

**M.A.T. in Secondary Education**

## Physics 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 <sup>1</sup>	Foundations of Education in the United States	3		FA/SP/SU
<input type="checkbox"/>	PSYC 160 <sup>1</sup>	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"/> Orientation to the Prof.	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 <sup>1</sup>	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"/> General Instructional Methods	MSSE 370	General Instr. Methods for Grades 6-12	3	1,3	FA/SP
<input type="checkbox"/> Initial Field Placement	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"/> Middle School Teaching Methods and Practicum	MSSE 414	Natural Science 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 412	FA/SP
<input type="checkbox"/>	LED 440	Disciplinary Literacy in Secondary Education	3	1,3,4	FA/SP/SU

<sup>1</sup>Pre-professional Secondary Education minor declared & approved<sup>2</sup>Application to the Teacher Education Program required<sup>3</sup>Admission to the Teacher Education Program required<sup>4</sup>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

<sup>1</sup>Conditionally admitted to the graduate program

<sup>2</sup>Admission to the Teacher Education Program required

<sup>3</sup>Unconditionally admitted to the graduate program

<sup>4</sup>Passing score on Praxis Subject Assessment

## B.S. Degree Requirements (6 credits)

For guidance on courses to satisfy your degree requirements: [https://www.jmu.edu/registrar/ba\\_and\\_bs\\_degree\\_courses.shtml](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"/>	Scientific Literacy	PHYS 150	General Physics II	3	P: "C-" or higher in PHYS 140; C: PHYS 150L	FA/SP
<input type="checkbox"/>	Quantitative Reasoning	MATH 236	Calculus II	4	P: "C-" or higher in MATH 235	FA/SP/SU

## Physics Content Knowledge Licensure Requirements...

...as they fit with the JMU Physics Major, Multidisciplinary Secondary Education Concentration.

Requirement	Course	Course Title	Credits	Pre/Co-Requisites/Notes	Semester Offered	
<b>Physics Core – 40 credit hours</b>						
<input type="checkbox"/>	PHYS 105	Foundations of Physics	1		FA	
<input type="checkbox"/>	PHYS 106	Foundations of Physics Research	1			
<input type="checkbox"/>	VDOE: mechanics req.	PHYS 140 <i>or</i>	General Physics I <i>or</i>	3	140 C: PHYS 140L 240 C: PHYS 240L	FA/SP/SU
		PHYS 240	University Physics I			FA/SP
<input type="checkbox"/>		PHYS 140L <i>or</i>	General Physics Laboratory I <i>or</i>	1	140L C: PHYS 140 240L C: PHYS 240	FA/SP/SU
		PHYS 240L	University Physics Laboratory I			FA
<input type="checkbox"/>	VDOE: optics req.	PHYS 150 <i>or</i>	General Physics II <i>or</i>	3	150 P: "C-" or higher in PHYS 140; C: PHYS 150L 250 P: "C-" or higher in PHYS 240; C: MATH 236	SP/SU
		PHYS 250	University Physics II			FA/SP
<input type="checkbox"/>		PHYS 150L <i>or</i>	General Physics Laboratory II <i>or</i>	1	150L P: PHYS 140L, PHYS 140; C: PHYS 150 250L P: PHYS 240, PHYS 240L; C: PHYS 250	SP/SU
		PHYS 250L	University Physics Laboratory II			SP
<input type="checkbox"/>		PHYS 247	Data Acquisition and Analysis Techniques II	1	P: PHYS 150L/250L	FA/SP

Requirement	Course	Course Title	Credits	Pre/Co-Requisites/Notes	Semester Offered
<input type="checkbox"/> VDOE: mechanics req.	PHYS 260	University Physics III	3	P: "C" or higher in PHYS 150/250; C: MATH 237	SP
<input type="checkbox"/> VDOE: modern physics	PHYS 270	Modern Physics	3	P: "C" or higher in PHYS 150/250; C: MATH 237	FA
	PHYS 270L	Modern Physics Laboratory	1	C: PHYS 270	FA
<input type="checkbox"/> VDOE: mechanics req.	PHYS 340	Mechanics	3	P: PHYS 260, MATH 238	FA
<input type="checkbox"/> VDOE: elect. & mag. req.	PHYS 350	Electricity & Magnetism	3	P: PHYS 260, MATH 238	SP
<input type="checkbox"/> PHYS/VDOE: Chemistry requirement	CHEM 131 & CHEM 131L	General Chemistry I <i>and</i> General Chemistry Laboratory I	3 1	C: CHEM 131L or CHEM 135L	FA/SP/SU FA/SP/SU
	<input type="checkbox"/> VDOE: Calculus	MATH 231 & MATH 232 <i>or</i>	Calculus with Functions I (C3QR) Calculus with Functions II	3 3	P: ALEKS
MATH 235		Calculus I (C3QR)	4		
<input type="checkbox"/>	MATH 236	Calculus II	4	P: "C-" or higher in MATH 235	FA/SP/SU
<input type="checkbox"/>	MATH 237	Calculus III	4	P: "C-" or higher in MATH 236	FA/SP/SU

### Multidisciplinary Secondary Education Concentration

#### Required Courses for all Multidisciplinary Concentrations

MATH 238 Linear Algebra with Differential Equations, or MATH 300

Linear Algebra & MATH 336 Elementary Differential Equations

PHYS 344 Advanced Physics Laboratory I

PHYS 345 Advanced Physics Laboratory II

PHYS 380 Thermodynamics and Statistical Mechanics

PHYS 391 Seminar (fall-only, take for 0 credit hours)

PHYS 392 Seminar (spring-only, take for 1 credit hour)

PHYS 491 Seminar (fall-only, take for 0 credit hours)

PHYS 492 (Seminar (spring-only, take for 1 credit hour)

Complete at least 2 credit hours in research from the following options:

- ASTR/PHYS 398 Independent Study in Physics or Astronomy
- ASTR/PHYS 498R Undergraduate Research in Physics or Astronomy
- ISCI 450A Interscience Research
- PHYS 499 Honors

BIO 140 Foundations of Biology I (C3NS)

BIO 140L Foundations of Biology I Laboratory (C3L)

CHEM 132 General Chemistry II

CHEM 132L General Chemistry Laboratory

GEOL 110 Physical Geology (C3NS)

GEOL 110L Physical Geology Laboratory (C3L)

MATH 238 Linear Algebra with Differential Equations

PHYS 380 Thermodynamics and Statistical Mechanics

PHYS 460 Quantum Mechanics

Complete at least 2 credit hours in research from the following options:

- ASTR/PHYS 398 Independent Study in Physics or Astronomy
- ASTR/PHYS 498R Undergraduate Research in Physics or Astronomy
- ISCI 450A Interscience Research
- PHYS 499 Honors

**Please contact the Physics Department with questions about the Physics major or Physics 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 Physics major.

Requirement	Course	Course Title	Credits	Pre/Co-Requisites/Notes	Semester Offered
<b>MADISON FOUNDATIONS</b>					
<input type="checkbox"/>	Critical Thinking (C1CT)		3		FA/SP/SU
<input type="checkbox"/>	Human Communication (C1HC)		3	Choose any option from the General Education Planner.	FA/SP/SU
<input type="checkbox"/>	Writing (C1W)	WRTC 103 Rhetorical Reading and Writing	3	Must earn a C or higher.	FA/SP/SU
<b>ARTS AND HUMANITIES</b>					
<input type="checkbox"/>	Human Questions and Contexts (C2HQC)		3		FA/SP/SU
<input type="checkbox"/>	Visual and Performing Arts (C2VPA)		3	Choose any option from the General Education Planner.	FA/SP/SU
<input type="checkbox"/>	Literature (C2L)		3		FA/SP/SU
<b>THE NATURAL WORLD</b>					
<input type="checkbox"/>	Quantitative Reasoning (C3QR)	MATH 231 <i>or</i> MATH 235	Calculus with Functions I <i>or</i> Calculus I	3 4	P: ALEKS
<input type="checkbox"/>	Physical Principles (C3PP)	PHYS 140	General Physics I	3	C: PHYS 140L FA/SP/SU
<input type="checkbox"/>	Natural Systems (C3NS)	BIO 140 <i>or</i> GEOL 110	Foundations of Biology I <i>or</i> Physical Geology	3	BIO 140 C: BIO 140L FA/SP
<input type="checkbox"/>	Lab Experience (C3Lab)	PHYS 140L	General Physics Laboratory I	1	C: PHYS 140 FA/SP
<b>AMERICAN AND GLOBAL PERSPECTIVES</b>					
<input type="checkbox"/>	The American Experience (C4AE)		4		FA/SP/SU
<input type="checkbox"/>	The Global Experience (C4GE)		3	Choose any option from the General Education Planner.	FA/SP/SU
<b>SOCIOCULTURAL AND WELLNESS AREA</b>					
<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