Astronomy, B.A.

Learning Outcomes
Astronomy majors will be able to:

• demonstrate understanding of the fundamental concepts in astrophysics such as gravity, the nature of light, the physical characteristics of matter, and the motions of astronomical objects in the night sky;

• demonstrate proficiency in each of the major areas of astronomy—cosmology, galaxies, accretion and compact objects, the life cycle, and properties of stars and solar system science;

• show a working knowledge of a broad array of astrophysical phenomena that are based upon fundamental concepts; and

• gain familiarity with astronomical observations, instrumentation, computational methods, and software.

Requirements
The Bachelor of Arts with a major in astronomy requires a minimum of 120 s.h., including at least 49 s.h. of work for the major. The B.A. program requires fewer physics and mathematics courses than the B.S. program does, giving students a wider choice of electives. Students take calculus in addition to physics and astronomy courses, which include laboratories. They also must complete the College of Liberal Arts and Sciences GE CLAS Core.

The program is designed for students who wish to build considerable knowledge in astronomy but do not plan a research-oriented career in the field. It is appropriate for students planning careers in secondary school science teaching or science-related administration.

The B.A. with a major in astronomy requires the following courses or their equivalents.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mathematics Courses</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Physics Courses</td>
<td>24-29</td>
</tr>
<tr>
<td></td>
<td>Astronomy Courses</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Total Hours</td>
<td>49-54</td>
</tr>
</tbody>
</table>

Mathematics Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH:1850</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>MATH:1860</td>
<td>Calculus II</td>
<td>4</td>
</tr>
</tbody>
</table>

Physics Courses

If students select PHYS:3811 Electricity and Magnetism I, they must complete the prerequisite before they register for that course.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS:1701</td>
<td>Physics I</td>
<td>4</td>
</tr>
<tr>
<td>PHYS:1702</td>
<td>Physics II</td>
<td>4</td>
</tr>
<tr>
<td>PHYS:2703</td>
<td>Physics III</td>
<td>4</td>
</tr>
</tbody>
</table>

Astronomy Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTR:1771</td>
<td>Introductory Astronomy I: Basic Astrophysics and Planetary Astronomy</td>
<td>4</td>
</tr>
<tr>
<td>ASTR:1772</td>
<td>Introductory Astronomy II: Stellar, Galactic, and Extragalactic Astronomy</td>
<td>4</td>
</tr>
<tr>
<td>ASTR:3771</td>
<td>Introduction to Astrophysics I</td>
<td>3</td>
</tr>
<tr>
<td>ASTR:3772</td>
<td>Introduction to Astrophysics II</td>
<td>3</td>
</tr>
<tr>
<td>ASTR:4850</td>
<td>Astronomical Laboratory</td>
<td>3</td>
</tr>
</tbody>
</table>

Undergraduate majors who plan to pursue graduate study are advised to go as far as they can beyond the minimum requirements listed above, including further work in mathematics. In planning this work, they should be guided by the College of Liberal Arts and Sciences maximum hours rule: Students earning a B.A. may apply a maximum of 56 s.h. earned in one department to the minimum 120 s.h. required for graduation, whether or not the coursework is accepted toward requirements for the major. Students who earn more than 56 s.h. from one department may use the additional semester hours to satisfy requirements for the major (if the department accepts them), and the grades they earn become part of their grade-point average, but they cannot apply the additional semester hours to the minimum 120 s.h. required for graduation.

Double Major in Physics and Astronomy

Students working toward a Bachelor of Arts with a double major in physics and in astronomy must complete all requirements for both majors and must earn a minimum of 56 s.h. outside the Department of Physics and Astronomy in order to graduate. Students interested in earning a double major should consult with their advisors. See Requirements for a Bachelor’s Degree on the College of Liberal Arts and Sciences website.

Honors

Honors in the Major

Students majoring in astronomy have the opportunity to graduate with honors in their major. They must maintain a University of Iowa g.p.a. of at least 3.33. Students must earn 6-8 s.h. in PHYS:4999 Undergraduate Research during their junior and senior years and conduct an investigation.
under the guidance of a faculty member. They must present a written report of their research (honors thesis) and describe their research results at a departmental seminar.

**University of Iowa Honors Program**

In addition to honors in the major, students have opportunities for honors study and activities through membership in the University of Iowa Honors Program. Visit [Honors at Iowa](#) to learn about the University's honors program.

Membership in the UI Honors Program is not required to earn honors in the astronomy major.

**Academic Plans**

**Four-Year Graduation Plan**

The following checkpoints list the minimum requirements students must complete by certain semesters in order to stay on the University's Four-Year Graduation Plan. Courses in the major are those required to complete the major; they may be offered by departments other than the major department.

- **Before the third semester begins:** math through calculus I-II and physics I-II
- **Before the fifth semester begins:** physics III-IV and at least one more course in the major
- **Before the seventh semester begins:** three more courses in the major and at least 90 s.h. earned toward the degree
- **Before the eighth semester begins:** five more courses in the major

**Sample Plan of Study**

Sample plans represent one way to complete a program of study. Actual course selection and sequence will vary and should be discussed with an academic advisor. For additional sample plans, see MyUI.

### Astronomy, B.A.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Academic Career</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Research: students are strongly encouraged to be active participants in research within the department.</td>
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<tr>
<td></td>
<td>Students can pursue a double major in Astronomy and Physics and earn more than 56 s.h. from the department toward these degrees but must also complete at least 56 s.h. outside of the Department of Physics &amp; Astronomy.</td>
<td></td>
</tr>
<tr>
<td><strong>First Year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fall</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASTR:1771</td>
<td>Introductory Astronomy I: Basic Astrophysics and Planetary Astronomy</td>
<td>4</td>
</tr>
<tr>
<td>MATH:1850</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>PHYS:1701</td>
<td>Physics I</td>
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### Second Year

<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>Fall</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH:2700</td>
<td>Introduction to Linear Algebra</td>
<td>4</td>
</tr>
<tr>
<td>PHYS:2703</td>
<td>Physics III</td>
<td>4</td>
</tr>
<tr>
<td>GE CLAS Core: World Languages First Level Proficiency or elective course</td>
<td>4 - 5</td>
<td></td>
</tr>
<tr>
<td>GE CLAS Core: Social Sciences</td>
<td>3</td>
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### Third Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td><strong>Fall</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASTR:3771</td>
<td>Introduction to Astrophysics I</td>
<td>3</td>
</tr>
<tr>
<td>PHYS:3756</td>
<td>Intermediate Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>PHYS:3811</td>
<td>Electricity and Magnetism I</td>
<td>3</td>
</tr>
<tr>
<td>GE CLAS Core: World Languages Second Level Proficiency or elective course</td>
<td>4 - 5</td>
<td></td>
</tr>
<tr>
<td>Elective course</td>
<td>1 - 3</td>
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### Fourth Year

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GE CLAS Core: Diversity and Inclusion</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PHYS:3730</td>
<td>Statistical Physics</td>
<td>3</td>
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<tr>
<td>GE CLAS Core: Historical Perspectives</td>
<td>3</td>
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<tr>
<td>Elective course</td>
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<td></td>
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<tr>
<td>Elective course</td>
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<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td><strong>Spring</strong></td>
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</tr>
<tr>
<td>ASTR:3772</td>
<td>Introduction to Astrophysics II</td>
<td>3</td>
</tr>
<tr>
<td>PHYS:3710</td>
<td>Intermediate Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>GE CLAS Core: Literary, Visual, and Performing Arts</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>GE CLAS Core: World Languages Fourth Level Proficiency or elective course</td>
<td>4 - 5</td>
<td></td>
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</tbody>
</table>

### Fifth Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GE CLAS Core: Values and Culture</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>
Elective course

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
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<td></td>
<td>3</td>
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</tbody>
</table>

Degree Application: apply on MyUI before deadline (typically in February for spring, September for fall)

- a Fulfills a major requirement and may fulfill a GE requirement.
- b Enrollment in math courses requires completion of a placement exam.
- c While this course is not a major requirement, it is strongly recommended and a prerequisite for many physics and astronomy courses in the department.
- d Students who have completed four years of a single language in high school have satisfied the GE CLAS Core World Languages requirement. Enrollment in world languages courses requires a placement exam, unless enrolling in a first-semester-level course.
- e GE CLAS Core courses may be completed in any order unless used as a prerequisite for another course. Students should consult with an advisor about the best sequencing of courses.
- f Typically this course is offered every other year. Check MyUI for course availability since offerings are subject to change.
- g Students may use elective courses to earn credit towards the total s.h. required for graduation or to complete a double major, minors, or certificates.
- h Please see Academic Calendar, Office of the Registrar website for current degree application deadlines. Students should apply for a degree for the session in which all requirements will be met. For any questions on appropriate timing, contact your academic advisor. For more information visit http://commencement.uiowa.edu/. If applicable search for ‘Early and Late Participation’ to find this page (e.g. participate in graduation ceremony in May, degree conferral in August).

Career Advancement

Astronomy graduates have mastered skills that are readily transferable to a number of fields. They might choose to work in research, engineering, software development, teaching, finance, biomedical research, or consulting. Some graduates plan for careers in secondary school science teaching or science-related administration or plan to earn professional degrees.

About 70 percent of physics and astronomy graduates go on to graduate school. With help from the department’s in-house recruiting office, they win acceptance to some of the best graduate programs in the country.

The Pomerantz Career Center offers multiple resources to help students find internships and jobs.