

M.A.T. in Secondary Education

Earth Science Endorsement Course Checklist

Catalog Year 2024-2025

Pedagogical Knowledge & Pedagogical Content Knowledge Requirements**Courses Required for Teacher Education Admission:** Grade of "C" or higher required in each course.

Requirement	Course	Course Title	Credits	Pre/Co-Requisites/Notes	Semester Offered
<input type="checkbox"/>	EDUC 200 ¹	Foundations of Education in the United States	3		FA/SP/SU
<input type="checkbox"/>	PSYC 160 ¹	Life Span Human Development	3	C5SD	FA/SP/SU
<input type="checkbox"/>	WRTC 103	Rhetorical Reading and Writing	3	C1W	FA/SP/SU

Secondary Education Undergraduate Coursework: Grades of "B-" or higher required in all courses unless otherwise indicated.

Requirement	Course	Course Title	Credits	Pre/Co-Requisites/Notes	Semester Offered
<input type="checkbox"/>	MSSE 101 <i>or</i> CSM 199	Orientation to the Profession <i>or</i> Science Outreach in Schools	1		FA/SP SP
<input type="checkbox"/>	EDUC 200 ¹	Foundations of Education in the United States	3	Required for Teacher Education admission; grade of "C" or higher	FA/SP/SU
<input type="checkbox"/>	MSSE 210	Diversity in Middle/Secondary Grades	3	1,2	FA/SP
<input type="checkbox"/>	MSSE 370	General Instructional Methods for Grades 6-12	3	1,3	FA/SP
<input type="checkbox"/>	MSSE 371 <i>or</i> MSSE 430	Clinical Experience in Adolescent Education <i>or</i> Introduction to Mentoring Valley Scholars	1 3	1,3	FA/SP FA
<input type="checkbox"/>	MSSE 414	Natural Sciences Teaching Methods, Grades 6-8	3	1,3,4; C: MSSE 415	FA
<input type="checkbox"/>	MSSE 415	Content Area Field Experience in Middle Schools	3	1,3,4; C: MSSE 414	FA
<input type="checkbox"/>	LED 440	Disciplinary Literacy in Secondary Educ.	3	1,3,4	FA/SP/SU

¹ Pre-professional Secondary Education minor declared & approved² Application to the Teacher Education Program required³ Admission to the Teacher Education Program required⁴ Completion of MSSE 370**Mandatory Tasks:**

- Be admitted to the Teacher Education Program before you enroll in MSSE 370 and MSSE 371.
- Attend a Student Teaching Information Meeting in the Fall of your senior year and apply to Student Teaching by October 31 of your senior year.
- Apply to The Graduate School no later than November 15 of your senior year for Spring admission or no later than April 1 of your senior year for Summer admission. Earlier is better to have a transcript review prior to your final undergraduate semester.
- Attempt your Praxis Subject Assessment no later than March 1 of your senior year and pass it no later than August 15.

College of Education Department of Middle, Secondary, and Mathematics EducationMemorial Hall, 395 S. High Street, Room 3200, MSC 6912 Harrisonburg, VA 22807 | (540) 568-6486 | <https://www.jmu.edu/coe/msme/>

This document is provided as an advising resource only. Official curriculum requirements are listed in the JMU Undergraduate Catalog and the JMU Graduate Catalog. In the case of discrepancies, the University Catalog is the official curriculum students must follow. This document was reviewed by the Middle, Secondary, and Mathematics Education Academic Unit Head on June 1, 2024.

Secondary Education Graduate Coursework: Grades of "B-" or higher required in all courses unless otherwise indicated.

Requirement	Course	Course Title	Credits	Pre/Co-Requisites/Notes	Semester Offered	
<input type="checkbox"/>	EDUC 540	Educational Technology	3	1,2	SP/SU	
<input type="checkbox"/>	EXED 512	Behavior Management in the Classroom	3	1,2	SP/SU	
<input type="checkbox"/>	MSSE 607	Curriculum Theory in a Diverse Society	3	1,2	FA/SU	
<input type="checkbox"/>	MSSE 625	Assessment of and for Learning	3	1,2	SP/SU	
<input type="checkbox"/>	MSSE 620	Differentiation of Instruction and Assessment to Meet the Needs of Adolescent Learners	3	1,2	FA/SP	
<input type="checkbox"/>	High School Teaching Methods and Practicum	MSSE 544	Natural Sciences Teaching Methods, Grades 9-12	3	2,3; C: MSSE 549	FA
<input type="checkbox"/>		MSSE 549	Field Experience in High School Natural Science, Practicum III	3	2,3; C: MSSE 544	FA
<input type="checkbox"/>		MSSE 630	Research for Practitioners	3	2,3	FA
<input type="checkbox"/>		MSSE 650	Internship Seminar	3	2,3,4; C: MSSE 675	SP
<input type="checkbox"/>	Student Teaching #1	MSSE 675	Internship in Middle and Secondary Educ.	3	2,3,4; C: MSSE 650	SP
<input type="checkbox"/>	Student Teaching #2	MSSE 675	Internship in Middle and Secondary Educ.	3	2,3,4; C: MSSE 650	SP

¹Conditionally admitted to the graduate program

²Admission to the Teacher Education Program required

³Unconditionally admitted to the graduate program

⁴Passing score on Praxis Subject Assessment

B.A. Degree Requirements (6 to 17 credit hours)

For guidance on courses to satisfy your degree requirements: https://www.jmu.edu/registrar/ba_and_bs_degree_courses.shtml.

Requirement	Course	Course Title	Credits	Pre/Co-Requisites/Notes	Semester Offered	
<input type="checkbox"/>	Intermediate Foreign Language ¹	231 &	Intermediate [foreign language] I &	3	231 P: 102 or 109 or 111 or FLP	FA ²
		232 or	Intermediate [foreign language] II or	3	232 P: 231 or FLP	SP ²
		212	Intensive [foreign language] II	6	P: 102 or 109 or 111 or FLP	SU ²
<input type="checkbox"/>	Philosophy			3	Any philosophy course except PHIL 120 or PHIL 150	FA/SP/SU

¹May need to complete elementary levels of foreign language first based on your Foreign Language Placement Exam Score.

²Varies by language

Earth Science Content Knowledge Licensure Requirements...

...as they fit with the JMU Earth Science – BA major.

Requirement	Course	Course Title	Credits	Pre/Co-Requisites/Notes	Semester Offered
Earth Science Core (Students are expected to complete CHEM 131 and CHEM 131L before enrolling in 300-level geology courses)					
<input type="checkbox"/>	GEOL 167	History and Philosophy of the Geosciences	3		
<input type="checkbox"/>	VDOE: structural geology	GEOL 102 <i>or</i> GEOL 110 <i>or</i> GEOL 115 <i>or</i> GEOL 210 Applied Physical Geology (C3NS)	3	110 C: GEOL 110L	
<input type="checkbox"/>	VDOE: field investigations	GEOL 110L Physical Geology Laboratory (C3L)	1	P: GEOL 110 or inst. permission	
<input type="checkbox"/>	VDOE: oceanography	GEOL 211 <i>or</i> GEOL 401 Introduction to Oceanography (C3NS) <i>or</i> Oceanography for Teachers	3	401: offered infrequently	
<input type="checkbox"/>	VDOE: paleontology	GEOL 230 Evolution of Earth	4	P: GEOL 110L or GEOL 115L or instructor permission	
<input type="checkbox"/>		GEOL 291 Writing and Communicating in the Geosciences	1	P: GEOL 110L, GEOL 102, or GEOL 115L; must take prior to senior year	
<input type="checkbox"/>	VDOE: meteorology	GEOL 320 Meteorology	3		
<input type="checkbox"/>	VDOE: petrology	GEOL 367 Genesis of Solid Earth Materials	4	P: GEOL 110L or GEOL 115L	
<input type="checkbox"/>	VDOE: petrology	GEOL 377 Earth Surface Processes	3	P: GEOL 110L or GEOL 115L and GEOL 210 or inst. perm.	
<input type="checkbox"/>	VDOE: structural geology	GEOL 387 Stratigraphy, Structure, and Tectonics	4	P: GEOL 110L or GEOL 115L and GEOL 230	
<input type="checkbox"/>		GEOL 477 Contemporary Issues in the Geosciences	4	P: GEOL 211, GEOL 320, GEOL 367, and GEOL 377	
<input type="checkbox"/>	VDOE: astronomy/space science	ASTR 220 <i>or</i> GEOL 307 General Astronomy I: The Night Sky, the Solar System and Stars <i>or</i> Planetary Geology	3	220 P: PHYS 140 or PHYS 240 307 P: GEOL 110L or GEOL 115L	FA
Earth Science Major Research Requirement (2-6 credit hours)					
<input type="checkbox"/>	GEOL 491 <i>or</i> GEOL 494 <i>or</i> GEOL 497 <i>or</i> GEOL 499A & GEOL 499B & GEOL 499C	Geological Literature and Research <i>or</i> Internship in Geology <i>or</i> Problems in Geology <i>or</i> Honors in Geology <i>and</i> Honors in Geology <i>and</i> Honors in Geology	2 1-3 1-3 1 2 3	P: GEOL 291 or inst. permis. P: GEOL 291, minimum 8 geol. Cr. Hr., & geol GPA 2.5+ P: GEOL 291 or inst. permis. P: GEOL 291 and GPA 3.25+ P: GEOL 291 and GPA 3.25+ P: GEOL 291 and GPA 3.25+	

Requirement	Course	Course Title	Credits	Pre/Co-Requisites/Notes	Semester Offered
Earth Science Major Cognate Courses (Complete at least 6 credit hours of mathematics, including at least one of the courses listed below.)					
<input type="checkbox"/>	ES/VDOE: Biology requirement	BIO 140 & BIO 140L Foundations of Biology I (C3NS) <i>and</i> Foundations of Biology I Lab (C3L)	3 1	C: BIO 140L C: BIO 140	FA/SP FA/SP
<input type="checkbox"/>	ES/VDOE: Chemistry requirement	CHEM 131 & CHEM 131L General Chemistry I (C3PP) <i>and</i> General Chemistry Laboratory I (C3L)	3 1	C: CHEM 131L or CHEM 135L C: CHEM 131	FA/SP/SU FA/SP/SU
<input type="checkbox"/>	ES/VDOE: Physics requirement	PHYS 140 & PHYS 140L College Physics I (C3PP) <i>and</i> General Physics Laboratory I (C3L)	3 1	C: PHYS 140L C: PHYS 140	FA/SP/SU FA/SP/SU
<input type="checkbox"/>	ES: Cognate Requirement (choose one course and co-requisite lab if applicable)	BIO 350 <i>or</i> Paleobiology <i>or</i>	4	350 P: GEOL 230, BIO 150/BIO 150L P: "C-" or higher in CHEM 131 and CHEM 131L or CHEM 135L; 132 C: CHEM 132L or CHEM 136L; 132L C: CHEM 132	FA
		CHEM 132 & CHEM 132L <i>or</i> General Chemistry II <i>and</i> General Chemistry Laboratory II <i>or</i>	3 1	150 P: "C-" or higher in PHYS 140 C: PHYS 150L 150L P: PHYS 140, PHYS 140L C: PHYS 150	FA/SP/SU FA/SP/SU
		PHYS 150 & PHYS 150L <i>or</i> College Physics II <i>and</i> General Physics Laboratory II <i>or</i>	3 1	P: GEOL 110L or GEOL 1150L or PHYS 140-PHYS 150 or PHYS 240-PHYS 250 or inst. perm.	SP/SU SP/SU
		GEOL 440 Geophysics	4		
<input type="checkbox"/>	ES/VCOE: First Math requirement	MATH 205 <i>or</i> Introductory Calculus I (C3QR) <i>or</i>	3	205 P: MATH 135 or MATH 155 or MATH 156, or ALEKS	FA/SP
		MATH 232 <i>or</i> MATH 235 Calculus with Functions II <i>or</i> Calculus I (C3QR)	3 4	232 P: MATH 231 235 P: ALEKS	FA/SP FA/SP/SU
<input type="checkbox"/>	ES: Second Math requirement		3	MATH 220 is recommended	

Please contact the Geology and Environmental Science Department with questions about the Earth Science major or Earth Science coursework.

General Education Requirements

Be sure to follow the General Education course suggestions listed below for maximum overlap of the General Education Program with your Pre-Professional Secondary Education minor and Earth Science major.

Requirement	Course	Course Title	Credits	Pre/Co-Requisites/Notes	Semester Offered
MADISON FOUNDATIONS					
<input type="checkbox"/>	Critical Thinking (C1CT)		3	Choose any option from the General Education Planner.	FA/SP/SU
<input type="checkbox"/>	Human Communication (C1HC)		3		FA/SP/SU
<input type="checkbox"/>	Writing (C1W)	WRTC 103 Rhetorical Reading and Writing	3		Must earn a C or higher.
ARTS AND HUMANITIES					
<input type="checkbox"/>	Human Questions and Contexts (C2HQC)		3	Choose any option from the General Education Planner.	FA/SP/SU
<input type="checkbox"/>	Visual and Performing Arts (C2VPA)		3		FA/SP/SU
<input type="checkbox"/>	Literature (C2L)		3		FA/SP/SU

Requirement	Course	Course Title	Credits	Pre/Co-Requisites/Notes	Semester Offered	
THE NATURAL WORLD						
<input type="checkbox"/>	Quantitative Reasoning (C3GR)	MATH 205 <i>or</i> Introductory Calculus I <i>or</i> MATH 220 <i>or</i> Elementary Statistics <i>or</i> MATH 235 Calculus I	3 3 4	205 P: MATH 135 or MATH 155 or MATH 156 or ALEKS 220 P: C- or higher in MATH 105 or ALEKS 235 P: ALEKS	FA/SP/SU FA/SP/SU FA/SP/SU	
	<input type="checkbox"/>	Physical Principles (C3PP)	CHEM 131	General Chemistry I	3	C: CHEM 131L or CHEM 135L FA/SP/SU
	<input type="checkbox"/>	Natural Systems (C3NS)	BIO 140	Foundations of Biology I	3	C: BIO 140L FA/SP
<input type="checkbox"/>	Lab Experience (C3Lab)	BIO 140L	Foundations of Biology I Laboratory	1	C: BIO 140 FA/SP	
AMERICAN AND GLOBAL PERSPECTIVES						
<input type="checkbox"/>	The American Experience (C4AE)		4	Choose any option from the General Education Planner.	FA/SP/SU	
<input type="checkbox"/>	The Global Experience (C4GE)		3		FA/SP/SU	
SOCIOCULTURAL AND WELLNESS AREA						
<input type="checkbox"/>	Wellness Domain (C5WD)		3	Choose any option from the General Education Planner.	FA/SP/SU	
<input type="checkbox"/>	Sociocultural Domain (C5SD)	PSYC 160	Life Span Human Development	3	Must earn a C or higher. FA/SP/SU	