

DEPARTMENT OF GEOLOGY & GEOPHYSICS

# UNDERGRADUATE SURVIVAL MANUAL

2015-2016



SCHOOL OF OCEAN & EARTH SCIENCE & TECHNOLOGY  
UNIVERSITY OF HAWAI‘I AT MĀNOA



SCHOOL OF OCEAN AND EARTH  
SCIENCE AND TECHNOLOGY  
UNIVERSITY OF HAWAI‘I AT MĀNOA

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# **INTRODUCTION**

## **GEOLOGY & GEOPHYSICS**

The geosciences are central to the scientific study of the Earth and other bodies in our solar system, and the scope of geosciences is extremely broad. Geology and geophysics tend to focus primarily on the solid, rocky portions of the planets (including the Earth), but also include hydrology and have important ties to meteorology and oceanography. The Earth and many of the other planets are dynamic. Geoscientists study internal and surface features and processes on the planets, and strive to understand their underlying causes. Research on earth and planetary sciences ranges from submarine volcanism to monitoring the environment, from coastal erosion to past climate changes, from the origins of life to monitoring earthquakes and active volcanoes, and from the composition of meteorites and Mars to the distribution of petroleum and water resources. The geosciences offer rich variety, stimulating opportunities for multidisciplinary discoveries of great intellectual and practical importance, and many employment opportunities in Hawai'i and around the world.

## **JOB OPPORTUNITIES**

Earth science jobs typically offer tremendous variety, opportunities to work both outdoors and in the laboratory, and many opportunities for distant travel. This rich variety is one of the special appeals of a career in the earth sciences. Many earth scientists find employment in the development of our natural resources and the stewardship of our environment. This trend is likely to continue. The need for clean water, sound policies for land use, and stable energy resources continues to increase locally, nationally, and globally. Earth scientists, because of their training, make key contributions in these areas and can expect employment opportunities to expand to meet growing needs.

Employment opportunities exist in both the private and public sectors. Environmental firms and the petroleum industry hire many earth scientists. Geologists and geophysicists also work for numerous state and federal agencies, colleges, and universities. Earth scientists commonly work as part of multi-disciplinary teams with computer scientists, engineers, biologists, chemists, physicists, geographers, and science writers. Geological specialists are also employed extensively in the aerospace industry, in the evaluation of extraterrestrial data from satellites and rovers, and in the planning of future human missions in space. With their broad backgrounds in multiple sciences, geologists are also well prepared for careers as science teachers.

## **PREPARE FOR YOUR DEGREE**

Prospective majors are strongly encouraged to build a solid background of understanding in chemistry, physics, mathematics, and earth sciences. These disciplines form the foundation for investigating how the Earth and other planets work. This broad science foundation also prepares students for diverse opportunities and for work in multi-disciplinary teams.

## **CHALLENGES AND REWARDS**

Geology and geophysics provide excellent training in critical thinking and prepare students for a wide variety of employment opportunities ranging from public service to teaching, as well as for students curious about our place in nature. The intellectual rewards of basic geoscience research are comparable to those in other exciting fields such as biomedical research, particle physics, and cosmology. Current challenges in the geosciences include how to reduce damage from earthquakes and volcanic eruptions, discovering the history of Mars, understanding the forces that move the surface plates of the Earth, and contributing to wiser stewardship and use of the Earth's precious resources (to name just a few). As dynamic sciences, geology and geophysics also provide challenges to students. All the interesting opportunities to decipher the patterns of the Earth are much more rewarding to the prepared mind and to the student who makes the most of his or her educational experiences.

# THE DEPARTMENT OF GEOLOGY & GEOPHYSICS

## WHO WE ARE

The Department of Geology & Geophysics is one of three undergraduate programs within the School of Ocean & Earth Science & Technology (SOEST), and SOEST is one of approximately 15 colleges and schools at the University of Hawai'i at Mānoa (UHM). The department offers outstanding programs of study at the undergraduate and graduate levels. The faculty is large (about 25 teaching and research faculty and about 30 additional graduate faculty) and diverse, with strong programs in all major subdisciplines. The department is one of the larger earth science departments in the country and carries on research worldwide. Students have immediate access to many people engaged in the process of discovery. The spirit of curiosity and the pursuit of knowledge are alive and well here!

The geographic location of Honolulu in the midst of the Pacific Ocean and the rich geologic setting provide a natural focus for research programs in seismology, volcanology, marine geology and geophysics, tectonics, planetary science, sedimentology, hydrogeology, geochemistry, paleoceanography, meteorites, and many other fields.

The quality of the school's research vessels, submersibles, laboratories, and computing facilities reflects its strong commitment to excellence in field studies, as well as in theoretical and modeling work. The quality of the faculty, research facilities, and opportunities are difficult to match. Research universities such as UHM present unique opportunities for students to conduct hands-on research. The department provides several fellowships to undergraduates on a competitive basis to encourage their participation in research, and we encourage all undergraduates to try to find student help employment within the department, and to complete a Senior Thesis. These provide opportunities for students and faculty to interact closely, and you are encouraged to take advantage of these opportunities to further your academic success.

## WHERE TO GET HELP

All G&G faculty are helpful and willing to answer questions about basic science, ongoing research, opportunities for employment, and suggested coursework. A few people in the department have official student-advising roles, so formal questions about your academic planning should be directed at them.

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# POLICIES, PROCEDURES & REQUIREMENTS

Graduation with an undergraduate degree in Geology & Geophysics requires completion of UH Manoa General Education Requirements, SOEST Requirements, and GG major requirements. The GG Student Learning Objectives (SLOs) define the overarching products of the required courses for our majors, and present department policy on the expected knowledge, skills, attitudes, competencies, and habits of mind that GG students are expected to acquire in each of the required classes in the major.

## UH MĀNOA REQUIREMENTS

Please view the University of Hawaii Catalog (<http://www.catalog.hawaii.edu/>) for complete details on:

- Undergraduate Education: <http://www.catalog.hawaii.edu/pdf/008-025undergradEd14.pdf>
- General Education Core Requirements: <http://www.catalog.hawaii.edu/corerequirements/default.htm>  
General Education at UHM consists of 4 categories, Foundations, Diversification, Focus, and Second Language. The Second Language requirement differs among the different colleges; for SOEST undergraduates, the language requirement has been waived (see below).

Foundations requirements consist of 1 FW (Foundations – Written Communication), 2 FG (Foundations Global and Multicultural Perspectives), and 1 FS (Foundations Symbolic Reasoning) courses, for a total of 12 credits. Note that the only FW course for entering freshmen is ENG 100, and the only FW course for transfers is ENG 190. Note also that MATH 241/242 and 215./216 either of which is a requirement for all SOEST undergraduates, is an FS course, so the 1 FW and 2 FG courses add 3 courses (9 credits) above the SOEST and GG major courses.

Diversification requirements consist of 2 DS (Diversification – Social Science), 2 out of the 3 DL (Diversification – Literature), DA (Diversification – Art) and DH (Diversification – Humanities) categories, 1 DB (Diversification – Biology), 1 DP (Diversification – Physical Science), and 1 DY (Diversification – Laboratory). Note that all required GG courses carry the DP and/or DY designations, and that the Biology/Microbiology/Zoology courses required of all SOEST students all satisfy the DB requirement. The remaining diversification requirements, DS, DL/DA/DH add 3 courses (12 credits) above the SOEST and GG major courses.

Focus requirements consist of 5 W-Focus (Writing Intensive) courses, at least 2 of which must be numbered 300 and above, 1 H-Focus (Hawaiian, Asian and Pacific) course, 1 O-Focus (Oral Communication) course, and 1 E-Focus (Contemporary Ethical Issues) course. All O-Focus and E-Focus courses are numbered 300 and above. The number of credits that the Focus requirements adds to a student's total above the major courses is difficult to calculate because some Diversification courses and some GG Major courses carry Focus designations. It is possible to satisfy all the Focus requirements with GG courses, and students are urged to do so. This not only helps to lower the total number of courses a student has to take, but also fulfills the goal of the Focus requirement, namely to integrate Writing, Oral Communication, Ethical thinking, and Hawaiian/Asian perspectives into each major.

**Note: In some cases, a single course may simultaneously satisfy requirements in two or more of these categories.**

- SOEST departments, institutes, and courses from the UH Manoa catalog: <http://www.catalog.hawaii.edu/pdf/290-308soest14.pdf>
- Campus policies and information: <http://www.catalog.hawaii.edu/pdf/079-082campusPolicies14.pdf>

## SOEST REQUIREMENTS

120 credits total (the same as all UHM undergraduates).

- Chemistry  
CHEM 161, 161L, 162, 162L (8 credits total)
- Physics  
PHYS 151, 151L, 152, 152L (8 credits total) for the BA  
PHYS 170, 170L, 272, 272L (9 credits total) for the BS
- Mathematics  
MATH 241 or 215 for the BA (4 credits total)  
MATH 241 and 242 or 215 and 216 for the BS (8 credits total)
- Biological Sciences  
One biological science course (also satisfies the UHM DB requirement)
- 45 upper-division credits (i.e. from courses numbered 300 and above).

Note that none of the Chemistry, Physics, Mathematics, and Biology courses listed above are upper-division, and therefore do not count toward the UH Mānoa 45 upper-division-credit requirement. Effective fall 2015, students that were previously enrolled in a SOEST major (i.e., they were a SOEST major during spring 2015) can choose to either (1) stay with the academic requirements that were in place upon their acceptance into their SOEST major (i.e., they can keep the two semesters of language as a graduation requirement), or (2) they can adopt the new rules which do not require two semesters of language, but will require some other credits (likely six) to replace the space formerly occupied by the language credits (so that they get the 120 minimum credits required for all UH undergraduate degree programs). SOEST majors that start their first semester in SOEST this fall (fall 2015) are under the new rules with regards to language (i.e., they are not required to take two semesters of language to graduate from their particular SOEST major, but can do so with elective credits if they desire).

- Minimum cumulative GPA of 2.00 for all UH Mānoa courses.



## **DEPARTMENTAL STUDENT LEARNING OBJECTIVES (SLOs)**

The Student Learning Objectives (SLOs) together with the procedures to measure how well they are met, provide the Department of Geology & Geophysics (GG) community – students, faculty, staff, and alumni – with the overarching expectations of the department with respect to its required course curriculum. The SLOs do not just reflect the curriculum but also provide guidance to students about expectations and about GG department policy for meeting these expectations. The Department of Geology & Geophysics was responsible for developing these SLOs for its required courses.

The SLOs are intended to serve several related purposes:

- Specify desirable outcomes for students who complete our degree programs. These benchmarks help to demonstrate if the department is achieving its goal of developing life-long learners who will contribute to society.
- Present department expectations on knowledge, skills, competencies, and habits of mind that GG courses are expected to develop in our students.
- Establish tangible objectives the department can use for self evaluation.
- Describe what students should expect of themselves upon successful completion of each required course.

The department has five overall Student Learning Objectives:

1. Students can explain the relevance of geology and geophysics to human needs, including those appropriate to Hawaii, and are able to discuss issues related to geology and its impact on society and planet Earth.
2. Students can apply technical knowledge of relevant computer applications, laboratory methods, field methods, and the supporting disciplines (math, physics, chemistry, biology) to solve real-world problems in geology and geophysics.
3. Students use the scientific method to define, critically analyze, and solve a problem in earth science.
4. Students can reconstruct, clearly and ethically, geological knowledge in both oral presentations and written reports.
5. Students can evaluate, interpret, and summarize the basic principles of geology and geophysics, including the fundamental tenets of the sub-disciplines, and their context in relationship to other core sciences, to explain complex phenomena in geology and geophysics.

These objectives are addressed in GG courses at various levels and points in the curriculum, including introduction of concepts and material, development of their use, and implementation of full proficiency, depending on the particular SLO and course. In other words, the required courses for an undergraduate GG major build upon and complement each other to develop the knowledge and capability of students. A table depicting how the required GG courses contribute to the overall curriculum can be found in this document at the GG website:

[http://www.soest.hawaii.edu/GG/resources/docs/gg-undergrad-SLO\\_Master\\_Checklist\\_Final.pdf](http://www.soest.hawaii.edu/GG/resources/docs/gg-undergrad-SLO_Master_Checklist_Final.pdf)

## DEPARTMENT OF GEOLOGY & GEOPHYSICS REQUIREMENTS

### Requirements for a Bachelor of Science (BS) in Geology and Geophysics

This BS degree is designed for students interested in pursuing graduate work or employment in the geosciences. It provides essential grounding in computational, analytical, and observational skills needed in earth science. The program is interdisciplinary and emphasizes the integration of biology, chemistry, physics, and mathematics in the study of the Earth.

#### The BS degree requires:

- 1) 37 credits in the Geology and Geophysics curriculum including: one introductory level Geology and Geophysics course with a lab, two non-introductory and seven upper division GG courses, and a two-credit research seminar (GG 410).
- 2) A minimum of 11 credits of approved upper division science electives in Geology & Geophysics. With advice and consent of the undergraduate advisor, courses in other natural sciences, mathematics, or engineering may be substituted as electives. Students are encouraged to participate in an internship, a research project, senior thesis or enroll in a mainland summer field course as an elective.
- 3) Required support mathematics and science classes include physics, chemistry, biological sciences, and two semesters of college calculus; these total 28-29 credits and should be taken as early as possible.

#### Required Geology and Geophysics Courses (37 credits)

GG 101 Dynamic Earth (3), or 103 Geology of the Hawaiian Islands (3), or GG 170 Physical Geology (4)  
GG 101 Dynamic Earth Laboratory (1) unless GG 170 is taken  
GG 200 Geological Inquiry (4; W-focus)  
GG 250 Scientific Programming (3)  
GG 301 Mineralogy (4)  
GG 302 Igneous and Metamorphic Petrology (3; W-focus in alternating years)  
GG 303 Structural Geology (3)  
GG 304 Physics of Earth and Planets (4) **OR** GG 450 Geophysical Methods (4)  
GG 305 Geological Field Methods (3; W-focus)  
GG 309 Sedimentology & Stratigraphy (4; W-focus in alternating years)  
GG 325 Geochemistry (3)  
GG 410 Undergraduate Seminar (2; O-focus)

#### Approved Upper Division Geology and Geophysics Courses (11 credits)

300 and 400-level GG courses located in the current UHM catalog:  
<http://www.catalog.hawaii.edu/courses/departments/gg.htm>

#### Required Support Courses (28-29 credits) are:

General Chemistry (CHEM 161, 161L, 162, 162L)  
Calculus I and II (MATH 241, 242 or MATH 215, 216; MATH 241 and 215 satisfy UHM FS req.)  
General Physics (PHYS 170, 170L, 272, 272L)  
Biological Science (BIOL 171, or ZOOL 101, or MICRO 130; all also satisfy UHM DB requirement)

#### Minimum Grade Requirement

In addition to maintaining the minimum cumulative GPA of 2.0, undergraduate majors in Geology & Geophysics are required to earn a minimum grade of C (not C-) in all courses applied to the GG major requirements (i.e. required GG courses, support courses in chemistry, mathematics, physics, and biology, and GG electives). Any course in which a C or better grade is not achieved must be re-taken until it is achieved.

## **Requirements for a BS Track Emphasizing Basic Science and Research**

This alternate BS track allows for a more flexible course work program that is tailored to the student's individual goals. It requires the student to work with an advisor on a research thesis.

### The BS Basic Science and Research Track requirements are:

- 1) The applicant must have a minimum combined GPA of 3.0 in 30 credits of the required support courses (see below) plus in GG 170 (or 101, or 102, or 103, or 104, or 106, or 130 and 101L), 200, and 250. The application will consist of a one-page statement of the student's objectives and research interests, presented to a GG departmental undergraduate advisor and the proposed faculty thesis advisor. Acceptance into the research track requires the approval of both the faculty advisor and the proposed thesis advisor.
- 2) The thesis must be carefully planned and meet departmental requirements. A thesis supervisor and topic should be identified when a student enters the program. The thesis work requires at least 6 (but not more than 9) credit hours of GG 499 Undergraduate Thesis. The thesis research is presented in writing, following the style of a scientific article, and orally in a public seminar. The thesis is evaluated by both the research supervisor and a departmental undergraduate advisor.

### Required Geology and Geophysics Courses (22 credits)

GG 170 Physical Geology (4) (or 101 Dynamic Earth (3), or 103 Geology of the Hawaiian Islands (3) and 101L Dynamic Earth Laboratory)

GG 200 Geological Inquiry (4)

GG 250 Scientific Programming (3)

GG 410 Undergraduate Seminar (2)

GG 413 Geological Data Analysis I (3)

GG 499 Undergraduate Thesis (6)

### Approved Upper Division Geology and Geophysics Electives (25 credits)

300 and 400-level GG courses located in the current UHM catalog:

<http://www.catalog.hawaii.edu/courses/departments/gg.htm>

### Required Support Courses (28 credits)

Chemistry: CHEM 161 (3), 161L (1), 162 (3), 162L (1)

Calculus I and II: MATH 241 (4) and 242 (4)

Physics: PHYS 170 (4), 170L (1), 272 (3), 272L (1)

Biology: BIOL 171 (3), 171L (1)

## Requirements for a Bachelor of Arts (BA) in Geology

The BA degree in geology is appropriate for students interested in Earth science but not necessarily intending to pursue graduate school. It is more flexible than the BS program and has two tracks, Environmental Earth Science and Earth Science Education. The Environmental Geology BA track is for students who intend to enter the environmental/geotechnical job market. It includes traditional geology topics as well as more applied topics such as hydrogeology, geospatial information, and environmental geochemistry. The Earth Science Education BA track is for students who want to become high-quality middle-school and high-school teachers. The curriculum includes all required topical coursework for Earth Sciences certification by the Hawai'i State Department of Education, including courses in meteorology and oceanography. Upon graduating with a BA in Earth Science Education, a student will enroll in the College of Education's 1-year Post-Baccalaureate certificate program to become certified as an Earth Science teacher in Hawai'i. Neither of these offers appropriate preparation for graduate school, and we strongly discourage students from switching from the BS to BA in their last year of study. Note that SOEST students are allowed to double-major in majors within the College of Arts & Sciences, but not vice versa.

### The BA in Environmental Earth Science track requires:

- 1) 27 credits in the Geology and Geophysics curriculum including: one introductory level Geology and Geophysics course with a lab, six non-introductory GG courses, and a two-credit research seminar (GG 410).
- 2) A minimum of 37 credits of approved electives are also required, and at least 12 credits of these must be upper division; these courses can be in Geology and Geophysics or in other natural sciences, mathematics, or engineering. Students are encouraged to participate in an internship, a research project, senior thesis or enroll in a mainland summer field course as an elective.
- 3) Required supporting mathematics and science classes include physics, chemistry, biological sciences, and one semester of college calculus; these total 23-24 credits and should be taken as early as possible.

### The Required Geology and Geophysics Courses (27 credits) are:

GG 101 Dynamic Earth (3), or GG 102 Introduction to Global Change (3), or 103 Geology of the Hawaiian Islands (3), or GG104 Volcanoes in the Sea (3), or GG 106 Humans and the Environment (3), or GG130 Geologic Hazards, and GG 101L Dynamic Earth Laboratory (1) **OR** GG 170 Physical Geology (4)  
GG 200 Geological Inquiry (4; W-focus)  
GG 305 Geological Field Methods (3; W-focus)  
GG 309 Sedimentology & Stratigraphy (4; W-focus in alternating years)  
GG 325 Geochemistry, or GG 425 Environmental Geochemistry (3)  
GG 410 Undergraduate Seminar (2; O-focus)  
GG 455 Hydrogeology (4)  
GG 461 Geospatial Information (3)

### Approved Upper Division Geology and Geophysics Courses (12 credits)

300 and 400-level GG courses located in the current UHM catalog:  
<http://www.catalog.hawaii.edu/courses/departments/gg.htm>

### Required Support Courses (23-24 credits)

General Chemistry (CHEM 161, 161L, 162, 162L)  
Calculus I (MATH 241 or 215; both satisfy UHM FS requirement)  
College Physics (PHYS 151, 151L, 152, 152L)  
Biological Science (BIOL 171, or BOT 101, or BOT 105 or ZOOL 101, or MICRO 130; all also satisfy UHM DB req.)

### Minimum Grade Requirement

In addition to maintaining the minimum cumulative GPA of 2.0, undergraduate majors in Geology & Geophysics are required to earn a minimum grade of C (not C-) in all courses applied to the GG major requirements (i.e. required GG courses, support courses in chemistry, mathematics, physics, and biology, and GG electives). Any course in which a C or better grade is not achieved must be re-taken until it is achieved.

### The BA in Earth Science Education degree requires:

- 1) 39 credits in the Geology and Geophysics, Oceanography, and Meteorology curricula including: one introductory level Geology and Geophysics course with a lab, one introductory planetary science or astronomy course, one introductory course in Meteorology with a lab, one non-introductory and three upper division GG courses, one non-introductory and one upper division Oceanography course, one upper division teacher-education course, and a two-credit research seminar (GG 410).
- 2) A minimum of 28 credits of approved upper division electives are also required; these courses can be in Geology and Geophysics or in other natural sciences, mathematics, or engineering. Students are encouraged to participate in an internship, a research project, senior thesis or enroll in a mainland summer field course as an elective.
- 3) Supporting mathematics and science classes include physics, chemistry, biological sciences, and one semester of college calculus; these total 23-24 credits and should be taken as early as possible.

### The Required GG, Meteorology, Oceanography, and Institute for Teacher Education Courses (39 credits; 17 are UD)

GG 101 Dynamic Earth (3), or GG 102 Introduction to Global Change (3), or 103 Geology of the Hawaiian Islands (3), or GG104 Volcanoes in the Sea (3), or GG 106 Humans and the Environment (3), or GG130 Geologic Hazards, and GG 101L Dynamic Earth Laboratory (1) **OR** GG 170 Physical Geology (4)  
MET 101 and 101L Introduction to Meteorology (4)  
GG 105 Voyage through the Solar System (3) or ASTR 110 Survey of Astronomy (3)  
GG 200 Geological Inquiry (4; W-focus)  
MET 200 Atmospheric Processes and Phenomena (3)  
OCN 201 and 201L Science of the Sea (4)  
GG 300 Volcanology (3)  
GG 305 Geological Field Methods (3; W-focus)  
OCN 310 Global Environmental Change (3)  
ITE 401 Engaging the Adolescent Learner (3)  
GG 406 Natural Disasters (3; E-focus)  
GG 410 Undergraduate Seminar (2; O-focus)

### Approved Upper Division Science Courses (5 credits)

300 and 400-level GG courses located in the current UHM catalog:  
<http://www.catalog.hawaii.edu/courses/departments/gg.htm>  
also GEOG 388, 405; BOT 450; NREM 477; TPSS 304; any other SOEST UD course

### Required Support Courses (23-24 credits)

General Chemistry (CHEM 161, 161L, 162, 162L)  
Calculus I (MATH 241 or 215; both satisfy UHM FS requirement)  
College Physics (PHYS 151, 151L, 152, 152L)  
Biological Science (BIOL 171; also satisfies UHM DB req.)

### Minimum Grade Requirement

In addition to maintaining the minimum cumulative GPA of 2.0, undergraduate majors in Geology & Geophysics are required to earn a minimum grade of C (not C-) in all courses applied to the GG major requirements (i.e. required GG courses, support courses in chemistry, mathematics, physics, and biology, and GG electives). Any course in which a C or better grade is not achieved must be re-taken until it is achieved.

### **Requirements for Minor in Geology and Geophysics**

The minor requires GG 101 or 103 or 170, 101L (unless 170 is taken), 200, and 11 credits of non-introductory courses at the 300 level or higher. A 2.0 GPA is required in these courses. The minor is flexible and can provide either an introductory survey of geology or emphasize areas of particular interest to the student. A student interested in a minor in geology and geophysics should consult with an advisor from the department to tailor a plan best suited to the student's interest.

# PLANNING FOR YOUR ACADEMIC SUCCESS

**Planning is an essential part of gaining success and reaping its benefits. Your success depends on it!**

## ACADEMIC ADVISING

Academic advising is an essential element in a successful undergraduate experience. The School of Ocean and Earth Science and Technology requires each major to meet at least once a semester with his or her major advisor prior to the next semester's registration. A student will not be able to register for the next semester otherwise. Although the conversations between advisor and student focus on courses and academic planning, the department recognizes that advising sessions involve the whole student. Discussions on relationships, careers, health concerns, and other life-related situations are also explored upon request and as appropriate. Students are encouraged to make appointments with their advisors at any time and not just prior to their registration for the next semester.

Students *must* be active participants in mapping out their academic plans; advisors can only advise. Arrive prepared for your meetings with your advisors. Be accountable for yourself. Each student has access to his or her own academic record utilizing the University of Hawaii's STAR Report via their MYUH accounts.

GG advisors are Dr. Robert Dunn and Dr. Greg Ravizza. Each student will be assigned to one of these advisors upon entering the program. However, students are welcome to meet with either advisor in the event their assigned advisor is unavailable. Ms. Leona Anthony oversees academic advising for all students in SOEST.

## EMAIL and EMAIL ACCOUNT

Official email communication is conducted through your @hawaii.edu address. If you utilize another address, please link it to this one. You will be able to keep this address even after you graduate if you sign up for the 'Ohana program: <http://www.hawaii.edu/askus/932>. **Check your inbox daily for important information and updates.**

## PLACEMENT EXAMS

**Placement exams are given for several courses including mathematics, chemistry, English, and foreign and Hawaiian language. The placement exams are commonly scheduled two weeks prior to the beginning of a semester, or just prior to registration for continuing students. Find out when the exams will be given as soon as possible, then arrange to take the exam. A delayed placement exam could cost you an extra semester or two in school. For more information, contact the department directly and consult the most current Schedule of Classes booklet or on the Registration Homepage through your MYUH account.**

**MATH:** [www.math.hawaii.edu/home/Placement.html](http://www.math.hawaii.edu/home/Placement.html)

**CHEMISTRY:** [www.chem.hawaii.edu/](http://www.chem.hawaii.edu/)

**EUROPEAN LANGUAGES:** <http://manoa.hawaii.edu/lea/for-students/placement-exams/>

**ASIAN & PACIFIC LANGUAGES:** Go to specific departments to inquire and note that Hawaiian language is part of Hawai'i inuiākea (School of Hawaiian Knowledge).

## COMPLETE MATH & SCIENCE PRE-REQUISITES EARLY

A solid foundation in mathematics, physics, and chemistry is essential to your success in this program. Prepare by taking course prerequisites early on so that you will be adequately prepared to move on to the next level of courses. Backtracking can result in loss of credits toward your program.

Backtracking is defined in the UHM catalog as: *Completion of a lower-level or prerequisite course after (or while) taking an advanced course. Additional credit and grade points are not awarded for lower-level courses if they are taken after or concurrently with the advanced course for which they are explicitly or implicitly prerequisites.*

## GRADE POINT AVERAGE

**To ensure continuation in the GG program, students are required to maintain at least a 2.00 cumulative grade point average. Failure to meet this requirement will result in a student being placed on probation. If a student's**

cumulative GPA does not rise above a 2.0 while on probation, the student may be suspended. Rules governing probation, suspension, and dismissal are found on page 19 in the UHM General Catalog: A minimum grade of C (not C-) in GG, chemistry, mathematics, physics, and biology courses is required of majors in Geology and Geophysics.

### SOEST TUTOR

Each semester, SOEST employs one tutor for its undergraduates to assist with chemistry, math, and physics. Unlimited tutoring services are free to all SOEST undergraduate majors. The name and contact information for the tutor is announced at the beginning of each semester. Group or individual sessions are arranged between the tutor and student. The College of Arts & Sciences runs a tutoring service called the “Learning Emporium” in Bilger Annex 209 for students taking Math, Chemistry, Physics, and ICS courses:  
<http://www.hawaii.edu/natsci/learningemporium.php>

### UHM CATALOG IN HAND?

You should obtain a copy of the UHM General Catalog for the semester in which you enter and be familiar with the rules and regulations. Although the catalog is available on the web, many students find a paper copy more convenient to read, tag, and highlight for future reference.

### EXPECTATIONS FOR CONDUCT

The Department, like the University and scientific community at large, expects and depends on a respectful, fair, and ethical behavior by its members, including students. In turn, each student should expect to be treated in such a manner. Every student is responsible for reading, understanding and abiding by the Student Conduct Code: ([http://www.studentaffairs.manoa.hawaii.edu/policies/conduct\\_code/](http://www.studentaffairs.manoa.hawaii.edu/policies/conduct_code/)) as well as other school and university policies, and to complete and sign the Code of Student Conduct Affirmation Form when joining the Department. University Policy concerning sexual harassment includes information on discerning appropriate from inappropriate behavior and the procedure for submitting a complaint ([http://www.hawaii.edu/offices/eo/policies.php?policy=sexual\\_harassment](http://www.hawaii.edu/offices/eo/policies.php?policy=sexual_harassment)). *Each new student should take the following on-line program to be familiar with UH policy:*  
<http://training.newmedialearning.com/psh/uhawaii/index.htm>

### STEPS TOWARD GRADUATION

- Check your online STAR Report.
- **Communicate your graduation plans to your faculty advisor on a regular basis and** at least two semesters prior to the semester in which you plan to graduate.
- Obtain a Graduation Worksheet, complete it with your faculty advisor, and submit the completed worksheet to Leona Anthony no later than two semesters prior to your graduation date.
- Attend a SOEST Exit Interview session at the beginning of the semester in which you plan to graduate.
- Complete the “Application for Graduation” form after your exit interview.
- Pay Application for Graduation Fee via MYUH or at the UHM Cashier’s Office.
- Commencement announcements, cap and gown, and other detailed information will be sent to you via email.

## HANDY WEBSITES

MYUH: [www.hawaii.edu/myuh/manoa](http://www.hawaii.edu/myuh/manoa)

STAR Academic Reports: [www.star.hawaii.edu](http://www.star.hawaii.edu)

University of Hawaii Catalog: <http://www.catalog.hawaii.edu/>

UHM Office of International Education: <http://www.hawaii.edu/oie/>

UHM Financial Aid Services: <http://www.island.hawaii.edu/finaid/>

Office of the Vice Chancellor for Academic Affairs: <http://www.manoa.hawaii.edu/ovcaa/academics>

Office of the Vice Chancellor for Students: [www.studentaffairs.manoa.hawaii.edu](http://www.studentaffairs.manoa.hawaii.edu)

UHM Student Employment & Cooperative Education: [www.sece.its.hawaii.edu](http://www.sece.its.hawaii.edu)

SOEST: <http://www.soest.hawaii.edu/>

SOEST Academic and Education website: [www.soest.hawaii.edu/soest\\_web/soest.academics.htm](http://www.soest.hawaii.edu/soest_web/soest.academics.htm)

GG: [www.soest.hawaii.edu/gg](http://www.soest.hawaii.edu/gg)

Hawaii Academy of Science: <http://www.hawaii.edu/acadsci/index.html>

Hawaii Volcanoes National Park: <http://www.nps.gov/havo>

American Geophysical Union: [www.agu.org](http://www.agu.org)<http://www.agu.org/>

The Environmental Careers Organization: [www.eco.org](http://www.eco.org)

Geological Society of America: [rock.geosociety.org](http://rock.geosociety.org)

National Park Service: [www.nps.gov](http://www.nps.gov)

Orion Grassroots Network for Internships: <http://www.orionsociety.org/pages/ogn/ics.cfm>

U.S. Geological Survey: [www.usgs.gov](http://www.usgs.gov)

STAR: [https://www.star.hawaii.edu:10012/Scholarship\\_live/login.jsp](https://www.star.hawaii.edu:10012/Scholarship_live/login.jsp)

## **GAIN EXPERIENCE...GET INVOLVED**

The Department urges each and every student to seek and create opportunities to work outside of the classroom. Several fellowships are available to undergraduates on a competitive basis to encourage their participation in research and geologic field courses.

### **SEMINARS**

Everyone is welcome to attend any and all of the Department's seminars. The seminars provide students with a snapshot of activities in the science community. During the academic year (Fall and Spring), a TGIF seminar every Friday afternoon presents current research by SOEST faculty and visitors. After the TGIF seminars, attendees gather outside of the building for further discussions, fellowship, and refreshments.

### **GEOLOGY CLUB**

The Geology Club was started many years ago by GG majors as a way to enjoy each other's company outside of classes, and to help fund the GG 305 Field Methods field trip to the Mojave Desert each spring. The trip is a required part of a course required for graduation, and the cost per student is close to \$1000, including airfare. Students who contribute to the fund-raising effort receive partial support for this expense. The club also plans field trips around the island and conducts creative fundraising programs including their successful recycling program. If you have a desire to bring undergraduate GG majors together, enjoy being with other students who enjoy the outdoors, or just want to be involved in a worthwhile cause in your area of study, then the Geology Club is for you.

### **SOEST CLUB**

The purpose of the SOEST club is to build, support, and encourage relationships among students in the school to help develop a vibrant collegiate network that will help students advance their professional careers. Social events and community service projects are planned throughout the year.

### **SOEST STUDENT AMBASSADOR PROGRAM**

Each semester, three SOEST majors are selected to be student ambassadors of SOEST. These ambassadors are selected on the basis of their application, GPA, and course load. Each student receives assistance toward their semester's tuition. Responsibilities include: 1) recruiting prospective students to SOEST; 2) encouraging student interest and participation in SOEST; 3) portraying SOEST positively to the University and outside communities; and 4) providing service for events scheduled during the semester.

### **UNDERGRADUATE LOUNGE**

POST 714 is the undergraduate lounge, and is available for all GG undergraduate majors to congregate in and study. GG Undergraduates are responsible for keeping this room clean and safe. Students are responsible for following the rules and regulations set forth by the Department prior to receiving an individual door key code. Access to the lounge is monitored 24 hours a day, 7 days a week.

### **COMPUTER LAB**

GG Undergraduates have access to the GG Computer Labs at all times provided that the POST Building is open and a class is not being held in the lab. Students are responsible for following the rules and regulations set forth by the Department prior to receiving an individual door key code. Access to the lab is monitored 24 hours a day, 7 days a week. Applications for a door code are available from the Geology & Geophysics Department Office in POST 701.

### **STUDENT ASSISTANTSHIPS ON RESEARCH GRANTS**

Many faculty employ GG undergraduates on research projects. Students interested in working on a research project should consult with the appropriate faculty members. These student-help positions are an excellent way to learn about how actual Earth science research is conducted, to gain training in various analytical techniques, and to earn money. All student employment opportunities are posted at the Student Employment and Cooperative Education (SECE) site: <http://www.hawaii.edu/sece/>

## INTERNSHIPS

Internships are offered year round and declared SOEST majors may earn credits from the internship toward graduation through enrollment in GG 395. For more information, go to:  
[http://www.soest.hawaii.edu/SOEST\\_News/Internship/index.html](http://www.soest.hawaii.edu/SOEST_News/Internship/index.html)

## RESEARCH CRUISES

Occasionally, students are invited to participate as scientists aboard nearshore research cruises. The all-expenses-paid experience is invaluable for future geoscientists. Email announcements are sent when these opportunities become available throughout the year.

## UNDERGRADUATE THESIS

Although not required, students are strongly encouraged to carry out a scientific project of small to moderate scope with one or more chosen faculty researchers (i.e., a Senior Thesis). Students must complete a document in the style of scientific journal article. For possible research topics, visit the department website or discuss options with an advisor. Course credits are also available.



## OTHER OPPORTUNITIES

### AGATIN T. ABBOTT MEMORIAL AWARD

This award is given to an outstanding senior each year based on academic record. Contributions to the department's programs may also be considered. Awarded each spring.

### C-MORE SCHOLARS PROGRAM

The C-MORE (Center for Microbial Oceanography: Research and Education) Scholars Program provides students majoring in an ocean or earth science-related field, especially underrepresented students such as Native Hawaiians and Pacific Islanders, the opportunity to participate in hands-on research experiences. Awardees receive guidance and help from a mentor who is a scientist at the university and/or industry. Three levels of awards are offered, depending on the skill and knowledge level of the applicant. Mentors can be chosen by the student, or we can assist the applicant with finding a mentor based on their interests in science. Students may reapply to be a C-MORE Scholar each semester, and there is a required orientation at the start of the Fall and Spring semesters.

### WILLIAM T. COULBOURN FELLOWSHIP IN MARINE GEOLOGY

The William T. Coulbourn Fellowship in Marine Geology is offered yearly on a competitive basis to undergraduate or graduate students in the Department of Geology and Geophysics. The purpose of this award is to support student research in sedimentary marine geology. Both graduates and undergraduates may apply. As much as \$1,000 in support is available per year. Those receiving a Coulbourn Fellowship are required to present, within one year, an oral summary of their results at either a regularly scheduled meeting of the Geology Club or another public forum. Application deadline is April 1.

### HAROLD T. STEARNS FELLOWSHIP

Undergraduate and graduate students in the Geology and Geophysics Department may apply yearly for Harold T. Stearns funds to support research in fields that Dr. Stearns was active in researching. The awards shall be for research in the following areas.

- 1) Studies of limestone and ancient emerged and submerged shorelines related to eustatic and tectonic changes in sea level on islands in the central Pacific, other Pacific Islands, and along shores bordering the Pacific Ocean.
- 2) Geologic mapping of Pacific Islands for which no adequate geologic maps are available.
- 3) Hydrologic studies of Pacific Islands.
- 4) Geochemical, petrologic and radiometric studies of limestone and volcanic rocks on Pacific Islands.

5) Analysis of geophysical data of submerged terraces bordering a Pacific Island.

Those receiving a Harold T. Stearns Fellowship are required to present, within one year, an oral summary of their results at a regularly scheduled meeting of the Geology Club, or other public forum. Application deadline is April 1.

### **SPACE GRANT UNDERGRADUATE FELLOWSHIPS**

The University of Hawai‘i Space Grant College, as a participant in the national Space Grant College and Fellowship Program, invites applications for NASA Undergraduate Space Grant Fellowships to support studies in fields related to space (this means scientific disciplines or fields of study including astronomy, geology, meteorology, oceanography, math, physics, engineering, computer science and life sciences).

All full time undergraduates enrolled at any campus in the University of Hawai‘i System who have declared a major and propose a study with a strong space component are eligible to apply for two-semester fellowships. In rare instances, a one-semester project may be considered. Fellowship applicants must be U.S. citizens, and the applicant must be sponsored by a mentor who is willing to advise the student for the duration of the award. Awards will be based on academic qualifications of the student, quality of proposed research, appropriateness of proposed research to NASA’s goals, and feasibility of proposed research within the planned academic time-frame. Fellows are expected to work 10-15 hours a week on their project. Financial support includes a stipend of \$1750 per semester and up to \$500 for supplies and/or travel pertinent to their project. Women, under-represented minorities and physically challenged students are particularly encouraged to apply.

For additional information contact the Hawai‘i Space Grant Consortium Office in POST 501. Applications are due by 15 June for fall semester proposals, or 1 December for spring semester proposals.

### **TUITION SCHOLARSHIPS**

The School of Ocean and Earth Science and Technology provides some funds toward tuition waivers each semester. These merit-based awards are determined by the previous semester’s grades of full time majors in Geology & Geophysics, Global Environmental Science, and Meteorology. Waivers are awarded by the Associate Dean of SOEST. No application is required.

### **FIELD CAMP STIPENDS**

The Department of Geology and Geophysics offers field camp stipends to undergraduate Geophysics majors. Award stipends of up to \$750 per successful candidate will be offered. Fellowships will be awarded based on the quality of the application and availability of funds.

For more opportunities inquire within the department or check STAR:  
[https://www.star.hawaii.edu:10012/Scholarship\\_live/login.jsp](https://www.star.hawaii.edu:10012/Scholarship_live/login.jsp)



# PLANNING AND PROGRESS FORMS

## **BS**

<http://www.manoa.hawaii.edu/ovcaa/programsheets/2015-2016PDFs/ProgramSheets/SOEST/BSGeologyGeophysics.pdf>

## **BA Environmental Earth Science track**

<http://www.manoa.hawaii.edu/ovcaa/programsheets/2015-2016PDFs/ProgramSheets/SOEST/BAGeologyEES.pdf>

## **BA Earth Science Education track**

<http://www.manoa.hawaii.edu/ovcaa/programsheets/2015-2016PDFs/ProgramSheets/SOEST/BAGeologyESE.pdf>

## UHM General Ed, Core & Graduation Requirements (2015-2016)

☐ Boxes are checked off only if course is completed with a passing grade

### FOUNDATIONS (Circle/highlight completed courses):

- ☐ **Written Communication (FW):** ENG100, 100A, 190; ELI 100
- ☐ **Symbolic Reasoning (FS):** BUS 250; ICS 141, 241; MATH 100, 112, 140, 161, 203, 215, 241, 251A; NREM 203; PHIL 110, 111
- ☐ **Global & Multicultural Perspectives (FG):** 2 courses from different groups
  - ☐ **Group A (early):** ANTH 151, ART 175, HIST 151, HIST 161A, or WS 175
  - ☐ **Group B (modern):** AMST 150, ANTH 152, ART 176, FSHN 141, GEOG 102, HAW 100, HIST 152, 162A, LING 105, TIM 102 or WS 176
  - ☐ **Group C (early to modern):** GEOG 151, LLL 150, MUS 107 or REL 150

Diversification courses must come from different departments than the courses used to satisfy the Foundations Global & Multicultural Perspectives requirement. For example, a student who takes ANT 151 and ART 176 for her FG requirement cannot use Anthropology or Art courses to satisfy her Diversification requirement.

### DIVERSIFICATION (List completed courses)

**Arts (DA), Humanities (DH) & Literatures (DL):** 2 courses totaling 6 credits from two areas (e.g. if one is a DA course the other must be either a DH or DL)

☐ \_\_\_\_\_ DA/DH/DL (circle one)                      ☐ \_\_\_\_\_ DA/DH/DL (circle one)

**Biological Sciences (DB), Physical Sciences (DP) & Science Laboratory (DY):** 2 courses and 1 lab

☐ \_\_\_\_\_ DB  
 ☐ \_\_\_\_\_ DP  
 ☐ \_\_\_\_\_ DY

**Social Sciences (DS):** 2 courses totaling 6 credits from two different departments

☐ \_\_\_\_\_ DS    ☐ \_\_\_\_\_ DS

### GRADUATION REQUIREMENTS (List completed courses)

**Focus Courses:** Double dipping with Diversification & Major OK

☐ _____ Contemporary Ethical Issues (E)	☐ _____ Written Communication (W)
☐ _____ Hawaiian, Asian & Pacific Issues (H)	☐ _____ Written Communication (W)
☐ _____ Oral Communication (O)	☐ _____ Written Communication (W)
☐ _____ Written Communication (W*)	☐ _____ Written Communication (W*)

\*WI must be numbered 300- or 400-level

#### Focus Requirements for Non-UH System Transfer Students

No. of accepted UH credit hours	W	H	E	O
0-36	5*	1	1	1
37-54	4*	1	1	1
55-88	3*	1	1-E <u>or</u> 1-O	
89+	2*	1	0	0

#### Focus Requirements for UH System Transfer Students

No. of accepted UH credit hours	W	H	E	O
0-54	5*	1	1	1
55-88	5*	1	1-E <u>or</u> 1-O	
89+	5*	1	0	0

*\*At least two "W" courses must be numbered at the 300- or 400-level.*

G&G UNDERGRADUATE ADVISOR'S CHECKLIST FOR BS REQUIREMENTS

☐ Boxes are checked off only if a grade of C (not C-) or better is earned in the course.

STUDENT'S NAME: \_\_\_\_\_

I.D. NUMBER: \_\_\_\_\_

EMAIL ADDRESS: \_\_\_\_\_

ADVISOR: \_\_\_\_\_

CONTACT NUMBER: \_\_\_\_\_

SEMESTER & YEAR ENTERED GG: \_\_\_\_\_

SEMESTER & YEAR ENTERED UHM: \_\_\_\_\_

UHM CLASS STATUS UPON ENTRY: \_\_\_\_\_

**CHEMISTRY, MATH, PHYSICS & BIOLOGICAL SCIENCE REQUIREMENTS**

- ☐ \_\_\_\_\_ CHEM 161, General Chemistry (3)
☐ \_\_\_\_\_ CHEM 161L, General Chemistry Lab (1)
☐ \_\_\_\_\_ MATH 241, Calculus I (4)
☐ \_\_\_\_\_ PHYS 170, General Physics I (4)
☐ \_\_\_\_\_ PHYS 170L, General Physics I Lab (1)
☐ \_\_\_\_\_ CHEM 162, General Chemistry II (3)
☐ \_\_\_\_\_ CHEM 162L, General Chemistry Lab II (1)
☐ \_\_\_\_\_ MATH 242, Calculus II (4)
☐ \_\_\_\_\_ PHYS 272, General Physics II (3)
☐ \_\_\_\_\_ PHYS 272L, General Physics II Lab (1)

**ONE OF THE FOLLOWING BIOLOGICAL SCIENCE COURSES:** \_\_\_\_\_

- ☐ BIOL 171+L, Introductory Biology and Lab (4)
☐ ZOOL 101, Principles of Zoology (3)
☐ MICRO 130, General Microbiology (3)

**GG REQUIRED**(37credits)

- ☐ \_\_\_\_\_ GG 101 Dynamic Earth OR GG 103 (3) and
☐ \_\_\_\_\_ GG 101L Dynamic Earth Lab (1)
OR ☐ \_\_\_\_\_ GG 170 Physical Geology (4)
☐ \_\_\_\_\_ GG 200 Geological Inquiry (4)
☐ \_\_\_\_\_ GG 250 Scientific Programming (3)
☐ \_\_\_\_\_ • GG 301 Mineralogy (4)
☐ \_\_\_\_\_ • GG 302 Igneous & Metamorphic Petrology (3)
☐ \_\_\_\_\_ • GG 303 Structural Geology (3)
☐ \_\_\_\_\_ • GG 304 Physics of Earth & Planets (4)
OR ☐ \_\_\_\_\_ GG 450 Geophysical Methods (4)
☐ \_\_\_\_\_ • GG 305 Geological Field Methods (3)
☐ \_\_\_\_\_ • GG 309 Sedimentology & Stratigraphy (4)
☐ \_\_\_\_\_ • GG 325 Environmental Geochemistry (3)
☐ \_\_\_\_\_ • GG 410 Undergraduate Seminar (2)

**GG ELECTIVES** (11 credits)

With advice and consent of advisor, courses in other natural sciences, mathematics, or engineering may be substituted as electives.

- ☐ • GG 300, Volcanology (3)
☐ • GG 312, Geomathematics (3)
☐ • GG 399, Directed Reading (V)
☐ • GG 401, Introduction to Mineral Physics (3)
☐ • GG 406, Natural Disaster: Geoethics & the Layman (3)
☐ • GG 407, Energy & Mineral Resources (3)
☐ • GG 413, Geological Data Analysis I (3)
☐ • GG 420, Coastal Geology (3)
☐ • GG 421, Geologic Record of Climate Change (3)
☐ • GG 423, Marine Geology (3)
☐ • GG 425, Environmental Geochemistry (3)
☐ • GG 430, Geology & Mineral Resources of Asia (3)
☐ • GG 444, Plate Tectonics (3)
☐ • GG 451, Earthquakes (3)
☐ • GG 454, Engineering Geology (3)
☐ • GG 455, Hydrogeology (4)
☐ • GG 460, Geological Remote Sensing (4)
☐ • GG 461, Geospacial Information (3)
☐ • GG 466, Planetary Geology (3)
☐ • GG 499, Undergraduate Thesis (3)

☐ • \_\_\_\_\_ ( )

☐ • \_\_\_\_\_ ( )

☐ • \_\_\_\_\_ ( )

☐ • \_\_\_\_\_ ( )

\*\*\*\*\*

• Denotes upper division course

## G&G UNDERGRADUATE ADVISOR'S CHECKLIST FOR BA REQUIREMENTS

### TRACK: Environmental Earth Science

Boxes are checked off only if a grade of C (not C-) or better is earned in the course.

STUDENT'S NAME: \_\_\_\_\_

I.D. NUMBER: \_\_\_\_\_

EMAIL ADDRESS: \_\_\_\_\_@hawaii.edu

ADVISOR: \_\_\_\_\_

SEMESTER & YEAR ENTERED UHM: \_\_\_\_\_ GG: \_\_\_\_\_

UHM CLASS STATUS UPON ENTRY: \_\_\_\_\_

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### CHEMISTRY, MATH, PHYSICS & BIOLOGICAL SCIENCE REQUIREMENTS

- |  |  |
|--|--|
| <input type="checkbox"/> _____ CHEM 161, General Chemistry (3)                               | <input type="checkbox"/> _____ CHEM 162, General Chemistry II (3)      |
| <input type="checkbox"/> _____ CHEM 161L, General Chemistry Lab (1)                          | <input type="checkbox"/> _____ CHEM 162L, General Chemistry Lab II (1) |
| <input type="checkbox"/> _____ MATH 215, Applied Calculus <u>OR</u> MATH 241, Calculus I (4) |  |
| <input type="checkbox"/> _____ PHYS 151, College Physics I (3)                               | <input type="checkbox"/> _____ PHYS 152, College Physics II (3)        |
| <input type="checkbox"/> _____ PHYS 151L, College Physics I Lab (1)                          | <input type="checkbox"/> _____ PHYS 152L, College Physics II Lab (1)   |

### ONE OF THE FOLLOWING BIOLOGICAL SCIENCE COURSES:

- |  |  |
|--|--|
| <input type="checkbox"/> BIOL 171, Introductory Biology (3)  | <input type="checkbox"/> BOT 101, General Botany (3)         |
| <input type="checkbox"/> MICRO 130, General Microbiology (3) | <input type="checkbox"/> ZOOL 101, Principles of Zoology (3) |

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### **GG REQUIRED**(30 credits)

One of the following:

- |   |  |
|---|--|
| <input type="checkbox"/> _____ GG 101 Dynamic Earth (3)                   | <input type="checkbox"/> _____ GG 106 Humans and the Environment (3) |
| <input type="checkbox"/> _____ GG 102 Introduction to Global Change (3)   | <input type="checkbox"/> _____ GG 130 Geologic Hazards (3)           |
| <input type="checkbox"/> _____ GG 103 Geology of the Hawaiian Islands (3) | <input type="checkbox"/> _____ GG 170 Physical Geology (4)           |
| <input type="checkbox"/> _____ GG 104 Volcanoes in the Sea (3)            |  |

Each of the following:

- |  |   |
|--|---|
| <input type="checkbox"/> _____ GG 101L Dynamic Earth Lab (1) [unless GG 170 is taken]                                  | <input type="checkbox"/> _____ GG 410 Research Seminar (2)        |
| <input type="checkbox"/> _____ GG 200 Geological Inquiry (4)   | <input type="checkbox"/> _____ GG 455, Hydrogeology (4)           |
| <input type="checkbox"/> _____ GG 305 Geological Field Methods (3)   | <input type="checkbox"/> _____ GG 461, Geospatial Information (3) |
| <input type="checkbox"/> _____ GG 309 Sedimentology & Stratigraphy (4)   |   |
| <input type="checkbox"/> _____ GG 325 Fundamentals of Geochemistry (3) <u>OR</u> GG 425 Environmental Geochemistry (3) |   |

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### **SCIENCE ELECTIVES**; (Required: 15 credits)

- |  |   |
|--|---|
| <input type="checkbox"/> GG 250, Scientific Programming (3)            | <input type="checkbox"/> GG 425, Environmental Geochemistry (3)                             |
| <input type="checkbox"/> GG 300, Volcanology (3)                       | <input type="checkbox"/> GG 444, Plate Tectonics (3)  |
| <input type="checkbox"/> GG 301, Mineralogy (4)                        | <input type="checkbox"/> GG 450, Geophysical Methods (4)                                    |
| <input type="checkbox"/> GG 302, Igneous and Metamorphic Petrology (3) | <input type="checkbox"/> GG 451, Earthquakes (3)  |
| <input type="checkbox"/> GG 303, Structural Geology (3)                | <input type="checkbox"/> GG 454, Engineering Geology (3)                                    |
| <input type="checkbox"/> GG 304, Physics of Earth & Planets (4)        | <input type="checkbox"/> GG 466, Planetary Geology (3)                                      |
| <input type="checkbox"/> GG 312, Geomathematics (3)                    | <input type="checkbox"/> GG 499, Undergraduate Thesis (3)                                   |
| <input type="checkbox"/> GG 325, Fundamentals of Chemistry(3)          | <input type="checkbox"/> GEOG 405, Water in the Environment (3)                             |
| <input type="checkbox"/> GG 395, Undergraduate Internship (V)          | <input type="checkbox"/> NREM 477, Geographic Information Systems for Resource Managers (3) |
| <input type="checkbox"/> GG 399, Directed Reading (V)                  | <input type="checkbox"/> OCN 320, Aquatic Pollution (3)                                     |
| <input type="checkbox"/> GG 402, Hawaiian Geology (3)                  | <input type="checkbox"/> TPSS 304, Fundamentals of Soil Science (4)                         |
| <input type="checkbox"/> GG 406, Natural Disasters (3)                 |   |
| <input type="checkbox"/> GG 407, Energy & Mineral Resources (3)        | <input type="checkbox"/> _____  |
| <input type="checkbox"/> GG 413, Geological Data Analysis I (3)        | <input type="checkbox"/> _____  |
| <input type="checkbox"/> GG 420, Coastal Geology (3)                   | <input type="checkbox"/> _____  |
| <input type="checkbox"/> GG 421, Geologic Record of Climate Change (3) | <input type="checkbox"/> _____  |
| <input type="checkbox"/> GG 423, Marine Geology (3)                    | <input type="checkbox"/> _____  |



# G&G UNDERGRADUATE ADVISOR'S CHECKLIST FOR BA REQUIREMENTS

## TRACK: Earth Science Education

Boxes are checked off only if a grade of C (not C-) or better is earned in the course.

STUDENT'S NAME: \_\_\_\_\_

I.D. NUMBER: \_\_\_\_\_

EMAIL ADDRESS: \_\_\_\_\_@hawaii.edu

ADVISOR: \_\_\_\_\_

SEMESTER & YEAR ENTERED UHM: \_\_\_\_\_ GG: \_\_\_\_\_

UHM CLASS STATUS UPON ENTRY: \_\_\_\_\_

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### CHEMISTRY, MATH, PHYSICS & BIOLOGICAL SCIENCE REQUIREMENTS

- |  |  |
|--|--|
| <input type="checkbox"/> _____ CHEM 161, General Chemistry (3)                               | <input type="checkbox"/> _____ CHEM 162, General Chemistry II (3)      |
| <input type="checkbox"/> _____ CHEM 161L, General Chemistry Lab (1)                          | <input type="checkbox"/> _____ CHEM 162L, General Chemistry Lab II (1) |
| <input type="checkbox"/> _____ MATH 215, Applied Calculus <u>OR</u> MATH 241, Calculus I (4) |  |
| <input type="checkbox"/> _____ PHYS 151, College Physics I (3)                               | <input type="checkbox"/> _____ PHYS 152, College Physics II (3)        |
| <input type="checkbox"/> _____ PHYS 151L, College Physics I Lab (1)                          | <input type="checkbox"/> _____ PHYS 152L, College Physics II Lab (1)   |

### REQUIRED BIOLOGICAL SCIENCE COURSE & LAB:

- |   |   |
|---|---|
| <input type="checkbox"/> BIOL 171, Introductory Biology (3) | <input type="checkbox"/> BIOL 17L, Introductory Biology Lab (1) |
|---|---|

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### GG REQUIRED(30 credits)

One of the following:

- |  |   |
|--|---|
| <input type="checkbox"/> _____ GG 101, Dynamic Earth (3)                   | <input type="checkbox"/> _____ GG 106, Humans and the Environment (3) |
| <input type="checkbox"/> _____ GG 102, Introduction to Global Change (3)   | <input type="checkbox"/> _____ GG 130, Geologic Hazards (3)           |
| <input type="checkbox"/> _____ GG 103, Geology of the Hawaiian Islands (3) | <input type="checkbox"/> _____ GG 170, Physical Geology (4)           |
| <input type="checkbox"/> _____ GG 104, Volcanoes in the Sea (3)            |   |

Each of the following:

- |  |   |
|--|---|
| <input type="checkbox"/> _____ GG 101L, Dynamic Earth Lab (1) [unless GG 170 is taken] | <input type="checkbox"/> _____ OCN 201L, Science of the Sea Lab (1)         |
| <input type="checkbox"/> _____ MET 101, Introduction to Meteorology (3)                | <input type="checkbox"/> _____ GG 300, Volcanology (3)                      |
| <input type="checkbox"/> _____ MET 101L, Introduction to Meteorology Lab (1)           | <input type="checkbox"/> _____ GG 305, Geological Field Methods (3)         |
| <input type="checkbox"/> _____ GG 105, Voyage through Solar System (3)                 | <input type="checkbox"/> _____ OCN 310, Global Environmental Change (3)     |
| <input type="checkbox"/> _____ <u>OR</u> ASTR 110, Survey of Astronomy (3)             | <input type="checkbox"/> _____ GG 406, Natural Disasters (3)                |
| <input type="checkbox"/> _____ GG 200, Geological Inquiry (4)                          | <input type="checkbox"/> _____ ITE 401, Engaging the Adolescent Learner (3) |
| <input type="checkbox"/> _____ MET 200, Atmospheric Processes & Phenomena (3)          | <input type="checkbox"/> _____ GG 410, Research Seminar (2)                 |
| <input type="checkbox"/> _____ OCN 201, Science of the Sea (3)                         |   |

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### SCIENCE ELECTIVES: (Required: 5 credits)

- |  |   |
|--|---|
| <input type="checkbox"/> GG 301, Mineralogy (4)                        | <input type="checkbox"/> GG 425, Environmental Geochemistry (3)                               |
| <input type="checkbox"/> GG 302, Igneous and Metamorphic Petrology (3) | <input type="checkbox"/> GG 444, Plate Tectonics (3)  |
| <input type="checkbox"/> GG 303, Structural Geology (3)                | <input type="checkbox"/> GG 450, Geophysical Methods (4)                                      |
| <input type="checkbox"/> GG 304, Physics of Earth & Planets (4)        | <input type="checkbox"/> GG 451, Earthquakes (3)  |
| <input type="checkbox"/> GG 312, Geomathematics (3)                    | <input type="checkbox"/> GG 454, Engineering Geology (3)                                      |
| <input type="checkbox"/> GG 325, Fundamentals of Chemistry(3)          | <input type="checkbox"/> GG 455, Hydrogeology (4)   |
| <input type="checkbox"/> GG 395, Undergraduate Internship (V)          | <input type="checkbox"/> GG 460, Geological Remote Sensing (4)                                |
| <input type="checkbox"/> GG 399, Directed Reading (V)                  | <input type="checkbox"/> GG 461, Geospacial Information (3)                                   |
| <input type="checkbox"/> GG 402, Hawaiian Geology (3)                  | <input type="checkbox"/> GG 466, Planetary Geology (3)  |
| <input type="checkbox"/> GG 407, Energy & Mineral Resources (3)        | <input type="checkbox"/> GEOG 405, Water in the Environment (3)                               |
| <input type="checkbox"/> GG 413, Geological Data Analysis I (3)        | <input type="checkbox"/> NREM 477, Geographic Information Systems for Resource Managers (3)   |
| <input type="checkbox"/> GG 420, Coastal Geology (3)                   | <input type="checkbox"/> OCN 320, Aquatic Pollution (3)                                       |
| <input type="checkbox"/> GG 421, Geologic Record of Climate Change (3) | <input type="checkbox"/> OCN 331, Living Resources of the Sea (3)                             |
| <input type="checkbox"/> GG 423, Marine Geology (3)                    | <input type="checkbox"/> OCN 357, Ridge to Reef: Coastal Ecosystem Ecology & Connectivity (3) |
|  | <input type="checkbox"/> TPSS 304, Fundamentals of Soil Science (4)                           |

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## Bachelor of Science (BS), Geology & Geophysics: 4-Year Academic Plan (2015-2016)

Year <sup>1</sup>	CR	UD	Year <sup>2</sup>	CR	UD	Year <sup>3</sup>	CR	UD	Year <sup>4</sup>	CR	UD
Fall			Fall			Fall			Fall		
GG <sup>1</sup> 01	3	0	GG <sup>2</sup> 01	4	4	GG <sup>3</sup> 250	3	0	GG <sup>4</sup> 03	3	3
GG <sup>1</sup> 01L	1	0	CHEM <sup>2</sup> 62	3	0	PHYS <sup>3</sup> 52	3	0	GG <sup>4</sup> 10 <sup>2</sup>	2	2
MATH <sup>1</sup> 40	3	0	CHEM <sup>2</sup> 62L	1	0	PHYS <sup>3</sup> 52L	1	0	Elect <sup>3</sup> 00+ <sup>2</sup>	3	3
ENG <sup>1</sup> 00	3	0	DS	3	0	GG <sup>3</sup> Elect <sup>3</sup> 00+	3	3	Elect <sup>3</sup> 00+	3	3
FG	3	0	FG	3	0	Elect <sup>3</sup> 00+	3	3	Elect <sup>3</sup> 00+	3	3
HSL <sup>1</sup> 01	3	0				Elect	3	0	Elect	1	0
	<b>16</b>	<b>0</b>		<b>14</b>	<b>4</b>		<b>16</b>	<b>6</b>		<b>15</b>	<b>14</b>
Spring			Spring			Spring			Spring		
GG <sup>2</sup> 00	4	0	GG <sup>3</sup> 02	3	3	GG <sup>4</sup> 09 <sup>2</sup>	4	4	GG <sup>4</sup> 05 <sup>2</sup>	3	3
MATH <sup>2</sup> 41	4	0	PHYS <sup>3</sup> 51	3	0	GG <sup>4</sup> Elect <sup>3</sup> 00+	3	3	Elect <sup>3</sup> 00+	3	3
CHEM <sup>2</sup> 61	3	0	PHYS <sup>3</sup> 51L	1	0	DA/DH/DL	3	0	Elect <sup>3</sup> 00+	3	3
CHEM <sup>2</sup> 61L	1	0	DA/DH/DL	3	0	Elect <sup>3</sup> 00+	3	3	Elect <sup>3</sup>	3	0
HSL <sup>2</sup> 02	3	0	DS	3	0	Elect <sup>3</sup>	3	0	DB	3	0
	<b>15</b>	<b>0</b>		<b>13</b>	<b>3</b>		<b>16</b>	<b>10</b>		<b>15</b>	<b>9</b>
<b>Total Credits:</b>	<b>31</b>	<b>0</b>		<b>27</b>	<b>7</b>		<b>32</b>	<b>16</b>		<b>30</b>	<b>23</b>
									<b>Grand Total:</b>		
									Total UD Credits: 26		
									Total Credits: 20		

### University of Hawaii General Education Requirements:

- FG – Global & Multicultural Perspective course
- DA – Diversification course in the Arts
- DH – Diversification course in the Humanities
- DL – Diversification course in Literature
- DS – Diversification course in the Social Sciences

- Focus E – Contemporary Ethical Issues course
- Focus H – Hawaiian, Asia & Pacific Issues course
- Focus O – Oral communication course
- Focus W – Writing intensive course



# Bachelor of Arts (BA), Environmental Earth Science: 4 –Year Academic Plan (2015-2016)

## BA in Environmental Earth Science

(Internal Version)

Semester & Year 1: Fall		
Courses	Credits	UD Cr
GG101L	4	0
MATH40	3	0
ENG00(FW)	3	0
FG	3	0
OEST00	0	0
	13	0

Semester & Year 1: Spring		
Courses	Credits	UD Cr
GG200(W)	4	0
CHEM61+L	4	0
MATH15/241	4	0
FG	3	0
	15	0
	28	0

Semester & Year 2: Fall		
Courses	Credits	UD Cr
CHEM62+L	4	0
GGBiologyReq	3	0
DS	3	0
DH(H)	3	0
GG250/Elective	3	0
	13	0

Semester & Year 2: Spring		
Courses	Credits	UD Cr
GG09(W)	4	4
PHYS51+L	4	0
DS	3	0
DA/DL	3	0
	14	4
	30	10

Semester & Year 3: Fall		
Courses	Credits	UD Cr
GG10(O)	2	2
GG25	3	3
PHYS52+L	4	0
Elective	3	0
UDElective(W)	3	3
	15	8

Semester & Year 3: Spring		
Courses	Credits	UD Cr
GGlective	3	3
GGlective	3	3
Elective	3	0
Elective	4	0
UDElective(W)	3	3
	16	9
	31	17

Semester & Year 4: Fall		
Courses	Credits	UD Cr
GG61	3	3
GGlective	3	3
GGlective	3	3
UDElective(W)	3	3
UDElective	3	3
	15	15

Semester & Year 4: Spring		
Courses	Credits	UD Cr
GG05(W)	3	3
GG55	4	4
GGlective(E)	3	3
Elective	3	0
Elective	3	0
	16	10
	31	19

Focus designated courses are expected but not guaranteed.

Total: 120  
Upper Division: 66  
4/6/15  
Effective Fall 2015

- University of Hawaii General Education Requirements:
- FG – Global & Multicultural Perspective course
  - DA – Diversification course in the Arts
  - DH – Diversification course in the Humanities
  - DL – Diversification course in Literature
  - DS – Diversification course in the Social Sciences

- Focus E – Contemporary Ethical Issues course
- Focus H – Hawaiian, Asia & Pacific Issues course
- Focus O – Oral communication course
- Focus W – Writing intensive course