

## DEPARTMENT OF ASTRONOMY

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### Bachelor of Science in Astronomy

The BS in Astronomy requires 120 credit hours, including 18 hours in astronomy, 40 hours in physics, 14 hours in math, 3 hours in computer programming, and 15 hours in technical electives.

#### Astronomy Hours: 18, up to 21 with Astronomy capstone

ASTR 221 Stars and Planets (3)  
ASTR 222 Galaxies and Cosmology (3)  
ASTR 306 Astronomical Techniques (3)  
ASTR 311 Stellar Physics (3)  
ASTR 323 The Local Universe (3)  
ASTR 328 Cosmology & the Structure of the Universe (3)  
^ASTR 351 Astronomy Capstone (3)  
^A Capstone Experience is required of all students. The Astronomy BS does not require the Astronomy Capstone but only that a Capstone be taken in some field.

#### Physics Hours: 40

PHYS 121 General Physics I: Mechanics (4)  
or PHYS 123 Physics and Frontiers I (4)  
PHYS 122 General Physics II: Electricity & Magnetism (4)  
or PHYS 124 Physics and Frontiers II (4)  
PHYS 203 Laboratory Physics (4)  
PHYS 204 Advanced Instrumentation Lab (4)  
PHYS 221 General Physics III: Modern Physics (3)  
PHYS 250 Mathematical Physics & Computing (3)  
PHYS 310 Classical Mechanics (3)  
PHYS 313 Thermodynamics & Statistical Mechanics (3)  
PHYS 324 Electricity & Magnetism I (3)  
PHYS 325 Electricity & Magnetism II (3)  
PHYS 331 Quantum Mechanics I (3)  
PHYS 332 Quantum Mechanics II (3)

#### Math Hours: 14

MATH 121 Calculus for Science & Engineering I (4)  
MATH 122 Calculus for Science & Engineering II (4)  
or MATH 124 Calculus II (4)  
MATH 223 Calculus for Science & Engineering III (3)  
or MATH 227 Calculus III (3)  
MATH 224 Elementary Differential Equations (3)  
or MATH 228 Differential Equations (3)

#### ENGR/Computing Hours: 3

ENGR 131 Elementary Computer Programming (3)

#### Technical Electives Hours: 15

Technical Electives are additional courses which satisfy interests of the student but also fall within the scientific objectives of the major, and must be approved by your advisor. Example courses include:

ASTR 333 Dark Matter  
DSCI 351 Exploratory Data Science  
EEPS 340 Earth and Planetary Interiors  
EEPS 345 Planetary Materials  
HIST 209 The Copernican Revolution  
MATH 201 Introduction to Linear Algebra for Applications  
PHIL 203 Revolutions in Science  
PHYS 301 Advanced Laboratory Physics I  
PHYS 326 Physical Optics  
STAT 312R Statistics for Engineering and Physical Sciences

### Sample Plan of Study: BS in Astronomy

This is a representative schedule only. Not all courses are offered in exactly the semester and year listed here. Please consult your advisor about course availability and sequencing.

First Year — Fall Semester (14 credits)	Units
MATH 121 Calculus for Science and Engineering I	4
PHYS 121 General Physics I - Mechanics	4
Academic Inquiry Seminar or GER Breadth	3
Open Elective	3
First Year — Spring Semester (14 credits)	Units
MATH 122 Calculus for Science and Engineering II	4
PHYS 122 General Physics II - E&M	4
ENGR 131 Elementary Computer Programming	3
Academic Inquiry Seminar or GER Breadth	3
Second Year — Fall Semester (16 credits)	Units
ASTR 221 Stars and Planets	3
MATH 223 Calculus for Science and Engineering III	3
PHYS 221 Introduction to Modern Physics	3
PHYS 203 Analog & Digital Electronics	4
GER Breadth	3
Second Year — Spring Semester (16 credits)	Units
ASTR 222 Galaxies and Cosmology	3
MATH 224 Elementary Differential Equations	3
PHYS 250 Computational Methods in Physics	3
PHYS 204 Advanced Instrumentation Lab	4
GER Breadth	3
Third Year — Fall Semester (15 credits)	Units
ASTR 328 Cosmology and the Structure of the Universe	3
PHYS 313 Thermodynamics and Statistical Mechanics	3
Technical Elective	3
GER Breadth	3
Open Elective	3
Third Year — Spring Semester (15 credits)	Units
ASTR 311 Stellar Physics	3
PHYS 324 Electricity and Magnetism I	3
PHYS 310 Classical Mechanics	3
Technical Elective	3
GER Breadth	3
Fourth Year — Fall Semester (15 credits)	Units
ASTR 323 The Local Universe	3
PHYS 325 Electricity and Magnetism II	3
PHYS 331 Introduction to Quantum Mechanics I	3
Technical Elective	3
Capstone Project	3
Fourth Year — Spring Semester (15 credits)	Units
ASTR 306 Astronomical Techniques	3
PHYS 332 Introduction to Quantum Mechanics II	3
Technical Elective	3
Technical Elective	3
GER Breadth	3
<b>Total</b>	<b>120</b>

## Bachelor of Arts in Astronomy (also for Secondary Major in Astronomy)

The BA in Astronomy requires 120 credit hours, including 15 hours in astronomy, 26 hours in physics, 14 hours in math, 3 hours in computer programming, and 9 hours in technical electives. The Astronomy BA is normally done in conjunction with a second major (or as a secondary major), and the open electives should be taken as needed to fill the requirements of the other major.

### Astronomy Hours: 15, up to 18 with Astronomy capstone

ASTR 221 Stars and Planets (3)

ASTR 222 Galaxies and Cosmology (3)

^ASTR 351 Astronomy Capstone (3)

### Three of the following:

ASTR 306 Astronomical Techniques (3)

ASTR 311 Stellar Physics (3)

ASTR 323 The Local Universe (3)

ASTR 328 Cosmology & the Structure of the Universe (3)

^A Capstone Experience is required of all students. The Astronomy BA does not require the Astronomy Capstone but only that a Capstone be taken.

### Physics Hours: 26

PHYS 121 General Physics I: Mechanics (4)

PHYS 122 General Physics II: Electricity & Magnetism (4)

PHYS 221 General Physics III: Modern Physics (3)

PHYS 250 Mathematical Physics & Computing (3)

PHYS 310 Classical Mechanics (3)

PHYS 313 Thermodynamics & Statistical Mechanics (3)

PHYS 324 Electricity & Magnetism I (3)

PHYS 331 Quantum Mechanics I (3)

### Math Hours: 14

MATH 121 Calculus for Science & Engineering I (4)

MATH 122 Calculus for Science & Engineering II (4)  
or MATH 124 Calculus II (4)

MATH 223 Calculus for Science & Engineering III (3)  
or MATH 227 Calculus III (3)

MATH 224 Elementary Differential Equations (3)  
or MATH 228 Differential Equations (3)

### ENGR/Computing Hours: 3

ENGR 131 Elementary Computer Programming (3)

### Technical Electives Hours: 9

Technical Electives are additional courses which satisfy interests of the student but also fall within the scientific objectives of the major, and must be approved by your advisor. Example courses include:

ASTR 333 Dark Matter

DSCI 351 Exploratory Data Science

EEPS 340 Earth and Planetary Interiors

EEPS 345 Planetary Materials

HIST 209 The Copernican Revolution

MATH 201 Introduction to Linear Algebra for Applications

PHIL 203 Revolutions in Science

PHYS 203 Analog and Digital Electronics

PHYS 326 Physical Optics

STAT 312R Statistics for Engineering and Physical Sciences

## Sample Plan of Study: BA in Astronomy

This is a representative schedule for a student with a single major. Not all courses are offered in exactly the semester and year listed here. Please consult your advisor about course availability and sequencing.

### First Year — Fall Semester (14 credits)

	Units
MATH 121 Calculus for Science and Engineering I	4
PHYS 121 General Physics I - Mechanics	4
Academic Inquiry Seminar or GER Breadth	3
Open Elective	3

### First Year — Spring Semester (14 credits)

	Units
MATH 122 Calculus for Science and Engineering II	4
PHYS 122 General Physics II - E&M	4
ENGR 131 Elementary Computer Programming	3
Academic Inquiry Seminar or GER Breadth	3

### Second Year — Fall Semester (16 credits)

	Units
ASTR 221 Stars and Planets	3
MATH 223 Calculus for Science and Engineering III	3
PHYS 221 Introduction to Modern Physics	3
GER Breadth	3
Open Electives	4

### Second Year — Spring Semester (15 credits)

	Units
ASTR 222 Galaxies and Cosmology	3
MATH 224 Elementary Differential Equations	3
PHYS 250 Computational Methods in Physics	3
PHYS 310 Classical Mechanics	3
GER Breadth	3

### Third Year — Fall Semester (15 credits)

	Units
ASTR 328 Cosmology and the Structure of the Universe	3
PHYS 313 Thermodynamics and Statistical Mechanics	3
GER Breadth	3
Open Electives	6

### Third Year — Spring Semester (16 credits)

	Units
ASTR 311 Stellar Physics	3
PHYS 324 Electricity and Magnetism I	3
Technical Elective	3
GER Breadth	3
Open Electives	4

### Fourth Year — Fall Semester (15 credits)

	Units
PHYS 331 Introduction to Quantum Mechanics I	3
Technical Elective	3
Capstone Project	3
Open Electives	6

### Fourth Year — Spring Semester (15 credits)

	Units
ASTR 306 Astronomical Techniques	3
Technical Elective	3
GER Breadth	3
Open Elective	6

**Total            120**