

ASTRONOMY, BA

Degree: Bachelor of Arts (BA)

Major: Astronomy

Program Overview

The Bachelor of Arts in Astronomy provides a theoretical foundation and practical experience in the field of astronomy. The program offers flexible coursework in astronomy, math, and physics that helps to facilitate double or secondary majors. Students develop skills in data analysis, computational methods, and science communication. This program prepares students for study in astronomy at the graduate level. The program is also good preparation for careers in data science, science education, public outreach, and related fields.

Learning Outcomes

- Students will be able to identify astronomical objects and describe their essential properties.
- Students will be able to apply physical laws and quantitative mathematics to understand astronomical phenomena.
- Students will be able to use computational methods to characterize and interpret data.
- Students will be able to apply astronomical knowledge to develop and execute a focused research project.
- Students will be able to demonstrate effective science communication skills to explain the results of scientific research.
- Students will be able to apply physical laws and quantitative mathematics to understand advanced theoretical and laboratory physics concepts.

Undergraduate Policies

For undergraduate policies and procedures, please review the Undergraduate Academics section of the General Bulletin.

Accelerated Master's Programs

Undergraduate students may participate in accelerated programs toward graduate or professional degrees. For more information and details of the policies and procedures related to accelerated studies, please visit the Undergraduate Academics section of the General Bulletin.

Program Requirements

Students seeking to complete this major and degree program must meet the general requirements for bachelor's degrees and the Unified General Education Requirements. Students completing this program as a secondary major while completing another undergraduate degree program do not need to satisfy the school-specific requirements associated with this major.

The Bachelor of Arts in Astronomy requires 120 credit hours, including 15 credit hours in astronomy, 26 credit hours in physics, 14 credit hours in math, 3 credit hours in computer programming, and 9 credit hours in technical electives.

Code	Title	Credit Hours
Required 200 Level Courses:		6
ASTR 221	Stars and Planets	
ASTR 222	Galaxies and Cosmology	
Required 300 Level Courses:		9
<i>Choose three of the following:</i>		
ASTR 306	Astronomical Techniques	
ASTR 311	Stellar Physics	
ASTR 323	The Local Universe	
ASTR 328	Cosmology and the Structure of the Universe (Additional required courses)	
Additional required courses:		
MATH 121	Calculus for Science and Engineering I	4
MATH 122	Calculus for Science and Engineering II	4
or MATH 124	Calculus II	
MATH 223	Calculus for Science and Engineering III	3
or MATH 227	Calculus III	
MATH 224	Elementary Differential Equations	3
or MATH 228	Differential Equations	
PHYS 121	General Physics I - Mechanics	4
or PHYS 123	Physics and Frontiers I - Mechanics	
PHYS 122	General Physics II - Electricity and Magnetism	4
or PHYS 124	Physics and Frontiers II - Electricity and Magnetism	
PHYS 221	Introduction to Modern Physics	3
PHYS 250	Computational Methods in Physics	3
PHYS 310	Classical Mechanics	3
PHYS 313	Thermodynamics and Statistical Mechanics	3
PHYS 324	Electricity and Magnetism I	3
PHYS 331	Introduction to Quantum Mechanics I	3
ENGR 131	Elementary Computer Programming	3
Technical electives: ^a		9
ASTR 333	Dark Matter	
DSCI 351	Exploratory Data Science	
EEPS 345	Planetary Materials	
HSTY 209	The Copernican Revolution	
MATH 201	Introduction to Linear Algebra for Applications	
PHIL 203	Revolutions in Science	
PHYS 203	Analog and Digital Electronics	
PHYS 316	Introduction to Nuclear and Particle Physics	
PHYS 325	Electricity and Magnetism II	
PHYS 326	Physical Optics	
PHYS 332	Introduction to Quantum Mechanics II	
PHYS 349	Methods of Mathematical Physics I	
STAT 312R	Basic Statistics for Engineering and Science Using R Programming	
Total Credit Hours		67

a Consult advisor for other acceptable classes.

Sample Plan of Study

First Year

		Credit Hours
Fall		
MATH 121	Calculus for Science and Engineering I	4
PHYS 121	General Physics I - Mechanics	4
	or PHYS 123 or Physics and Frontiers I - Mechanics	
Academic Inquiry Seminar, Breadth, or Elective course ^a		3
Open Elective		3
Credit Hours		14

Spring

MATH 122	Calculus for Science and Engineering II	4
	or MATH 124 or Calculus II	
PHYS 122	General Physics II - Electricity and Magnetism	4
	or PHYS 124 or Physics and Frontiers II - Electricity and Magnetism	
ENGR 131	Elementary Computer Programming	3
Academic Inquiry Seminar, Breadth, or Elective course ^a		3
Credit Hours		14

Second Year

Fall

ASTR 221	Stars and Planets	3
MATH 223	Calculus for Science and Engineering III	3
	or MATH 227 or Calculus III	
PHYS 221	Introduction to Modern Physics	3
Breadth, or Elective course ^a		3
Open Elective		4
Credit Hours		16

Spring

ASTR 222	Galaxies and Cosmology	3
MATH 224	Elementary Differential Equations	3
	or MATH 228 or Differential Equations	
PHYS 250	Computational Methods in Physics	3
PHYS 310	Classical Mechanics	3
Breadth, or Elective course ^a		3
Credit Hours		15

Third Year

Fall

ASTR 328	Cosmology and the Structure of the Universe	3
PHYS 313	Thermodynamics and Statistical Mechanics	3
Breadth, or Elective course ^a		3
Open Electives		6
Credit Hours		15

Spring

ASTR 311	Stellar Physics	3
PHYS 324	Electricity and Magnetism I	3
Breadth, or Elective course ^a		3
Technical Elective		3
Open Electives		4
Credit Hours		16

Fourth Year

Fall

PHYS 331	Introduction to Quantum Mechanics I	3
Technical Elective		3
Capstone ^b		3
Open Electives		6
Credit Hours		15

Spring

ASTR 306	Astronomical Techniques	3
Breadth, or Elective course ^a		3
Technical Elective		3
Open Electives		6
Credit Hours		15
Total Credit Hours		120

^a Unified General Education Requirement.

^b A Capstone Experience is required of all students. The Astronomy BA does not require the Astronomy Capstone but only that 3 credit hours of Capstone be taken in some field. Depending on the Capstone taken, the 3 credit hours may be spread over two semesters.