Communication	3
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Additional MA/SCI Electives

Choose 6 credits from this list (p. 2)		6
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To be eligible for a teaching license in mathematics only, either mathematics or science courses may be selected. To be eligible for teaching licenses in both mathematics and science, two science elective courses must be selected from EMS 375, PY 124, MEA 130 or MEA 101 and one must be chosen from PY 123, MEA 130, MEA 101, ES 100, ES 200, or ES 300. Grades below a C are not permitted in these sciences courses. (at most one grade below a C is permitted in required and elective math, statistics, and computer science courses)

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
ECI 309	Teaching in the Middle Years ²	3
ECI 306	Middle Years Reading ²	3
ELP 344	School and Society ²	3
ECI 305	Equity and Education 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 474	Teaching Mathematics Topics in the Middle Grades ²	3
EMS 470	Methods and Materials for Teaching Mathematics ²	3
EMS 471	Student Teaching in Mathematics ²	10
EMS 495	Senior Seminar in Mathematics and Science Education ²	2
EMS 490	School Mathematics from an Advanced Perspective ²	3

ECI 416	Teaching Students with Disabilities in Inclusive Classrooms ²	3
GEP Courses		
ENG 101	Academic Writing and Research ¹	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)		
World Language Proficiency (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/world-language-proficiency/) (verify requirement)		
Free Electives		
Free Electives ²		5
Total Hours		120

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

Science Elective

Code	Title	Hours
ES 100	Introduction to Environmental Sciences	3
ES 200	Climate Change and Sustainability	3
ES 300	Energy and Environment	3
MEA 101	Geology I: Physical	3
MEA 130	Introduction to Weather and Climate	3
PY 123	Stellar and Galactic Astronomy	3

Additional Mathematics/Science Electives

Code	Title	Hours
CSC 110	Computer Science Principles - The Beauty and Joy of Computing	3
MA 116	Introduction to Scientific Programming (Math)	3
ST 312	Introduction to Statistics II	3
MA 242	Calculus III	3
MA 325	Introduction to Applied Mathematics	3
MA 335	Symbolic Logic	3
MA 341	Applied Differential Equations I	3
MA 351	Introduction to Discrete Mathematical Models	3
MA 402	Mathematics of Scientific Computing	3
MA 410	Theory of Numbers	3
MA 416	Introduction to Combinatorics	3
MA 421	Introduction to Probability	3
MA 425	Mathematical Analysis I	3
MA 427	Introduction to Numerical Analysis I	3
MA 430	Mathematical Models in the Physical Sciences	3

MA 432	Mathematical Models in Life Sciences	3
MA 437	Applications of Algebra	3
LOG 335	Symbolic Logic	3
PY 124	Solar System Astronomy	3
MEA 130	Introduction to Weather and Climate	3
MEA 101	Geology I: Physical	3
EMS 375	Methods of Teaching Science I	3

Semester Sequence

This is a sample.

First Year

Fall Semester		Hours
MA 141	Calculus I ⁴	4
Select one of the following: ²		4
CH 100	Chemistry and Society ¹	
or CH 101	and or Chemistry - A Molecular Science and	
CH 102	General Chemistry Laboratory	
ENG 101	Academic Writing and Research	4
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		1
ED 100	Intro to Education ³	2
Hours		15

Spring Semester

MA 241	Calculus II ²	4
BIO 105	Biology in the Modern World	4
& BIO 106	and Biology in the Modern World Laboratory ¹	
COM 112	Interpersonal Communication ^D	3
GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/)		3
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		1
Hours		15

Second Year

Fall Semester		Hours
MA 225	Foundations of Advanced Mathematics ^{2, 4}	3
PY 131	Conceptual Physics ¹	4
EMS 204	Introduction to Mathematics Education ³	2
ED 204	Introduction to Teaching in Today's Schools ³	2
GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/)		3
Free Elective		2
Hours		16
Spring Semester		Hours
MA 103	Topics in Contemporary Mathematics ²	3
or MA 105	or Mathematics of Finance	
or MA 114	or Introduction to Finite Mathematics with Applications	
Select one:		
MA 305	Introductory Linear Algebra and Matrices ²	
or MA 405	or Introduction to Linear Algebra	

Science Elective (p. 2) ^{1, 5}		
Mathematics Elective ^{2, 4}		3
EDP 304	Educational Psychology ³	3
ECI 309	Teaching in the Middle Years ³	3
ECI 305	Equity and Education ³	3
Hours		15
Third Year		
Fall Semester		
MA 403	Introduction to Modern Algebra ²	3
ELP 344	School and Society ³	3
ED 311	Classroom Assessment Principles and Practices ³	2
ED 312	Classroom Assessment Principles and Practices Professional Learning Lab ³	1
ST 311	Introduction to Statistics ²	3
Free Electives		3
Hours		15
Spring Semester		
EMS 474	Teaching Mathematics Topics in the Middle Grades ³	3
ECI 306	Middle Years Reading ³	3
ECI 416	Teaching Students with Disabilities in Inclusive Classrooms ³	3
EMS 480	Teaching Mathematics with Technology	3
Select one of the following:		3
Mathematics (p.) ²		
Science Elective ^{1, 5}		
Hours		15
Fourth Year		
Fall Semester		
MA 408	Foundations of Euclidean Geometry ²	3
EMS 470	Methods and Materials for Teaching Mathematics ³	3
EMS 490	School Mathematics from an Advanced Perspective	3
Select one of the following: ⁴		3
Mathematics Elective (p.) ²		
Science Elective ^{1, 5}		
GEP Interdisciplinary Perspectives (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/)		2
Hours		14
Spring Semester		
EMS 495	Senior Seminar in Mathematics and Science Education	2
EMS 471	Student Teaching in Mathematics	10
Hours		12
Total Hours		117

¹ At most one grade below a C- is permitted in the courses satisfying the science requirements for a student intending to license in mathematics. For a student intending to license in mathematics and science, no grades below a C are permitted in the courses satisfying the science requirements.

- ² At most one grade below a C is permitted in the mathematics, statistics, and computer science courses.
- ³ 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.
- ⁴ Grade below a C is not permitted in MA 141 or MA 225.
- ⁵ To be eligible for a teaching license in mathematics only, either mathematics or science courses may be selected. To be eligible for teaching licenses in both mathematics and science, two science elective courses must be selected from EMS 375, PY 124, MEA 130 or MEA 101 and one must be chosen from PY 123, MEA 130, MEA 101, ES 100, ES 200, or ES 300. Grades below C are not permitted in these science 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.

Focus 2 Apply Assessment (<https://www.focus2career.com/Portal/Register.cfm?SID=1929>) (Available to prospective students) A career assessment tool designed to support prospective students in exploring and choosing the right major and career path based on your unique personality, interests, skills and values. Get started with Focus 2 Apply and see how it can guide your journey at NC State.

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/>)