# Bachelor of Science in Earth Sciences: Hydrology Emphasis – GEOL 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 Geology. Twenty-six units in the major (CHEM 115/CHEM 215/CHEM 216, ERTH 210, ERTH 500, ERTH 505, MATH 226, two elective units) 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).

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Semester</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ERTH 205</td>
<td>Techniques in Earth Sciences</td>
<td>2</td>
</tr>
<tr>
<td>ERTH 400</td>
<td>Earth Systems I</td>
<td>3</td>
</tr>
<tr>
<td>ERTH 425</td>
<td>Geomorphology I</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 111 &amp; PHYS 112 or PHYS 220 and PHYS 222</td>
<td>General Physics I or General Physics with Calculus I and General Physics with Calculus I Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>GE Area A: Written English Communication II (A4)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>or University Elective if A4 met in transfer</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Units</td>
<td>16</td>
</tr>
<tr>
<td>Second Semester</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ERTH 442</td>
<td>Surface Water Hydrology</td>
<td>4</td>
</tr>
<tr>
<td>ERTH 600GW</td>
<td>Earth's Climate History - GWAR</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 121 &amp; PHYS 122 or PHYS 240 and PHYS 242</td>
<td>General Physics II or General Physics with Calculus III and General Physics with Calculus III Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>GE Area UD–B: Upper Division Physical and/or Life Sciences</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Hydrology Emphasis Elective</td>
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<td>2</td>
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<tr>
<td>Third Semester</td>
<td></td>
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</tr>
<tr>
<td>ERTH 430</td>
<td>Fluid Dynamics in Earth Systems</td>
<td>3</td>
</tr>
<tr>
<td>ERTH 444</td>
<td>Hydrogeology</td>
<td>4</td>
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</tbody>
</table>

### Fourth Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
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<tbody>
<tr>
<td>ERTH 544</td>
<td>Groundwater Contamination</td>
<td>3</td>
</tr>
<tr>
<td>ERTH 690</td>
<td>Earth Sciences Capstone Presentation</td>
<td>1</td>
</tr>
<tr>
<td>Culminating Experience: Senior Honors Thesis or Senior Project or Field Geology</td>
<td>2-4</td>
<td></td>
</tr>
<tr>
<td>ERTH 695</td>
<td>Senior Project</td>
<td></td>
</tr>
<tr>
<td>ERTH 698</td>
<td>Senior Thesis</td>
<td></td>
</tr>
<tr>
<td>Field Geology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper Division GE: UD-C or UD-D</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>U.S. and California Government (bulletin.sfsu.edu/undergraduate-education/graduation-requirements/#usg) or University Elective if US/CA Government met before transfer</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>University Elective</td>
<td></td>
<td>0-1</td>
</tr>
<tr>
<td>Total Units</td>
<td></td>
<td>14</td>
</tr>
</tbody>
</table>

1. Consult with department advisor about selection of ERTH course.  
2. Take ERTH 697 Senior Honors Thesis or take University Elective (1 unit) if opting for Senior Project or Field Geology.  
3. Only if opting for Senior Project or Field Geology to satisfy Culminating Experience.  
4. Four unit Field Geology option typically takes place in summer following 4th semester.  
5. If opting for Senior Honors Thesis or Senior Project to satisfy Culminating Experience.

### 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  
- Upper-division GE, areas B, C and D (9 units) - check for courses that also satisfy Major and/or American Institutions.  
- Students transferring with the AS-T in Geology are not required to fulfill SF State Studies or Complementary Studies requirements.

#### Earth Sciences Major (Emphasis in Hydrology): 42-43 units

[CHEM 115, MATH 226, ERTH 210, ERTH 500, ERTH 505, and seven units of Geology emphasis electives, five units of CHEM 215/CHEM 216, one]
unit of four unit Historical Geology, and one unit of four unit Calculus II in the Geology AS-T met in transfer.

- Basic Science & Math Foundation (8 units in PHYS) If some or all PHYS completed before transfer, consult with a major advisor about appropriate course choices.
- Earth Sciences Core/GWAR (8 units) Three of the four units of Historical Geology in the AS-T substitute for ERTH 500, and three of the four units of Calculus II in the Geology AS-T substitute for ERTH 505.
- Hydrology Emphasis (17 units)
- Electives (5 units) Five units of CHEM 215/CHEM 216, one unit of four unit Historical Geology, and one unit of Calculus II in the Geology AS-T satisfy seven units of the 12 unit elective requirement; if taken before transfer, Mineralogy satisfies four units of the elective requirement. If Mineralogy completed before transfer, consult with a major advisor about appropriate course choices.
- Culminating Experience (4-5 units): Take ERTH 690 (1 unit) along with one of the following three options: Senior Honors Thesis (ERTH 697/ERTH 698 (2 units each); Senior Project (ERTH 695, 3 units); or Field Geology course (4 units) offered as a summer field camp, typically the summer following the 4th semester.

University Electives: Zero or More units
Depends on course choices made at the community college, how transferred units are applied to the requirements above, Culminating Experience option selected, and course choices at SF State. Some courses may meet more than one requirement, e.g. both in UD GE and in the major.

Upper-Division GE: UD-C or UD-D (Courses Listed Also Satisfy US History)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIS 460</td>
<td>Power and Politics in American Indian History</td>
<td>3</td>
</tr>
<tr>
<td>HIST/JS 449</td>
<td>American Jewish History</td>
<td>3</td>
</tr>
<tr>
<td>HIST 466/RRS 600</td>
<td>History of People of Color in the U.S.</td>
<td>3</td>
</tr>
<tr>
<td>HIST 470</td>
<td>The U.S. Constitution to 1896</td>
<td>3</td>
</tr>
<tr>
<td>HIST 471</td>
<td>The U.S. Constitution since 1896</td>
<td>3</td>
</tr>
<tr>
<td>HIST 478</td>
<td>American Popular Culture History: Barnum to Reality TV</td>
<td>3</td>
</tr>
<tr>
<td>HIST 484</td>
<td>Disability and Culture in the U.S.</td>
<td>3</td>
</tr>
<tr>
<td>MUS 506</td>
<td>Survey of Jazz</td>
<td>3</td>
</tr>
<tr>
<td>MUS 559</td>
<td>Women in Jazz</td>
<td>3</td>
</tr>
</tbody>
</table>