

# Checklist for the Bachelor of Arts in Earth Science

Updated for advising for Spring 2016



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**Overview:** Welcome! The B.A. in Earth Science at SSU provides a modern and relevant learning experience for our majors while providing a flexible path toward graduation. It includes a broad suite of geoscience-related electives across the university to provide students with a customizable self-directed curriculum that best suits their interests and career needs. This degree provides a modern, interdisciplinary, liberal-arts synthesis in the geosciences and to the study of geology and the Earth. We hope to attract a diverse group of students interested in careers in geoscience, local and state scientific and regulatory agencies, K-12 science teaching, attending law school, attending grad school in the history of science, or (for example) being a park ranger or working in a field other than pure geology. Contact us for more information!

## **MAJOR CORE:**

**One of these 100-level Geology courses;** these include the 3-unit GE classes Geology 102: Our Dynamic Earth (GE B1); or Geology 105: The Age of Dinosaurs (GE B1); or Geology 110: Natural Disasters (GE B3). Consider Geology 107: Introduction to Earth Science only under special circumstances (it is intended for teacher training, it is not GE), ask for details. Of these intro courses, the ideal course is Geology 102.

**GEOL 303: Advanced Principles of Geology.** Prerequisite is **one** of the following: GEOL 102 (the best choice), GEOL 105, GEOL 110, GEOL 107 (restricted, see above), GEOL 120, GEOG 201, ENSP 303, ENSP 309, BIOL 312, ANTH 201, or the equivalent of these courses. This class fills the major requirement and also GE B3, but only if you have 60 units completed by the end of the semester in which you take 303. Registration preference in **Geology 303** is given to Earth Science B.A. and Geology B.S. students. This class is offered in both the Fall and Spring semesters.

**GEOL 304: Geologic Mapping and Report Writing**, which is a field course. The prerequisite is concurrent enrollment in GEOL 303. This class is not GE. You should take 303 and 304 together in the same semester. Also offered Fall and Spring. There is a 5-day required field trip.

Take **two** of the following 300-level **pairs** of Geology courses. The two course pairs you take from this list of four pairs of courses do not double count as electives. The two pairs here that you don't take could count as electives:

**1. GEOL 307 & 308: Igneous and Metamorphic Petrology, and the Field course**  
Prerequisite is GEOL 205, Mineralogy (which itself has a prerequisite of CHEM 115A) and a physical geology course, such as GEOL 102 or GEOL 303, and completion or concurrent enrollment in CHEM 115B. There is a 5-day required field trip in GEOL 308.

**2. GEOL 311 & 312, Sedimentary Geology, and the Seds Field course.**  
Prerequisite is GEOL 303 and GEOL 304. There is a 5-day required field trip in GEOL 312.

**3. GEOL 313 & 314, Paleontology, and the Paleo Field course.** Prerequisite is GEOL 303 or GEOL 102. There is a 5-day required field trip in GEOL 314.

**4. GEOL 317 & 318, Structural Geology, and the Structure Field course.**  
Prerequisites are GEOL 303, GEOL 304, and GEOL 309, Computer Applications in Geology, and a mathematics course in Trigonometry. There is a 5-day required field trip in GEOL 318.

Take **one** of these math courses:

MATH 160 (formerly MATH 107): Precalculus; or MATH 161: Calculus I; or MATH 165: Elementary Statistics, or the equivalent of these courses. You can also take additional mathematics courses if you are inclined.

Take **one** of these chemistry courses:

CHEM 102: Chemistry and Society; or CHEM 105: Elements of General, Organic and Biochemistry; CHEM 110: Introductory General Chemistry; or CHEM 115A: General Chemistry, or the equivalent of these courses if you took them at a junior college as a transfer student. You can also take additional chemistry courses if you are inclined.

**Take any 100-level or 200-level Physics course**, there are several to select from, such as: PHYS 100: Descriptive Physics, or ASTR 100: Descriptive Astronomy. Or take Geology 310 – Geophysics and it will double count as both your physics requirement and as a major elective.

## **MAJOR ELECTIVES:**

**Take thirty-three (33) additional units** in earth science-related courses, see the list below of SSU courses in the departments of Geology, Anthropology, Studio Art, Geography, Astronomy, Biology, and Environmental Studies and Planning for specific approved suggestions. Note: Major Elective courses below must be approved by your major advisor.

- Of the 33 elective units, at least 20 units must be 200-level or above.
- At least 15 elective units must be geology courses in the Geology Department, and the other 18 units (for a total of 33 units) can be from anywhere on the list below.
- Make sure your ARR (Academic Requirements Report) in PeopleSoft is accurate and up-to-date with the green, yellow, and red indicators. See any member of the geology faculty if you have questions.

### **Approved Major Elective Courses for the Bachelor of Arts in Earth Science**

**GEOLOGY – not all these courses are offered each year, so check to see what the current offerings are. Pay particular attention to prerequisites:**

GEOL 102 Our Dynamic Earth (3 units) GE B1

GEOL 105 The Age of Dinosaurs (3 units) GE B1

GEOL 107 Introduction to Earth Science (3 units, not GE) *highly recommended for students pursuing a teaching credential*

GEOL 110 Natural Disasters (3 units) GE B3

GEOL 120 Regional Field Geology (3 units, dormant course)

GEOL 205 Mineralogy (4 units, GEOL 303, CHEM 115A are co-requisites or prerequisites)

GEOL 215 Global Climate Change, new for Spring 2016, no pre-reqs

GEOL 301 Natural History of the Hawaiian Islands (3 units, GEOL 102, or BIOL 115 or 123 is prerequisite, or consent.) Upper Division GE, GE B3

GEOL 302 The Geology of Climate Change (3 units, GEOL 303 or consent prerequisite, dormant course)

GEOL 306 Environmental Geology (3 units, dormant course)

GEOL 307 Igneous and Metamorphic Petrology (4 units, GEOL 205, 303 prerequisites)

GEOL 308 Igneous and Metamorphic Petrology Field Course (1 unit, GEOL 304 prereq). There is a 5-day required field trip in GEOL 308.

GEOL 309 Computer Applications in Geology (4 units, GEOL 303, 304 prerequisites; restricted to BS majors unless there is room)

GEOL 310 Geophysics (4 units, GEOL 303 and trigonometry prerequisites) (will double count as both physics requirement and as a major elective)

GEOL 311 Sedimentary Geology (4 units, GEOL 303 is prerequisite)

GEOL 312 Sedimentary Geology Field Course (1 unit, GEOL 311 is prerequisite). There is a 5-day required field trip in GEOL 312.

GEOL 313 Paleontology (4 units, GEOL 102 or 303 is prerequisite)

GEOL 314 Paleontology Field Course (1 unit, GEOL 313 prerequisite). There is a 5-day required field trip in GEOL 314.

GEOL 317 Structural Geology (4 units, GEOL 303, 309, Trigonometry are prerequisites)

GEOL 318 Structural Geology Field Course (1 unit, GEOL 304 is prerequisite). There is a 5-day required field trip in GEOL 318.

GEOL 320 Basin Analysis (4 units, GEOL 311 is prerequisite, dormant course)

GEOL 321 Burgess Shale Paleontology (3 units, GEOL 313, 314 are prerequisites). There is a 6-day field trip in GEOL 321 to Canada. By permission only.

## *BA in Earth Sciences – Checklist*

GEOL 323 Hydrology (3 units, GEOL 102 or consent; MATH 106 or 107 are prerequisites)

GEOL 326 Stratigraphy and Earth History (4 units, GEOL 303 or consent prerequisites, dormant course)

GEOL 420 Integrated Field Experience (4 units, GEOL 303, 304, 307, 308, 311, 312, 317, 318 are prerequisites). There is a 10-day required field trip in GEOL 420 over Spring Break.

GEOL 427 Advanced Field Geology = Summer Field Camp (4 units, GEOL 420, Senior Field, is the prerequisite). We call this Summer Field Camp and it is usually taken only by BS Geology majors in the summer after walking at Commencement. Please be aware of the additional cost of this course and plan early for how you will finance the course. You must apply and be accepted at another university's summer field camp, and then transfer the units back to SSU to complete your degree. Field camps vary widely in cost. Summer field camp usually is 5 weeks or 6 weeks long. Ask if you have questions.

GEOL 422 Geochemistry (3 units, dormant course)

GEOL 425 Economic Geology (3 units, dormant course)

GEOL 495 Special Studies (1-4 units)

### **ANTHROPOLOGY**

ANTH 201 Introduction to Biological Anthropology (3 units)

ANTH 202 Introduction to Archaeology (3 units)

ANTH 301 Human Fossils and Evolution (4 units, ANTH 201 or BIOL 115 is prerequisite)

ANTH 322 Historical Archaeology (4 units)

ANTH 325 World Prehistory (4 units)

### **STUDIO ART**

ARTS 202 Beginning Drawing (2-4 units)

### **ASTRONOMY (within the Department of Physics and Astronomy)**

ASTR 100 Descriptive Astronomy (3 units)

ASTR 231 Introductory Observational Astronomy (2 units, ASTR 100 is pre- or co-requisite)

ASTR 305 Frontiers in Astronomy (3 units, ASTR 100 is prerequisite)

ASTR 350 Cosmology (3 units, ASTR 100 is prerequisite)

### **BIOLOGY**

BIOL 312 Biological Oceanography (3 units, BIOL 110, 115, or "121/122" is prerequisite)

BIOL 333 Ecology (4 units, BIOL "121" and MATH 165 are prerequisites)

BIOL 335 Marine Ecology (4 units, BIOL "121" and MATH 165 are prerequisites)

### **ENVIRONMENTAL STUDIES AND PLANNING**

ENSP 200 Global Environmental Issues (3 units, ENGL 101 or PHIL 101 is prerequisite)

ENSP 302 Applied Ecology (4 units)

ENSP 303 Applied Physical Science (4 units)

ENSP 309 Soil Science (3-4 units)

ENSP 322 Conservation Biology (3-4 units, ENSP 302 and BIOL "122" are prerequisites)

ENSP 330 Energy, Technology and Society (4 units)

ENSP 451 Water Regulation (3 units)

## GEOGRAPHY

GEOG 204 Global Environmental Systems (4 units)

GEOG 205 Introduction to Map Reading and Interpretation (1 unit)

GEOG 315 Field Methods in Geography (2 units, GEOG 205 and MATH 165 are prerequisites or co-requisites)

GEOG 340 Conservation of Natural Resources (4 units)

GEOG 360 Geomorphology (4 units, GEOG 204, GEOL 102 prerequisite)

GEOG 365 Biogeography and Landscape Ecology (4 units, BIOL 115, “121, or 122” is prerequisite)

GEOG 370 Weather and Climate (4 units, GEOG 204 is prerequisite)

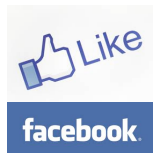
GEOG 380 Remote Sensing and Image Processing (4 units, GEOG 205 is prerequisite)

GEOG 387 Geographic Information Systems (4 units, GEOG 205 is prerequisite)

See any of the Geology Department faculty if you are interested in majoring in. The department office is next to the dinosaur skeleton on the first floor of Darwin Hall, east end (the other end from the elevator). Department phone: 707-664-2301.

See any of the Geology Department faculty if you are interested in majoring in Earth Science. The department office and the faculty offices are next to the *Dilophosaurus* dinosaur skeleton (how cool is *that?*) on the first floor of Darwin Hall, at the east end of the building (the other end from the elevator). Our Department phone number is: 707-664-2301. Our web page is:

<http://www.sonoma.edu/geology/>



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Sonoma State University Geology Department

Sonoma State University Paleontology Minor

Updated 11/23/2015 for advising for Spring 2016