

Physics - Teaching B.A.

Physics - teaching Major

The B.A. Physics major in teaching requires a minimum of 120 total hours to graduate. This total includes UNIFI/General Education requirements, the Professional Experiences requirements, Educator Essentials requirements, and the following specified major requirements, to complete the minimum of 120 hours.

This major leads to endorsement #156: 5-12 Physics.

Required

Mathematics:

MATH 1420	Calculus I	4
MATH 1421	Calculus II	4

Physics:

PHYSICS 1100	First-Year Projects in Physics	1
PHYSICS 1701	Physics I for Science and Engineering	4
PHYSICS 1702	Physics II for Science and Engineering	4
PHYSICS 2300	Physics III: Theory and Simulation	3
PHYSICS 4080/5080	Resources for Teaching Physics	2
PHYSICS 4100/5100	Modern Physics	4
PHYSICS 4110/5110	Modern Physics Laboratory	2

Electives

Physics: all 3000+ level courses	6
Mathematics or non-physics science courses from the College of Humanities, Arts and Sciences *	4

Total Hours **38**

* Excluding all 820:xxx and mathematics below *MATH 1420*.

Professional Experiences

Required:

EDUC 2385	Teaching Methods I: Secondary Science ^{*,**}	3
EDUC 2485	Teaching Internship I: Secondary Science	3
EDUC 3585/5585	Teaching Methods II: Secondary Science [*]	3
EDUC 3685/5685	Teaching Internship II: Secondary Science	3
EDUC 4138	Secondary School Teaching	12
Total Hours		24

* A grade of C (2.00) or higher is required for all Methods courses.

**Physics Teaching majors can count EDUC 2385 Teaching Methods I: Secondary Science for category 5 of Educator Essentials.

It is recommended that sufficient work including current curricula should be taken for licensure approval in a second area. Common teaching combinations are physics-chemistry or physics-mathematics.

Educator Essentials

Required: *

Select one of the following in each category:

Category 1: The Learner **3**

EDPSYCH 1500	Reflections on Learning
EDPSYCH 2068	Development and Learning in Sociocultural Contexts
EDPSYCH 2100	Creativity and Higher Order Thinking in the Classroom
SOCFOUND 2243	Rethinking the Learning Society: Education and Its Future(s)

Category 2: Social Contexts of Learning **3**

SOCFOUND 2119	Social & Cultural Foundations of Education
SOCFOUND 2134	A Modern History of Education in the United States
SOCFOUND 2334	Education Policy and Politics of Education
TESOL 2015	Language Today

Category 3: Education for All **3**

KINES 4152	Adapted Physical Education
SOCFOUND 3334	Education, Power, and Change
SOCFOUND 3434	Social Movements and Education
SPIE 3140	Interdisciplinary and Intersectional Study of Education for All
SPIE 3150	Meeting the Needs of Diverse Learners in Classrooms
TESOL 3710	Content Area Strategies for English Language Learners

Category 4: The Classroom Environment **3**

EDPSYCH 3200	Deeper Motivation and the Highly Engaged Classroom
EDPSYCH 3300	Level Up: Gamified Learning Environments
ECIE 4151	Early Childhood Curriculum Development and Organization
RTNL 3360	Playful Learning and Project-Based Experiences: Techniques for Ed and Recreational Environments
SOCFOUND 3219	Critical Perspectives on Technology and Education

Category 5: Effective Pedagogy **3**

ARTED 4600	Expressive Learning Assessment
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LRNTECH 3600	Technology, Pedagogy, and Learning in the Digital Age	
MEASRES 3510	Assessment for Learning	
TEACHING 3500	Effective Teaching through Differentiation, Technology and Assessment	
Category 6: The Professional Educator		3
ECIE 3149	Child, Family, School and Community Relationships	
SOCFOUND 3519	Teacher Leadership & Educational Change	
TEACHING 3177	Collaborative Partnerships for Educators	
Total Hours		18

* A grade of C (2.00) or higher is required in each Educator Essentials course.

Honors Research

Students who complete a sustained research project in physics education may be invited to do Honors Research. Students must first complete 4 credit hours of PHYSICS 3000 Undergraduate Research in Physics and then 1 credit hour of PHYSICS 4990 Senior Thesis.

Four-Year Plan

Physics Teaching, B.A.

This is a sample plan of study with a suggested sequencing of classes for the major. University electives may be applied to earn additional academic majors, minors, or certificates. Students should regularly meet with their academic advisor to plan their specific semester schedule to include UNIFI/General Education program and/or university elective hours required.

Course	Title	Hour
Freshman		
Fall		
MATH 1420	Calculus I (satisfies UNIFI: Quantitative Reasoning)	4
PHYSICS 1100	First-Year Projects in Physics	1
PHYSICS 1701	Physics I for Science and Engineering (satisfies UNIFI: Scientific Reasoning)	4
UNIFI: Written Communication		3
UNIFI: Human Condition (Global)		3
Hours		15
Spring		
MATH 1421	Calculus II	4
PHYSICS 1702	Physics II for Science and Engineering	4
UNIFI: Oral Communication		3
University Electives		6
Hours		17
Sophomore		
Fall		
Educator Essentials Courses		6
PHYSICS 2300	Physics III: Theory and Simulation	3
UNIFI: Responsibility		3

University Electives		4
Hours		16
Spring		
Educator Essentials Courses		6
PHYSICS 4100/5100	Modern Physics	4
PHYSICS 4110/5110	Modern Physics Laboratory	2
UNIFI: Human Expression		3
Hours		15
Junior		
Fall		
Educator Essentials Course		3
EDUC 2385	Teaching Methods I: Secondary Science	3
EDUC 2485	Teaching Internship I: Secondary Science	3
UNIFI: Connect		3
Physics Elective		3
Hours		15
Spring		
PHYSICS 4080/5080	Resources for Teaching Physics	2
Physics Elective		3
UNIFI: Connect		3
University Electives		9
Hours		17
Senior		
Fall		
EDUC 3585/5585	Teaching Methods II: Secondary Science	3
EDUC 3685/5685	Teaching Internship II: Secondary Science	3
UNIFI: Connect		3
Natural Science or Math Elective		4
Hours		13
Spring		
EDUC 4138	Secondary School Teaching	12
Hours		12
Total Hours		120

Learning Outcomes

Physics Teaching, B.A.

- Apply Techniques of Experimental Physics
- Understand Principles of Theoretical Physics
- Apply Techniques of Computational Physics
- Understand and Practice Modern Physics Pedagogy

A student who has earned a bachelor's degree in physics from the University of Northern Iowa must demonstrate competence at the introductory (second-year) level in all three content areas (experimental, theoretical, and computational) through course-level outcomes aligned with each branch. A successful B.A. Physics Teaching student must also demonstrate knowledge and understanding of physics pedagogy. Competence in both content and pedagogy are necessary for the successful practice of high-school physics teaching.

Related Programs

- Chemistry - Teaching B.A.
- Comprehensive Secondary Science - Teaching B.A.