

BA/BS MAJOR IN PHYSICS

Requirements for a Bachelor of Arts or Bachelor of Science Degree with a Major in Physics

Additional Graduation Requirements (<https://catalog.una.edu/undergraduate/academic-procedures-requirements/graduation-requirements>)

Code	Title	Hours
General Education Component (https://catalog.una.edu/undergraduate/academic-procedures-requirements/general-education-component)		
Area I (Written Composition) ¹		6
Area II (Humanities and Fine Arts)		12
Area III (Natural Sciences and Mathematics)		11
Area IV (History, Social and Behavioral Sciences)		12
Area V (https://www.una.edu/areav)		
Major Core Requirements in Physics		
PH 251 & PH 252	Technical Physics I and Technical Physics II ²	10
PH 343	Modern Physics	4

Major Concentration Requirements

Select one of the following Options:

Option I: Professional Physics (<https://catalog.una.edu/undergraduate/colleges-programs/arts-sciences/physics-earth-science/#professional-physics>)

Option II: General Physics (<https://catalog.una.edu/undergraduate/colleges-programs/arts-sciences/physics-earth-science/#general-physics>)

Option III: Geophysics (<https://catalog.una.edu/undergraduate/colleges-programs/arts-sciences/physics-earth-science/#geophysics>)

Option IV: General Science (<https://catalog.una.edu/undergraduate/colleges-programs/arts-sciences/physics-earth-science/#general-science>)

Minor

Option I: Professional Physics

A minor is not required for Option I.

Option II: General Physics

A minor, second major or second degree is required for Option II (<https://catalog.una.edu/undergraduate/colleges-programs/arts-sciences/physics-earth-science/#programsofferedtext>)

Option III: Geophysics

A second major or a second degree in an approved area is required for Option III (<https://catalog.una.edu/undergraduate/colleges-programs/arts-sciences/physics-earth-science/#programsofferedtext>)

Option IV: General Science

A second major or a second degree in an approved area is required for Option IV (<https://catalog.una.edu/undergraduate/colleges-programs/arts-sciences/physics-earth-science/#programsofferedtext>)

General Electives

If required, to bring total in each option to 128.

- ¹ For BA degree, select 6 hours of a required foreign language at the introductory level.
- ² Fulfills computer literacy requirement for Option III

Concentration Options

Option I: Professional Physics

Code	Title	Hours
PH 356W	Intermediate Laboratory ¹	4
PH 444	Quantum Mechanics	3
PH 447	Electricity and Magnetism	3
PH 448	Electromagnetic Fields	3
PH 456	Thermodynamics and Statistical Mechanics	3
PH 471	Classical Dynamics	3
PH 480-489		6
PH 495	Directed Research	1-3
PH 498	Senior Assessment Seminar	1
Select 3 hours from the following courses:		3
PH 480	Topics in Physics ²	
PH 481	Topics in Physics	
PH 482	Topics in Physics	
PH 483	Topics in Physics	
PH 484	Topics in Physics	
PH 485	Topics in Physics	
PH 486	Topics in Physics	
PH 487	Topics in Physics	
PH 488	Topics in Physics	
PH 489	Topics in Physics	
PH 495	Directed Research	
Total Hours ⁴		30-32

- ¹ These courses are required in the major field if not completed as a part of the General Education component.

Prescribed Supporting Courses

Code	Title	Hours
MA 125	Calculus I ¹	4
MA 126	Calculus II ¹	4
MA 227	Calculus III ¹	4
MA 238	Applied Differential Equations I	3
Total Hours		3-15

- ¹ Fulfills computer literacy requirement for Option III

Option II: General Physics

Code	Title	Hours
PH 356W	Intermediate Laboratory ¹	4
PH 447	Electricity and Magnetism	3
PH 471	Classical Dynamics	3
PH 495	Directed Research	3
PH 498	Senior Assessment Seminar	1

Select twelve credits of Physics Electives at the 300-400 level	12
Total Hours ⁴	26

¹ These courses are required in the major field if not completed as a part of the General Education component.

Prescribed Supporting Courses

Code	Title	Hours
MA 125	Calculus I ¹	4
MA 126	Calculus II ¹	4
MA 227	Calculus III ¹	4
MA 238	Applied Differential Equations I	3
Total Hours		3-15

¹ Fulfills computer literacy requirement for Option III

Option III: Geophysics

Code	Title	Hours
ES 131	Earth Science/Physical Geology	4
ES 350	Introduction to Geophysics	4
ES 365	Data Analysis in Geophysics	3
ES 410	Tectonics	3
ES 420	Seismology	4
ES 495	Directed Research	2
PH 356W	Intermediate Laboratory ¹	4
PH 447	Electricity and Magnetism	3
PH 471	Classical Dynamics	3
PH 498	Senior Assessment Seminar	1
Select three hours of Physics Electives (300-400 level)		3
Total Hours ⁴		34

¹ This course is required in the major field if not completed as a part of the General Education component

Prescribed Supporting Courses

Code	Title	Hours
MA 125	Calculus I ¹	4
MA 126	Calculus II ¹	4
MA 227	Calculus III ¹	4
MA 238	Applied Differential Equations I	3
Total Hours		3-15

¹ Fulfill computer literacy requirement for student's enrolled Option

Option IV: General Science¹

Code	Title	Hours
BI 111	Principles of Biology	4
BI 112	Principles of Biology	4
BI 305	Cell Biology	4
BI 306	Genetics	4
CH 111 & 111L	General Chemistry and General Chemistry Laboratory	4
CH 112 & 112L	General Chemistry and General Chemistry Laboratory	4
CH 311 & 311L	Organic Chemistry and Organic Chemistry Laboratory	5

CS 135	Computer Skills for Problem-Solving (or higher) ²	3
ES 131	Earth Science/Physical Geology	4
ES 132	Historical Geology	4
MA 125	Calculus I	4
MA 126	Calculus II	4
PH 251	Technical Physics I	5
PH 252	Technical Physics II	5
PH 343	Modern Physics	4
Select one course from the following:		3-4
BI 307	Microbiology	
BI 312	Evolution	
BI 421	Ecology	
CH 312 & 312L	Organic Chemistry and Organic Chemistry Laboratory	
ES 445	Mineralogy	
PH 125	Descriptive Astronomy	
PH 356W	Intermediate Laboratory ³	
Select one course with accompanying lab from the following:		4-5
CH 321	Quantitative Analysis	
CH 322	Instrumental Analysis ³	
CH 341	Applied Physical Chemistry	
Select one course from the following:		3-4
ES 330	Meteorology	
ES 375	Technology and the Environment	
ES 431	Structural Geology	
ES 455W	Paleobiology ³	
Total Hours ⁴		74

¹ Option IV requires a second major or a second degree in an approved area.

² Fulfills computer literacy requirement for student's enrolled option

³ These courses are required in the major if not completed as part of the General Education component

⁴ A laboratory is included in science courses that carry 4-5 credit hours (Physics and Earth Science Department).