# Bachelor of Science in Earth Sciences: Hydrology Emphasis Roadmap

120 Total Units Required  
Minimum Number of Units in the Major: 68

## Course Title Units
### First Semester
- **CHEM 100** Preparation for Chemistry 3  
  or SF State Studies or University Elective if CHEM 115 prerequisites are already satisfied  
- GE Area A: Oral Communication (A1) or Critical Thinking (A3) 3  
- GE Area A: Written English Communication (A2) 3  
- GE Area C: Arts (C1) 3  
- GE Area D: U.S. History (D2) or U.S. and California Government (D3) 3  
**Units** 15

### Second Semester
- **CHEM 115** General Chemistry I: Essential Concepts of Chemistry 5  
- **MATH 226** Calculus I 4  
- GE Area A: Oral Communication (A1) or Critical Thinking (A3) 3  
- GE Area A: Written English Communication II (A4) 3  
**Units** 15

### Third Semester
- **MATH 227** Calculus II 4  
- **PHYS 111** General Physics I (Area B: Physical Science B1 and Laboratory Science B3) 4  
  or General Physics with Calculus I and General Physics with Calculus I Laboratory  
- GE Area C: Humanities: Literature (C3) 3  
- GE Area D: U.S. History (D2) or U.S. and California Government (D3) 3  
**Units** 15

### Fourth Semester
- **PHYS 121** General Physics II (or General Physics with Calculus III and General Physics with Calculus III Laboratory) 4  
- GE Area B: Life Science (B2) 3  
- Area C: Arts (C1) or Humanities (C2) 3  
- Area D: Social Sciences (D1) 3  
**Units** 13

### Fifth Semester
- Select One:  
  - **ERTH 210** Physical Geology 3  
  - **ERTH 230** Environmental Geology 3  
  - **ERTH 330** California Water 3  
  - **ERTH 400** Earth Systems I 3  
  - **ERTH 425** Geomorphology 4  
  - GE Area UD–B: Upper Division Physical and/or Life Sciences (Consider SF State Studies Course) 3  
- SF State Studies or University Elective 3  
**Units** 17-19

### Sixth Semester
- **ERTH 205** Techniques in Earth Sciences 2  
- **ERTH 430** Fluid Dynamics in Earth Systems 3  
- **ERTH 600GW** Earth’s Climate History - GWAR 3  
- Emphasis Elective (13 units total): Select additional Hydrology emphasis electives upon advisement – Take Two  6-8  
- GE Area UD–C: Upper Division Arts and/or Humanities (Consider SF State Studies Course) 3  
**Units** 16-17

### Seventh Semester
- **ERTH 442** Surface Water Hydrology 4  
- **ERTH 444** Hydrogeology 4  
- **ERTH 500** Earth Systems II 3  
- **ERTH 505** Quantitative Methods in Earth Sciences 3  
**Units** 14

### Eighth Semester
- **ERTH 544** Groundwater Contamination 3  
- **ERTH 690** Earth Sciences Capstone Presentation or Undergraduate Research and Senior Thesis 4  
- Emphasis Elective (13 units total): Select additional Hydrology emphasis electives upon advisement – Take Two  6-8  
- GE Area UD–D: Upper Division Social Sciences (Consider SF State Studies Course) 3  
**Units** 16-18

**Total Units** 120-125
To avoid taking additional units, it is recommended that you meet **LLD and SFSU Studies** requirements (AERM, GP, ES, SJ) within your GE or major.

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.

Depending on courses completed through Early Start and in high school, students in Pathway/Category 3 or 4 may be required to enroll in additional courses before they can take MATH 199 or MATH 226. Most students in Pathway/Category 3 or 4 will need to take a stretch format for MATH 199 (MATH 197 in Fall 2018 and MATH 198 in Spring 2019). 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).