Middle Grades Education (BS): Mathematics and Sciences Concentration

The Middle Grades Education (BS): Mathematics and Sciences Concentration (BS) program in the Department of Teacher Education and Learning Sciences seeks to prepare teachers who can effectively educate young adolescents while being responsive to their unique needs, interests, and abilities. Graduates earn an undergraduate degree and initial licensure for teaching in grades 6-9 in two subject disciplines: Mathematics and Sciences. During the course of this program, students will complete several middle school field experiences, including a year-long senior student teaching internship.

NOTE: This program is currently not accepting students.

Plan Requirements

Code	Title	Hours
Communication and English		
COM 112	Interpersonal Communication	3
ENG 101	Academic Writing and Research [1]	4
History & Philosophy of Science		
Select one of the following:		3
HI 321	Scientific Revolution and European Society, 1500-1800	
HI 322	Rise of Modern Science	
HI 341	Technology in History	
PHI 340	Philosophy of Science	
STS 301	Science and Civilization	
Mathematics		
MA 141	Calculus I	4
MA 241	Calculus II	4
MA 114	Introduction to Finite Mathematics with Applications	3
MA 225	Foundations of Advanced Mathematics	3
MA 408	Foundations of Euclidean Geometry	3
Select one of the following:		3
CSC 110	Computer Science Principles - The Beauty and Joy of Computing	
CSC 112	Introduction to Computing-FORTRAN	
CSC 200		
Select one of the following:		3
ST 101	Statistics by Example	
ST 311	Introduction to Statistics	
ST 371	Introduction to Probability and Distribution Theory	
Mathematics Elective (p. 2)		3
Sciences		
BIO 181	Introductory Biology: Ecology, Evolution, and Biodiversity	4
BIO 183	Introductory Biology: Cellular and Molecular Biology	4
CH 101	Chemistry - A Molecular Science	3
CH 102	General Chemistry Laboratory	1
CH 201	Chemistry - A Quantitative Science	3
CH 202	Quantitative Chemistry Laboratory	1
PY 131	Conceptual Physics	4
MEA 101	Geology I: Physical	3
MEA 110	Geology I Laboratory	1
MEA 130	Introduction to Weather and Climate	3
MEA 135	Introduction to Weather and Climate Laboratory	1
Professional Education		
EMS 375	Methods of Teaching Science I	3
EMS 476	Student Teaching in Science	4
ECI 305	Equity and Education	3
ECI 416	Teaching Students with Disabilities in Inclusive Classrooms	3
ELP 344	School and Society	3
EMS 476	Student Teaching in Science	4
EMS 470	Methods and Materials for Teaching Mathematics	3
EMS 471	Student Teaching in Mathematics	4
EMS 474	Teaching Mathematics Topics in the Middle Grades	3
ECI 309	Teaching in the Middle Years	3
ECI 306	Middle Years Reading	3
EMS 373	Instructional Materials in Science	3
or EMS 480	Teaching Mathematics with Technology	
HESM 280		2
EDP 304	Educational Psychology	3
GEP Courses		
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 Foundations of American Democracy (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-fad/) (verify requirement)		
World Language Proficiency (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/world-language-proficiency/) (verify requirement)		
Free Elective		**2**
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.

Mathematics Electives

Code	Title	Hours
BMA 573	Mathematical Modeling of Physical and Biological Processes I	3
BMA 574	Mathematical Modeling of Physical and Biological Processes II	3
CSC 416	Introduction to Combinatorics	3
CSC 427	Introduction to Numerical Analysis I	3
CSC 428	Introduction to Numerical Analysis II	3
CSC 565	Graph Theory	3
CSC 580	Numerical Analysis I	3
CSC 583	Introduction to Parallel Computing	3
E 531	Dynamic Systems and Multivariable Control I	3
ECG 528	Options and Derivatives Pricing	3
FIM 528	Options and Derivatives Pricing	3
FIM 548	Monte Carlo Methods for Financial Math	3
FIM 549	Financial Risk Analysis	3
ISE 505	Linear Programming	3
LOG 335	Symbolic Logic	3
MA 103	Topics in Contemporary Mathematics	3
MA 103A	Topics in Contemporary Mathematics	3
MA 105	Mathematics of Finance	3
MA 114	Introduction to Finite Mathematics with Applications	3
MA 116	Introduction to Scientific Programming (Math)	3
MA 132	Computational Mathematics for Life and Management Sciences	1
MA 151	Calculus for Elementary Education I	3
MA 152	Calculus for Elementary Education II	3
MA 205		3
MA 225	Foundations of Advanced Mathematics	3
MA 242	Calculus III	4
MA 302	Numerical Applications to Differential Equations	1
MA 303	Linear Analysis	3
MA 305	Introductory Linear Algebra and Matrices	3
MA 315	Mathematics Methods in Atmospheric Sciences	4
MA 325	Introduction to Applied Mathematics	3
MA 331	Differential Equations for the Life Sciences	3
MA 335	Symbolic Logic	3
MA 341	Applied Differential Equations I	3
MA 351	Introduction to Discrete Mathematical Models	3
MA 401	Applied Differential Equations II	3
MA 402	Mathematics of Scientific Computing	3
MA 403	Introduction to Modern Algebra	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 507	Survey of Real Analysis	3
MA 508	Survey of Geometry	3
MA 509	Survey of Abstract Algebra	3
MA 510	Selected Topics In Mathematics For Secondary Teachers	1-6
MA 511	Advanced Calculus I	3
MA 512	Introduction to Analysis	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 528	Options and Derivatives Pricing	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 580	Numerical Analysis I	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
MBA 528	Options and Derivatives Pricing	3
MEA 315	Mathematics Methods in Atmospheric Sciences	4
OR 504	Introduction to Mathematical Programming	3
OR 505	Linear Programming	3
OR 531	Dynamic Systems and Multivariable Control I	3
OR 565	Graph Theory	3
ST 412	Long-Term Actuarial Models	3
ST 413	Short-Term Actuarial Models	3
ST 546	Probability and Stochastic Processes I	3

Middle Grades Education (BS): Mathematics and Sciences (13MIDEDBS-13MIDEDMSD)

Semester Sequence

This is a sample.

First Year		
Fall Semester		**Hours**
CH 101	Chemistry - A Molecular Science	3
CH 102	General Chemistry Laboratory	1
MA 141	Calculus I	4
ENG 101	Academic Writing and Research	4
COM 112	Interpersonal Communication	3
	Hours	**15**
Spring Semester		
MEA 101	Geology I: Physical	3
MEA 110	Geology I Laboratory	1
CH 201	Chemistry - A Quantitative Science	3
CH 202	Quantitative Chemistry Laboratory	1
MA 241	Calculus II	4
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		1
	Hours	**13**
Second Year		
Fall Semester		
BIO 181	Introductory Biology: Ecology, Evolution, and Biodiversity	4
CSC 200		3
MEA 130	Introduction to Weather and Climate	3
MEA 135	Introduction to Weather and Climate Laboratory	1
Free Electives		3
MA 114	Introduction to Finite Mathematics with Applications	3
	Hours	**17**
Spring Semester		
BIO 183	Introductory Biology: Cellular and Molecular Biology	4
PY 131	Conceptual Physics	4
EDP 304	Educational Psychology	3
Select one of the following:		3
ST 101	Statistics by Example	
ST 311	Introduction to Statistics	
ST 371	Introduction to Probability and Distribution Theory	
	Hours	**14**
Third Year		
Fall Semester		
ECI 309	Teaching in the Middle Years	3
ELP 344	School and Society	3
EMS 373 or EMS 480	Instructional Materials in Science or Teaching Mathematics with Technology	3
ECI 305	Equity and Education	3
MA 225	Foundations of Advanced Mathematics	3
HESM 280		2
	Hours	**17**
Spring Semester		
PSY 476	Psychology of Adolescent Development	3
EMS 375	Methods of Teaching Science I	3
ECI 416	Teaching Students with Disabilities in Inclusive Classrooms	3
Mathematics Elective		3
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		1
Free Elective		2
	Hours	**15**
Fourth Year		
Fall Semester		
EMS 470	Methods and Materials for Teaching Mathematics	3
EMS 471	Student Teaching in Mathematics	4
EMS 474	Teaching Mathematics Topics in the Middle Grades	3
EMS 476	Student Teaching in Science	4
	Hours	**14**
Spring Semester		
ECI 306	Middle Years Reading	3
Select one of the following:		3
HI 321	Scientific Revolution and European Society, 1500-1800	
HI 322	Rise of Modern Science	
HI 341	Technology in History	
PHI 340	Philosophy of Science	
STS 301	Science and Civilization	

GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/)	6
GEP Interdisciplinary Perspectives (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/)	3
Hours	**15**
Total Hours	**120**

Career Opportunities

Career Titles

- 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.