

BACHELOR OF ARTS IN PHYSICS: CONCENTRATION IN ASTRONOMY - QUANTITATIVE REASONING CATEGORY I/II AND ENG 114

120 Total Units Required
 Minimum Number of Units in the Major: 52

Course	Title	Units
First Semester		
ASTR 115	Introduction to Astronomy (Major Lower-Division Prerequisite, B1)	3
ENG 114	Writing the First Year. Finding Your Voice (A2) ¹	3
MATH 226	Calculus I (Major Lower-Division Prerequisite, B4) ²	4
GE Area A ³		3
GE Area C		3
	Units	16
Second Semester		
MATH 227	Calculus II (Major Lower-Division Prerequisite)	4
PHYS 220 & PHYS 222	General Physics with Calculus I and General Physics with Calculus I Laboratory (Major Lower-Division Prerequisite, B1, B3)	4
GE Area A		3
GE Area E		3
	Units	14
Third Semester		
ASTR 301	Observational Astronomy Laboratory (Major Upper-Division Core)	2
MATH 228	Calculus III (Major Lower-Division Prerequisite)	4
PHYS 230 & PHYS 232	General Physics with Calculus II and General Physics with Calculus II Laboratory (Major Lower-Division Prerequisite)	4

GE Area C		3
GE Area D		3
	Units	16
Fourth Semester		
ASTR 300	Stars, Planets, and the Milky Way (Major Upper-Division Core)	3
PHYS 240 & PHYS 242	General Physics with Calculus III and General Physics with Calculus III Laboratory (Major Lower-Division Prerequisite)	4
GE Area B: Life Science (B2)		3
GE Area C		3
GE Area D		3
	Units	16
Fifth Semester		
PHYS 320 & PHYS 321	Modern Physics I and Modern Physics Laboratory (Major Upper-Division Core)	5
GE Area D		3
SF State Studies or University Elective - Take Two ⁴		6
	Units	14
Sixth Semester		
ASTR/PHYS 340GW	The Big Bang - GEAR (Major Upper-Division Core)	3
ASTR 470	Observational Techniques in Astronomy (Major Upper-Division Core)	3
GE Area UD-B: Upper-Division Physical and/or Life Sciences (Consider SF State Studies Course)		3
GE Area UD-C: Upper-Division Arts and/or Humanities (Consider SF State Studies Course)		3
SF State Studies or University Elective - Take Two ⁴		3
	Units	15
Seventh Semester		
Major Elective - Take Two ⁵		6
GE Area UD-D: Upper-Division Social Sciences (Consider SF State Studies Course)		3
SF State Studies or University Elective ⁴		4
	Units	13
Eighth Semester		
PHYS 695	Culminating Experience in Physics (Major Upper-Division Core)	1
Major Elective - Take One ⁵		3
SF State Studies or University Elective - Take Four ⁴		12
	Units	16
	Total Units	120

¹ ENG 114 can only be taken if you complete Directed Self-Placement (DSP) and select ENG 114; if you choose ENG 104/ENG 105 through DSP you will satisfy A2 upon successful completion of ENG 105 in the second semester; multilingual students may be advised into alternative English courses.

² Depending on courses completed through Early Start, students in Pathway/Category III or IV may be required to enroll in a support course to complement their Quantitative Reasoning/B4 requirement. There are multiple course options for this pathway. Before enrolling in a B4 course, students should verify their MATH Pathway/Category in their Student Center (<http://cms.sfsu.edu/content/student-center>). Information regarding the courses that correspond with your MATH Pathway/Category can be found on the Developmental Studies Office Website (<http://developmentalstudies.sfsu.edu>).

³ To avoid taking additional units, it is recommended that you meet **SF State Studies** requirements (AERM, GP, ES, SJ) within your GE or major.

⁴ **Complementary Studies**

Upon completion of the B.A. in Physics program, students will have taken 12 units of Calculus courses that satisfy the Complementary Studies requirement for a B.A. degree.

Students who have earned AA-T or AS-T degrees and are pursuing a similar B.A. degree at SF State are required to fulfill the Complementary Studies requirement as defined by the major department. Students should consult with a major advisor about how transfer units and/or SF State units can best be applied to this requirement in order to ensure degree completion within 60 units.

⁵ **Major Elective (8 units)**

At least 8 units of upper-division courses in astronomy, physics, geosciences, mathematics or related subjects, selected on advisement. No more than 3 units of 600 level courses may count toward this requirement.