BACHELOR OF ARTS IN PHYSICS: CONCENTRATION IN ASTRONOMY – PHYS ASSOCIATE DEGREE FOR TRANSFER ROADMAP

This is a sample pathway for students who transfer to San Francisco State University in the current Bulletin year with an AS-T in Physics. Twenty-four units in the major (MATH 226, MATH 227, MATH 228, PHYS 220, PHYS 222, PHYS 230, PHYS 240 and PHYS 242) and all lower division GE requirements have been satisfied. Additional units in the major may have been satisfied. Check with a major advisor about the most appropriate course sequence. Degree completion guaranteed in 60 units; see the Associate Degree for Transfer (ADT) section for more information (http://bulletin.sfsu.edu/undergraduate-admissions/transfer-students).

### Course Title Units

#### First Semester
- **ASTR 115**  
  Introduction to Astronomy  
  1  
  3
- **PHYS 320**  
  Modern Physics I  
  1  
  5
- **PHYS 321**  
  Modern Physics Laboratory  
  1  
  5
- **GE Area A: Written English Communication II (A4)**  
  1  
  3
  1  
  3
- **Upper Division GE: UD-B, UD-C, or UD-D**  
  1  
  3

**Units**  
17

#### Second Semester
- **ASTR 300**  
  Stars, Planets, and the Milky Way  
  1  
  3
- **ASTR 340GW**  
  The Big Bang - GWAR  
  1  
  3
  1  
  3
- **Major Elective**  
  1  
  3
- **University Elective**  
  1  
  3

**Units**  
15

#### Third Semester
- **ASTR 301**  
  Observational Astronomy Laboratory  
  1  
  2
- **Major Elective**  
  1  
  2
- **Upper Division GE: UD-B, UD-C, or UD-D**  
  1  
  3
- **University Elective – Take Two**  
  1  
  6

**Units**  
13

#### Fourth Semester
- **ASTR 470**  
  Observational Techniques in Astronomy  
  1  
  3
- **PHYS 480**  
  Introduction to Optics & Photonics  
  1  
  3
- **PHYS 695**  
  Culminating Experience in Physics  
  1  
  1

**Upper Division GE: UD-B, UD-C, or UD-D**  
3

**University Electives**  
5

**Total Units**  
60

1 ASTR 115, ASTR 301 and PHYS 320/PHYS 321 offered fall semesters only.

2 ASTR 300, ASTR 340 GW, ASTR 470, PHYS 480 and PHYS 695 offered spring semesters only.

To Do at SF State:

Enough total units to reach 120 minimum for graduation; 40 units minimum at the upper division level; to include the following:

**University-Wide Requirements: 9–18 Units**
- ENG 214 or equivalent A4 course (0–3 units) if not taken before transfer
- American Institutions (0–6 units): US History, US Government, California State and Local Government requirements if not taken before transfer
- Upper division GE, areas B, C and D (9 units)
- Students entering the major with the AS-T in Physics are not required to fulfill SF State Studies requirements.
- Complementary Studies is met in major with required mathematics.

**Physics B.A. (Astronomy) Major: 28 Units**
- MATH 226, MATH 227, MATH 228, PHYS 220, PHYS 222, PHYS 230, PHYS 232, PHYS 240 and PHYS 242 met in transfer.
  - Prerequisites (3 units)
  - Upper division Requirements (17 units)
  - Upper division Electives (8 units) Selected on advisement. Units may be in astronomy, physics, geosciences, mathematics, or related subjects. No more than 3 units of 600-level courses may count towards elective units.

**University Electives: 14 or More Units**

Depends on course choices made at the community college, how transferred units are applied to the requirements above, and course choices at SF State. Some courses may meet more than one requirement, e.g. both in UD GE and the major. Upper division electives recommended in order to meet the minimum 40-unit requirement.