

ASTRONOMY (BS)

Astronomers seek to understand the structure and evolution of planets, stars, galaxies, and the universe. Immediate employment opportunities for astronomy majors include public education related positions at planetariums and museums; data analyst positions in science and industry, and laboratory work.

Students also learn the fundamentals of astronomical observing, data collection, and analysis, including hands-on experience at Benedictine's Daglen Observatory.

Transfer students pursuing a major in Astronomy must take a minimum of 40% of the coursework required for the major at Benedictine College.

Program Mission

The mission of the Astronomy Program is to advance understanding of and foster curiosity about the physical universe, to enlighten students in critical thinking, to instruct students in applying the scientific method, and to enrich the College's liberal arts curriculum. Graduates will have a strong foundation in observational and theoretical astronomy and astrophysics, which prepares them for graduate study and careers in astronomy and related fields; they also gain a strong set of analytical and technical skills that prepare them to pursue careers in a wide range of other fields.

Program Outcomes

1. Graduates will have factual knowledge and conceptual understanding of advanced topics in astronomy, within the framework of a liberal arts education.
2. Graduates will be able to use physical data to solve quantitative problems in astronomy.
3. Graduates will be proficient in fundamental laboratory skills, including data analysis, and the use of instrumentation.
4. Graduates will be able to interpret and utilize the scientific literature and will be able to communicate scientific results clearly and concisely via oral and written reports.
5. Graduates will have the tools to succeed in graduate study or careers in astronomy and related fields, as well as the analytical and technical skills to succeed in a variety of other fields.
6. Graduates will have the interpersonal and professional skills to effectively work within teams and be project leader of teams of varied cultural and experiential backgrounds regardless of cultural differences.

Guidelines for Acceptance to a Physics & Astronomy Department Major

In order to ensure that students are on a successful academic trajectory, it is recommended that students who have not earned at least a C average in both Classical Physics I and II should not declare a major in the Physics & Astronomy Department. Students who have not achieved this minimum grade guideline but who still seek acceptance to a major in one of the programs in the Physics & Astronomy Department must meet with and receive approval from the Department Chair.

Program Requirements

Code	Title	Hours
Requirements		
ASTR-1300	Sun & Solar System	4
ASTR-1400	Stars & Stellar Systems	4
ASTR-3000	Observational Astronomy	3
ASTR-4100	Introduction to Astrophysics	3
ASTR-4200	Solar System Astrophysics	3
ASTR-4300	Galaxies & Cosmology	3
PHYS-2100 & PHYS-2101	Classical Physics I and Classical Physics I Lab	4
PHYS-2110 & PHYS-2111	Classical Physics II and Classical Physics II Lab	4
PHYS-3200	Relativity & Atomic Physics	3
PHYS-3201	Modern Physics Lab	1
PHYS-3210	Nuclear & Elementary Particle Physics	2
PHYS-3211	Modern Physics Lab II	1
PHYS-4100	Mechanics I	3
PHYS-4110	Mechanics II	3
PHYS-4600	Electricity & Magnetism I	3
PHYS-4610	Electricity & Magnetism II	3
PHYS-4800	Quantum Mechanics	3
PHYS-4400	Thermodynamics	3
PHYS-4300	Optics	3
PHYS-4301	Optics Laboratory	1
ASTR-COMP	Senior Comprehensive Exam	0
PHYS-4910	Physics & Astronomy Research	1
Four semesters of PHYS-4900–PHYS-4903, Physics Colloquium		0
Required Supporting Courses		
CHEM-1200	General Chemistry I Lecture	3
CHEM-1210	General Chemistry II Lecture	3
CHEM-1201	General Chemistry I Laboratory	1
CHEM-1211	General Chemistry II Lab	1
Select one of the following:		2-4
CSCI-2300	Programming for Scientists & Engineers	
CSCI-1140	Introduction to Computer Science I	
ENGR-2000	Computer Applications in Engineering	
MATH-1300	Calculus I	4
MATH-1350	Calculus II	4
MATH-2300	Calculus III	4
MATH-3100	Differential Equations	3
Recommended Supporting Courses		
MATH-2500	Linear Algebra	
MATH-2550	Discrete Mathematical Structures I	
MATH-3200	Probability & Statistics	
MATH-3300	Numerical Computation	
Total Hours		83-85

Suggested Sequence of Courses for a Bachelor of Science Degree in Astronomy

Course	Title	Hours
Freshman Year		
First Semester		
PHYS-2100 & PHYS-2101	Classical Physics I and Classical Physics I Lab	4
ASTR-1300	Sun & Solar System	4
MATH-1300	Calculus I	4
CHEM-1200	General Chemistry I Lecture	3
CHEM-1201	General Chemistry I Laboratory	1
GNST-1000	BC Experience	1
Hours		17
Second Semester		
PHYS-2110 & PHYS-2111	Classical Physics II and Classical Physics II Lab	4
ASTR-1400	Stars & Stellar Systems	4
MATH-1350	Calculus II	4
CHEM-1210	General Chemistry II Lecture	3
CHEM-1211	General Chemistry II Lab	1
Hours		16
Sophomore Year		
First Semester		
ASTR-3000	Observational Astronomy	3
EXSC-1115	Wellness for Life	1
MATH-2300	Calculus III	4
Foreign Language		4
PHYS-3200	Relativity & Atomic Physics	3
PHYS-3201	Modern Physics Lab	1
EXSC Fitness Course		1
Hours		17
Second Semester		
PHIL-1750	Principles of Nature	3
THEO-1100	Introduction to Theology	3
MATH-3100	Differential Equations	3
Foreign Language		4
PHYS-3210	Nuclear & Elementary Particle Physics	2
PHYS-3211	Modern Physics Lab II	1
Hours		16
Junior Year		
First Semester		
ASTR-4100	Introduction to Astrophysics	3
PHYS-4100	Mechanics I	3
Person and Community Foundation		3
PHYS-4900	Physics Colloquium	0
Faith Foundation		3
ENGL-1010	English Composition	3
Philosophical Inquiry		3
Hours		18
Second Semester		
ASTR-4300	Galaxies & Cosmology	3

CSCI-2300	Programming for Scientists & Engineers	3
Aesthetic Experience		3
PHYS-4110	Mechanics II	3
PHYS-4300	Optics	3
PHYS-4301	Optics Laboratory	1
PHYS-4901	Physics Colloquium	0
Hours		16
Senior Year		
First Semester		
ASTR-4200	Solar System Astrophysics	3
Historical Inquiry		3
PHYS-4400	Thermodynamics	3
PHYS-4600	Electricity & Magnetism I	3
PHYS-4800	Quantum Mechanics	3
PHYS-4902	Physics Colloquium	0
PHYS-4910	Physics & Astronomy Research	1
Hours		16
Second Semester		
PHYS-4610	Electricity & Magnetism II	3
Philosophical Inquiry		3
PHYS-4903	Physics Colloquium	0
Faith Foundation		3
Aesthetic Experience		3
Historical Inquiry Foundation		3
ASTR-COMP	Senior Comprehensive Exam	0
Hours		15
Total Hours		131