# 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  

### 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  

### Third Semester  
**MATH 227** Calculus II 4  
**PHYS 111** General Physics I 4  
**PHYS 112** or PHYS 220 and PHYS 222  
**GE Area C: Humanities: Literature (C3)** 3  
**GE Area D: U.S. History (D2) or U.S. and California Government (D3)** 3  

### Fourth Semester  
**PHYS 121** or PHYS 240 and PHYS 242  
**General Physics II or General Physics with Calculus III and General Physics with Calculus Laboratory** 4  

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

### 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  

### 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  

### Eighth Semester  
**ERTH 544** Groundwater Contamination 3  
**ERTH 690** or ERTH 697 and ERTH 698  
**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  

**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).