I. Page URL (http://www-staging.bu.edu/academics/cas/programs/english/ba/)

Staging URLs only

http://www-staging.bu.edu/academics/cas/programs/astronomy/ba/

II. Page title (e.g., BA in English)

BA in Astronomy

III. Program description and opportunities

Describe the course of study in the major. Communicate why a student might want to pursue this course of study. What is exciting about the major? What sorts of career paths do students pursue after this course of study? Are there global programs that may be of particular interest to students in this major? Are there opportunities for research or for honors in this major?

Astronomy encompasses the most interesting physical phenomena in the universe, from the atmospheres of planets, to the discovery and characterization of planets orbiting other stars, the nature of galaxies and the stars in them, the supermassive black holes that reside at the centers of all large galaxies, and how the universe got to be the way it is. Astronomy majors gain exposure to the principles of astronomy, physics, and mathematics. They learn to communicate astronomical information effectively to a variety of audiences using the spoken and written word. They learn to think critically and evaluate, interpret, and solve problems related to astronomy, physics, and general scientific topics. The BA in Astronomy prepares students for entry into the competitive science, technology, engineering, and mathematics (STEM) workplace. Students develop the technical skills and problem-solving experience that gives them the tools to work in the modern, high-tech world.
IV. Learning outcomes (REQUIRED for all Major Program Pages; not applicable to Minor Program Pages)

Place the program learning outcomes here; these should match those submitted to the Provost’s office in November. If you need assistance, see the guide on the Provost’s Learning Outcomes Assessment webpage, “Writing Learning Outcomes” or contact Gillian Pierce, Director of Learning Assessment.

Learning Outcomes

1. Demonstrate a broad knowledge of the principles of astronomy.
2. Communicate astronomical information effectively, both in writing and verbally, and to a variety of audiences.
3. Think critically and evaluate, interpret, and solve problems related to astronomical topics as well as other technical and general scientific topics.

V. Requirements

List all requirements for the major, beginning with BU Hub general education requirements and college/school-specific requirements (if applicable).

BU has standardized the language used to describe different paths within a major (e.g., concentrations, specializations, tracks); please check the definitions on the Provost’s website and make sure your Bulletin copy uses language that is consistent with BU definitions.

NOTE: Beginning with the 2018/2019 Bulletin, the Requirements section of all Major Program Pages were edited to adhere to University BU Hub language guidelines. All your Major Program Pages requirements section now begin with text similar to this:

“All students entering as freshmen in Fall 2018 and after will pursue coursework in the BU Hub, a general education program that is integrated into the entire undergraduate experience. BU Hub requirements are flexible and can be satisfied in many different ways, through coursework in and beyond the major and, in some cases, through co-curricular activities. Students majoring in [ ] will, through coursework in the major, satisfy BU Hub requirements in…”

This introductory text must be kept, but please take the time to ensure that the stated BU Hub requirements your major satisfies are accurate and up-to-date. Edit as necessary.

The above standard Hub text is not applicable to Minor Program Pages.
Requirements

All students entering as freshmen in Fall 2018 and after will pursue coursework in the BU Hub, a general education program that is integrated into the entire undergraduate experience. BU Hub requirements are flexible and can be satisfied in many different ways, through coursework in and beyond the major and, in some cases, through co-curricular activities. Students majoring in Astronomy will ordinarily, through coursework in the major, satisfy BU Hub requirements in Scientific Inquiry and Quantitative Reasoning, as well as some of the requirements in Communication and the Intellectual Toolkit. Remaining BU Hub requirements will be satisfied by selecting from a wide range of available courses outside the major or, in some cases, co-curricular experiences.

Astronomy majors will also satisfy College of Arts & Sciences requirements, described [here](#).

Principal (Required) Courses

A total of 15 courses are required, all completed with a grade of C or higher. Unless otherwise noted, all courses are 4 credit hours.

**Prerequisites (4)**

- CAS AS 202 Principles of Astronomy I
- CAS AS 203 Principles of Astronomy II
- CAS PY 211 General Physics (or PY 251 Principles of Physics I)
- CAS PY 212 General Physics (or PY 252 Principles of Physics 2)

**Principal (Required) Courses (11)**

- CAS AS 311 Planetary Physics
- CAS AS 312 Stellar and Galactic Astrophysics
- CAS AS 441 Observational Astronomy
- CAS MA 123 Calculus I
- CAS MA 124 Calculus II
- CAS MA 225 Multivariate Calculus
- CAS PY 313 Waves and Modern Physics (or PY 351 Modern Physics I)
  and at least four courses from the following list:
  - CAS AS 413 Extragalactic Astrophysics and Cosmology
  - CAS AS 414 Solar and Space Physics
  - CAS AS 491 Directed Studies in Astronomy (or AS 492, but not both)
  - CAS PY 355 Methods of Theoretical Physics, PY 405 Electromagnetic Fields and Waves I, PY 408 Intermediate Mechanics, PY 410 Statistical Thermodynamics, or PY 451 Quantum Physics I

Students who enter the program with a strong background in calculus may substitute CAS MA 127 or MA 129 for the combination of MA 123 and MA 124, in consultation with their academic advisor.

Recommended Courses

Any from the above required list if not taken as a principal course, in addition to CAS MA 226, MA 242, PY 406, PY 452, GE 310, CS 111, and CS 112. Students who plan to enter graduate school to study astronomy should take several of the recommended and alternate principal courses, in consultation with an Astronomy academic advisor.
VI. Honors requirements

If your program offers the possibility to graduate with honors in the major/program, list those requirements here. General comments on honors may appear above in section IV.

Honors in the Major

Honors in Astronomy is an opportunity for senior undergraduates in the Department of Astronomy to conduct in-depth research in the field and to be more fully involved in the intellectual life of the department. To graduate with Honors in Astronomy, a student must author a well-written thesis, give a public presentation based on the thesis, and take an oral examination about the thesis with a committee of the Astronomy faculty. In addition, the student must, for at least one semester, regularly attend and participate in one of the following: the Space Physics Seminar Series, the Astrophysics Seminar Series, the Space Physics Journal Club, or the Astrophysics Journal Club. The Astronomy faculty committee will consider the quality of the written thesis, the quality of the presentation, the result of the oral examination, and the participation of the student in the Seminar or Journal Club series to determine whether the student will be awarded Honors in Astronomy. A grade of B+ or better in both semesters of CAS AS 401/402 (“Honors Work in Astronomy”) is also required to receive Honors in Astronomy.

VII. Links for link boxes (optional)

See the Style Guide for things you may want to include. Please format them as below. Up to 10 links per each section (Beyond the Bulletin and Related Bulletin Pages) may be included.

Related Bulletin Pages
(links to pages within the Bulletin)
  • Label (i.e., CAS Programs), URL (i.e., http://www.bu.edu/academics/cas/programs)

  • College of Arts & Sciences Departments
  • College of Arts & Sciences Courses
  • Abbreviations and Symbols

Beyond the Bulletin
(links to sites outside bu.edu/academics)
  • Label (i.e., Study Abroad), URL (i.e., http://www.bu.edu/abroad)
Make sure to save this as a new document, titled with the name of the Bulletin page to which you want changes applied. For example, the page for the BA in English will be saved as BA_in_English.